SYDNEY TRAINS

ENVIRONMENTAL SITE ASSESSMENT

SURPLUS DEPOT SITES - 20 EDDY ST, KIAMA, NSW 2533

SEPTEMBER 2019

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Environmental Site Assessment
Surplus Depot Sites - 20 Eddy St, Kiama, NSW 2533

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EXECUTIVE SUMMARY

Rail Corporation New South Wales (RailCorp) owns 18 former depot properties, which are now surplus to operational requirements. RailCorp and Sydney Trains are in the process of assessing these surplus properties to determine the potential future uses, considering re-purposing and/or divestment.

Sydney Trains commissioned WSP Australia Pty Ltd (WSP) to undertake a combined preliminary and detailed site investigation and hazardous materials survey at the former depot property located at 20 Eddy St, Kiama NSW, described as Lot 1 of Deposited Plan 883525 (the site). This report details the results of the preliminary and detailed site investigation; the hazardous materials survey is reported separately.

SCOPE OF WORK

The assessment included a desktop study, a site inspection and an intrusive soil assessment. Six boreholes were drilled and selected soil samples were analysed for:

- total recoverable hydrocarbons (TRH)
- benzene, toluene, ethylbenzene, xylene and naphthalene (BTEXN)
- polycyclic aromatic hydrocarbons (PAHs)
- polychlorinated biphenyls (PCBs)
- phenols
- metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc)
- organochlorine pesticides (OCPs)/organophosphate pesticides (OPPs).

SOIL RESULTS

Metals were detected above the LORs in all samples, for all of the eight metals analysed. Soil results for the fill and natural soil samples analysed showed exceedances of the adopted assessment criteria for arsenic, above human health criteria for low-density residential and public open space values. Ecological criteria were exceeded for arsenic and copper above values for areas of ecological significance, residential, open space and commercial/industrial uses.

TRH concentrations exceeded the limits of reporting (LORs) at one location, in two samples (BH04 – 0.2 and BH04 – 2.3), within the C_{34}-C_{40} fraction. PAH concentrations were recorded above the ecological assessment criteria in one sample (BH03 – 1.3). OCP concentrations were recorded above the LORs in two samples (BH04 – 0.2 and BH05 – 0.6). All these results were below the relevant adopted criteria.

BTEXN, phenols, OPPs and PCBs were below the LORs in all samples analysed.

CONCLUSIONS

The following represents the findings of the investigation:

- Historical aerial imagery indicates that the site was used for storage and warehouse purposes as early as 1963. The current building configuration was constructed between 1993 and 2002. Prior to this time, the surrounding area was primarily residential and commercial properties.
- The current surrounding land uses are residential to the north and west of the site, and commercial to the east and south of the site. The rail corridor runs south-west to north-east parallel to the site on the eastern boundary.

- Presumed synthetic mineral fibre insulation and PCB-containing capacitors insulation were identified. The condition of the presumed hazardous materials was described as good to fair condition and were all deemed to present a low risk.
- No asbestos-containing material was identified during the hazardous material survey nor in the observed soils in any of the borehole locations.
- No environment protection licences, clean-up orders, authorisations or applications were recorded for the site. The site is not listed on the NSW Environment Protection Authority contaminated sites register.
- Subsurface conditions generally comprised fill material to a maximum depth of 2.9 m below ground level (mBGL), generally overlaying a mottled brown and grey stiff clay.
- Metals were present in all of the samples analysed, although the majority of results are considered likely to be naturally occurring. Arsenic exceeded the adopted criteria for human health and/or ecological protection in four of the samples, and copper exceeded ecological criteria in one sample.

TRH, PAHs and DDT were detected across four samples, all below the adopted criteria. Exceedances of the human health criteria for arsenic were recorded for residential and open space uses. Under the site zoning, of SP2 – Infrastructure, there are a range of potential permissible land uses of varying sensitivities. WSP understands that the likely future use of the site is commercial/industrial use; given the analytical results WSP considers the site suitable for this use. If the site is redeveloped or divested for potential low density residential or open space, some remediation or management works (removal or capping of fill material) will be required.

Exceedances of the ecological assessment criteria were recorded, however based on the ecological value of the area and likely end use of the site, ecological protection is not a controlling factor. Due to the widespread presence of ecological exceedances at the site in shallow soil, terrestrial ecosystems may be significantly affected if extensive vegetation is proposed. Additional consideration of the risk to terrestrial ecosystems may be considered if required for future use.

A summary of site suitability findings is presented in Table ES.1.

Table ES.1 Future land use suitability

POTENTIAL FUTURE LAND USE	SUITABILTY	COMMENTS
Commercial/industrial	Suitable in current state	N/A
Medium to high density residential	Suitable in current state	N/A
Low density residential	Remediation/management required	Remediation works required if change in land use to residential prior to being deemed suitable.
Open space	Remediation/management required	Remediation works required if change in land use to open space prior to being deemed suitable.

1 INTRODUCTION AND OBJECTIVES

1.1 INTRODUCTION

Rail Corporation New South Wales (RailCorp) owns 18 former depot properties, which are now surplus to operational requirements. RailCorp and Sydney Trains are in the process of assessing these surplus properties to determine the potential future uses, considering re-purposing and/or divestment.

Sydney Trains commissioned WSP Australia Pty Ltd (WSP) to undertake a combined preliminary and detailed site investigation and hazardous materials survey at the former depot property located at 20 Eddy St, Kiama, NSW, described as Lot 1 of Deposited Plan 883525 (the site). The site location is presented in Figure 1, Appendix A. This report details the results of the preliminary and detailed site investigation; the hazardous materials survey is reported separately (reference: WSP 2019, *Kiama Depot, Hazardous Materials Survey*).

1.2 OBJECTIVES

WSP understands the objectives of the assessment works were to:

- document the relevant history of the site
- identify potential sources of contamination at the site, including potential off-site sources
- assess the nature and extent of contamination at the site
- assess the risk of any identified contamination within the context of the site
- assess the suitability of the site for potential land use scenarios (including residential, open space and commercial/industrial)
- where a site is unsuitable for the potential land uses, provide recommendations for making the site suitable for each use.

1.3 SCOPE OF WORKS

The scope of works for the site investigation included:

- desktop assessment of site history and setting, including commissioning of a property report by Land Insight and Resources Pty Ltd (Land Insight and Resources)
- review of hazardous materials survey reports (reference: WSP 2019, *Kiama Depot, Hazardous Materials Survey)*
- a site walkover to assess for potential sources of contamination
- preparation of a sampling analysis quality plan (SAQP)
- use of electromagnetic service location equipment to assess the sub-surface around the drilling locations for potential underground services
- drilling of six soil bores (BH01 to BH06) to a maximum depth of 2.5 m below ground level (mBGL) in an approximate grid pattern across the site
- logging of soils in accordance with Unified Soil Classification System (USCS) and AS1726-1993 Geotechnical Site Investigations

- collection of soil samples from each soil bore at the surface and at nominal depths of approximately 0.1 mBGL, 0.5 mBGL, 1.0 mBGL and every metre thereafter, as well as any additional depth intervals which exhibited visual or olfactory evidence of potential contamination
- field screening of soil samples using a hand-held photo-ionisation detector (PID) to evaluate the potential presence of volatile organic compounds (VOCs)
- analysis of selected soil samples at a National Association of Testing Authorities (NATA) accredited laboratory for potential contaminants of concern
- development of a conceptual site model (CSM)
- preparation of this report detailing the findings of the intrusive investigation, including identified risks and land use suitability for a contaminated land context

A plan showing all intrusive locations is included as Figure 2 in Appendix A.

1.4 TECHNICAL FRAMEWORK

The works were undertaken in accordance with standard WSP procedures, with reference (where applicable) to the following guideline documents:

- *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM; as amended 2013)
- Standards Australia 2005, *Guide to the Sampling and Investigation of Potentially Contaminated Soils Part 1. Non-Volatile and Semi-Volatile Compounds*, AS4482.1-2005
- Standards Australia 1999, *Guide to the Sampling and Investigation of Potentially Contaminated Soils Part 2. Volatile Substances*, AS4482.2-1999.
- NSW Government Office of Environment and Heritage 2011 (OEH), *Guidelines for Consultants Reporting on Contaminated Sites.*

2 SITE BACKGROUND INFORMATION AND SETTING

2.1 SITE LOCATION AND DESCRIPTION

The site is located in the residential zone of Kiama, approximately 700 m south of the town centre and approximately 250 m south-west of Kiama train station. The site is unused and contains a brick building and an adjoining metal building, with the site footprint sealed with asphalt or concrete, as shown in Figure 2 in Appendix A.

Table 2.1 Site identification details

Site address	20 Eddy St, Kiama, NSW 2533
Current owner	RailCorp
Lot/Plan	Lot 1 of Deposited Plan 883525
Zoning	SP2: Infrastructure (Railway) under *Kiama Local Environmental Plan 2011*
Local government authority	Municipality of Kiama
Current land use	Currently unused, formerly a depot
Proposed land use	Re-purposing and/or divestment to use commensurate with zoning WSP understands that the likely future use of the site will be continuation of the SP2 (railway infrastructure) zoning with possible additional commercial/industrial uses.
Site area	1,424 m^2

2.2 SURROUNDING LAND USE

Surrounding land uses include:

- North – Eddy Street, then residential properties, places of worship and community facilities
- East – The railway then commercial properties (medical practise and chemist), followed by Coronation Park and Kiama Beach
- South – The railway line then commercial buildings (a café and a few shops), followed by Manning Street
- West – Eddy Street, then the Kiama Bowling Club and residential buildings beyond.

2.3 SITE PHYSICAL SETTING

2.3.1 TOPOGRAPHY

The site is situated between approximately 9 and 15 metres in Australian Height Datum (mAHD). The general slope of the site is towards the south-west.

2.3.2 REGIONAL GEOLOGY

The site is underlain by Palaeozoic aged Shoalhaven Group deposits comprising trachyte tuff with pebbly bands (NSW Statewide Geology 1:250 000 map).

2.3.3 ACID SULFATE SOILS

A search of the Australian Soil Resource Information System (ASRIS) indicated that soil at the site is classified as low probability of acid sulfate soils (ASS) occurrence.

2.3.4 REGIONAL HYDROLOGY

The nearest surface water body is Kiama Beach, approximately 250 m east of the site. Approximately 330 m south of the site is a tributary of Spring Creek, which flows directly into the ocean at Kiama Beach.

2.3.5 HYDROGEOLOGY

According to the Land Insight and Resources report (presented in Appendix B) there are seven registered bores within 1 km of the site. Details are summarised in Table 2.2.

Table 2.2 Groundwater bore search

BORE ID	DATE OF COMPLETION	DEPTH (mBGL)	REGISTERED USE	DISTANCE FROM SITE	STANDING WATER LEVEL (mBGL)
GW111161	19/04/2007	4.3	Monitoring	73 m north-east	-
GW111162	18/04/2007	7.0	Monitoring	128 m north-east	-
GW111163	19/04/2007	7.1	Monitoring	147 m north-east	-
GW107387	18/02/2004	4.5	Monitoring	670 m north	3.8
GW107388	18/02/2004	4.0	Monitoring	670 m north	2.3
GW107389	18/02/2004	3.3	Monitoring	680 m north	-
GW013278	01/04/1948	0.0	Water Supply	790 m south-west	-

A review of the Australia State of the Environment (2016) groundwater resources database (https://soe.environment.gov.au/theme/inland-water/topic/2016/groundwater-resources, accessed on 7 June 2019 revealed that the site is located within a fractured or fissured regional aquifer of low to moderate productivity.

2.4 CONTAMINATED SITE REGISTER

According to the Land Insight and Resources report there is one site within 1 km that has been notified to the NSW Environment Protection Authority (EPA); a former gasworks, located at 105-109 and 113 Shoalhaven Street, Kiama, 133 m west of the site. The site is listed as not requiring regulation under the *Contaminated Land Management Act 1997* (NSW).

2.5 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997 REGISTER

According to the Land Insight and Resources report there are no sites within 500 m of the site listed on the *Protection of the Environment Operations Act 1997* (NSW) public register as holding an environment protection licence (EPL).

The report further describes a range of potentially contaminated properties surrounding the site at various distances. Three sites within a 200 metre radius that may have potentially contaminating activities including a garden supply retailer, mechanical repair facility and building material supplier.

2.6 HISTORICAL AERIAL PHOTOGRAPHY REVIEW

A review of historical aerial photography covering the site and surrounding area was undertaken with a summary of the observed land use changes described in Table 2.3. Historical aerial photographs obtained from Land Insight and Resources are included Appendix B.

Table 2.3 Summary of aerial photographs

1963	**Site:** The site consisted of five small structures, possibly storage units, along the eastern border. **Surrounding area:** Eddy Street was present adjacent to the western border and continuing north toward Kiama Railway Station and Black Beach. The railway was present along the eastern border. Land to the north, south and west was occupied by commercial property as well as low to medium density residential properties. Kiama Bowling Club was directly west and Coronation Park and Kiama Surf Beach further east of the site.
1970	**Site:** The site consisted of cleared land. **Surrounding area:** No significant changes from the 1963 aerial photograph.
1974	**Site:** The site consisted of one small structure, possibly a storage unit, in the central area. **Surrounding area:** No significant changes from the 1970 aerial photograph.
1984	**Site:** An additional structure was present in the centre of the site. **Surrounding area:** No significant changes from the 1974 aerial photograph.
1993	**Site:** No significant changes from the 1984 aerial photograph. **Surrounding area:** A carnival is present to the north-east of Coronation Park. No other significant changes since the 1984 aerial photograph.
2002	**Site:** This site was occupied by two larger buildings, consistent with the brick building and metal clad building present today. Several cars were parked different areas of the site. **Surrounding area:** Slight infrastructural development occurred south of the site with the addition of a roundabout at the intersection between Barney and Manning Street.
2008	**Site:** No significant changes from the 2002 aerial photograph. **Surrounding area:** Slight development to the railway occurred outside the northern border.
2010	**Site:** No significant changes from the 2008 aerial photograph. **Surrounding area:** No significant changes from the 2008 aerial photograph.
2014	**Site:** Two small storage units were added in the south of the site. **Surrounding area:** No significant changes from the 2010 aerial photograph.

2016	**Site:** A third storage unit was added in the south of the site. **Surrounding area:** No significant changes from the 2014 aerial photograph.
2018	**Site:** The storage units previously on site were removed. The site consisted of the brick building and metal clad building as is evident in present time. **Surrounding area:** No significant changes from the 2016 aerial photograph.

2.7 DANGEROUS GOODS LICENSE REVIEW

A search of the records held by SafeWork NSW indicates the site has no record of holding dangerous goods licenses.

2.8 HISTORICAL LAND TITLE REVIEW

Available land titles reviewed by WSP indicate the site was owned by Railway Commissioners of NSW, now referred to as Rail Corporation NSW, since 1893.

2.9 SENSITIVE ENVIRONMENTAL RECEPTORS

Based on the site setting, sensitive receptors potentially include:

- workers at the site and maintenance/underground workers
- future site users after divestment (presumed to be in accordance with zoning)
- residential occupants to the north and commercial occupants to the west of the site
- users of groundwater bores registered for recreational and domestic use within a 1 km radius of the site.

2.10 SITE WALKOVER

An inspection of the site was conducted on 20 May 2019. A site layout figure is presented as Figure 2 in Appendix A. Pertinent site photographs are included in Appendix C.

The site is two adjoining rectangles enclosed by a fence line, with the rail corridor to the east and Eddy Street to the west. The site is generally flat and surfaced with asphalt. Two access gates provide entry to the site. There is a small carpark along the southern portion.

The site is occupied by one large brick building and one adjoining large metal shed, with two roller door shutters. The building and warehouse house walls were in good condition with no visible signs of deterioration. The buildings were covered concrete hardstand that had no visible cracks.

Cameron Penny, the Sydney Trains site contact, was interviewed during the site inspection. Mr Penny confirmed the site was unmanned and not utilised by Sydney Trains anymore. He indicated that when the site was operation, it was used as an emergency response centre for the rail corridor. The site did not have any distinguishable features to suggest any areas of potential concern.

2.11 HAZARDOUS MATERIALS SURVEY FINDINGS

Pertinent findings of the hazardous materials survey have been summarised as follows:

- presumed synthetic mineral fibres (SMF) insulation was identified on the underside of the internal roof

- presumed PCBs containing capacitors were identified in the external light fittings due to age and appearance of electrical fittings.

The condition of the presumed and identified hazardous materials were described as good to fair condition and were all deemed to present a low risk.

2.12 PRELIMINARY CONCEPTUAL SITE MODEL

Based on the site inspection and the desktop review of site setting and historical land use information, a preliminary conceptual site model (CSM) was prepared. This is summarised in Table 2.4.

Table 2.4 Preliminary CSM

Likely sources of impact	Likely sources of impact at the site include: — importation of fill material — storage of chemicals including solvents, paints, oils, etc. — storage and use of diesel.
Contaminants of concern	Contaminants of concern at the site comprise: — total recoverable hydrocarbons (TRH) — benzene, toluene, ethylbenzene and xylene (BTEXN) — polycyclic aromatic hydrocarbons (PAHs) — polychlorinated biphenyl (PCBs) — phenols — metals — organochlorine pesticides (OCPs)/organophosphate pesticides (OPPs) — asbestos
Potential exposure pathways	Potential exposure pathways include: — ingestion of, and dermal contact with, impacted soil or groundwater — inhalation of dust from contaminated soil — inhalation of vapour in on-site buildings — inhalation of vapour in shallow excavation trenches.
Potential sensitive receptors	Based on the site setting, sensitive receptors potentially include: — workers at the site and maintenance/underground workers — future site users after divestment (presumed to be in accordance with zoning) — commercial receptors to the west of the site. — users of groundwater bores registered for recreational and domestic use within a 1 km radius of the site.

3 DATA QUALITY OBJECTIVES

Systematic planning is critical to successful execution of any assessment and is used to define the type, quantity and quality of data needed to inform decisions. The United States Environmental Protection Agency has defined a process for establishing data quality objectives (DQOs) that is referenced in the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM; as amended 2013). The DQO process ensures that:

- the study objectives are set
- appropriate types of data are collected to meet study objectives
- the tolerance levels are set for potential decision errors.

The DQO process is a seven-step iterative planning approach. The outputs of the DQO process are qualitative and quantitative statements which are developed in the first six steps. They define the purpose of the data collection effort, clarify what the data should represent to satisfy this purpose and specify the performance requirements for the quality of information to be obtained from the data. The output from the first six steps is then used in the seventh step to develop the data collection design that meets all performance criteria and other design requirements and constraints. The DQO process adopted for the works is summarised in Table 3.1.

Table 3.1 DQO process

STEP	DESCRIPTION	OUTCOME
1	State the problem	RailCorp and Sydney Trains want to assess surplus depot sites to determine the potential future uses, which may lead to re-purposing and/or divestment. The investigations are required to assess the nature and extent of any potential contamination at each site.
2	Identify the decisions	The decisions to be made based on the results of the investigation are as follows: — Have the potentially impacted media been adequately sampled and analysed to document the baseline condition of the site? — Were all the potential sources identified and targeted and contaminants of concern analysed? — Is there potential risk to current or future users or occupiers of the site?
3	Identify the inputs to the decision	The inputs required to make the above decisions are as follows: — site history and setting — geological and hydrogeological data — concentrations of contaminants of concern — site assessment criteria (outlined in Section 5) — observation data including presence of odours or discoloration — distribution of identified contamination.
4	Identify the study boundaries/constraints on data	The boundaries of the investigation(s) have been identified as follows: — Spatial boundaries: the spatial boundary of the investigation area is defined as the geographical extent of each site (see Figure 1) and the depth of investigation. — Temporal boundaries: the date of the project inception (May 2019) to the completion of the fieldwork under the proposed investigation.

STEP	DESCRIPTION	OUTCOME
5	Develop a decision rule	Analytical results were compared against the adopted site assessment criteria comprising human-health and ecological investigation and screening levels for permittable future uses. If concentrations exceeded the site criteria, then consideration of the potential risk to receptors was assessed. Where potential risk is identified then further assessment, mitigation or remediation will be recommended.
6	Specify limits on decision errors	The acceptable limits on decision errors to be applied in the investigation and the manner of addressing possible decision errors have been developed based on the data quality indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness and are presented in Section 3.1.
7	Optimise the design for obtaining data	This assessment has been designed considering the available information regarding the site. The resource effective data collection design that is expected to satisfy the DQOs is described in detail in Section 4. To ensure the design satisfies the DQOs, DQIs have been established to set acceptance limits on field methodologies and laboratory data collected.

3.1 DATA QUALITY INDICATORS

DQIs for sampling techniques and laboratory analyses of collected representative soil samples define the acceptable level of error required for the assessment works The field methodologies and data obtained will be assessed with reference to the following measures:

- precision: a quantitative measure of the variability (or reproducibility) of data
- accuracy: a quantitative measure of the closeness of reported data to the true value
- representativeness: the confidence (expressed qualitatively) that data is representative of each media present on the site
- comparability: a qualitative parameter expressing the confidence with which one data set can be compared with another
- completeness: a measure of the amount of useable data (expressed as %) from a data collection activity.

A summary of the field and laboratory DQIs that will be considered are detailed in Tables 3.2 and 3.3.

Table 3.2 DQIs for field methodologies

MEASURE	DQI
PRECISION	
Standard operating procedures (SOPs)	SOPs appropriate and complied with
Field duplicates	Duplicates collected and analysed at a rate of at least 1 pair (intra- and inter-laboratory duplicates) per 20 primary samples
ACCURACY	
SOPs	SOPs appropriate and complied with
Blank samples	A rinsate blank was collected each day to assess potential for cross-contamination during sampling. A transport blank was prepared by the laboratory and transported with the samples to assess the potential for cross-contamination during storage and transport.
REPRESENTATIVENESS	
Media	Appropriate media sampled to collect data, including consideration of the potential for groundwater impact
COMPARABILITY	
SOPs	Same SOPs used on each occasion
Field staff	Experienced field staff used to complete work
Environmental conditions	Relevant conditions recorded and considered (temperature, rain, wind, etc.)
Sampling	Same type of samples collected
COMPLETENESS	
SOPs	SOPs appropriate and complied with
Sampling	All required samples collected

Table 3.3 DQIs for laboratory analysis

MEASURE	DQI
PRECISION	
Duplicate sample results	Relative per cent differences (RPDs) within acceptance limits, detailed in Section 8.1.
Laboratory-prepared trip blanks	Below limits of reporting (LORs)
Laboratory method blanks	Below LORs
Laboratory method spikes and duplicates	Recovery between 70% and 130%
Laboratory accreditation	National Association of Testing Authorities (NATA) certified for analyses requested
ACCURACY	
Sample holding times	All holding times met
Sample analytical methods used	As per NEPM (2013)
REPRESENTATIVENESS	
Sample analysis	All required samples analysed
COMPARABILITY	
Sample analytical methods used	As per NEPM (2013)
Same units	Justify/quantify if different
Same laboratories	Justify/quantify if different
Same LORs	Justify/quantify if different
COMPLETENESS	
Sample analysis	All critical samples analysed All required analytes analysed
Sample documentation	All required documentation complete

4 SAMPLING ANALYSIS PLAN

4.1 SAMPLING PLAN AND RATIONALE

A sampling, analysis and quality plan (SAQP) for the surplus depot program, covering the site, was developed by WSP with respect to known site uses and potential contaminants of concern (WSP 2019). The number of exploratory locations at the site was designed in general accordance with Table A of the *Sampling Design Guidelines* (NSW EPA, 1995).

Chosen sampling locations were systematic, in a grid-based pattern (not targeted), taking into consideration the presence of known underground and aboveground services and physical limitations of subsurface conditions. A minimum of two soil samples per location were collected and analysed for the main contaminants of concern.

Based on the initial desktop assessment and the site inspection, it was considered that soil sampling alone would be suitable for assessing the contamination status at the site. WSP considered that the likely sources of impact would be surficial in nature (uncontrolled filling, leaks and spills from aboveground chemical or fuel storage, etc.) that have limited ability to cause impact to groundwater.

The sampling locations for the site are included in Figure 2 in Appendix A.

4.2 FIELDWORK

Fieldworks were conducted on the following dates:

- 20 May 2019: Site inspection
- 11 June 2019: Utility locating, intrusive investigations
- 12 June 2019: hazardous materials inspection

4.2.1 SOIL ASSESSMENT METHODOLOGY

The soil assessment methodology is summarised in Table 4.1.

Table 4.1 Soil investigation methods

ACTIVITY	DETAILS
Service location	All soil bore locations were checked for the potential presence of buried services by a professional services locator before the commencement of the field investigations. Underground service plans for the area were obtained prior to the commencement of the investigations and used to assist with locating underground services. This included requesting any available plans from Sydney Trains showing rail infrastructure.
Concrete cutting	Concrete cutting was conducted where required at bore locations to allow intrusive soil investigations beneath the existing concrete/bitumen hard standing.
Drilling method	Soil bores were drilled using a combination of hand augering (to a minimum of 1.5 m below ground level (mBGL)) and solid flight auger drilling (depending on ground conditions) by a professional drilling company (Stratacore). Soil bores were generally advanced to a minimum depth of 0.5 m into residual soils unless refusal was encountered. If visual or olfactory evidence of contamination was noted, boreholes were extended 0.5 m beyond the extent of observed contamination to adequately characterise both the fill material and underlying natural soils.

ACTIVITY	DETAILS
Soil logging	Soils were logged based on field interpretation and consistent with AS 1726-1993 Australian Standard Geotechnical site investigations.
Field screening	Soil samples were screened in the field using a photo-ionisation detector (PID) unit calibrated to a known concentration of isobutylene gas (100 parts per million) prior to testing. The PID unit used was fitted with a 10.6 eV globe, considered suitable for the field screening of most common volatile contaminants of concern.
Soil sampling method	Soil augers were removed periodically during drilling works and samples were obtained from the relevant intervals. Soil samples were handled using disposable nitrile gloves and samples were stored in glass jars supplied by the primary laboratory. Gloves were changed prior to the collection of each new sample.
Soil sample preservation	Soil samples were stored on ice in an insulated container immediately after sampling. Samples were kept chilled prior to and during delivery to the laboratory.
Soil bore abandonment	Soil bores were backfilled using drill cuttings with the surface finished with a capping consistent with the surrounding surface material.

4.3 LABORATORY ANALYSIS

Primary soil samples and intra-laboratory samples were analysed by Eurofins Environmental Testing Australia Pty Ltd (Eurofins), with inter-laboratory duplicate samples analysed by Australian Laboratory Services Pty Ltd (ALS). Both laboratories are accredited by NATA for the analytical suites to be conducted. A summary of the soil laboratory analysis undertaken is provided Table 4.3.

Table 4.2 Soils laboratory analysis plan

ANALYTES	PRIMARY SAMPLES	DUPLICATE PAIRS	RINSATE BLANKS	TRANSPORT BLANKS[1]	TOTAL
TRH, BTEXN, PAHs, metals, OCPs, OPPS, PCBs, phenols	12	1	1	1	16

(1) Analysed for TRH and BTEXN only

5 ASSESSMENT CRITERIA

To assess the relative concentrations and significance of any potential contaminants detected through laboratory analysis it is usual to reference established human health and environmental screening criteria. Whilst the objective of this assessment is to document the current condition of the site, these contaminant screening criteria will also be used to represent threshold concentrations of specific contaminants which, if exceeded in a given sample, may pose a health or environmental risk.

Schedule B1 of the NEPM (2013) defines health investigation levels (HILs) that have been developed for a range of metals and organic contaminants in soil. HILs are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. The HILs are applicable to all soil types and generally apply to the top 3 m of soil. HILs have been developed for four generic land use settings:

- HIL A: Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools)
- HIL B: Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats
- HIL C: Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary school fields and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate
- HIL D: Commercial/industrial such as shops, offices, factories and industrial sites.

It is anticipated that the end use is likely to be commercial/industrial. However, as the end use of the sites have not been confirmed, WSP has screened soil results against all four criteria to determine potential risks.

Health screening levels (HSLs) have been developed for selected petroleum compounds and fractions and are applicable for assessing human health risk via the vapour intrusion and inhalation pathway. The HSLs depend on specific soil physicochemical properties and land use scenarios, and apply to different soil types and depths. Again, as the final end use of the sites have not been confirmed, WSP has screened soil results against criteria for all land uses, with the soil type selected to be based of observations of the geology encountered during the assessment works.

The NEPM (2013) also outlines ecological investigation levels (EILs) developed for selected metals and organic substances. These are applicable for assessing risk to terrestrial ecosystems. EILs depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2 m of soil. EILs have been developed for three generic land use settings:

- areas of ecological significance
- urban residential areas and public open space
- commercial and industrial land uses.

Soil results will be compared to urban residential areas/public open space and commercial and industrial land use criteria. Additional soil parameters are required to calculate EILs for chromium, copper, nickel and zinc. One sample was analysed for pH, CEC and clay content to determine site-specific EILs.

Ecological screening levels (ESLs) have been also been developed for selected petroleum hydrocarbon compounds and TRH fractions and are applicable for assessing risk to terrestrial ecosystems. ESLs broadly apply to coarse and fine-grained soils and various land uses and, like EILs, are generally applicable to the top 2 m of soil. As with health-based screening levels, these criteria are screening criteria only; exceedances of these criteria are triggers to undertake additional assessment of the risk to terrestrial ecosystems.

Adopted criteria are included in the analytical summary tables in Appendix E.

6 INVESTIGATION RESULTS

6.1 SOIL RESULTS

6.1.1 SOIL PROFILE

Soil borehole logs are included in Appendix D and provide details of soil types encountered at each of the sampling locations.

Surficial material across the site consisted of a bitumen and road base layer. Fill material was encountered in all six sampling locations at depths between 0.1 mBGL and 2.8 mBGL. The underlying fill material generally consisted of a brown gravelly sand, with anthropogenic material inclusions and high ballast content. The fill material gradually increased in clay content down to approximately 2.5 mBGL where natural grey brown clays were encountered.

6.1.2 FIELD SCREENING

No visual or olfactory evidence of contamination was observed in any of the six soil bores drilled as part of the assessment. A maximum PID reading of 5.1 parts per million was recorded was recorded at location BH01 (1.5 mBGL).

6.1.3 SOIL ANALYTICAL CHEMICAL RESULTS

Copies of laboratory certificates are included in Appendix G and summary tables of soil analytical results are included in Appendix E.

Metals were detected above the LORs in all samples. Concentrations of arsenic were recorded above the human health assessment criteria for low density residential and open space use.

TRH in the C_{34}-C_{40} fraction was above the LOR at one location, in both samples analysed from BH04 (BH04 – 0.2 and BH04 – 2.3). These concentrations were below the adopted criteria.

Benzo(a)pyrene concentrations were recorded exceeding the ecological assessment criteria in one sample (BH03 – 1.3).

OCP concentrations were recorded above the LORs in two samples (BH04 – 0.2 and BH05 – 0.6),but were below the adopted criteria.

BTEXN, phenols, OPPs and PCBs were below the LORs in all samples analysed.

Table 6.1 shows the exceedances.

Table 6.1 Adopted assessment exceedances – Human health

GUIDELINES	ANALYTE ASSESSMENT CRITERIA (mg/kg)	SAMPLE ID (CONCENTRATION IN mg/kg)
NEPM 2013 – HILs Residential A	Arsenic (100)	BH01_ 0.7 (120), BH01_1.5 (170), BH03_ 1.3 (480) and BH05_0.6 (150)
NEPM 2013 – HILs Recreational C	Arsenic (300)	BH03_ 1.3 (480)

Table 6.2 Adopted assessment exceedances – Ecological

GUIDELINES	ANALYTE ASSESSMENT CRITERIA (mg/kg)	SAMPLE ID (CONCENTRATION IN mg/kg)
NEPM 2013 EILs – Urban residential and public open space	Arsenic (100)	BH01_ 0.7 (120), BH01_1.5 (170), BH03_ 1.3 (480) and BH05_0.6 (150)

GUIDELINES	ANALYTE ASSESSMENT CRITERIA (mg/kg)	SAMPLE ID (CONCENTRATION IN mg/kg)
	Copper (250)	BH03_0.1 (260)
NEPM 2013 EILs – Commercial/industrial	Arsenic (160)	BH01_ 1.5 (170) and BH03_ 1.3 (480)
NEPM 2013 ESLs – Urban residential and public open space	Benzo(a)pyrene (0.7)	BH03_1.3 (0.9)

7 QUALITY ASSURANCE AND CONTROL

7.1 FIELD QA/QC

Analytical results and RPD calculations for the intra-laboratory field duplicate are included in the analytical results tables in Appendix F.

The precision of the results for each analyte between the primary sample and the field duplicate was determined by calculating the RPD, as follows:

$$RPD = \frac{(Concentration\ 1 - Concentration\ 2)\ x\ 100}{(Concentration\ 1 + Concentration\ 2)\ /\ 2}$$

Based on Australian Standard AS 4482.1-2005, a field duplicate RPD within the range of 30% to 50% is considered acceptable. Generally higher RPD values occur for organic compounds than for metals and where low concentrations of an analyte are recorded.

Table 7.1 Field QA/QC procedures

QA/QC REQUIREMENT	COMPLETED?	COMMENTS
Appropriate sampling strategy used and representative samples collected	Yes	The adopted sampling methodology was in accordance with AS4482.1:2005.
Field instruments calibrated	Yes	Field equipment including the PID was calibrated in the field prior to use.
Appropriate and well documented sample collection, handling, transportation and decontamination procedures	Yes	All sample collection and transportation was conducted in accordance with WSP contaminated land management procedures which have been developed in accordance with published industry guidelines and standards and best practice.
Chain of custody documentation completed	Yes	All samples were transported under WSP chain of custody procedures and signed chain of custody documents are included in Appendix G.
Required number (1:20) of blind field replicates collected	Yes	A minimum 20% quality control duplicates were collected for the primary contaminants of concern.

QA/QC REQUIREMENT	COMPLETED?	COMMENTS
Acceptable soil QC sample RPD results	Yes	Soil RPD results for the intra- and inter-laboratory duplicate sample pair are included in the analytical results tables in Appendix F. There were a number of RPD exceedances with the intra and inter laboratory replicates: — BH06 – 0.5 and intra-laboratory duplicate QC01 for lead, RPD of 33%, and zinc, RPD of 33% — BH06 – 0.5 and inter-laboratory duplicate QC01A for arsenic, RPD of 48%, and copper, RPD of 55%. These are outside the acceptable range for the soil sampling, however exceedances are likely attributed to the heterogeneity within the soil matrix and are minor. The potential variability is typical for fill material and does not affect the outcome of the report.
Required numbers of blank/spike samples collected	Yes	One trip blank and one trip spike were collected for the sample batch.
Acceptable blank results	Yes	Trip blank results were reported below the laboratory LORs.
Samples delivered to laboratories within sample holding times and with correct preservative(s)	Yes	Samples were delivered to the laboratories within the sample holding times and in laboratory-supplied containers prepared with the appropriate preservative (where required) as documented on the sample receipt notices issued by the laboratory.

7.2 LABORATORY QA/QC

Table 7.2 indicates conformance to laboratory QA/QC procedures.

The results of internal laboratory quality control procedures are provided with the laboratory reports (Appendix G). The acceptance criteria for internal laboratory replicates is generally set at an RPD of 20% to 50%. Laboratory recoveries should be in the range 75% to 125%.

Table 7.2 Laboratory QA/QC procedures

QA/QC REQUIREMENT	COMPLETED	COMMENTS
Samples extracted and analysed within relevant holding times	Yes	Refer to Eurofins quality control report in Appendix G.
All analyses NATA accredited	Yes	Eurofins is NATA accredited for all the analyses performed.
Appropriate analytical methodologies used, in accordance with Schedule B(3) of the NEPM	Yes	Refer to the quality control report in Appendix G for methods used and relevance to Schedule B(3) of the NEPM.
Acceptable laboratory LORs adopted	Yes	All LORs were below the adopted assessment criteria where specified.

QA/QC REQUIREMENT	COMPLETED	COMMENTS
Acceptable laboratory QC results	Mostly	A summary of the limits of reporting adopted are provided in the laboratory analysis reports in Appendix G.

Overall, it was considered that the QA/QC procedures and results were generally adequate and that the analytical results obtained were of acceptable quality for the purposes of this report.

8 DISCUSSION OF RESULTS

The majority of analytes were below the laboratory LORs and therefore below the assessment criteria. Detections of metals, in some cases exceeding human health or ecological criteria, were present across the site. Concentrations of metals were generally even distributed laterally and vertically, and may represent natural background conditions rather than contamination. Some arsenic results in the fill material were elevated above the natural soils.

TRH, PAHs and DDT were detected across four samples; BH03_ 1.3, BH04_ 0.2, BH04_ 2.3 and BH05_0.6. Three of these samples are in fill material and one is in natural soil. Although none of the results exceeded any adopted criteria, they do indicate some contamination is present in fill material at the site. This is not considered to present a risk to identified receptors under the potential future land uses.

8.1 UPDATED CONCEPTUAL SITE MODEL

The CSM for the site has been updated based on the findings of the investigation. It is summarised in Table 8.1.

Table 8.1 Preliminary CSM

Likely sources of impact	Likely sources of impact at the site include: — importation of fill material — storage of chemicals including solvents, paints, oils, etc. — storage and use of diesel.
Contaminants of concern	Contaminants of concern at the site comprise: — PAHs — metals.
Potential exposure pathways	Potential exposure pathways include: — ingestion of, and dermal contact with, impacted soil or groundwater.
Potential sensitive receptors	Based on the site setting, sensitive receptors potentially include: — workers at the site and maintenance/underground workers — future site users after divestment (presumed to be in accordance with zoning) — commercial receptors to the west of the site.

There are currently no complete exposure pathways as the site disused or if the site is redeveloped for commercial/industrial purposes. If the site is divested or redeveloped for low density residential or open space use, potential complete exposure pathways for direct contact would exist.

9 CONCLUSIONS AND RECOMMENDATIONS

The assessment included a desktop study, a site inspection and an intrusive soil assessment. The following represents the findings of the investigation

- The site structures consisted of a large brick building with an adjoining metal building to the north. The remaining site footprint is sealed with asphalt, with the exception of small grassed areas along some boundaries. A disused train turntable is situated directly north of the site.
- Historical aerial imagery indicates that the site was used for storage and warehouse purposes from 1961 onwards. The current building configuration was constructed between 1993 and 2002. Prior to this time, the surrounding area was primarily residential and commercial properties.
- No EPA environment protection or clean-up orders, authorisations or applications were recorded for the site. The site is not listed on the NSW EPA contaminated sites register.
- The current surrounding land uses are residential to the north and west of the site, and commercial to the east and south of the site. The rail corridor runs south-west to north-east parallel to the site on the eastern boundary.
- Presumed SMF insulation and PCB-containing capacitors insulation were identified. The condition of the presumed hazardous materials was described as good to fair condition and were all deemed to present a low risk.
- No asbestos-containing material was identified during the hazardous material survey nor in the observed soils in any of the borehole locations.
- Site subsurface conditions generally comprise of fill material to a maximum depth of 2.9 mBGL, generally overlaying a mottle brown and grey firm clay.
- Metals were present in all of the samples analysed, although the majority of results are considered likely to be naturally occurring. Arsenic exceeded the adopted criteria for human health and/or ecological protection in four of the samples, and copper exceeded ecological criteria in one sample.
- TRH, PAHs and DDT were detected across four samples, all below the adopted criteria.

Exceedances of the human health criteria were recorded for low density residential and open space uses. Under the site zoning, of SP2 – Infrastructure, there are a range of potential permissible land uses of varying sensitivities. WSP understands that the likely future use of the site is commercial/industrial use; given the analytical results WSP considers the site suitable for this use. If the site is redeveloped or divested for potential low density residential or open space, some remediation or management works (removal or capping of fill material) will be required.

Exceedances of the ecological assessment criteria were recorded, however based on the ecological value of the area and likely end use of the site, ecological protection is not a controlling factor. Due to the widespread presence of ecological exceedances at the site in shallow soil, terrestrial ecosystems may be significantly affected if extensive vegetation is proposed. Additional consideration of the risk to terrestrial ecosystems may be considered if required for future use.

A summary of site suitability findings is presented in Table 9.1.

Table 9.1 Future land use suitability

POTENTIAL FUTURE LAND USE	SUITABILTY	COMMENTS
Commercial/industrial	Suitable in current state	N/A
Medium to high density residential	Suitable in current state	N/A

POTENTIAL FUTURE LAND USE	SUITABILTY	COMMENTS
Low density residential	Remediation/management required	Remediation works required if change in land use to residential prior to being deemed suitable.
Open space	Remediation/management required	Remediation works required if change in land use to open space prior to being deemed suitable.

10 LIMITATIONS

This Report is provided by WSP Australia Pty Limited (WSP) for Sydney Trains in response to specific instructions from the Client and in accordance with WSP's proposal dated April 2019 and agreement with the Client dated May 2019 (Agreement).

PERMITTED PURPOSE

This Report is provided by WSP for the purpose described in the Agreement and no responsibility is accepted by WSP for the use of the Report in whole or in part, for any other purpose (Permitted Purpose).

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The services undertaken by WSP in preparing this Report were limited to those specifically detailed in the Report and are subject to the scope, qualifications, assumptions and limitations set out in the Report or otherwise communicated to the Client.

Except as otherwise stated in the Report and to the extent that statements, opinions, facts, conclusion and / or recommendations in the Report (Conclusions) are based in whole or in part on information provided by the Client and other parties identified in the report (Information), those Conclusions are based on assumptions by WSP of the reliability, adequacy, accuracy and completeness of the Information and have not been verified. WSP accepts no responsibility for the Information.

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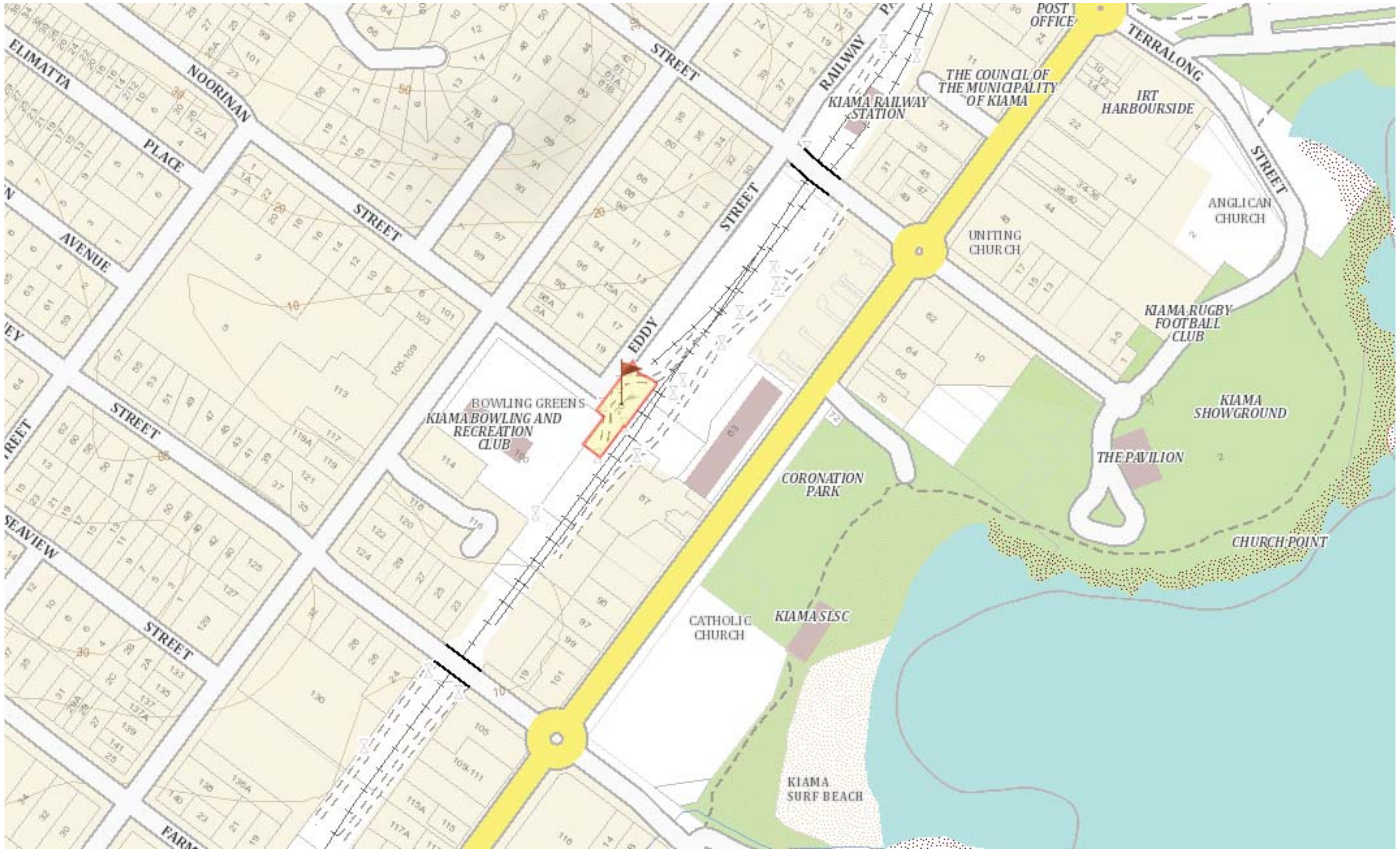
11 REFERENCES

- National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).
- Australian Standard 1999, *Guide to the sampling and investigation of potentially contaminated soil – Part 2: Volatile substances*, AS4482.1.
- Land Insight and Resources 2019, *Enviro-Screen Property Details 20 Eddy St, Kiama NSW.*
- WSP 2019, *Sampling, analysis and quality plan, environmental site assessment, surplus depot sites, Package 1.*
- WSP 2019, *Hazardous Materials Survey, Kiama Depot.*

APPENDIX A

FIGURES



Base map source: Six Maps (2019)

Site boundary

Figure 1 – Site location
20 Eddy Street, Kiama
NSW 2533

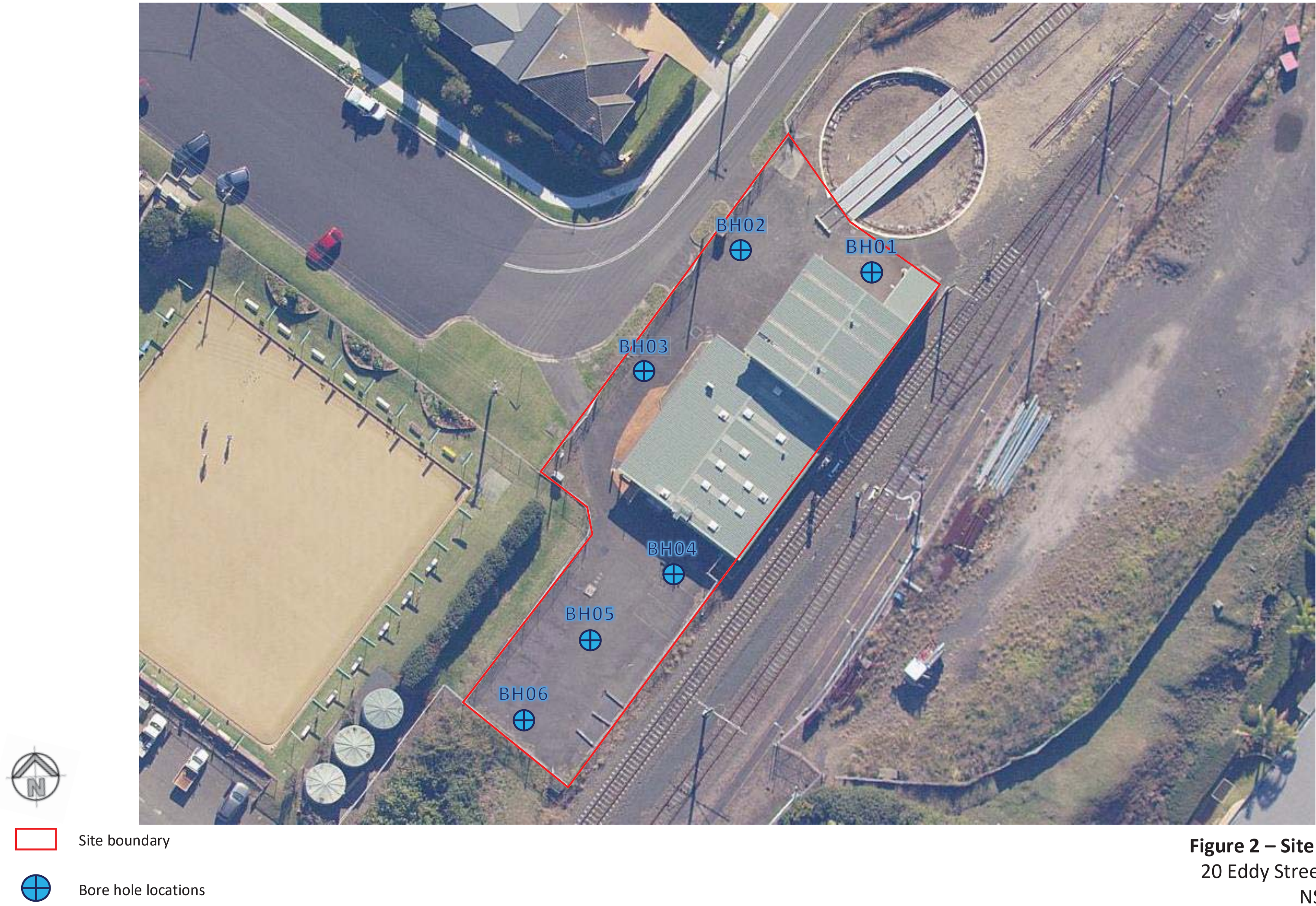


Figure 2 – Site location
20 Eddy Street, Kiama
NSW 2533

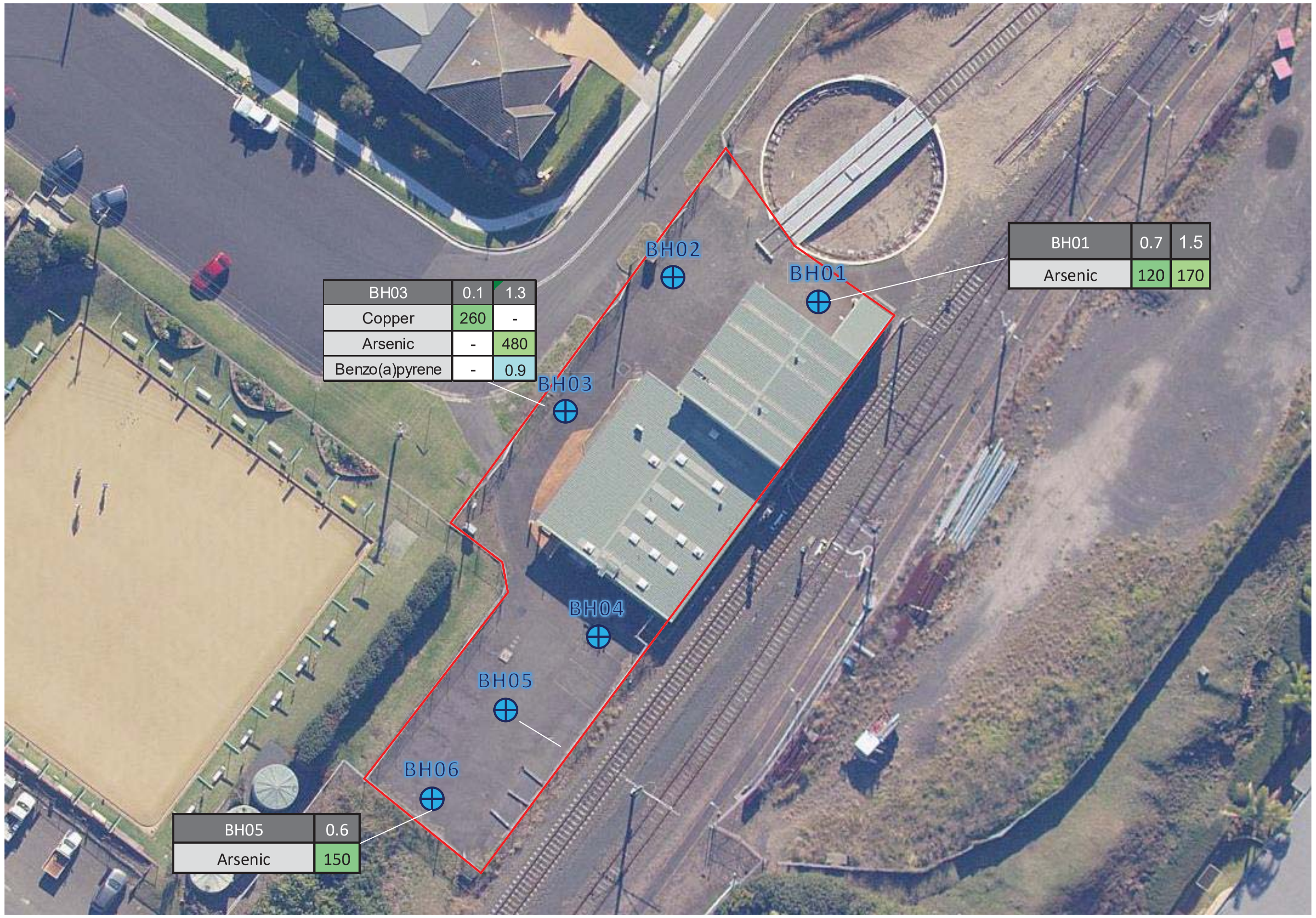
NEPM EIL Comm/Ind

NEPM EIL Urban Res

NEPM ESLs Comm/Ind

NEPM ESLs Urban Res

All results are displayed in mg/kg



Site boundary

Bore hole locations

Figure 3 – Ecological Exceedance locations
20 Eddy Street, Kiama
NSW 2533

NEPM HILs Rec C

NEPM HILs Res A

NEPM HILs Res B

All results are displayed in mg/kg

Site boundary

Bore hole locations

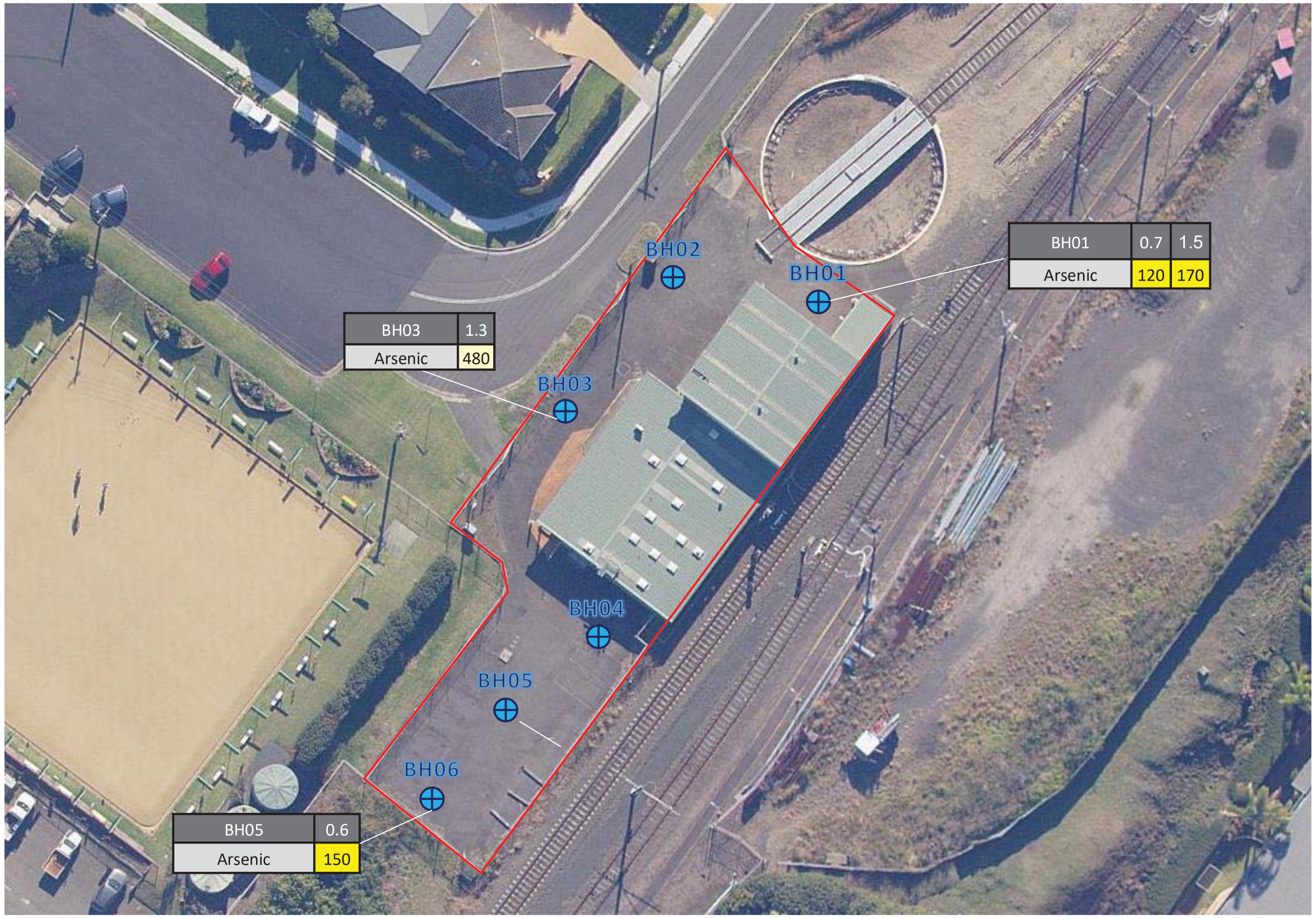


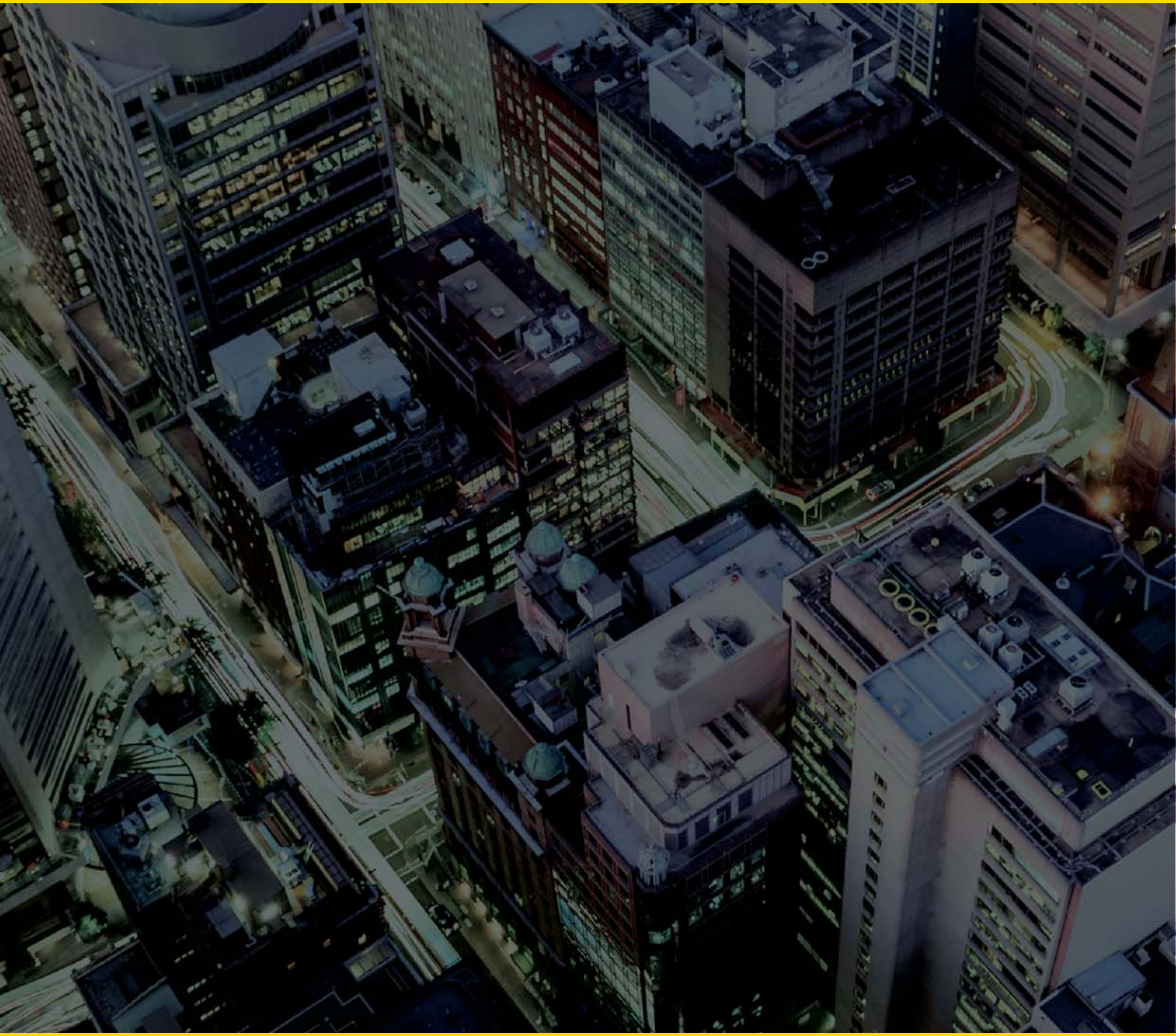
Figure 4 – Human Exceedance locations
20 Eddy Street, Kiama
NSW 2533

APPENDIX B

ENVIROSIGHT REPORTS

Fast, Accurate and Comprehensive Environmental and Development Risk Information

LAND INSIGHT & RESOURCES



ENVIRO-SCREEN

Property Details

20 Eddy Street, Kiama NSW

Search Date: 14 May 2019

Understanding your Report

Your Report has been produced by Land Insight and Resources (LI Resources).

Your Report is based on information available from public databases and sources at the date of reporting. The information gathered relates to land that is within a 200 to 2000 m radius (buffer zone) from the boundaries of the Property. A smaller or larger radius may be applied for certain records (as listed under records and as shown in report maps).

While every effort is made to ensure the details in your Report are correct, LI Resources cannot guarantee the accuracy or completeness of the information or data provided.

The report provided by LI Resources includes data listed on page 3 (table of contents). All sources of data and definitions are provided on the report maps and as listed in the Product Guide (Attached). For a full list of references, metadata, publications or additional information not provided in this report, please contact LI Resources at info@liresources.com.au.

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INDEX

Section 1 Environmental Records Summary – Property Setting

1.1 SITE LOCATION MAP AND SENSITIVE RECEPTORS

Map 1 (500m Buffer)

Sensitive receptor	Category	Distance (m)*	Direction
Bowling Greens	Sports Field	55	west
Kiama Bowling and Recreation Club	Club	75	west
Catholic Church	Place of Worship	151	south-east
Coronation Park	Park	152	south-east
Ss Peter And Paul Catholic Primary School	Primary School	188	south-east
Aspect South Coast School Ss Peter And Paul Kiama	Primary School	188	south-east
Kiama SLSC	Community Facility	200	south-east
Uniting Church	Place of Worship	294	north-east
Kiama Court House	Court House	390	north-east
The Pavilion	Community Facility	400	east
Surf Beach Holiday Park	Tourist Park / Home Village	424	south-east
Kendalls Point Reserve	Park	425	south-east
Kiama Academy of Early Learning	Child Care Centre	428	north-west
Old Fire Station Community Arts Centre	Community Facility	435	north
Presbyterian Church	Place of Worship	439	north-east
Kiama Ambulance Station	Ambulance Station	440	north
Kiama Rugby Football Club	Community Facility	440	north-east
Irt Harbourside	Retirement Village	447	north-east
Playground	Playground	454	north-east
Kiama Public School	Primary School	467	north-west
Kiama Showground	Showground	480	east
Anglican Church	Place of Worship	494	north-east

*Distance from the sensitive receptor point feature to the site boundary centroid.

1.2 PLANNING CONTROLS

Map 2 (onsite)

Zoning	SP2	Infrastructure (Railway)
Environmental Planning Instruments	Not identified	

1.3 SOIL LANDSCAPE

Map 3a (onsite)

Soil Landscape	ERka	KIAMA	**Soil Group**	EROSIONAL
Description	**Landscape**—rolling low hills with broad crests, long convex slopes and steep coastal headlands on Blow Hole Latite. Relief 40–60 m. Slopes <20%. Extensive rock outcrop. Extensively cleared with stands of closed-forest. **Soils**—deep (>150 cm) Krasnozems (Gn4.11) on crests and upper slopes and Prairie Soils (Gn4.51, Gn4.81) on lower slopes. **Limitations**—run-on, water erosion hazard (localised), mass movement hazard (localised), sodicity, low permeability, low wet bearing strength, moderate shrink-swell (subsoil).			

1.4 ACID SULFATE SOIL (OEH 2011)

Map 3a (onsite)

	On the Property?	Within Record Search Buffer?
Acid Sulfate Soil Risk Maps (ASS) *(Table 1.5.1)*	Class 5	Class 5

1.5 ATLAS OF AUSTRALIAN ACID SULFATE SOIL AND SALINITY

Map 3b (onsite)

ASRIS Atlas of Australian Sulfate Soils *(Table 1.5.2)*	Bn(p4)	ASS in inland lakes, waterways, wetlands and riparian zones	**Probability of Occurrence**	Low Probability of occurrence
Hydrologic Soil Group *(Table 1.5.3)*	A - high			
Salinity Hazard	Not identified			

Table 1.5.1. Classification scheme in the ASS Planning Maps

	Class of Land as shown on ASS Planning Maps
1	Any works
2	Works below natural ground surface Works by which the watertable is likely to be lowered
3	Works beyond 1m below natural ground surface Works by which the watertable is likely to be lowered beyond 1m below natural ground surface
4	Works beyond 2m below natural ground surface Works by which the watertable is likely to be lowered beyond 2m below natural ground surface
5	Works within 500m of adjacent Class 1, 2, 3, or 4 land which are likely to lower the watertable below 1m AHD on adjacent Class 1, 2, 3 or 4 land.

For each class of land, the maps identify the type of works likely to present an environmental risk if undertaken in the particular class of land. If these types of works are proposed, further investigation is required to determine if ASS are actually present and whether they are present in such concentrations as to pose a risk to the environment.

Table 1.5.2. Australian Atlas of Acid Sulfate Soils[1] (ASS) map (CSIRO/NatCASS)

Code	Distinguishing soil/sediment properties, vegetation, landforms, or other characteristics
	Probability of Occurrence of ASS[1]
A	**High Probability of occurrence -** (>70% chance of occurrence in mapping unit)
B	**Low Probability of occurrence** - (6-70% chance of occurrence in mapping unit)
C	**Extremely low probability of occurrence** - (1-5% chance of occurrence in mapping unit)
D	**No probability of occurrence** - (<1% chance of occurrence in mapping unit)
x	**Disturbed ASS[1] terrain -** (ASS[1] material present below urban development).
u	**Unclassified** - (Insufficient information to classify map unit)
	Zones
a	Potential acid sulfate soil material and/or Monosulfidic Black Ooze (MBO).
b, c	Potential acid sulfate soil generally within upper 1 m.
c, d, e	ASS[1] generally within upper 1 m.
f	ASS[1] generally below 1 m from the surface
g	ASS[1], generally below 3 m from the surface.
h	ASS[1] generally within 1 m of the surface.
i, j	ASS[1] generally below 1 m of the surface.
k	ASS[1] material and/or Monosulfidic Black Ooze (MBO).

Code	Distinguishing soil/sediment properties, vegetation, landforms, or other characteristics
	Probability of Occurrence of ASS[1]
l, m, n, o, p, q	ASS[1] generally within upper 1 m in wet / riparian areas.
	Subscripts to codes
(a)	Actual acid sulfate soil (AASS) = sulfuric material.
(p)	Potential acid sulfate soil (PASS) = sulfidic material.
(q)	Monosulfidic Black Ooze (MBO) is organic ooze enriched by iron monosulfides.
	Confidence levels
(1)	All necessary analytical and morphological data are available
(2)	Analytical data are incomplete but are sufficient to classify the soil with a reasonable degree of confidence
(3)	No necessary analytical data are available, but confidence is fair, based on a knowledge of similar soils in similar environments
(4)	No necessary analytical data are available, and classifier has little knowledge or experience with ASS, hence classification is provisional

[1]Acid Sulfate Soils (ASS) are all those soils in which sulfuric acid may be produced, is being produced, or has been produced in amounts that have a lasting effect on main soil characteristics (Pons 1973). Acid sulfate soil (ASS) may include PASS or AASS + PASS. Potential acid sulfate soil (PASS) = sulfidic material. Actual acid sulfate soil (AASS) = sulfuric material.

Table 1.5.3. Hydrologic Soil Group

Code	Soil Group Characteristics
A	Soils having high infiltration rates, even when thoroughly wetted and consisting chiefly of deep, well to excessively-drained sands or gravels. These soils have a high rate of water transmission.
B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.
C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission.
D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

1.6 GEOLOGY AND TOPOGRAPHY

Map 4 (onsite)

Geology

Map Sheet	Symbol	Formation	Group	Era	Period	Description
NSW 1:250 000 Statewide Geology	Pbh	-	Shoalhaven Group	Palaeozoic	Permian	Trachyte tuff with pebbly bands

Topography

Topography	12mAHD

Naturally Occurring Asbestos Potential

On the Property?	Within Record Search Buffer?
Not identified	Not identified

Map 5a (500m - 2000m Buffer)

	On the Property?	Within Record Search Buffer?
Aquifer Type	Porous, extensive highly productive aquifers	Porous, extensive highly productive aquifers
Drinking Water Catchments	Not identified	Not identified
Protected Riparian Corridor	Not identified	Not identified
UPSS Environmentally sensitive zone	Southern NSW area UPSS	Southern NSW area UPSS
Wetlands	Not identified	Not identified
Groundwater Bores	Not identified	Yes, see 1.7.1 and 1.7.2

Table 1.7.1. Groundwater Bore Details

Groundwater Bore ID	Authorised Purpose	Completion Date	Drilled Depth (m)	Final Depth (m)	SWL[1] (m)	Salinity[1]	Yield[1] (L/s)	Distance (m)	Direction
GW111161	Monitoring	19-04-07	4.30	4.30	-	-	-	73.24	north-east
GW111162	Monitoring	18-04-07	7.00	7.00	-	-	-	128.99	north-east
GW111163	Monitoring	19-04-07	7.10	7.10	-	-	-	147.19	north-east
GW107387	Monitoring	18-02-04	4.50	4.50	3.80	-	-	667.03	north
GW107388	Monitoring	18-02-04	4.00	4.00	2.30	-	-	668.66	north
GW107389	Monitoring	18-02-04	3.30	3.30	-	-	-	684.75	north
GW013278	Water Supply	01-04-48	0.00	3.00	-	Good	-	787.84	south-west

[1]The most recent data available from NSW Department of Industry – Lands & Water Division.

Table 1.7.2. Groundwater Bore Driller Lithology Details

Groundwater Bore ID	From Depth (m)	To Depth (m)	Lithology	Description	Distance (m)	Direction
GW111161	0	0.8	FILL	Fill,gravelly sandy clay	73.24	north-east
	0.8	1.6	FILL	Fill,clay,mod.to high plasticity,gravels	73.24	north-east
	1.6	3	FILL	Fill.as above,clay dark brown	73.24	north-east
	3	4.3	CLAY	Clay,high plasticity,brown,gravels	73.24	north-east
GW111162	0	0.6	FILL	Fill,gravelly silty clay,angular gravels	128.99	north-east
	0.6	0.9	CLAY	Clay,high plasticity	128.99	north-east
	0.9	7	LTIT	Latite,weatheread,fine grain,red brown	128.99	north-east
GW111163	0	0.1	ASH	Asphalt	147.19	north-east
	0.1	0.6	FILL	Fill,gravelly clay,high plasticity	147.19	north-east
	0.6	7.1	LTIT	Latite,weathered to 1.1m,red/brown	147.19	north-east

GW107387	0	0.8	CLAY	Clay filling	667.03	north
	0.8	3.5	19	Silty clay	667.03	north
	3.5	4.5	SDSN	Sandstone	667.03	north
GW107388	0	0.4	GRVL	Gravel filling	668.66	north
	0.4	1.8	19	Silty clay	668.66	north
	1.8	4	SDSN	Sandstone	668.66	north
GW107389	0	0.7	CLAY	Clay filling	684.75	north
	0.7	3	19	Silty clay	684.75	north
	3	3.3	SDSN	Sandstone	684.75	north

1.8 HYDROGEOLOGY AND OTHER BOREHOLES

Map 5b (2000m Buffer)

	On the Property?	Within Record Search Buffer?
Groundwater Vulnerability	Not identified	Not identified
Groundwater Exclusion Zones (Williamtown GMZ [1])	Not identified	Not identified
Hydrogeologic Unit	Palaeozoic and Pre-Cambrian Fractured Rock Aquifers (low permeability)	Palaeozoic and Pre-Cambrian Fractured Rock Aquifers (low permeability)
Other known borehole investigations (500m buffer)	Not identified	Not identified

1 - Primary Management Zone – this area has significantly higher levels of PFAS detected and therefore, the strongest advice applies. Secondary Management Zone – this area has some detected levels of PFAS; Broader Management Zone – the topography and hydrology of the area means PFAS detections could occur now and into the future

Groundwater Dependent Ecosystems

Name	On the Property?	Within Record Search Buffer?
Ecosystems that rely on the Surface expression of Groundwater	Not identified	Not identified
Ecosystems that rely on Subsurface presence of Groundwater	Not identified	High to low potential GDE from regional studies

Table 1.8.1. Other known borehole investigations (Coal Seam Gas (CSG), Petroleum Wells and Other Boreholes) (500m buffer)

Borehole ID	Purpose	Project	Client/License	Date Drilled	Depth (m)	Distance (m)	Direction
Not identified	-	-	-	-	-	-	-

Section 2 Environmental Records Summary – Contamination and Potentially Contaminating Activities

2.1 PFAS INVESTIGATION PROGRAM

Map 5b (2000m Buffer)

Site	Address	Distance (m)	Direction
Not identified	-	-	-

2.2 CONTAMINATED LAND RECORD OF NOTICES ISSUED UNDER THE CLM ACT 1997

Map 6 (1000m Buffer)

Site Name[2]	Site ID	Address[1]	Notices	Distance (m)	Direction
Not identified	-	-	-	-	-

1. Some addresses do not contain specific street numbers. Records identified as being in the surrounding area have been added for information.
2. Former NSW EPA sites. These sites have been removed from the Record of Notices and/or the Sites Notified lists and are kept here for information purposes only.

2.3 SITES NOTIFIED AS CONTAMINATED TO THE NSW EPA

Map 6 (1000m Buffer)

Site Name[2]	Address[1]	Activity that caused Contamination	EPA Site Management Class[3]	Distance (m)	Direction
Former Gasworks	105 to 109 and 113 Shoalhaven STREET KIAMA	Gasworks	Regulation under CLM Act not required	133	west

1. Some addresses do not contain specific street numbers. Records identified as being in the surrounding area have been added for information.
2. Former NSW EPA sites. These sites have been removed from the Record of Notices and/or the Sites Notified lists and are kept here for information purposes only.
3. The EPA maintains a record of sites that have been notified to the EPA by owners or occupiers as contaminated land. The sites notified to the EPA and recorded on the register are at various stages of the assessment and/or remediation process. Table 5 outlines the possible management status that can be attributed to a registered contaminated site.

Table 2.3.1. EPA Site Management Class Explanation

EPA Site Management Class	
Under Assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Contamination currently regulated under the CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under the POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.

EPA Site Management Class	
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

2.4 OTHER CONTAMINATION ISSUES

Map 6 (1000m Buffer)

Pasminco Smelter Lead Abatement Area

Site	Location	Distance (m)	Direction
Not identified	-	-	-

Former Gasworks Sites

Site	Location	Distance (m)	Direction
Former Gasworks	Shoalhaven Street, Kiama	133	west

Military Facilities

Site name	Defence code	Description	RCIP*	Distance (m)	Direction
Not identified	-		-	-	-

*RCIP (Regional Contamination Investigation Program)

2.5 POTENTIALLY CONTAMINATING ACTIVITIES

Map 7a (500m Buffer)

Aviation Fuel Depots/Terminals

Site name	Description	Status	Distance (m)	Direction
Not identified	-	-	-	-

Aviation Rescue Fire Fighting Facilities (ARFF)

Site name	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-

Cattle Dip Sites

Site name	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-

Derelict Mines and Quarries

Deposit Name	Method	Description	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Dry Cleaners

Site name	Location	Status	Distance (m)	Direction
Ryans Drycleaning & Laundry Service	69 Shoalhaven St, Kiama NSW 2533	Operational	336	north

Historical (Legacy) Landfills

Site name	Description	Distance (m)	Direction
Not identified	- -	-	-

Note: This is not an exhaustive list of all legacy landfills.

Liquid Fuel Depots/Terminals

Site name	Owner	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Power Stations

Site name	Owner	Primary Fuel Type	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Service Stations

Site name	Owner	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Substation / Switching Stations

Site name	Owner	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Telephone Exchanges

Site name	Location	Status	Distance (m)	Direction
KIAM	Manning Street Kiama	Operational	376	North-east

Waste Management Facilities

Site name	Owner	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Wastewater Treatment Facilities

Site name	Operator	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Unexploded Ordnance (UXO) Sites - Department of Defence (DoD)

Site name	Site ID	Category	Description	Distance (m)	Direction
Not identified	-		-	-	-

2.6 OTHER POTENTIALLY CONTAMINATING ACTIVITIES

Map 7b (200m Buffer)

Current Commercial and Trade Data

Site name	Category	Location	Status*	Distance (m)	Direction
South Coast Gardens & Trees	Garden supplies	100 Shoalhaven St Kiama, New South Wales	Current	138	west
Kiama Smash & Mechanical Repairs	Repair Facility	21 Barney St, Kiama NSW 2533	Current	160	South-east
Big River Group Kiama	Building materials supplier	113 Shoalhaven St, Kiama NSW 2533	Current	168	west

*Data is current as when this report was created. However due to the turnover of business locations, some addresses may be former.

Underground Storage Tank (UST)

Premises	Tank type	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Note: This is not an exhaustive list of all UST's.

2.7 NPI INDUSTRIAL FACILITIES

Map 8 (500m Buffer)

Facility name	Address	Primary ANZSIC Class	Latest report	Distance (m)	Direction
Not identified	-	-	-	-	-

2.8 LICENSING UNDER THE POEO ACT 1997

Map 8 (500m Buffer)

Licences

Licence holder	EPL Number	Location Name	Premise Address	Fee Based Activity	Distance (m)	Direction
Not identified		-	-	-	-	-

Delicensed Premises still Regulated by EPA, Licences Surrendered, Clean Up and Penalty Notices

Licence holder	Nº	Name	Premise Address	Fee Based Activity	Status	Distance (m)	Direction
Not identified		-	-	-	-	-	-

2.9 PUBLIC REGISTER OF PROPERTIES AFFECTED BY LOOSE-FILL ASBESTOS INSULATION

Map 8 (onsite)

Address	Match Found
Not identified	-

1948 HISTORICAL COMMERCIAL & TRADE DIRECTORY DATA

(200m Buffer)

Activity	Name	Address	Positional accuracy	Distance (m) *	Direction
Not identified	-	-	-	-	-

* If no distance is provided, address no longer exists.

1971 HISTORICAL COMMERCIAL & TRADE DIRECTORY DATA

(200m Buffer)

Activity	Name	Address	Positional accuracy	Distance (m) *	Direction
Dry Cleaners & Dyers	Kiama Laundry & Dry Cleaners	98 Shoalhaven Street, Kiama	Address	66m	North West
Dairy Produce - W'sale	Jamberoo Co-op Dairy Socy Ltd	Barney Street, Kiama	Street		
Carriers - Light	Yates T T	Shoalhaven Street, Kiama	Street		
Chemists - Pharmaceutical	Virtue G P	Manning Street, Kiama	Street		
Clothing - Uniforms - Mfrs &/or W'salers	Cleo-Cladders (Kiama) Pty Ltd	Manning Street, Kiama	Street		
Motor Service Stations	Richardson T W	Manning Street, Kiama	Street		
Panel Beaters &/or Painters	South Coast Panel Beaters	off Manning Street, Kiama	Street		
Taxis	Keir C W	Manning Street, Kiama	Street		
Motor Cars & Trucks - New	McKinnon Motors (Kiama) Pty Ltd	77 Manning Street, Kiama	Street		
Motor Cars & Trucks - Used	McKinnon Motors (Kiama) Pty Ltd	77 Manning Street, Kiama	Street		

* If no distance is provided, address no longer exists.

1981 HISTORICAL COMMERCIAL & TRADE DIRECTORY DATA

(200m Buffer)

Activity	Name	Address	Positional accuracy	Distance (m) *	Direction
Motor Service Stations & Garages	Surf Beach Motor Works Pty Ltd	83 Manning Street, Kiama	Address	49m	East
Nurserymen - Retail	Turner P M	89 Manning, Kiama	Address	61m	South
Hardware - Retail	Kiama Rural Co-Op & Hardware Ltd.	67 Manning, Kiama	Address	79m	North East
Stock Feeds & Supplements	Kiama Rural Co-Op & Hardware Ltd.	67 Manning, Kiama	Address	79m	North East

Motor Service Stations & Garages	Caltex Oil (Aust) Pty Ltd	Manning Street, Kiama	Street		
Motor Service Stations & Garages	Esso Australia Ltd	Manning Street, Kiama	Street		
Motor Service Stations & Garages	Shell Co of Aust Ltd The	Manning Street, Kiama	Street		
Carriers - Heavy	Gates Haulage	Barney Street, Kiama	Street		
Carriers - Heavy	Kiama Marine Service	Council Quarry, Barney Street, Kiama	Street		
Carriers - Heavy	Spindler C R	Barney Street, Kiama	Street		
Fuel Merchants	Ampol Petroleum Ltd	Barney Street, Kiama	Street		
Motor Body Builders	Vaseo Auto Engineering	Barney Street, Kiama	Street		
Motor Engineers & Repairers	Vased Auto Engineering	Barney Street, Kiama	Street		
Oil Merchants &/or Refiners	Kiama Marine Service	Barney Street, Kiama	Street		
Transport Services	Gates Haulage	Barney Street, Kiama	Street		
Building Supplies	Cukuna Pty Ltd	Shoalhaven Street, Kiama	Street		
Doors & Door Fittings	Cukuna Pty. Ltd.	Shoalhaven, Kiama	Street		
Timber Merchants	Cukuna Pty. Ltd.	Shoalhaven Street, Kiama	Street		
Hire Contractors	Hire-Ama	77 Manning Street, Kiama	Street		

* If no distance is provided, address no longer exists.

1991 HISTORICAL COMMERCIAL & TRADE DIRECTORY DATA (200m Buffer)

Activity	Name	Address	Positional accuracy	Distance (m) *	Direction
Lawn Mowers - Retail &/or Repairs	Kiama Mower & Cycle Centre	28a Bong Bong Street, Kiama	Address	0m	North East
Pump MFRs &/or Merhants	Kiama Mower & Cycle Centre	28a Bong Bong Street, Kiama	Address	0m	North East
Building Supplies	Kiama Building & Hire	67 Manning Street, Kiama	Address	79m	North East
Farm Equipment & Supplies	ACF Country Store Kiama	67 Manning, Kiama	Address	79m	North East
Fertilizers	Kiama Produce	67 Manning, Kiama	Address	79m	North East
Gates &/or Fencing Materials	Kiama Building & Hire	67 Manning, Kiama	Address	79m	North East

Hardware - Retail	Hardex Promotions Ltd. (A.C.F. Kiama)	67 Manning Street, Kiama	Address	79m	North East
Hardware - Retail	Kiama Building & Hire	67 Manning Street, Kiama	Address	79m	North East
Hire Builders', Contractors' & Handyman's Equipment	Kiama Building & Hire	67 Manning Street, Kiama	Address	79m	North East
Gas Suppliers	Gas Kiama	105 Shoalhaven, Kiama	Address	126m	West
Building Supplies	Cukuna Sales Pty. Ltd.	113 Shoalhaven Street, Kiama	Address	143m	West
Timber-Trade &/or Retail	Cukuna Sales Pty. Ltd.	113 Shoalhaven Street, Kiama	Address	143m	West
Bicycles & Accessories – Retail & Repairs	Leisure Coast Bicycles	66 Manning Street, Kiama	Address	159m	East
Fishing Nets	South Coast Commercial Fishing Supplies	64b Manning Street, Kiama	Address	171m	East
Contractors-General	Baker A J (Wollongong) Pty. Ltd.	Barney Street, Kiama	Street		
Demolition Contractors	Myco Earthmoving	Barney Street, Kiama	Street		
Excavating & /or Earth Moving Contractors	Myco Earthmoving	Barney Street, Kiama	Street		
Landscape Gardeners &/or Supplies	Kiama Landscape Supplies	Barney Street, Kiama	Street		
Panel Beaters &/or Painters	Vaseo Auto Engineering	Barney Street, Kiama	Street		
Plasterers & Plasterboard Fixers	Coastal Plaster Board Service Pty. Ltd.	Barney Street, Kiama	Street		
Sand, Soil & Gravel - Retail	Kiama Landscape Supplies	Barney Street, Kiama	Street		
Sand, Soil & Gravel - Retail	Myco Earthmoving	Barney Street, Kiama	Street		
Motor Service Stations & Garages	Caltex Oil (Aust) Pty. Ltd.	Manning Street, Kiama	Street		
Motor Service Stations & Garages	Shell Co of Aust Ltd The	Manning Street, Kiama	Street		
Mirrors	Maba Glass	71 Manning Street, Kiama	Street		
Glass Merchants &/or Glaziers	Gian & Glazing By Maba Glass	77 Manning, Kiama	Street		
Glass Merchants &/or Glaziers	Maba Glass	77 Manning Street, Kiama	Street		
Shop & Office Fitting	Maba Glass	77 Manning, Kiama	Street		
Shower Screens	Maba Glass (Showroom)	77 Manning Street, Kiama	Street		

* If no distance is provided, address no longer exists.

Land Insight and resources use a number of different address georeferencing methods and characterised them according to the following criteria: completeness (match rates) and positional accuracy. When address do not contain specific street numbers or a match is not found, records identified as being in the surrounding areas are included for reference.

Historical dataset positional accuracy and georeferencing results explanation

Positional accuracy	Georeferenced	Description
Address	Located to the address level	*When street address and names fully matched.*
Street	Located to the street centroid	*When street names match but no exact address was found. Location is approximate.*
Place	Located to the structure, building or complex	*When building, residential complex or structure name match but no exact address was found. Location is approximate.*
Suburb	Located to the suburb area	*When suburb name match but no exact address was found. Location is approximate.*
Not georeferenced	Not found	*When it was not georeferenced, and address could not be found.*

Section 3 Other Environmental Constraints

3.1 FEDERAL, STATE AND LOCAL HERITAGE

Map 9 (200m Buffer)

Local Environment Plan (LEP) Heritage

Site Name	Site ID	Significance	Class	Distance (m)*	Direction
Kiama Rail Yard Turntable	I100	Local	Item - General	2.5	North-east
Catholic Presbytery	I117	Local	Item - General	120	South-east
Gasworks (former)	I142	Local	Item - General	133	west
Inter-War Cottage	I141	Local	Item - General	144	North-west
Residence	I82	Local	Item - General	170	North-west

National Heritage List (NHL)

Site Name	Site ID	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Register of the National Estate (RNE)

Site Name	Site ID	Class	Status	Distance (m)	Direction
Catholic Presbytery	1512	Historic	Indicative Place	151	South-east
House	100101	Historic	Indicative Place	166	North-west

Non-Aboriginal heritage item (Local)

Site Name	Site ID	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Non-Aboriginal heritage item (SHR)*

Site Name	Site ID	Listing nº	Plan nº	Distance (m)	Direction
Kiama Railway Station Group and Turntable	5012065	01176	2410	0	onsite

*State Heritage Register

Commonwealth Heritage List (CHL)

Site Name	Site ID	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

World Heritage Area (WHA)

Site Name	Site ID	IUCN	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

3.2 NATURAL HAZARDS & COASTAL MANAGEMENT

Map 10 (500m Buffer)

Bush Fire Prone Land (BPL)

Category	On the Property?	Within Record Search Buffer?
Not identified	-	-

Fire History (Wildfires and Prescribed Burns)

Category	On the Property?	Within Record Search Buffer?
Not identified	-	-

Flood Hazard Area

Name	On the Property?	Within Record Search Buffer?
Not identified	-	-

3.3 STATE ENVIRONMENTAL PLANNING POLICY (COASTAL MANAGEMENT)

Map 10 (500m Buffer)

Type	On the Property?	Within Record Search Buffer?
Coastal Wetlands Proximity Area	Not identified	Not identified
Coastal Wetlands	Not identified	Not identified
Coastal Environment Area Map	Not identified	Yes
Coastal Use Area Map	Not identified	Yes

LAND INSIGHT
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ATTACHMENT A

Report Maps

SUBJECT AREA AND SENSITIVE RECEPTORS

LAND INSIGHT & RESOURCES

MAP 1

Enviro-Screen

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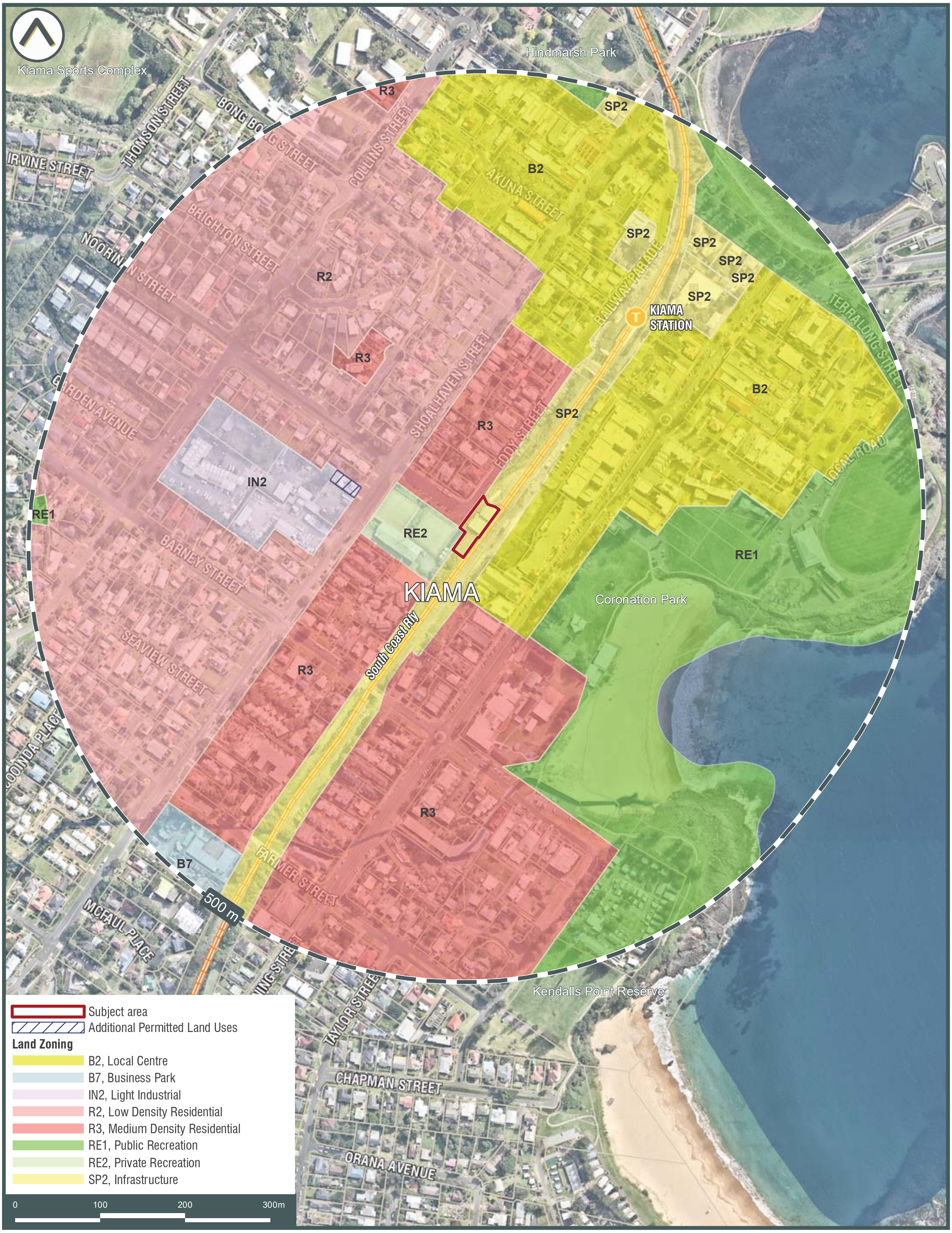

PLANNING CONTROLS

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MAP 2

Enviro-Screen

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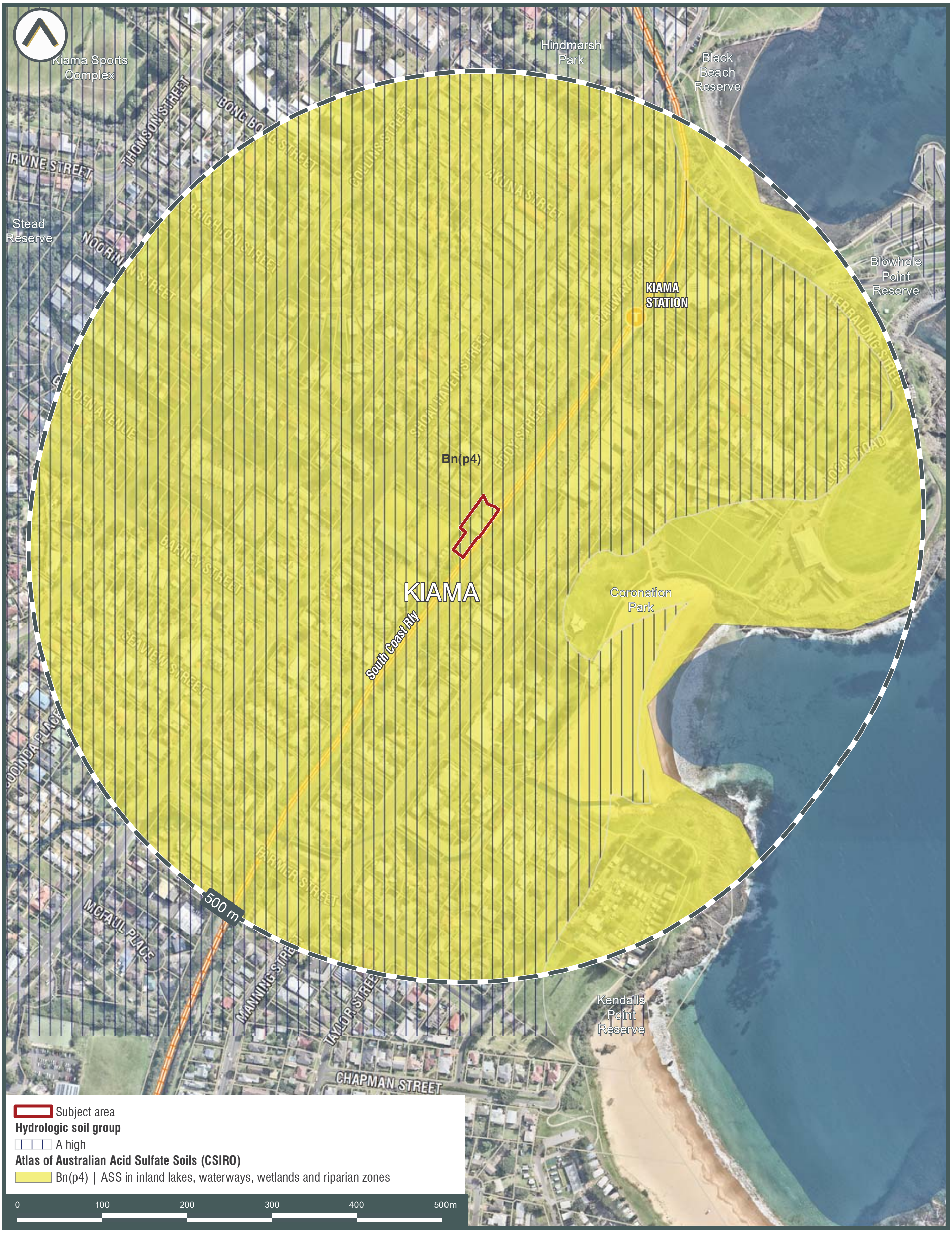
SOIL LANDSCAPES AND ACID SULFATE SOIL RISK

LAND INSIGHT & RESOURCES

MAP 3a

Enviro-Screen



ATLAS OF AUSTRALIAN ACID SULFATE SOILS AND SALINITY

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MAP 3b

Enviro-Screen

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GEOLOGY AND TOPOGRAPHY

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MAP 4 Enviro-Screen

HYDROGEOLOGY AND GROUNDWATER BORES

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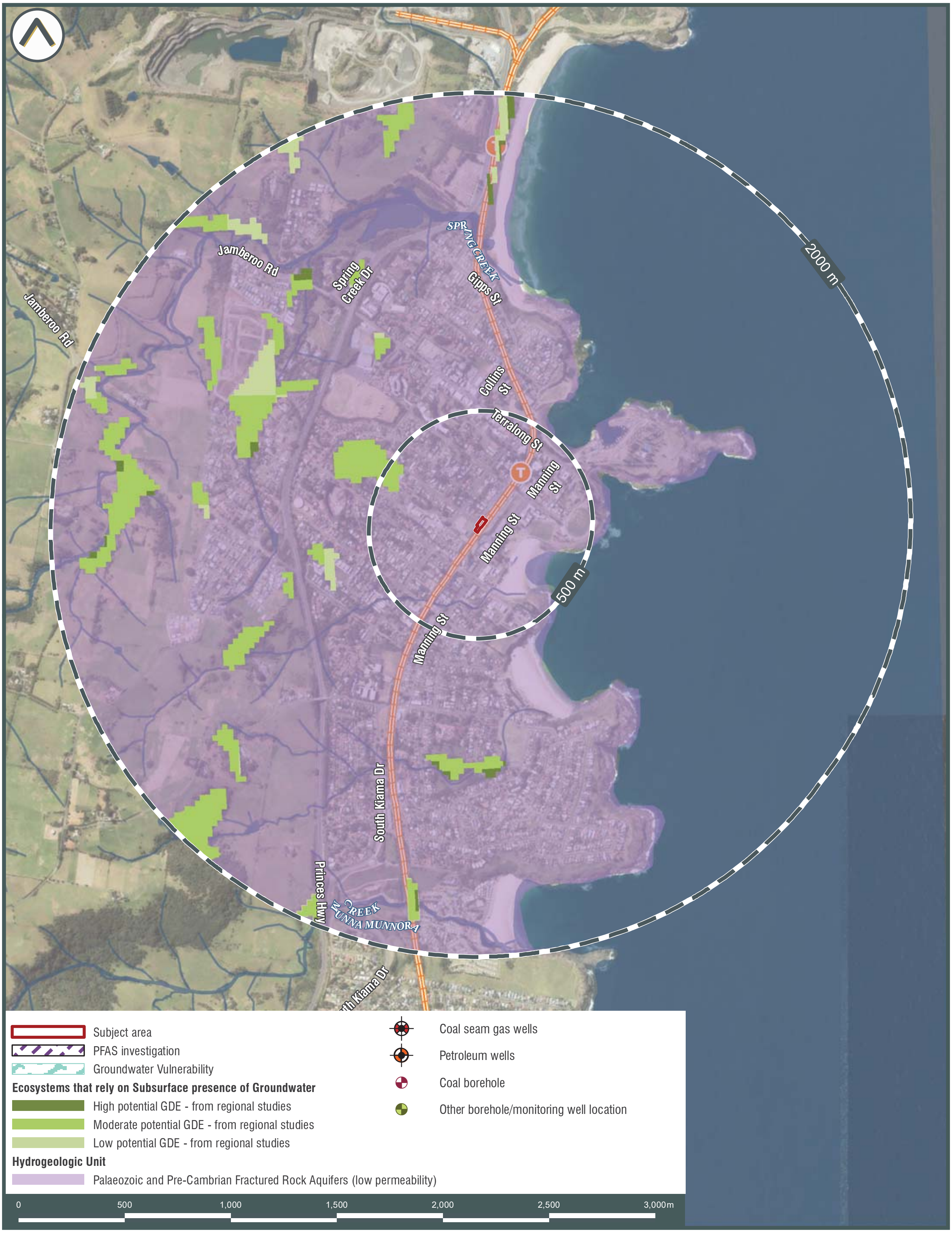
MAP 5a Enviro-Screen



HYDROGEOLOGY AND OTHER BOREHOLES

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MAP 5b Enviro-Screen

EPA RECORDS AND OTHER REGULATORY CONTAMINATION ISSUES

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MAP 6

Enviro-Screen

Subject area
Historical (Legacy) Landfills
Operational Service stations
Former Service stations
Aviation fuel depots
Aviation rescue and fire fighting facilities
Cattle dip
Derelict mine/quarry
Dry cleaners
Liquid fuel depots
Liquid fuel terminals
Power stations
Substation locations
Telephone exchanges
Waste management facilities
Wastewater Treatment Facility

0 | 200 | 400 | 600 | 800 | 1,000m

POTENTIALLY CONTAMINATING ACTIVITIES

LAND INSIGHT & RESOURCES

MAP 7a

Enviro-Screen

CURRENT COMMERCIAL AND TRADE DATA

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MAP 7

LICENSING UNDER THE POEO ACT 1997 AND NPI FACILITIES

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MAP 8

Enviro-Screen

HERITAGE

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MAP 9

Enviro-Screen

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NATURAL HAZARD AND COASTAL MANAGEMENT

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MAP 10

Enviro-Screen

ATTACHMENT B

Historical Imagery

LIR-00664 Aerial Photograph 1963 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1963

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MAP 11

LIR-00664 Aerial Photograph 1970 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1970

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MAP 12

LIR-00664 Aerial Photograph 1974 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1974

LAND INSIGHT & RESOURCES

MAP 13

LIR-00664 Aerial Photograph 1984 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1984

LAND INSIGHT & RESOURCES

MAP 14

LIR-00664 Aerial Photograph 1984 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1993

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MAP 15

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LIR-00664 Aerial Photograph 2002 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2002

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MAP 16

LIR-00664 Aerial Photograph 2008 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2008

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MAP 17

LIR-00664 Aerial Photograph 201014 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2010

LAND INSIGHT & RESOURCES

MAP 19

LIR-00664 Aerial Photograph 2014 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2014

LAND INSIGHT & RESOURCES

MAP 20

LIR-00664 Aerial Photograph 2016 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2016

LAND INSIGHT & RESOURCES

MAP 21

LIR-00664 Aerial Photograph 2018 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2018

LAND INSIGHT & RESOURCES

MAP 22

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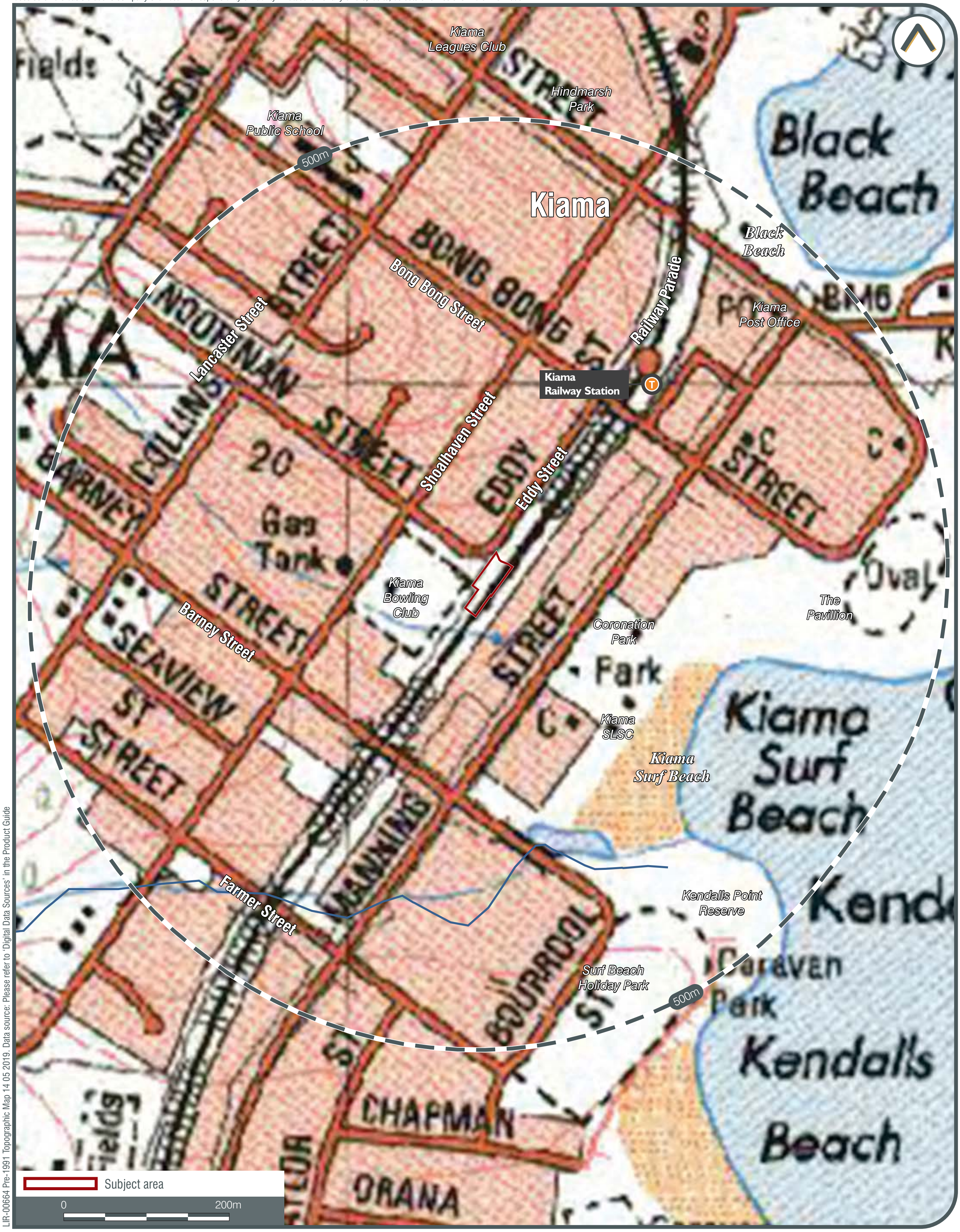

1969 - 1991 TOPOGRAPHIC MAP SERIES (KIAMA 9028-1S)

LAND INSIGHT & RESOURCES

MAP 22

APPENDIX C

SITE PHOTOGRAPHS

	PHOTOGRAPHIC LOG	
Client Name Sydney Trains	**Site Location** 20 Eddy Street, Kiama, NSW	**Project No.** PS114138

Photo No.	Date
1	20/05/2019

Description

Southern portion of the site, facing south

Photo No.	Date
2	20/05/2019

Description

Southern extent of one of the on-site buildings, facing east

	PHOTOGRAPHIC LOG	
Client Name Sydney Trains	**Site Location** 20 Eddy Street, Kiama, NSW	**Project No.** PS114138

Photo No.	Date
3	20/05/2019

Description

Northern portion of the site, two large roller doors for the warehouse, facing north-east

Photo No.	Date
4	11/06/2019

Description

Typical ballast inclusions found within the fill material

	PHOTOGRAPHIC LOG

Client Name	**Site Location**	**Project No.**
Sydney Trains	20 Eddy Street, Kiama, NSW	PS114138

Photo No.	**Date**
5	11/06/2019

Description

Road base gravels typically encountered during the top 0.5 mBGL

Photo No.	**Date**
6	11/06/2019

Description

Natural clays encountered at approximately 2.5 mBGL

APPENDIX D

BOREHOLE LOGS

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH01

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA								ASPHALT	D			
			0.10	PID=2.7 ppm	J			FILL: Gravelly SAND; coarse grained, loose, dark brown, angular gravels, brick, concrete, slag.	M			
			0.60	PID=3.8 ppm	J			FILL: Gravelly CLAY; medium plasticity, medium strength, soft, angular gravels, roadbase.	M			
			1	PID=5.1 ppm	J							
AS			1.50					High increase in roadbase/asphalt.	M			
			1.90					CLAY; high strength, medium plasticity, brown/grey mottles.	M			
			2	PID=0.9 ppm	J							
								END OF BOREHOLE AT 2.60 m				
			3									

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH02

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY VS VL S L F MD ST D VST VD H	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA									ASPHALT	D			
				0.10	PID=4.2 ppm	J			FILL: Gravelly SAND; coarse grained loose, brown/grey, angular gravels, brick, concrete, slag inclusions	D			
				0.50	PID=3.1 ppm	J			Increasing slag, larger gravels <60mm.				
				1.00					FILL: Gravelly SAND; coarse grained loose, brown/grey, angular gravels, brick, concrete.				
AS				1.50	PID=0.8 ppm	J			CLAY; high strength, low plasticity, soft, dark brown.	M			
				2.20	PID=0.3 ppm	J			Becoming firm, brown/grey mottles.				
				2.60					END OF BOREHOLE AT 2.60 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH03

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting: **GeoProbe** Hole Angle: **90°** Surface RL:
Borehole Diameter: Bearing: **---** Co-ords:

Borehole Information						Field Material Description						
1	2	3	4		5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY / CONSISTENCY VS S F ST VST H FB VL L MD D VD	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA									ASPHALT	D			
				0.10	PID=4.4 ppm	J			FILL: Sandy GRAVEL, loose, grey, angular gravels, <10mm, coarse grained sand.	D			
				0.50		J			<5mm gravel inclusions				
				1									
				1.20	PID=3.4 ppm	J			FILL: Gravelly CLAY, medium plasticity, medium strength, dark brown/orange, sub-angular gravels, bitumen, brick.	M			
AS				2									
				2.10	PID=0.3 ppm	J			CLAY; high strength, medium plasticity, firm, brown/grey mottles.	M			
									END OF BOREHOLE AT 2.60 m				
				3									

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH04

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY / CONSISTENCY VS VL S L F MD ST D VST VD H	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA								ASPHALT	D			
			0.10	PID=1.8 ppm	J			FILL: Gravelly SAND; coarse grained, loose angular gravels, <10mm, grey/brown, concrete, brick, roadbase, slag.	D			
			0.80 / 1	PID=2.1 ppm	J			FILL: Gravelly CLAY, low plasticity, medium strength, firm, angular gravels <30mm, dark brown	M			
AS			1.50	PID=0.8 ppm	J			Reducing gravels				
			1.80 / 2	PID=0.9 ppm	J			CLAY; high strength, low plasticity, firm, moist, grey/brown mottles.	M			
			3					END OF BOREHOLE AT 2.50 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH05

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY / CONSISTENCY VS S F ST VST H / FB VL L MD D VD	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA								ASPHALT	D			
			0.10	PID=0.8 ppm	J			FILL: Gravelly SAND; coarse grained, loose, dark brown/grey, roadbase gravels, bitumen, brick, slag.	D			
				PID=0.9 ppm	J							
			1									
AS			1.50					FILL: Gravelly CLAY, low strength, medium plasticity, soft, dark brown, angular gravels, bitumen.	M			
			2									
				PID=1.8 ppm	J							
			2.80					CLAY; high strength, medium plasticity, firm, grey/brown mottles.	M			
			3									
			3.10	PID=0.2 ppm	J			Becoming wet.	W			
								END OF BOREHOLE AT 3.80 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH06

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA								ASPHALT	D			
			0.10	PID=1.6 ppm	J			FILL: Gravelly SAND, coarse grained, loose, dark brown, roadbase gravels, slag, brick, concrete, ballast, gravels <80mm	M			
			0.50	PID=1.4 ppm	J			FILL: Gravelly CLAY; medium plasticity, low strength, dark brown, minor sands (10%), roadbase, gravels, brick, slag, concrete.	M			
			1									
AS			1.50	PID=0.7 ppm	J			Reducing gravel content				
			2									
			2.60					CLAY; high strength, medium plasticity, firm, grey/brown motttles.	M			
			3									
			3.10					Becoming wet.	W			
				PID=0.8 ppm	J							
								END OF BOREHOLE AT 3.50 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

APPENDIX E

ANALYTICAL RESULTS TABLES

		TRH							BTEX					
		C6 - C10	C6 - C10 less BTEX (F1)	C10 - C16	C10 - C16 less Naphthalene (F2)	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Sum)
		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		10	10	50	50	100	100	50	0.1	0.1	0.1	0.2	0.1	0.3
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil														
NEPM 2013 Table 1A(1) HILs Rec C Soil														
NEPM 2013 Table 1A(1) HILs Res A Soil														
NEPM 2013 Table 1A(1) HILs Res B Soil														
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand														
0-1m			260[#8]		NL[#9]				3	NL[#9]	NL[#9]			230
1-2m			370[#8]		NL[#9]				3	NL[#9]	NL[#9]			NL[#9]
2-4m			630[#8]		NL[#9]				3	NL[#9]	NL[#9]			NL[#9]
>=4m			NL[#9]		NL[#9]				3	NL[#9]	NL[#9]			NL[#9]
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand														
0-1m			NL[#9]		NL[#9]				NL[#9]	NL[#9]	NL[#9]			NL[#9]
1-2m			NL[#9]		NL[#9]				NL[#9]	NL[#9]	NL[#9]			NL[#9]
2-4m			NL[#9]		NL[#9]				NL[#9]	NL[#9]	NL[#9]			NL[#9]
>=4m			NL[#9]		NL[#9]				NL[#9]	NL[#9]	NL[#9]			NL[#9]
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand														
0-1m			45[#8]		110[#10]				0.5	160	55			40
1-2m			70[#8]		240[#10]				0.5	220	NL[#9]			60
2-4m			110[#8]		440[#10]				0.5	310	NL[#9]			95
>=4m			200[#8]		NL[#9]				0.5	540	NL[#9]			170
Field ID	**Date**													
BH1 0.7	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH1 1.5	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH02 0.6	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH02 2.3	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH03 0.1	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH03 1.3	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH04 0.2	**11-06-19**	<20	<20	<50	<50	<100	150	150	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH04 2.3	**11-06-19**	<20	<20	<50	<50	<100	120	120	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH05 0.6	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH05 3.5	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH06 0.5	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH06 3.5	**11-06-19**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3

Comments

#1 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) & naphthalene (should meet relevant HSL)

#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI

#4 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.

#5 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.

#6 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

#7 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) & napthhalene (should meet relevant HSL)
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

	PAHs																
	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum)
	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) HILs Comm/Ind D Soil																	4,000[#1]
NEPM 2013 Table 1A(1) HILs Rec C Soil																	300[#1]
NEPM 2013 Table 1A(1) HILs Res A Soil																	300[#7]
NEPM 2013 Table 1A(1) HILs Res B Soil																	400[#1]
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																	
0-1m														NL[#9]			
1-2m														NL[#9]			
2-4m														NL[#9]			
>=4m														NL[#9]			
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																	
0-1m														NL[#9]			
1-2m														NL[#9]			
2-4m														NL[#9]			
>=4m														NL[#9]			
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																	
0-1m														3			
1-2m														NL[#9]			
2-4m														NL[#9]			
>=4m														NL[#9]			

Field ID	Date	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum)
BH1 0.7	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH1 1.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02 0.6	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02 2.3	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 0.1	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 1.3	**11-06-19**	<0.5	<0.5	<0.5	0.8	0.9	0.6	<0.5	0.6	0.8	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	1.2	6
BH04 0.2	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH04 2.3	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05 0.6	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05 3.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 0.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 3.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<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 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) & naphthalene (should meet relevant HSL)

#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI

#4 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.

#5 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.

#6 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

#7 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) & napthhalene (should meet relevant HSL)
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

		Metals							
		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
		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
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil		3,000#2	900	3,600#3	240,000	1,500#4	730#5	6,000	400,000
NEPM 2013 Table 1A(1) HILs Rec C Soil		300#2	90	300#3	17,000	600#4	80#5	1,200	30,000
NEPM 2013 Table 1A(1) HILs Res A Soil		100#2	20	100#3	6,000	300#4	40#5	400	7,400
NEPM 2013 Table 1A(1) HILs Res B Soil		500#2	150	500#3	30,000	1,200#4	120#5	1,200	60,000
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand									
0-1m									
1-2m									
2-4m									
>=4m									
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand									
0-1m									
1-2m									
2-4m									
>=4m									
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand									
0-1m									
1-2m									
2-4m									
>=4m									
Field ID	**Date**								
BH1 0.7	**11-06-19**	120	<0.4	16	140	79	0.2	9.1	54
BH1 1.5	**11-06-19**	170	1	9.2	150	130	0.4	12	390
BH02 0.6	**11-06-19**	49	<0.4	8.8	100	78	0.1	20	48
BH02 2.3	**11-06-19**	4	<0.4	32	56	18	<0.1	6.6	41
BH03 0.1	**11-06-19**	2.2	<0.4	9.9	260	8.2	<0.1	6.3	56
BH03 1.3	**11-06-19**	*480*	<0.4	35	100	170	0.1	9.8	110
BH04 0.2	**11-06-19**	9.3	<0.4	<5	230	6.4	<0.1	8	62
BH04 2.3	**11-06-19**	25	<0.4	13	140	27	<0.1	12	89
BH05 0.6	**11-06-19**	150	<0.4	8.5	160	45	<0.1	10	83
BH05 3.5	**11-06-19**	6.8	<0.4	11	55	14	<0.1	5.1	29
BH06 0.5	**11-06-19**	74	<0.4	<5	170	25	<0.1	12	100
BH06 3.5	**11-06-19**	8.6	<0.4	10	92	12	<0.1	7.2	78

Comments

#1 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) & naphthalene (should meet relevant HSL)

#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI

#4 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.

#5 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.

#6 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

#7 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) & napthhalene (should meet relevant HSL)
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

		OCPs																		
		4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endrin ketone	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg
EQL		0.05	0.05	0.05	0.05	0.05	100	0.05	0.05	0.05	0.05	0.05	0.05	50	0.05	0.05	0.05	50	0.05	0.05
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil					45		530,000				3,600						100			50
NEPM 2013 Table 1A(1) HILs Rec C Soil					10		70,000				400						20			10
NEPM 2013 Table 1A(1) HILs Res A Soil					6		50,000				240						10			6
NEPM 2013 Table 1A(1) HILs Res B Soil					10		90,000				600						20			10
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>=4m																				
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>=4m																				
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>=4m																				
Field ID	**Date**																			
BH1 0.7	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH1 1.5	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH02 0.6	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH02 2.3	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH03 0.1	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH03 1.3	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH04 0.2	11-06-19	<0.05	<0.05	<0.05	0.44	<0.05	<100	<0.05	<0.05	<0.05	<0.05	0.44	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH04 2.3	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH05 0.6	11-06-19	<0.05	<0.05	<0.05	0.39	<0.05	<100	<0.05	<0.05	<0.05	<0.05	0.39	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH05 3.5	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH06 0.5	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH06 3.5	11-06-19	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05

Comments

#1 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) & naphthalene (should meet relevant HSL)

#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI

#4 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.

#5 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.

#6 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

#7 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) & napthhalene (should meet relevant HSL)
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

	Heptachlor epoxide	Hexachlorobenzene
	mg/kg	mg/kg
EQL	0.05	0.05
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil		80
NEPM 2013 Table 1A(1) HILs Rec C Soil		10
NEPM 2013 Table 1A(1) HILs Res A Soil		10
NEPM 2013 Table 1A(1) HILs Res B Soil		15
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand		
0-1m		
1-2m		
2-4m		
>=4m		
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand		
0-1m		
1-2m		
2-4m		
>=4m		
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand		
0-1m		
1-2m		
2-4m		
>=4m		

Field ID	Date	Heptachlor epoxide	Hexachlorobenzene
BH1 0.7	**11-06-19**	<0.05	<0.05
BH1 1.5	**11-06-19**	<0.05	<0.05
BH02 0.6	**11-06-19**	<0.05	<0.05
BH02 2.3	**11-06-19**	<0.05	<0.05
BH03 0.1	**11-06-19**	<0.05	<0.05
BH03 1.3	**11-06-19**	<0.05	<0.05
BH04 0.2	**11-06-19**	<0.05	<0.05
BH04 2.3	**11-06-19**	<0.05	<0.05
BH05 0.6	**11-06-19**	<0.05	<0.05
BH05 3.5	**11-06-19**	<0.05	<0.05
BH06 0.5	**11-06-19**	<0.05	<0.05
BH06 3.5	**11-06-19**	<0.05	<0.05

Comments

#1 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) & naphthalene (should meet relevant HSL)

#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI

#4 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.

#5 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.

#6 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

#7 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) & napthhalene (should meet relevant HSL)
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

				OI																
		Methoxychlor	Toxaphene	Azinophos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethoprop	Ethion	Fenitrothion	Fensulfothion
		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	mg/kg
EQL		0.2	1	0.2	0.2	0.2	0.2	0.2	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 1A(1) HILs Comm/Ind D Soil		2,500	160				2,000													
NEPM 2013 Table 1A(1) HILs Rec C Soil		400	30				250													
NEPM 2013 Table 1A(1) HILs Res A Soil		300	20				160													
NEPM 2013 Table 1A(1) HILs Res B Soil		500	30				340													
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>=4m																				
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>=4m																				
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>=4m																				
Field ID	**Date**																			
BH1 0.7	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11-06-19**	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Comments

#1 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) & naphthalene (should meet relevant HSL)

#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI

#4 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.

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#6 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

#7 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) & napthhalene (should meet relevant HSL)
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

		Ps	
		Fenthion	Malathion
		mg/kg	mg/kg
EQL		0.2	0.2
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil			
NEPM 2013 Table 1A(1) HILs Rec C Soil			
NEPM 2013 Table 1A(1) HILs Res A Soil			
NEPM 2013 Table 1A(1) HILs Res B Soil			
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand			
0-1m			
1-2m			
2-4m			
>=4m			
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand			
0-1m			
1-2m			
2-4m			
>=4m			
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand			
0-1m			
1-2m			
2-4m			
>=4m			
Field ID	**Date**		
BH1 0.7	**11-06-19**	<0.2	<0.2
BH1 1.5	**11-06-19**	<0.2	<0.2
BH02 0.6	**11-06-19**	<0.2	<0.2
BH02 2.3	**11-06-19**	<0.2	<0.2
BH03 0.1	**11-06-19**	<0.2	<0.2
BH03 1.3	**11-06-19**	<0.2	<0.2
BH04 0.2	**11-06-19**	<0.2	<0.2
BH04 2.3	**11-06-19**	<0.2	<0.2
BH05 0.6	**11-06-19**	<0.2	<0.2
BH05 3.5	**11-06-19**	<0.2	<0.2
BH06 0.5	**11-06-19**	<0.2	<0.2
BH06 3.5	**11-06-19**	<0.2	<0.2

Comments

#1 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) & naphthalene (should meet relevant HSL)

#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI

#4 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.

#5 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.

#6 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

#7 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) & napthhalene (should meet relevant HSL)
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

		Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-methyl	Pyrazophos	Ronnel	Terbufos	Tetrachlorvinphos	Tokuthion	Trichloronate
		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	2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																
NEPM 2013 Table 1A(1) HILs Rec C Soil																
NEPM 2013 Table 1A(1) HILs Res A Soil																
NEPM 2013 Table 1A(1) HILs Res B Soil																
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																
0-1m																
1-2m																
2-4m																
>=4m																
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																
0-1m																
1-2m																
2-4m																
>=4m																
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																
0-1m																
1-2m																
2-4m																
>=4m																
Field ID	**Date**															
BH1 0.7	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11-06-19**	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Comments

#1 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) & naphthalene (should meet relevant HSL)

#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI

#4 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.

#5 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.

#6 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

#7 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) & napthhalene (should meet relevant HSL)
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

		PCBs							
		Arochlor 1016	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aroclor 1221	PCBs (Sum of total)
		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	0.1	0.5
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil									7#6
NEPM 2013 Table 1A(1) HILs Rec C Soil									1#6
NEPM 2013 Table 1A(1) HILs Res A Soil									1#6
NEPM 2013 Table 1A(1) HILs Res B Soil									1#6
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand									
0-1m									
1-2m									
2-4m									
>=4m									
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand									
0-1m									
1-2m									
2-4m									
>=4m									
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand									
0-1m									
1-2m									
2-4m									
>=4m									
Field ID	**Date**								
BH1 0.7	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH1 1.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH02 0.6	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH02 2.3	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH03 0.1	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH03 1.3	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH04 0.2	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH04 2.3	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH05 0.6	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH05 3.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH06 0.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
BH06 3.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5

Comments

#1 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) & naphthalene (should meet relevant HSL)

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

#3 As Chromium VI

#4 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.

#5 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.

#6 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

#7 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) & napthhalene (should meet relevant HSL)

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

#9 Derived soil HSL exceeds soil saturation concentraiton

#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

		Phenols																		
		2,4,5-trichlorophenol	2,4,6-Trichlorophenol	2,4-dichlorophenol	2,4-dinitrophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol	Dinoseb	Pentachlorophenol	Phenol	tetrachlorophenols	Phenols (Total Halogenated)
		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	mg/kg
EQL		0.5	0.5	0.5	5	0.5	0.5	0.5	0.2	0.5	0.4	5	20	0.5	5	20	1	0.5	1	1
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																	660	240,000		
NEPM 2013 Table 1A(1) HILs Rec C Soil																	120	40,000		
NEPM 2013 Table 1A(1) HILs Res A Soil																	100	3,000		
NEPM 2013 Table 1A(1) HILs Res B Soil																	130	45,000		
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>=4m																				
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>=4m																				
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																				
0-1m																				
1-2m																				
2-4m																				
>=4m																				
Field ID	**Date**																			
BH1 0.7	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH1 1.5	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH02 0.6	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH02 2.3	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH03 0.1	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH03 1.3	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH04 0.2	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH04 2.3	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH05 0.6	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH05 3.5	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH06 0.5	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1
BH06 3.5	**11-06-19**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1

Comments

#1 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) & naphthalene (should meet relevant HSL)

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

#3 As Chromium VI

#4 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.

#5 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.

#6 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

#7 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) & napthhalene (should meet relevant HSL)

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

#9 Derived soil HSL exceeds soil saturation concentraiton

#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

		Phenols (Total Non Halogenated)
		mg/kg
EQL		20
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil		
NEPM 2013 Table 1A(1) HILs Rec C Soil		
NEPM 2013 Table 1A(1) HILs Res A Soil		
NEPM 2013 Table 1A(1) HILs Res B Soil		
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand		
0-1m		
1-2m		
2-4m		
>=4m		
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand		
0-1m		
1-2m		
2-4m		
>=4m		
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand		
0-1m		
1-2m		
2-4m		
>=4m		
Field ID	**Date**	
BH1 0.7	**11-06-19**	<20
BH1 1.5	**11-06-19**	<20
BH02 0.6	**11-06-19**	<20
BH02 2.3	**11-06-19**	<20
BH03 0.1	**11-06-19**	<20
BH03 1.3	**11-06-19**	<20
BH04 0.2	**11-06-19**	<20
BH04 2.3	**11-06-19**	<20
BH05 0.6	**11-06-19**	<20
BH05 3.5	**11-06-19**	<20
BH06 0.5	**11-06-19**	<20
BH06 3.5	**11-06-19**	<20

Comments

#1 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) & naphthalene (should meet relevant HSL)

#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI

#4 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.

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#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

Field ID	Date	C6 - C10	C6 - C10 less BTEX (F1)	C10 - C16	C10 - C16 less Naphthalene (F2)	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Sum)
		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		10	10	50	50	100	100	50	0.1	0.1	0.1	0.2	0.1	0.3
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind														
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space														
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m			125#7	25		-#8	-#8		8	10	1.5			10
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m			215#7	170		1,700	3,300		75	135	165			180
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m			180#9	120#10		300	2,800		50	85	70			105
BH1 0.7	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH1 1.5	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH02 0.6	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH02 2.3	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH03 0.1	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH03 1.3	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH04 0.2	11-06-19	<20	<20	<50	<50	<100	150	150	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH04 2.3	11-06-19	<20	<20	<50	<50	<100	120	120	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH05 0.6	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH05 3.5	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH06 0.5	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH06 3.5	11-06-19	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10 Moderate reliability.

Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene
		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
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind															370
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space															170
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m						1.4									
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m						1.4									
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m						0.7									
Field ID	**Date**														
BH1 0.7	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH1 1.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02 0.6	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02 2.3	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 0.1	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 1.3	**11-06-19**	<0.5	<0.5	<0.5	0.8	0.9	0.6	<0.5	0.6	0.8	<0.5	1.1	<0.5	<0.5	<0.5
BH04 0.2	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH04 2.3	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05 0.6	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05 3.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 0.5	**11-06-19**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 3.5	**11-06-19**	<0.5	<0.5	<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 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10 Moderate reliability.

Exceedances

- Exceedance of **Comm/Ind and Urban Res & Public Open Space**
- Exceedance of **Urban Res & Public Open Space**
- Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
- Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		Phenanthrene
		mg/kg
EQL		0.5
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind		
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space		
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m		
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m		
Field ID	**Date**	
BH1 0.7	**11-06-19**	<0.5
BH1 1.5	**11-06-19**	<0.5
BH02 0.6	**11-06-19**	<0.5
BH02 2.3	**11-06-19**	<0.5
BH03 0.1	**11-06-19**	<0.5
BH03 1.3	**11-06-19**	<0.5
BH04 0.2	**11-06-19**	<0.5
BH04 2.3	**11-06-19**	<0.5
BH05 0.6	**11-06-19**	<0.5
BH05 3.5	**11-06-19**	<0.5
BH06 0.5	**11-06-19**	<0.5
BH06 3.5	**11-06-19**	<0.5

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10 Moderate reliability.

Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		Pyrene	PAHs (Sum)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin
		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	2	0.4	2	5	5	0.1	2	5	0.05	0.05	0.05	0.05
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind				160#1		680	350	1,800#4		640	1,700				
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space				100#1		410	250	1,100#4		380	1,200				
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m															
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m															
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m															
Field ID	**Date**														
BH1 0.7	**11-06-19**	<0.5	<0.5	120	<0.4	16	140	79	0.2	9.1	54	<0.05	<0.05	<0.05	<0.05
BH1 1.5	**11-06-19**	<0.5	<0.5	170	1	9.2	150	130	0.4	12	390	<0.05	<0.05	<0.05	<0.05
BH02 0.6	**11-06-19**	<0.5	<0.5	49	<0.4	8.8	100	78	0.1	20	48	<0.05	<0.05	<0.05	<0.05
BH02 2.3	**11-06-19**	<0.5	<0.5	4	<0.4	32	56	18	<0.1	6.6	41	<0.05	<0.05	<0.05	<0.05
BH03 0.1	**11-06-19**	<0.5	<0.5	2.2	<0.4	9.9	260	8.2	<0.1	6.3	56	<0.05	<0.05	<0.05	<0.05
BH03 1.3	**11-06-19**	1.2	6	480	<0.4	35	100	170	0.1	9.8	110	<0.05	<0.05	<0.05	<0.05
BH04 0.2	**11-06-19**	<0.5	<0.5	9.3	<0.4	<5	230	6.4	<0.1	8	62	<0.05	<0.05	<0.05	0.44
BH04 2.3	**11-06-19**	<0.5	<0.5	25	<0.4	13	140	27	<0.1	12	89	<0.05	<0.05	<0.05	<0.05
BH05 0.6	**11-06-19**	<0.5	<0.5	150	<0.4	8.5	160	45	<0.1	10	83	<0.05	<0.05	<0.05	0.39
BH05 3.5	**11-06-19**	<0.5	<0.5	6.8	<0.4	11	55	14	<0.1	5.1	29	<0.05	<0.05	<0.05	<0.05
BH06 0.5	**11-06-19**	<0.5	<0.5	74	<0.4	<5	170	25	<0.1	12	100	<0.05	<0.05	<0.05	<0.05
BH06 3.5	**11-06-19**	<0.5	<0.5	8.6	<0.4	10	92	12	<0.1	7.2	78	<0.05	<0.05	<0.05	<0.05

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10 Moderate reliability.

Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		b-BHC
		mg/kg
EQL		0.05
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind		
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space		
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m		
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m		
Field ID	**Date**	
BH1 0.7	**11-06-19**	<0.05
BH1 1.5	**11-06-19**	<0.05
BH02 0.6	**11-06-19**	<0.05
BH02 2.3	**11-06-19**	<0.05
BH03 0.1	**11-06-19**	<0.05
BH03 1.3	**11-06-19**	<0.05
BH04 0.2	**11-06-19**	<0.05
BH04 2.3	**11-06-19**	<0.05
BH05 0.6	**11-06-19**	<0.05
BH05 3.5	**11-06-19**	<0.05
BH06 0.5	**11-06-19**	<0.05
BH06 3.5	**11-06-19**	<0.05

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10 Moderate reliability.

Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endrin ketone	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor
		µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg
EQL		100	0.05	0.05	0.05	0.05	0.05	0.05	50	0.05	0.05	0.05	50	0.05	0.05
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind					640										
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space					180										
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m															
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m															
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m															
Field ID	**Date**														
BH1 0.7	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH1 1.5	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH02 0.6	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH02 2.3	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH03 0.1	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH03 1.3	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH04 0.2	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	0.44	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH04 2.3	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH05 0.6	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	0.39	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH05 3.5	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH06 0.5	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05
BH06 3.5	11-06-19	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10 Moderate reliability.

Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		Heptachlor epoxide
		mg/kg
EQL		0.05
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind		
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space		
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m		
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m		
Field ID	**Date**	
BH1 0.7	**11-06-19**	<0.05
BH1 1.5	**11-06-19**	<0.05
BH02 0.6	**11-06-19**	<0.05
BH02 2.3	**11-06-19**	<0.05
BH03 0.1	**11-06-19**	<0.05
BH03 1.3	**11-06-19**	<0.05
BH04 0.2	**11-06-19**	<0.05
BH04 2.3	**11-06-19**	<0.05
BH05 0.6	**11-06-19**	<0.05
BH05 3.5	**11-06-19**	<0.05
BH06 0.5	**11-06-19**	<0.05
BH06 3.5	**11-06-19**	<0.05

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		Hexachlorobenzene	Methoxychlor	Toxaphene	Azinophos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos
		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	0.2	1	0.2	0.2	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind														
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space														
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m														
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m														
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m														
Field ID	**Date**													
BH1 0.7	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11-06-19**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10 Moderate reliability.

Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		Dimethoate	Disulfoton	EPN	Ethoprop	Ethion	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
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
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind													
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space													
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m													
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m													
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m													
Field ID	**Date**												
BH1 0.7	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11-06-19**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
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#8 Insufficient data to availability to derive a value.
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-methyl	Pyrazophos	Ronnel	Terbufos	Tetrachlorvinphos	Tokuthion	Trichloronate
		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	0.2
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind													
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space													
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m													
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m													
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m													
Field ID	**Date**												
BH1 0.7	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11-06-19**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		Arochlor 1016	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aroclor 1221	PCBs (Sum of total)	2,4,5-trichlorophenol	2.4.6-Trichlorophenol	2,4-dichlorophenol	2,4-dinitrophenol	2,4-dimethylphenol	2,6-dichlorophenol
		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	0.1	0.5	0.5	0.5	0.5	5	0.5	0.5
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind															
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space															
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m															
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m															
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m															
Field ID	**Date**														
BH1 0.7	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH1 1.5	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH02 0.6	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH02 2.3	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH03 0.1	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH03 1.3	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH04 0.2	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH04 2.3	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH05 0.6	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH05 3.5	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH06 0.5	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5
BH06 3.5	11-06-19	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		2-chlorophenol
		mg/kg
EQL		0.5
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind		
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space		
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m		
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m		
Field ID	**Date**	
BH1 0.7	**11-06-19**	<0.5
BH1 1.5	**11-06-19**	<0.5
BH02 0.6	**11-06-19**	<0.5
BH02 2.3	**11-06-19**	<0.5
BH03 0.1	**11-06-19**	<0.5
BH03 1.3	**11-06-19**	<0.5
BH04 0.2	**11-06-19**	<0.5
BH04 2.3	**11-06-19**	<0.5
BH05 0.6	**11-06-19**	<0.5
BH05 3.5	**11-06-19**	<0.5
BH06 0.5	**11-06-19**	<0.5
BH06 3.5	**11-06-19**	<0.5

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

		2-methylphenol	2-nitrophenol	3-&4-methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol	Dinoseb	Pentachlorophenol	Phenol	tetrachlorophenols	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)
		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	0.5	0.4	5	20	0.5	5	20	1	0.5	1	1	20
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind														
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space														
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m														
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m														
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m														
Field ID	**Date**													
BH1 0.7	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH1 1.5	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH02 0.6	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH02 2.3	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH03 0.1	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH03 1.3	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH04 0.2	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH04 2.3	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH05 0.6	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH05 3.5	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH06 0.5	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH06 3.5	**11-06-19**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10 Moderate reliability.

Exceedances

Exceedance of **Comm/Ind and Urban Res & Public Open Space**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

APPENDIX F

QA/QC TABLES

Sydney Trains
20 Eddy Street
Kiama, NSW 2533

Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	TRH				BTEX						
				C6 - C10	C10 - C16	C16 - C34	C34 - C40	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Acenaphthene	Acenaphthylene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				10	50	100	100	0.1	0.1	0.1	0.2	0.1	0.5	0.5
660634	BH06 0.5	6/11/2019	soil	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.5	<0.5
	QC01	6/11/2019	soil	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.5	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.5	<0.5
ES1918320	QC01A	6/11/2019	soil	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: (1 - 10 x EQL); 30 (10 - 20 x EQL); 30 (> 20 x EQL))

***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

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20 Eddy Street
Kiama, NSW 2533

Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	PAH													
				Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	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
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
660634	BH06 0.5	6/11/2019	soil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	QC01	6/11/2019	soil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ES1918320	QC01A	6/11/2019	soil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0

***RPDs have only been considered where a concentration is greater than 1 tir**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP**
*****Interlab Duplicates are matched on a per compound basis as methods va**

Sydney Trains
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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	Metals							
				Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
				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
660634	BH06 0.5	6/11/2019	soil	74	<0.4	<5	170	25	<0.1	12	100
	QC01	6/11/2019	soil	83	<0.4	<5	170	35	<0.1	12	140
RPD				11	0	0	0	**33**	0	0	**33**
660634	BH06 0.5	6/11/2019	soil	74	<0.4	<5	170	25	<0.1	12	100
ES1918320	QC01A	6/11/2019	soil	121	<1	5	171	44	<0.1	11	126
RPD				**48**	0	0	1	**55**	0	9	23

***RPDs have only been considered where a concentration is greater than 1 tir**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP**
*****Interlab Duplicates are matched on a per compound basis as methods va**

Sydney Trains
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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endrin ketone	Endosulfan II
				OCP													
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg
EQL				0.05	0.05	0.05	0.05	0.05	100	0.05	0.05	0.05	0.05	0.05	0.05	50	0.05
660634	BH06 0.5	6/11/2019	soil	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05
	QC01	6/11/2019	soil	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05
ES1918320	QC01A	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
***Interlab Duplicates are matched on a per compound basis as methods va

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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene
				mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.05	0.05	50	0.05	0.05	0.05	0.05	0.2	1
660634	BH06 0.5	6/11/2019	soil	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1
	QC01	6/11/2019	soil	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1
RPD				0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1
ES1918320	QC01A	6/11/2019	soil	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
***Interlab Duplicates are matched on a per compound basis as methods vai

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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	Azinophos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethoprop
				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	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	QC01	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
ES1918320	QC01A	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
***Interlab Duplicates are matched on a per compound basis as methods vai

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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	OPP													
				Ethion	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-methyl
				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	2	0.2	2	0.2	0.2	0.2
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2
	QC01	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2
ES1918320	QC01A	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
***Interlab Duplicates are matched on a per compound basis as methods va

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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

										PCB							
				Pyrazophos	Ronnel	Terbufos	Tetrachlorvinphos	Tokuthion	Trichloronate	Arochlor 1016	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aroclor 1221	PCBs (Sum of 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	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5
Lab Report Numbe	**Field ID**	**Date**	**Matrix Type**														
660634	**BH06 0.5**	**6/11/2019**	**soil**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
	QC01	**6/11/2019**	**soil**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	**BH06 0.5**	**6/11/2019**	**soil**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
ES1918320	**QC01A**	**6/11/2019**	**soil**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-	-	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 tir**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP**
*****Interlab Duplicates are matched on a per compound basis as methods va**

Sydney Trains
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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

				Phenols													
				2,4,5-trichlorophenol	2.4.6-Trichlorophenol	2,4-dichlorophenol	2,4-dinitrophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol
				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	5	0.5	0.5	0.5	0.2	0.5	0.4	5	20	0.5	5
Lab Report Numbe	**Field ID**	**Date**	**Matrix Type**														
660634	**BH06 0.5**	**6/11/2019**	**soil**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5
	QC01	**6/11/2019**	**soil**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	**BH06 0.5**	**6/11/2019**	**soil**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5
ES1918320	**QC01A**	**6/11/2019**	**soil**	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	-
RPD				0	0	0	-	0	0	0	0	0	0	-	-	0	-

***RPDs have only been considered where a concentration is greater than 1 tir**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP**
*****Interlab Duplicates are matched on a per compound basis as methods va**

Sydney Trains
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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	Dinoseb	Pentachlorophenol	Phenol	tetrachlorophenols	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				20	1	0.5	1	1	20
660634	BH06 0.5	6/11/2019	soil	<20	<1	<0.5	<1	<1	<20
	QC01	6/11/2019	soil	<20	<1	<0.5	<1	<1	<20
RPD				0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<20	<1	<0.5	<1	<1	<20
ES1918320	QC01A	6/11/2019	soil	-	<2	<0.5	-	-	-
RPD				-	0	0	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
***Interlab Duplicates are matched on a per compound basis as methods vai

Table F2 - Field and Rinsate Blanks
Sydney Trains Surplus Depot ESA
20 Eddy Street

			TRH							BTEX							
			C6 - C10	C6 - C10 less BTEX (F1)	C10 - C16	C10 - C16 less Naphthalene (F2)	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Sum)	Acenaphthene	Acenaphthylene
			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
Lab Report Number	Date	Matrix Type															
660634	6/11/2019	water	<20	<20	<50	<50	<100	<100	<100	<1	<1	<1	<2	<1	<3	<1	<1
660634	6/11/2019	soil	<20	<20	-	-	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-

Sydney Trains
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Table F2 - Field and Rinsate Blanks
Sydney Trains Surplus Depot ESA
20 Eddy Street

			PAH														
			Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum)
			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
Lab Report Number	**Date**	**Matrix Type**															
660634	6/11/2019	water	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
660634	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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Table F2 - Field and Rinsate Blanks
Sydney Trains Surplus Depot ESA
20 Eddy Street

			Metals													
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	2,4,5-trichlorophenol	2.4.6-Trichlorophenol	2,4-dichlorophenol	2,4-dinitrophenol	2,4-dimethylphenol	2,6-dichlorophenol
			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
Lab Report Number	**Date**	**Matrix Type**														
660634	6/11/2019	water	<1	<0.2	<1	<1	<1	<0.1	<1	<5	<10	<10	<3	<30	<3	<3
660634	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sydney Trains
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Table F2 - Field and Rinsate Blanks
Sydney Trains Surplus Depot ESA
20 Eddy Street

			Phenols													
			2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol	Dinoseb	Pentachlorophenol	Phenol	tetrachlorophenols	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)
			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
Lab Report Number	**Date**	**Matrix Type**														
660634	6/11/2019	water	<3	<3	<10	<6	<30	<100	<10	<30	<100	<10	<3	<30	<10	<100
660634	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX G

LABORATORY REPORTS

CHAIN OF CUSTODY RECORD

☐ Sydney Laboratory
Unit F3 Bld F 16 Mars Rd

☐

Brisbane Laboratory
Unit 1 21 Smallwood Pl Murarrie QLD 4172

☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close Oakleigh VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	WSP Australia Pty Limited	Project №	PS114138
Address	Level 27, 680 George Street Sydney, NSW 2000 Australia	Project Name	Sydney Trains - Kiama
Contact Name	Alexander Carpenter	Sampler(s)	Alex Carpenter
Phone №	0415 501 846	Handed over by	
Special Directions		Email for Invoice	Alex.Carpenter@wsp.com, APinvoices@pb.com.au
Purchase Order	PS114138	Email for Results	Alex.Carpenter@wsp.com
Quote ID №	190408WSPN		

Analyses (Note: Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing)

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)
☐ Overnight (9am)* ☐ 1 Day* ☐ 2 Day* ☐ 3 Day* ☑ 5 Day ☐ Other ( )
* Surcharges apply

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	B7A: TRH, BTEX, PAH, Phenols, Metals	B15: OCP, OPP, PCB	Hold	pH, cation exchange capacity and clay content	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH01 - 0.3	11/06/19	S			X								1		
2	BH01 - 0.7	11/6/19	S	X	X									1		
3	BH01 - 1.5	11/6/19	S	X	X									1		
4	BH01 - 2.4	11/6/19	S			X								1		
5	BH02 - 0.2	11/6/19	S			X								1		
6	BH02 - 0.6	11/6/19	S	X	X									1		
7	BH02 - 1.5	11/6/19	S			X								1		
8	BH02 - 2.3	11/6/19	S	X	X									1		
9	BH03 - 0.1	11/6/19	S	X	X									1		
10	BH03 - 0.5	11/6/19	S			X								1		
11	BH03 - 1.3	11/6/19	S	X	X									1		
12	BH03 - 2.2	11/6/19	S			X								1		
13	BH04 - 0.2	11/6/19	S	X	X									1		
14	BH04 - 1.0	11/6/19	S			X								1		
15	BH04 - 1.5	11/6/19	S			X								1		
16	BH04 - 2.3	11/6/19	S	X	X									1		
17	BH05 - 0.2	11/6/19	S			X								1		
18	BH05 - 0.6	11/6/19	S	X	X									1		
19	BH05 - 2.6	11/6/19	S			X								1		
20	BH05 - 3.5	11/6/19	S	X	X									1		
21	BH06 - 0.1	11/6/19	S			X								1		
22	BH06 - 0.5	11/6/19	S	X	X		X							1		
23	BH06 - 1.5	11/6/19	S											1		
	BH06 - 3.5	11/6/19	S	X	X											
	QC01	11/6/19	S	X	X									1		
	QC01A	11/6/19	S	X										1		Please forward to ALS
23	R_11062019	11/6/19	W													
24	TB01	11/6/19	S									2				
25																
	Total Counts			14	13	11	1					1		25		

Method of Shipment	☐ Courier (#) ☐ Hand Delivered ☐ Postal	Name		Date	__/__/__	Time	__:__
Eurofins | mgt Laboratory Use Only — Received By	Elvis D	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date 13/6/19	Time 6.26pm	Temperature	5.3°C
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature	Date __/__/__	Time __:__	Report №	660634

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

eurofins | mgt

Melbourne
6 Monterey Road
Dandenong South Vic 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**WSP Australia P/L NSW**
Contact name:	Alexander Carpenter
Project name:	SYDNEY TRAINS - KIAMA
Project ID:	PS114138
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jun 13, 2019 6:26 PM
Eurofins | mgt reference:	**660634**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.4 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☑ Sample containers for volatile analysis received with zero headspace.
- ☑ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

QC01A sent to ALS for analysis.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Alexander Carpenter - CarpenterA@pbworld.com.

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e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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NATA # 1261
Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SYDNEY TRAINS - KIAMA
Project ID: PS114138

Order No.: PS114138
Report #: 660634
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jun 13, 2019 6:26 PM
Due: Jun 20, 2019
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	BH1 0.7	Jun 11, 2019		Soil	S19-Jn14671				X	X		X
2	BH1 1.5	Jun 11, 2019		Soil	S19-Jn14672				X	X		X
3	BH02 0.6	Jun 11, 2019		Soil	S19-Jn14673				X	X		X
4	BH02 2.3	Jun 11, 2019		Soil	S19-Jn14674				X	X		X
5	BH03 0.1	Jun 11, 2019		Soil	S19-Jn14675				X	X		X
6	BH03 1.3	Jun 11, 2019		Soil	S19-Jn14676				X	X		X
7	BH04 0.2	Jun 11, 2019		Soil	S19-Jn14677				X	X		X
8	BH04 2.3	Jun 11, 2019		Soil	S19-Jn14678				X	X		X
9	BH05 0.6	Jun 11, 2019		Soil	S19-Jn14679				X	X		X

ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
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Project Name: SYDNEY TRAINS - KIAMA
Project ID: PS114138

Order No.: PS114138
Report #: 660634
Phone: 02 9272 5586
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Received: Jun 13, 2019 6:26 PM
Due: Jun 20, 2019
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
10	BH05 3.5	Jun 11, 2019		Soil	S19-Jn14680				X	X		X
11	BH06 0.5	Jun 11, 2019		Soil	S19-Jn14681	X		X	X	X	X	X
12	BH06 3.5	Jun 11, 2019		Soil	S19-Jn14682				X	X		X
13	QC01	Jun 11, 2019		Soil	S19-Jn14683				X	X		X
14	R_11062019	Jun 11, 2019		Water	S19-Jn14684		X					
15	TB01	Jun 11, 2019		Soil	S19-Jn14685		X					
16	BH01 0.3	Jun 11, 2019		Soil	S19-Jn14686		X					
17	BH01 2.4	Jun 11, 2019		Soil	S19-Jn14687		X					
18	BH02 0.2	Jun 11, 2019		Soil	S19-Jn14688		X					
19	BH02 1.5	Jun 11, 2019		Soil	S19-Jn14689		X					
20	BH03 0.5	Jun 11, 2019		Soil	S19-Jn14690		X					
21	BH03 2.2	Jun 11, 2019		Soil	S19-Jn14691		X					

ABN – 50 005 085 521
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Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SYDNEY TRAINS - KIAMA
Project ID: PS114138

Order No.: PS114138
Report #: 660634
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jun 13, 2019 6:26 PM
Due: Jun 20, 2019
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
22	BH04 1.0	Jun 11, 2019		Soil	S19-Jn14692		X					
23	BH04 1.5	Jun 11, 2019		Soil	S19-Jn14693		X					
24	BH05 0.2	Jun 11, 2019		Soil	S19-Jn14694		X					
25	BH05 2.8	Jun 11, 2019		Soil	S19-Jn14695		X					
26	BH06 0.1	Jun 11, 2019		Soil	S19-Jn14696		X					
27	BH06 1.5	Jun 11, 2019		Soil	S19-Jn14700		X					
Test Counts						1	14	1	13	13	1	13

Certificate of Analysis

WSP Australia P/L NSW
Level 27, Ernst & Young Centre
Sydney
NSW 2001

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention:	**Alexander Carpenter**
Report	**660634-S**
Project name	SYDNEY TRAINS - KIAMA
Project ID	PS114138
Received Date	Jun 13, 2019

Client Sample ID			**BH1 0.7**	**BH1 1.5**	**BH02 0.6**	**BH02 2.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Jn14671**	**S19-Jn14672**	**S19-Jn14673**	**S19-Jn14674**
Date Sampled			**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	72	91	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH1 0.7	BH1 1.5	BH02 0.6	BH02 2.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14671	S19-Jn14672	S19-Jn14673	S19-Jn14674
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	103	110	102	109
p-Terphenyl-d14 (surr.)	1	%	98	99	92	99
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	110	126	122	94
Tetrachloro-m-xylene (surr.)	1	%	120	127	115	101
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			BH1 0.7	BH1 1.5	BH02 0.6	BH02 2.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Jn14671**	**S19-Jn14672**	**S19-Jn14673**	**S19-Jn14674**
Date Sampled			**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	72	83	78	83
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	110	126	122	94
Tetrachloro-m-xylene (surr.)	1	%	120	127	115	101
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			BH1 0.7	BH1 1.5	BH02 0.6	BH02 2.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14671	S19-Jn14672	S19-Jn14673	S19-Jn14674
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	95	60	70	70
% Moisture	1	%	24	25	21	29
Heavy Metals						
Arsenic	2	mg/kg	120	170	49	4.0
Cadmium	0.4	mg/kg	< 0.4	1.0	< 0.4	< 0.4
Chromium	5	mg/kg	16	9.2	8.8	32
Copper	5	mg/kg	140	150	100	56
Lead	5	mg/kg	79	130	78	18
Mercury	0.1	mg/kg	0.2	0.4	0.1	< 0.1
Nickel	5	mg/kg	9.1	12	20	6.6
Zinc	5	mg/kg	54	390	48	41

Client Sample ID			BH03 0.1	BH03 1.3	BH04 0.2	BH04 2.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14675	S19-Jn14676	S19-Jn14677	S19-Jn14678
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	60	56	< 50
TRH C29-C36	50	mg/kg	73	< 50	66	81
TRH C10-36 (Total)	50	mg/kg	73	60	122	81
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	96	88	85	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH03 0.1	BH03 1.3	BH04 0.2	BH04 2.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Jn14675**	**S19-Jn14676**	**S19-Jn14677**	**S19-Jn14678**
Date Sampled			**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	150	120
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	150	120
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	1.1	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	1.4	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.7	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	0.8	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	0.9	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	0.8	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	1.1	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	1.2	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	6	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	115	118	105	113
p-Terphenyl-d14 (surr.)	1	%	104	106	100	112
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	0.44	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			BH03 0.1	BH03 1.3	BH04 0.2	BH04 2.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14675	S19-Jn14676	S19-Jn14677	S19-Jn14678
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	0.44	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	0.44	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	91	101	81	104
Tetrachloro-m-xylene (surr.)	1	%	100	112	97	106
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	87	91	80	92
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

eurofins | mgt

Client Sample ID			BH03 0.1	BH03 1.3	BH04 0.2	BH04 2.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Jn14675**	**S19-Jn14676**	**S19-Jn14677**	**S19-Jn14678**
Date Sampled			**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	91	101	81	104
Tetrachloro-m-xylene (surr.)	1	%	100	112	97	106
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	84	85	59	81
% Moisture	1	%	4.2	15	4.3	28
Heavy Metals						
Arsenic	2	mg/kg	2.2	480	9.3	25
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.9	35	< 5	13
Copper	5	mg/kg	260	100	230	140
Lead	5	mg/kg	8.2	170	6.4	27
Mercury	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.3	9.8	8.0	12
Zinc	5	mg/kg	56	110	62	89

Client Sample ID			BH05 0.6	BH05 3.5	BH06 0.5	BH06 3.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14679	S19-Jn14680	S19-Jn14681	S19-Jn14682
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	92	88	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	113	111	119	107
p-Terphenyl-d14 (surr.)	1	%	103	112	117	107

Client Sample ID			BH05 0.6	BH05 3.5	BH06 0.5	BH06 3.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14679	S19-Jn14680	S19-Jn14681	S19-Jn14682
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	0.39	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	0.39	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	0.39	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	83	106	104	86
Tetrachloro-m-xylene (surr.)	1	%	93	108	109	99
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			BH05 0.6	BH05 3.5	BH06 0.5	BH06 3.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14679	S19-Jn14680	S19-Jn14681	S19-Jn14682
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	87	82	89	81
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	83	106	104	86
Tetrachloro-m-xylene (surr.)	1	%	93	108	109	99
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	68	78	76	78

Client Sample ID			BH05 0.6	BH05 3.5	BH06 0.5	BH06 3.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14679	S19-Jn14680	S19-Jn14681	S19-Jn14682
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
% Clay	1	%	-	-	< 1	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	56	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	7.7	-
% Moisture	1	%	6.3	8.1	13	31
Heavy Metals						
Arsenic	2	mg/kg	150	6.8	74	8.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	8.5	11	< 5	10
Copper	5	mg/kg	160	55	170	92
Lead	5	mg/kg	45	14	25	12
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	10	5.1	12	7.2
Zinc	5	mg/kg	83	29	100	78
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	33	-

Client Sample ID			QC01
Sample Matrix			Soil
Eurofins | mgt Sample No.			S19-Jn14683
Date Sampled			Jun 11, 2019
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	20
TRH C15-C28	50	mg/kg	56
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	76
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100

Client Sample ID			QC01
Sample Matrix			Soil
Eurofins | mgt Sample No.			S19-Jn14683
Date Sampled			Jun 11, 2019
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	107
p-Terphenyl-d14 (surr.)	1	%	105
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05
a-BHC	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-BHC	0.05	mg/kg	< 0.05
d-BHC	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2
Toxaphene	1	mg/kg	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2
Dibutylchlorendate (surr.)	1	%	INT
Tetrachloro-m-xylene (surr.)	1	%	148

Client Sample ID			QC01
Sample Matrix			Soil
Eurofins | mgt Sample No.			S19-Jn14683
Date Sampled			Jun 11, 2019
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2
Demeton-S	0.2	mg/kg	< 0.2
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.2
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	81
Polychlorinated Biphenyls			
Aroclor-1016	0.5	mg/kg	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5
Total PCB*	0.5	mg/kg	< 0.5
Dibutylchlorendate (surr.)	1	%	INT
Tetrachloro-m-xylene (surr.)	1	%	148

Client Sample ID			QC01
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S19-Jn14683**
Date Sampled			**Jun 11, 2019**
Test/Reference	LOR	Unit	
Phenols (Halogenated)			
2-Chlorophenol	0.5	mg/kg	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1
Pentachlorophenol	1	mg/kg	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1
Total Halogenated Phenol*	1	mg/kg	< 1
Phenols (non-Halogenated)			
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2
2-Nitrophenol	1	mg/kg	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4
4-Nitrophenol	5	mg/kg	< 5
Dinoseb	20	mg/kg	< 20
Phenol	0.5	mg/kg	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20
Phenol-d6 (surr.)	1	%	85
% Moisture	1	%	14
Heavy Metals			
Arsenic	2	mg/kg	83
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	< 5
Copper	5	mg/kg	170
Lead	5	mg/kg	35
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	12
Zinc	5	mg/kg	140

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B7A			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 14, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 14, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Sydney	Jun 14, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Sydney	Jun 14, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jun 14, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Jun 14, 2019	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Clay	Brisbane	Jun 17, 2019	0 Day
- Method: LTM-GEN-7040			
pH (1:5 Aqueous extract at 25°C as rec.)	Sydney	Jun 14, 2019	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Jun 17, 2019	7 Day
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Jun 17, 2019	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
% Moisture	Sydney	Jun 13, 2019	14 Day
- Method: LTM-GEN-7080 Moisture			

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SYDNEY TRAINS - KIAMA
Project ID: PS114138

Order No.: PS114138
Report #: 660634
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jun 13, 2019 6:26 PM
Due: Jun 20, 2019
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	BH1 0.7	Jun 11, 2019		Soil	S19-Jn14671				X	X		X
2	BH1 1.5	Jun 11, 2019		Soil	S19-Jn14672				X	X		X
3	BH02 0.6	Jun 11, 2019		Soil	S19-Jn14673				X	X		X
4	BH02 2.3	Jun 11, 2019		Soil	S19-Jn14674				X	X		X
5	BH03 0.1	Jun 11, 2019		Soil	S19-Jn14675				X	X		X
6	BH03 1.3	Jun 11, 2019		Soil	S19-Jn14676				X	X		X
7	BH04 0.2	Jun 11, 2019		Soil	S19-Jn14677				X	X		X
8	BH04 2.3	Jun 11, 2019		Soil	S19-Jn14678				X	X		X
9	BH05 0.6	Jun 11, 2019		Soil	S19-Jn14679				X	X		X

ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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Site # 1254 & 14271

Sydney
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	WSP Australia P/L NSW	**Order No.:**	PS114138	**Received:**	Jun 13, 2019 6:26 PM
Address:	Level 27, Ernst & Young Centre Sydney NSW 2001	**Report #:**	660634	**Due:**	Jun 20, 2019
		Phone:	02 9272 5586	**Priority:**	5 Day
		Fax:	02 9272 5101	**Contact Name:**	Alexander Carpenter
Project Name:	SYDNEY TRAINS - KIAMA				
Project ID:	PS114138				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
10	BH05 3.5	Jun 11, 2019		Soil	S19-Jn14680				X	X		X
11	BH06 0.5	Jun 11, 2019		Soil	S19-Jn14681	X		X	X	X	X	X
12	BH06 3.5	Jun 11, 2019		Soil	S19-Jn14682				X	X		X
13	QC01	Jun 11, 2019		Soil	S19-Jn14683				X	X		X
14	R_11062019	Jun 11, 2019		Water	S19-Jn14684		X					
15	TB01	Jun 11, 2019		Soil	S19-Jn14685		X					
16	BH01 0.3	Jun 11, 2019		Soil	S19-Jn14686		X					
17	BH01 2.4	Jun 11, 2019		Soil	S19-Jn14687		X					
18	BH02 0.2	Jun 11, 2019		Soil	S19-Jn14688		X					
19	BH02 1.5	Jun 11, 2019		Soil	S19-Jn14689		X					
20	BH03 0.5	Jun 11, 2019		Soil	S19-Jn14690		X					
21	BH03 2.2	Jun 11, 2019		Soil	S19-Jn14691		X					

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Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
22	BH04 1.0	Jun 11, 2019		Soil	S19-Jn14692		X					
23	BH04 1.5	Jun 11, 2019		Soil	S19-Jn14693		X					
24	BH05 0.2	Jun 11, 2019		Soil	S19-Jn14694		X					
25	BH05 2.8	Jun 11, 2019		Soil	S19-Jn14695		X					
26	BH06 0.1	Jun 11, 2019		Soil	S19-Jn14696		X					
27	BH06 1.5	Jun 11, 2019		Soil	S19-Jn14700		X					
Test Counts						1	14	1	13	13	1	13

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	80			70-130	Pass	
TRH C10-C14	%	87			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	92			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	91			70-130	Pass	
o-Xylene	%	93			70-130	Pass	
Xylenes - Total	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	93			70-130	Pass	
TRH C6-C10	%	76			70-130	Pass	
TRH >C10-C16	%	92			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	121			70-130	Pass	
Acenaphthylene	%	120			70-130	Pass	
Anthracene	%	129			70-130	Pass	
Benz(a)anthracene	%	110			70-130	Pass	
Benzo(a)pyrene	%	113			70-130	Pass	
Benzo(b&j)fluoranthene	%	119			70-130	Pass	
Benzo(g.h.i)perylene	%	122			70-130	Pass	
Benzo(k)fluoranthene	%	126			70-130	Pass	
Chrysene	%	124			70-130	Pass	
Dibenz(a.h)anthracene	%	122			70-130	Pass	
Fluoranthene	%	115			70-130	Pass	
Fluorene	%	125			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	118			70-130	Pass	
Naphthalene	%	112			70-130	Pass	
Phenanthrene	%	128			70-130	Pass	
Pyrene	%	119			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	101			70-130	Pass	
4.4'-DDD	%	115			70-130	Pass	
4.4'-DDE	%	108			70-130	Pass	
4.4'-DDT	%	105			70-130	Pass	
a-BHC	%	114			70-130	Pass	
Aldrin	%	110			70-130	Pass	
b-BHC	%	104			70-130	Pass	
d-BHC	%	117			70-130	Pass	
Dieldrin	%	106			70-130	Pass	
Endosulfan I	%	104			70-130	Pass	
Endosulfan II	%	114			70-130	Pass	
Endosulfan sulphate	%	107			70-130	Pass	
Endrin	%	97			70-130	Pass	
Endrin aldehyde	%	103			70-130	Pass	
Endrin ketone	%	100			70-130	Pass	
g-BHC (Lindane)	%	112			70-130	Pass	
Heptachlor	%	110			70-130	Pass	
Heptachlor epoxide	%	109			70-130	Pass	
Hexachlorobenzene	%	105			70-130	Pass	
Methoxychlor	%	99			70-130	Pass	
Toxaphene	%	83			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	95			70-130	Pass	
Dimethoate	%	95			70-130	Pass	
Ethion	%	96			70-130	Pass	
Fenitrothion	%	109			70-130	Pass	
Mevinphos	%	102			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	87			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	113			30-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4-Dichlorophenol			%	128			30-130	Pass	
2.4.5-Trichlorophenol			%	123			30-130	Pass	
2.4.6-Trichlorophenol			%	121			30-130	Pass	
2.6-Dichlorophenol			%	130			30-130	Pass	
4-Chloro-3-methylphenol			%	120			30-130	Pass	
Pentachlorophenol			%	94			30-130	Pass	
Tetrachlorophenols - Total			%	116			30-130	Pass	
LCS - % Recovery									
Phenols (non-Halogenated)									
2-Methylphenol (o-Cresol)			%	128			30-130	Pass	
2-Nitrophenol			%	127			30-130	Pass	
2.4-Dimethylphenol			%	95			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)			%	118			30-130	Pass	
4-Nitrophenol			%	92			30-130	Pass	
Dinoseb			%	94			30-130	Pass	
Phenol			%	123			30-130	Pass	
LCS - % Recovery									
% Clay			%	100			70-130	Pass	
LCS - % Recovery									
Heavy Metals									
Arsenic			%	116			70-130	Pass	
Cadmium			%	113			70-130	Pass	
Chromium			%	116			70-130	Pass	
Copper			%	114			70-130	Pass	
Lead			%	116			70-130	Pass	
Mercury			%	121			70-130	Pass	
Nickel			%	114			70-130	Pass	
Zinc			%	115			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S19-Jn14821	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S19-Jn14821	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S19-Jn16302	NCP	%	113			70-130	Pass	
Acenaphthylene	S19-Jn16302	NCP	%	114			70-130	Pass	
Anthracene	S19-Jn16302	NCP	%	113			70-130	Pass	
Benz(a)anthracene	S19-Jn16302	NCP	%	108			70-130	Pass	
Benzo(a)pyrene	S19-Jn16302	NCP	%	109			70-130	Pass	
Benzo(b&j)fluoranthene	S19-Jn16302	NCP	%	125			70-130	Pass	
Benzo(g.h.i)perylene	S19-Jn16302	NCP	%	118			70-130	Pass	
Benzo(k)fluoranthene	S19-Jn16302	NCP	%	111			70-130	Pass	
Chrysene	S19-Jn16302	NCP	%	115			70-130	Pass	
Dibenz(a.h)anthracene	S19-Jn16302	NCP	%	119			70-130	Pass	
Fluoranthene	S19-Jn16302	NCP	%	117			70-130	Pass	
Fluorene	S19-Jn16302	NCP	%	114			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-Jn16302	NCP	%	115			70-130	Pass	
Naphthalene	S19-Jn16302	NCP	%	111			70-130	Pass	
Phenanthrene	S19-Jn16302	NCP	%	114			70-130	Pass	
Pyrene	S19-Jn16302	NCP	%	121			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S19-Jn14263	NCP	%	127			70-130	Pass	
4.4'-DDD	S19-Jn15950	NCP	%	117			70-130	Pass	
4.4'-DDE	S19-Jn15950	NCP	%	99			70-130	Pass	
4.4'-DDT	S19-Jn14263	NCP	%	91			70-130	Pass	
a-BHC	S19-Jn15950	NCP	%	106			70-130	Pass	
Aldrin	S19-Jn14263	NCP	%	130			70-130	Pass	
b-BHC	S19-Jn14263	NCP	%	117			70-130	Pass	
d-BHC	S19-Jn15950	NCP	%	107			70-130	Pass	
Dieldrin	S19-Jn15950	NCP	%	113			70-130	Pass	
Endosulfan I	S19-Jn14263	NCP	%	124			70-130	Pass	
Endosulfan II	S19-Jn15950	NCP	%	112			70-130	Pass	
Endosulfan sulphate	S19-Jn15950	NCP	%	109			70-130	Pass	
Endrin	S19-Jn14263	NCP	%	117			70-130	Pass	
Endrin aldehyde	S19-Jn14263	NCP	%	124			70-130	Pass	
Endrin ketone	S19-Jn14263	NCP	%	126			70-130	Pass	
g-BHC (Lindane)	S19-Jn14263	NCP	%	124			70-130	Pass	
Heptachlor	S19-Jn14263	NCP	%	125			70-130	Pass	
Heptachlor epoxide	S19-Jn14263	NCP	%	128			70-130	Pass	
Hexachlorobenzene	S19-Jn14263	NCP	%	124			70-130	Pass	
Methoxychlor	S19-Jn14263	NCP	%	96			70-130	Pass	
Toxaphene	S19-Jn14263	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S19-Jn19881	NCP	%	112			70-130	Pass	
Dimethoate	S19-Jn19881	NCP	%	105			70-130	Pass	
Ethion	S19-Jn19881	NCP	%	115			70-130	Pass	
Fenitrothion	S19-Jn10946	NCP	%	112			70-130	Pass	
Mevinphos	S19-Jn19881	NCP	%	118			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Total PCB*	S19-My49750	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Zinc	S19-Jn15960	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Jn14672	CP	%	92			70-130	Pass	
Cadmium	S19-Jn14672	CP	%	93			70-130	Pass	
Chromium	S19-Jn14672	CP	%	96			70-130	Pass	
Copper	S19-Jn14672	CP	%	100			70-130	Pass	
Lead	S19-Jn14672	CP	%	86			70-130	Pass	
Mercury	S19-Jn14672	CP	%	81			70-130	Pass	
Nickel	S19-Jn14672	CP	%	103			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S19-Jn14677	CP	%	82			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Jn14677	CP	%	89			70-130	Pass	
Toluene	S19-Jn14677	CP	%	87			70-130	Pass	
Ethylbenzene	S19-Jn14677	CP	%	88			70-130	Pass	
m&p-Xylenes	S19-Jn14677	CP	%	87			70-130	Pass	
o-Xylene	S19-Jn14677	CP	%	89			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total	S19-Jn14677	CP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S19-Jn14677	CP	%	76			70-130	Pass	
TRH C6-C10	S19-Jn14677	CP	%	82			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S19-Jn14678	CP	%	107			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-Jn17048	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S19-Jn14820	NCP	mg/kg	< 20	24	31	30%	Fail	Q15
TRH C15-C28	S19-Jn14820	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Jn14820	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Jn17048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Jn17048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Jn17048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Jn17048	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Jn17048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Jn17048	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-Jn17048	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Jn17048	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S19-Jn14820	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-Jn14820	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-Jn14820	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Jn14671	CP	mg/kg	120	120	1.0	30%	Pass	
Cadmium	S19-Jn14671	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-Jn14671	CP	mg/kg	16	15	9.0	30%	Pass	
Copper	S19-Jn14671	CP	mg/kg	140	130	12	30%	Pass	
Lead	S19-Jn14671	CP	mg/kg	79	94	18	30%	Pass	
Mercury	S19-Jn14671	CP	mg/kg	0.2	0.3	<1	30%	Pass	
Nickel	S19-Jn14671	CP	mg/kg	9.1	11	17	30%	Pass	
Zinc	S19-Jn14671	CP	mg/kg	54	56	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Jn14674	CP	%	29	29	1.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-Jn14676	CP	mg/kg	0.8	0.7	20	30%	Pass	
Benzo(a)pyrene	S19-Jn14676	CP	mg/kg	0.9	0.8	19	30%	Pass	
Benzo(b&j)fluoranthene	S19-Jn14676	CP	mg/kg	0.6	< 0.5	43	30%	Fail	Q15
Benzo(g.h.i)perylene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-Jn14676	CP	mg/kg	0.6	0.6	3.0	30%	Pass	
Chrysene	S19-Jn14676	CP	mg/kg	0.8	0.7	19	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Dibenz(a.h)anthracene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-Jn14676	CP	mg/kg	1.1	1.0	15	30%	Pass	
Fluorene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-Jn14676	CP	mg/kg	1.2	1.0	18	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S19-Jn14676	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S19-Jn14676	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S19-Jn14676	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S19-Jn14676	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S19-Jn14676	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S19-Jn14676	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-Jn14676	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S19-Jn14676	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S19-Jn14676	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-Jn14677	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S19-Jn14677	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S19-Jn14677	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S19-Jn14677	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	M19-Jn06199	NCP	%	14	15	9.0	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	B19-Jn12161	NCP	uS/cm	380	350	9.4	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M19-Jn10025	NCP	pH Units	7.0	6.9	Pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Gabriele Cordero	Senior Analyst-Inorganic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Julie Kay	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1918320**	Page	: 1 of 6
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Alex Carpenter	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: PS114138 - Sydney Trains Kiama	Date Samples Received	: 14-Jun-2019 13:20
Order number	: PS114138	Date Analysis Commenced	: 17-Jun-2019
C-O-C number	: ----	Issue Date	: 20-Jun-2019 16:19
Sampler	: Alex Carpenter		
Site	: ----		
Quote number	: EN/008/18 B		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Peter Wu		Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC01A	----	----	----	----
			Client sampling date / time	11-Jun-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1918320-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**13.3**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**121**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**5**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**171**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**44**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**11**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**126**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC01A	----	----	----	----
			Client sampling date / time	11-Jun-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1918320-001	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC01A	----	----	----	----
			Client sampling date / time	11-Jun-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1918320-001	--------	--------	--------	--------
				Result	----	----	----	----
EP080: BTEXN - Continued								
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	92.0	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	95.0	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	97.3	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	103	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	101	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	102	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	106	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	106	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	104	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%)	
		Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1918320**	Page	: 1 of 9
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Alex Carpenter	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: PS114138 - Sydney Trains Kiama	Date Samples Received	: 14-Jun-2019
Order number	: PS114138	Date Analysis Commenced	: 17-Jun-2019
C-O-C number	: ----	Issue Date	: 20-Jun-2019
Sampler	: Alex Carpenter		
Site	: ----		
Quote number	: EN/008/18 B		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Peter Wu		Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to higl

Key :
- Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
- CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
- LOR = Limit of reporting
- RPD = Relative Percentage Difference
- # = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2414343)									
ES1916981-021	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
ES1918478-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	10	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	8	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	12	12	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	29	28	3.65	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	58	59	0.00	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2409144)									
ES1918157-001	Anonymous	EA055: Moisture Content	----	0.1	%	5.8	6.0	3.58	No Limit
ES1918325-004	Anonymous	EA055: Moisture Content	----	0.1	%	19.1	19.7	3.19	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2414344)									
ES1916981-021	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1918478-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2408084)									
ES1918444-051	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)A: Phenolic Compounds (QC Lot: 2408084) - continued									
ES1918444-051	Anonymous	EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
ES1918320-001	QC01A	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2408084)									
ES1918444-051	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2408084) - continued									
ES1918444-051	Anonymous	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1918320-001	QC01A	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2407415)									
ES1918025-015	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1918321-004	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	15	16	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2408083)									
ES1918444-051	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1918320-001	QC01A	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2407415)									
ES1918025-015	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1918321-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	34	35	4.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2408083)									
ES1918444-051	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2408083) - continued									
ES1918320-001	QC01A	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 2407415)									
ES1918025-015	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1918321-004	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2414343)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	99.4	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.8	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	89.9	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	96.2	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	99.3	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2414344)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	89.3	70	105
EP075(SIM)A: Phenolic Compounds (QCLot: 2408084)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	98.4	71	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	95.7	72	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	96.1	71	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	98.5	67	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	98.7	54	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	96.5	68	126
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	94.3	66	120
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	92.5	70	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	95.4	70	116
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	99.3	54	114
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	94.0	60	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	45.6	10	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2408084)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	94.1	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	93.3	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	95.0	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	96.0	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	97.4	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	92.8	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	91.7	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	95.9	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	95.3	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	91.2	75	127

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2408084) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	92.6	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	91.0	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	100	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	93.8	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	93.7	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	95.1	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2407415)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	100	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2408083)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	95.0	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	100	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	103	71	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2407415)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	102	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2408083)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	98.2	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	101	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	106	63	131
EP080: BTEXN (QCLot: 2407415)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	103	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	106	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	106	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	105	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	106	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	102	63	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2414343)							
ES1916981-021	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	99.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2414343) - continued							
ES1916981-021	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	102	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	99.2	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	99.6	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	103	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2414344)							
ES1916981-021	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.0	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2408084)							
ES1918320-001	QC01A	EP075(SIM): Phenol	108-95-2	10 mg/kg	94.0	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	97.1	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	94.3	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	93.0	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	82.8	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2408084)							
ES1918320-001	QC01A	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	89.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2407415)							
ES1918025-015	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2408083)							
ES1918320-001	QC01A	EP071: C10 - C14 Fraction	----	523 mg/kg	104	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	122	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	132	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2407415)							
ES1918025-015	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	99.5	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2408083)							
ES1918320-001	QC01A	EP071: >C10 - C16 Fraction	----	860 mg/kg	98.4	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	124	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	67.8	52	132
EP080: BTEXN (QCLot: 2407415)							
ES1918025-015	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	94.7	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	101	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	99.3	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	95.3	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	98.8	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	90.6	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1918320**	Page	: 1 of 4
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Alex Carpenter	Telephone	: +61 2 8784 8555
Project	: PS114138 - Sydney Trains Kiama	Date Samples Received	: 14-Jun-2019
Site	: ----	Issue Date	: 20-Jun-2019
Sampler	: Alex Carpenter	No. of samples received	: 1
Order number	: PS114138	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) QC01A	**11-Jun-2019**	----	----	----	**17-Jun-2019**	25-Jun-2019	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QC01A	**11-Jun-2019**	**19-Jun-2019**	08-Dec-2019	✓	**19-Jun-2019**	08-Dec-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QC01A	**11-Jun-2019**	**19-Jun-2019**	09-Jul-2019	✓	**20-Jun-2019**	09-Jul-2019	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**19-Jun-2019**	27-Jul-2019	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**19-Jun-2019**	27-Jul-2019	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**18-Jun-2019**	25-Jun-2019	✓
Soil Glass Jar - Unpreserved (EP071) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**19-Jun-2019**	27-Jul-2019	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**18-Jun-2019**	25-Jun-2019	✓
Soil Glass Jar - Unpreserved (EP071) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**19-Jun-2019**	27-Jul-2019	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**18-Jun-2019**	25-Jun-2019	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES1918320**		
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Alex Carpenter	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: alex.carpenter@wsp.com	E-mail	: Brenda.Hong@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: PS114138 - Sydney Trains Kiama	Page	: 1 of 2
Order number	: PS114138	Quote number	: ES2019PARBRINSW0005 (EN/008/18 B)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Alex Carpenter		

Dates

Date Samples Received	: 14-Jun-2019 13:20	Issue Date	: 15-Jun-2019
Client Requested Due Date	: 20-Jun-2019	Scheduled Reporting Date	: **20-Jun-2019**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 8.7'C
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.

If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EA055-103 Moisture Content	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1918320-001	11-Jun-2019 00:00	QC01A	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
ACCOUNTS PAYABLE(AP INVOICES)		
- A4 - AU Tax Invoice (INV)	Email	apinvoices@pb.com.au
Alex Carpenter		
- *AU Certificate of Analysis - NATA (COA)	Email	alex.carpenter@wsp.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex.carpenter@wsp.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alex.carpenter@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex.carpenter@wsp.com
- A4 - AU Tax Invoice (INV)	Email	alex.carpenter@wsp.com
- Chain of Custody (CoC) (COC)	Email	alex.carpenter@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	alex.carpenter@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	alex.carpenter@wsp.com

26/6/19

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Sydney Laboratory — Unit F3 Bld F 16 Mars Rd Lane Cove West NSW 2066 — 02 9900 8400 EnviroSampleNSW@eurofins.com

☐

Brisbane Laboratory — Unit 1 21 Smallwood Pl Murarrie QLD 4172 — 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory — Unit 2 91 Leach Highway Kewdale WA 6105 — 08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory — 2 Kingston Town Close Oakleigh VIC 3166 — 03 8564 5000 EnviroSampleVic@eurofins.com

Company	WSP Australia Pty Limited
Address	Level 27, 680 George Street Sydney, NSW 2000 Australia
Contact Name	Alexander Carpenter
Phone №	0415 501 846
Special Directions	
Purchase Order	PS114138
Quote ID №	190408WSPN
Project №	PS114138
Project Name	Sydney Trains - Kiama
Sampler(s)	Alex Carpenter
Handed over by	
Email for Invoice	Alex.Carpenter@wsp.com, APInvoices@pb.com.au
Email for Results	Alex.Carpenter@wsp.com

Turnaround Time (TAT) Requirements: ☐ Overnight (9am)* ☐ 1 Day* ☐ 2 Day* ☐ 3 Day* ☑ 5 Day ☐ Other ( ) * Surcharges apply

Analyses / Containers

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	B7A: TRH, BTEX, PAH, Phenols, Metals	B16: OCP, OPP, PCB	Hold	pH, cation exchange capacity and clay content	40mL VOA vial	Jar (Glass or HDPE)	Sample Comments / Dangerous Goods Hazard Warning
1	BH01 - 0.3	11/06/19	S			X			1	
2	BH01 - 0.7	11/6/19	S	X	X				1	
3	BH01 - 1.5	11/6/19	S	X	X				1	
4	BH01 - 2.4	11/6/19	S			X			1	
5	BH02 - 0.2	11/6/19	S			X			1	
6	BH02 - 0.6	11/6/19	S	X	X				1	
7	BH02 - 1.5	11/6/19	S			X			1	
8	BH02 - 2.3	11/6/19	S	X	X				1	
9	BH03 - 0.1	11/6/19	S	X	X				1	
10	BH03 - 0.5	11/6/19	S			X			1	
11	BH03 - 1.3	11/6/19	S	X	X				1	
12	BH03 - 2.2	11/6/19	S			X			1	
13	BH04 - 0.2	11/6/19	S	X	X				1	
14	BH04 - 1.0	11/6/19	S			X			1	
15	BH04 - 1.5	11/6/19	S			X			1	
16	BH04 - 2.3	11/6/19	S	X	X				1	
17	BH05 - 0.2	11/6/19	S			X			1	
18	BH05 - 0.6	11/6/19	S	X	X				1	
19	BH05 - 2.8	11/6/19	S			X			1	
20	BH05 - 3.5	11/6/19	S	X	X				1	
21	BH06 - 0.1	11/6/19	S			X			1	
22	BH06 - 0.5	11/5/19	S	X	X		X		1	
23	BH06 - 1.5	11/5/19	S						1	
	BH06 - 3.5	11/5/19	S	X	X					
	QC01	11/6/19	S	X	X				1	
	QC01A	11/5/19	S	X					1	Please forward to ALS
23	R_11062019	11/6/19	W							
24	TB01	11/6/19	S					2		
25										
	Total Counts			14	13	11	1	1	25	

Method of Shipment: ☐ Courier (#) ☐ Hand Delivered ☐ Postal — Name — Date / / — Time

Environmental Division
Sydney
Work Order Reference
ES1918320

Telephone : + 61-2-8784 8555

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

8.7°C

Rec - sejffho 14/6/19 1500
8.7°C

APPENDIX H

CALIBRATION CERTIFICATES

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-113994**

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6ev			
Alarms	Beeper	✓	**Low**	**High**	**TWA**	**STEL**
	Settings	✓	50ppm	100ppm	N/A	N/A
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

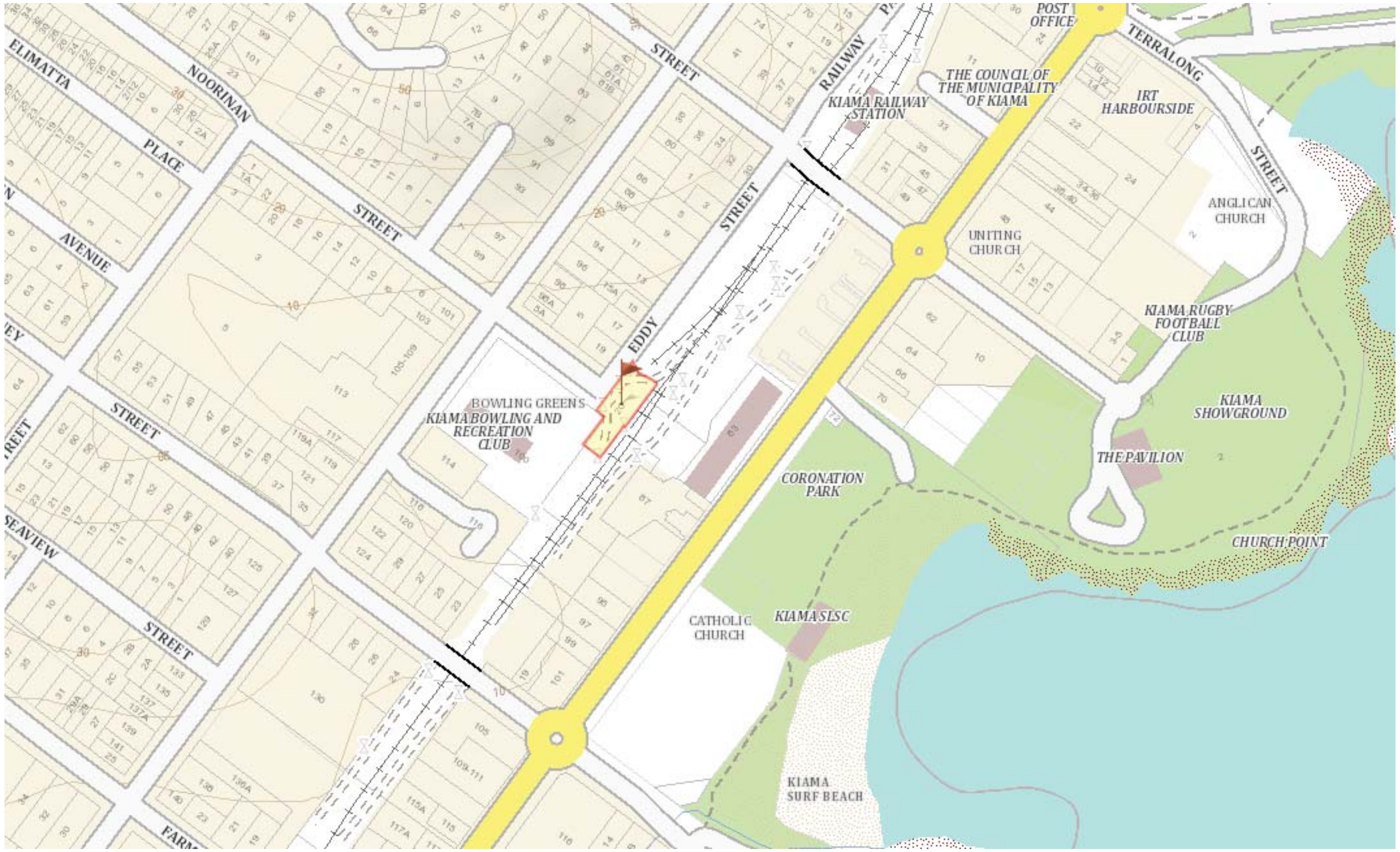
This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		98ppm Isobutylene	NATA	SY137		97.6ppm

Calibrated by: Srablia Sarah Lian

Calibration date: [illegible]

Next calibration due: [illegible]



Base map source: Six Maps (2019)

Site boundary

Figure 1 – Site location
20 Eddy Street, Kiama
NSW 2533

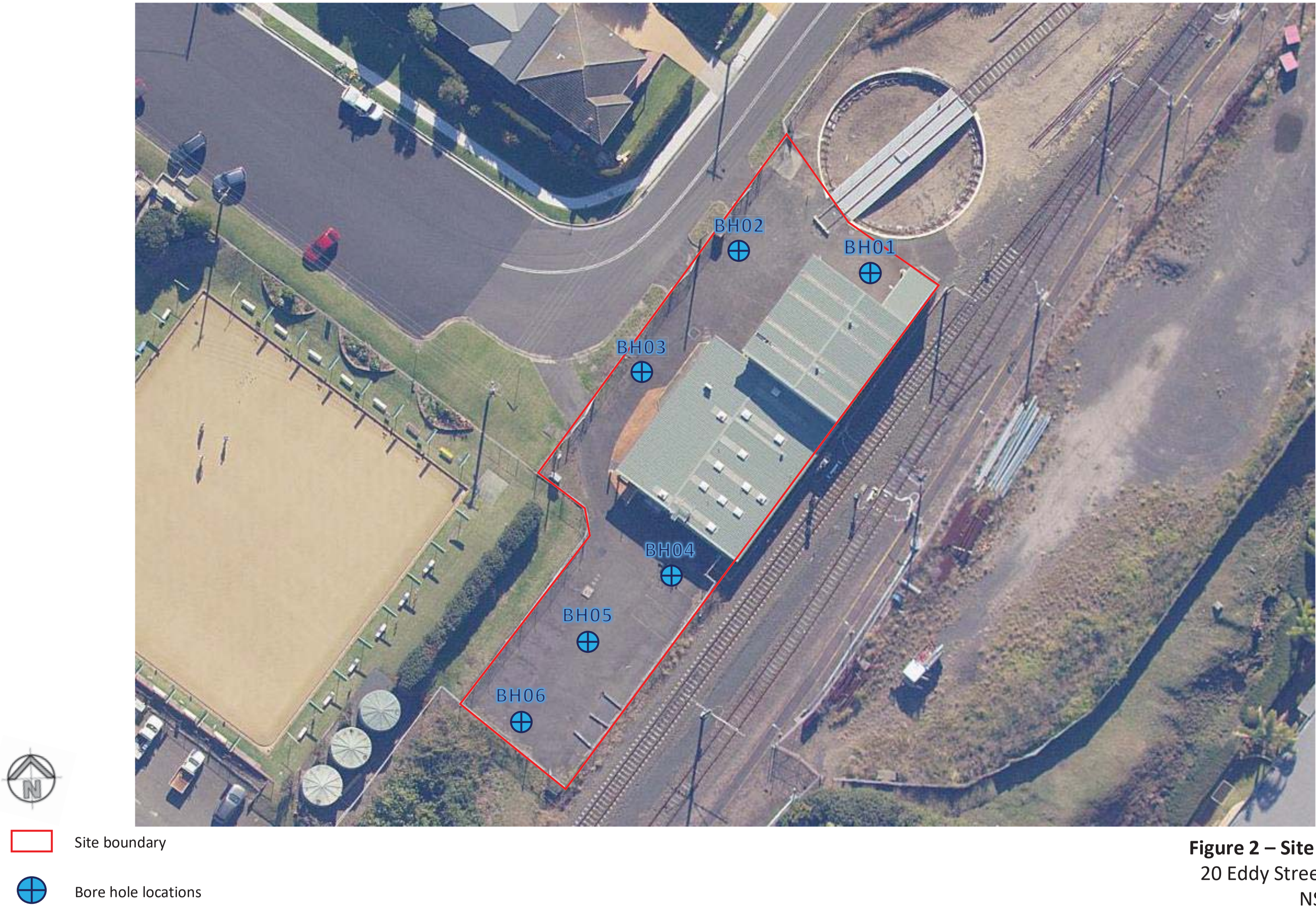


Figure 2 – Site location
20 Eddy Street, Kiama
NSW 2533

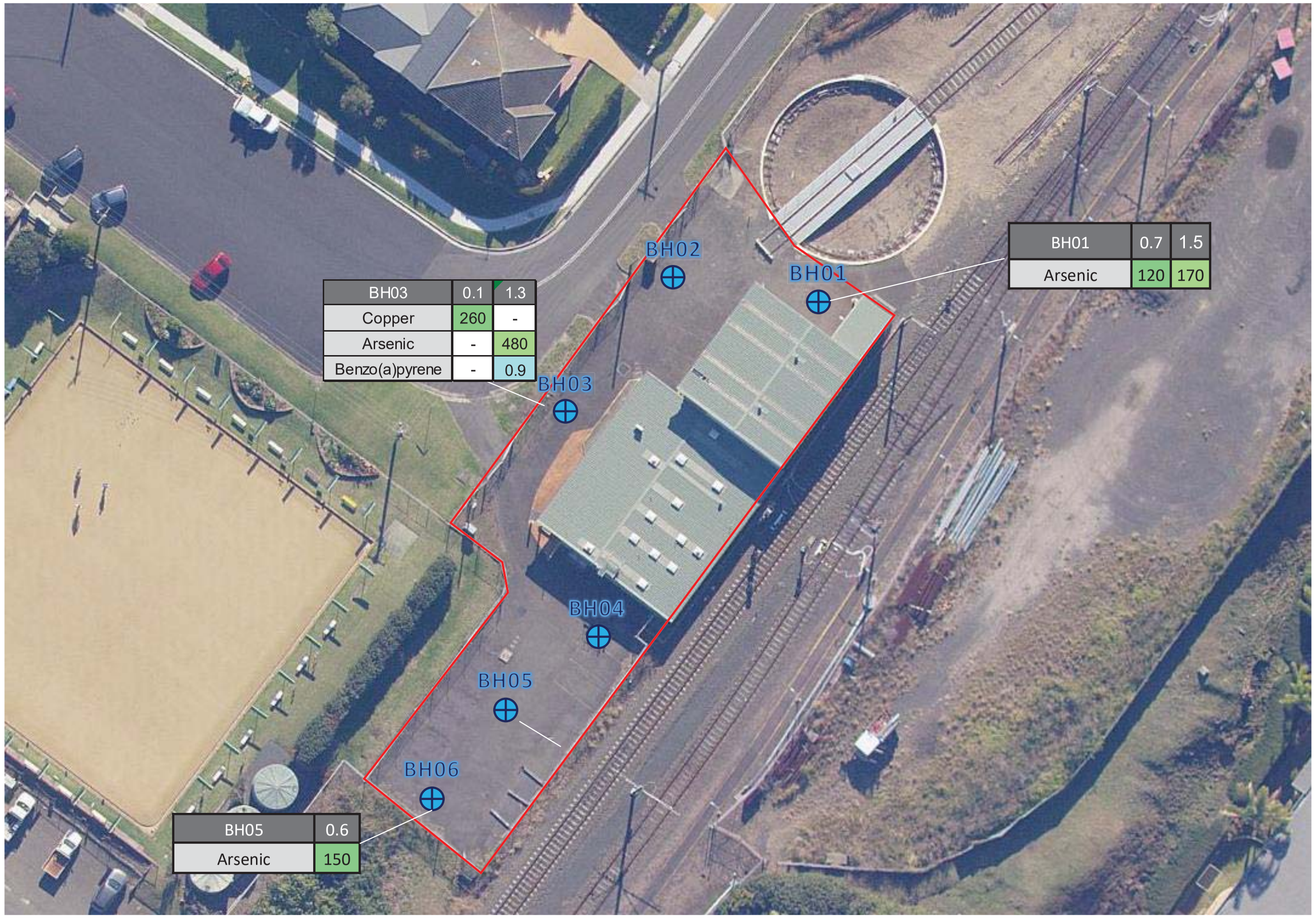
NEPM EIL Comm/Ind

NEPM EIL Urban Res

NEPM ESLs Comm/Ind

NEPM ESLs Urban Res

All results are displayed in mg/kg



N

Site boundary

Bore hole locations

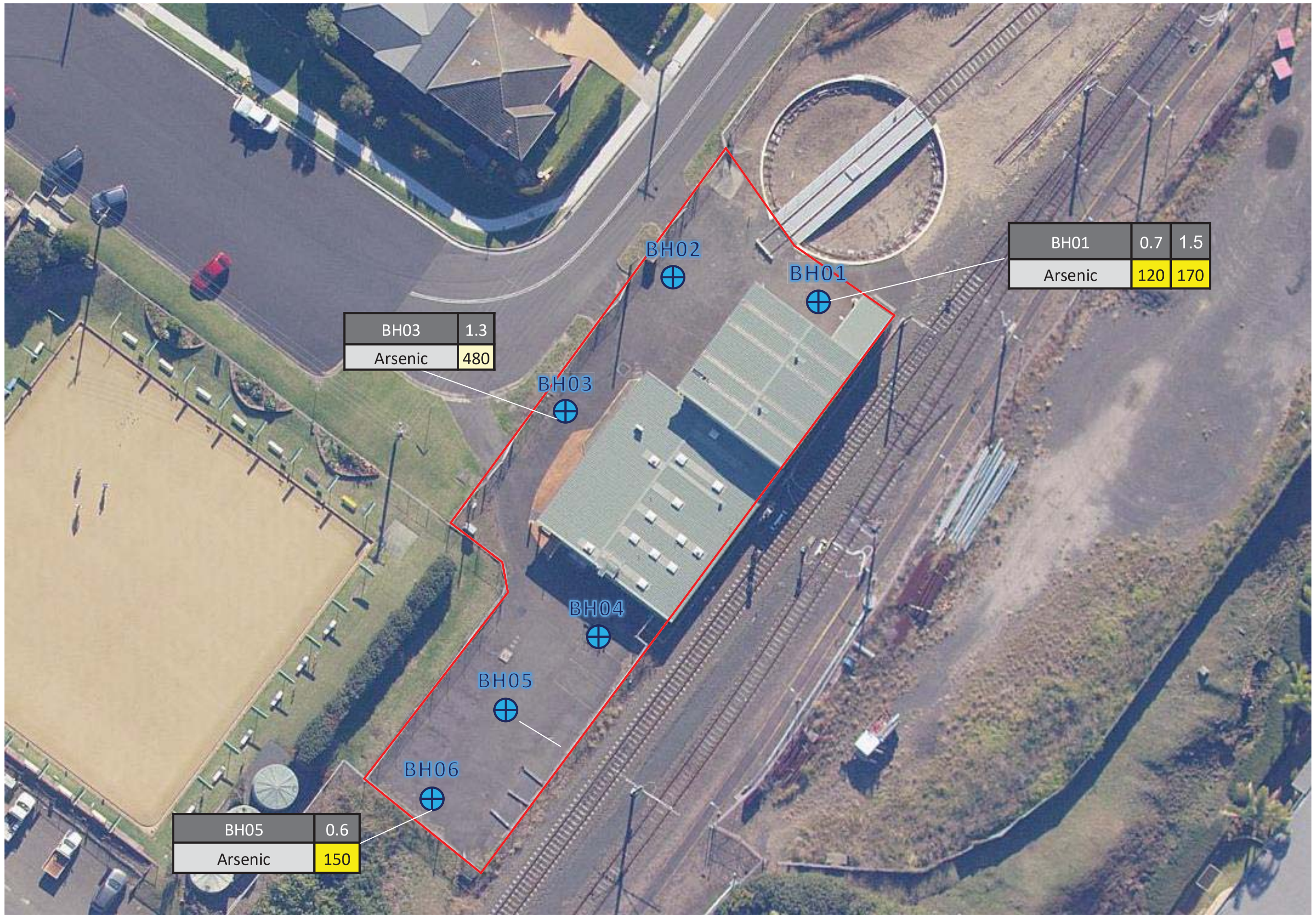
Figure 3 – Ecological Exceedance locations
20 Eddy Street, Kiama
NSW 2533

NEPM HILs Rec C

NEPM HILs Res A

NEPM HILs Res B

All results are displayed in mg/kg



Site boundary

Bore hole locations

Figure 4 – Human Exceedance locations
20 Eddy Street, Kiama
NSW 2533

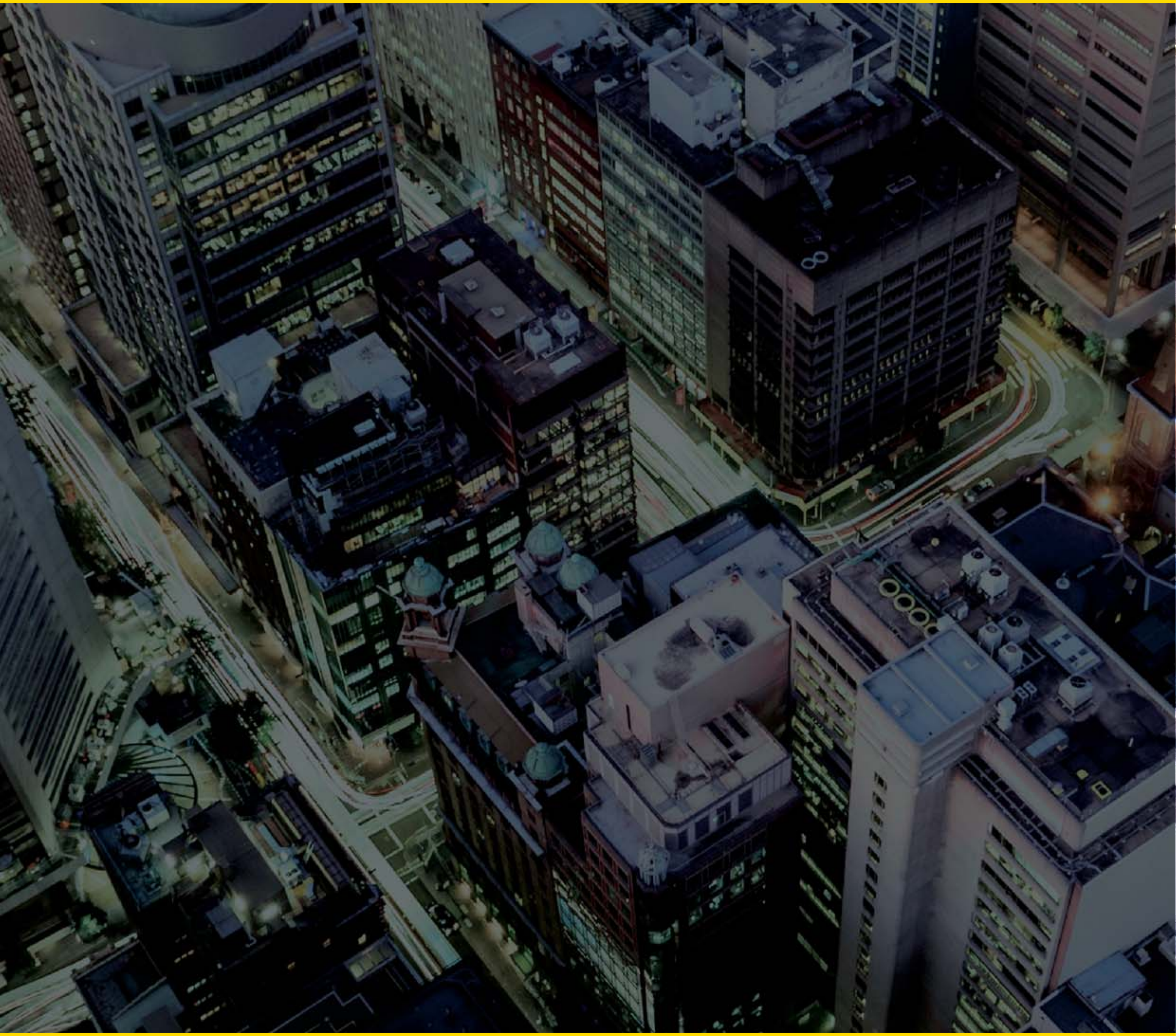
APPENDIX A

FIGURES

APPENDIX B

ENVIROSIGHT REPORTS

Fast, Accurate and Comprehensive Environmental and Development Risk Information



ENVIRO-SCREEN

Property Details

20 Eddy Street, Kiama NSW

Search Date: 14 May 2019

Understanding your Report

Your Report has been produced by Land Insight and Resources (LI Resources).

Your Report is based on information available from public databases and sources at the date of reporting. The information gathered relates to land that is within a 200 to 2000 m radius (buffer zone) from the boundaries of the Property. A smaller or larger radius may be applied for certain records (as listed under records and as shown in report maps).

While every effort is made to ensure the details in your Report are correct, LI Resources cannot guarantee the accuracy or completeness of the information or data provided.

The report provided by LI Resources includes data listed on page 3 (table of contents). All sources of data and definitions are provided on the report maps and as listed in the Product Guide (Attached). For a full list of references, metadata, publications or additional information not provided in this report, please contact LI Resources at info@liresources.com.au.

The report does not include title searches; dangerous good searches or; property certificates (unless requested); or information derived from a physical inspection, such as hazardous building materials, areas of infilling or dumping/spilling of potentially contaminated materials. It is important to note that these documents and an inspection can contain information relevant to contamination that may not be identified by this Report.

This Report, and your use of it, is regulated by LI Resources Terms and Conditions (See LIR Product Guide).

Land Insight and Resources

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e-mail: info@liresources.com.au

https://liresources.com.au/

INDEX

Section 1 Environmental Records Summary – Property Setting

1.1 SITE LOCATION MAP AND SENSITIVE RECEPTORS

Map 1 (500m Buffer)

Sensitive receptor	Category	Distance (m)*	Direction
Bowling Greens	Sports Field	55	west
Kiama Bowling and Recreation Club	Club	75	west
Catholic Church	Place of Worship	151	south-east
Coronation Park	Park	152	south-east
Ss Peter And Paul Catholic Primary School	Primary School	188	south-east
Aspect South Coast School Ss Peter And Paul Kiama	Primary School	188	south-east
Kiama SLSC	Community Facility	200	south-east
Uniting Church	Place of Worship	294	north-east
Kiama Court House	Court House	390	north-east
The Pavilion	Community Facility	400	east
Surf Beach Holiday Park	Tourist Park / Home Village	424	south-east
Kendalls Point Reserve	Park	425	south-east
Kiama Academy of Early Learning	Child Care Centre	428	north-west
Old Fire Station Community Arts Centre	Community Facility	435	north
Presbyterian Church	Place of Worship	439	north-east
Kiama Ambulance Station	Ambulance Station	440	north
Kiama Rugby Football Club	Community Facility	440	north-east
Irt Harbourside	Retirement Village	447	north-east
Playground	Playground	454	north-east
Kiama Public School	Primary School	467	north-west
Kiama Showground	Showground	480	east
Anglican Church	Place of Worship	494	north-east

*Distance from the sensitive receptor point feature to the site boundary centroid.

1.2 PLANNING CONTROLS

Map 2 (onsite)

Zoning	SP2	Infrastructure (Railway)
Environmental Planning Instruments	Not identified	

1.3 SOIL LANDSCAPE

Map 3a (onsite)

Soil Landscape	ERka	KIAMA	**Soil Group**	EROSIONAL
Description	**Landscape**—rolling low hills with broad crests, long convex slopes and steep coastal headlands on Blow Hole Latite. Relief 40–60 m. Slopes <20%. Extensive rock outcrop. Extensively cleared with stands of closed-forest. **Soils**—deep (>150 cm) Krasnozems (Gn4.11) on crests and upper slopes and Prairie Soils (Gn4.51, Gn4.81) on lower slopes. **Limitations**—run-on, water erosion hazard (localised), mass movement hazard (localised), sodicity, low permeability, low wet bearing strength, moderate shrink-swell (subsoil).			

1.4 ACID SULFATE SOIL (OEH 2011)

Map 3a (onsite)

	On the Property?	Within Record Search Buffer?
Acid Sulfate Soil Risk Maps (ASS) *(Table 1.5.1)*	Class 5	Class 5

1.5 ATLAS OF AUSTRALIAN ACID SULFATE SOIL AND SALINITY

Map 3b (onsite)

ASRIS Atlas of Australian Sulfate Soils *(Table 1.5.2)*	Bn(p4)	ASS in inland lakes, waterways, wetlands and riparian zones	**Probability of Occurrence**	Low Probability of occurrence
Hydrologic Soil Group *(Table 1.5.3)*	A - high			
Salinity Hazard	Not identified			

Table 1.5.1. Classification scheme in the ASS Planning Maps

Class of Land as shown on ASS Planning Maps	
1	Any works
2	Works below natural ground surface Works by which the watertable is likely to be lowered
3	Works beyond 1m below natural ground surface Works by which the watertable is likely to be lowered beyond 1m below natural ground surface
4	Works beyond 2m below natural ground surface Works by which the watertable is likely to be lowered beyond 2m below natural ground surface
5	Works within 500m of adjacent Class 1, 2, 3, or 4 land which are likely to lower the watertable below 1m AHD on adjacent Class 1, 2, 3 or 4 land.

For each class of land, the maps identify the type of works likely to present an environmental risk if undertaken in the particular class of land. If these types of works are proposed, further investigation is required to determine if ASS are actually present and whether they are present in such concentrations as to pose a risk to the environment.

Table 1.5.2. Australian Atlas of Acid Sulfate Soils[1] (ASS) map (CSIRO/NatCASS)

Code	Distinguishing soil/sediment properties, vegetation, landforms, or other characteristics
Probability of Occurrence of ASS[1]	
A	**High Probability of occurrence -** (>70% chance of occurrence in mapping unit)
B	**Low Probability of occurrence** - (6-70% chance of occurrence in mapping unit)
C	**Extremely low probability of occurrence** - (1-5% chance of occurrence in mapping unit)
D	**No probability of occurrence** - (<1% chance of occurrence in mapping unit)
x	**Disturbed ASS[1] terrain -** (ASS[1] material present below urban development).
u	**Unclassified** - (Insufficient information to classify map unit)
Zones	
a	Potential acid sulfate soil material and/or Monosulfidic Black Ooze (MBO).
b, c	Potential acid sulfate soil generally within upper 1 m.
c, d, e	ASS[1] generally within upper 1 m.
f	ASS[1] generally below 1 m from the surface
g	ASS[1], generally below 3 m from the surface.
h	ASS[1] generally within 1 m of the surface.
i, j	ASS[1] generally below 1 m of the surface.
k	ASS[1] material and/or Monosulfidic Black Ooze (MBO).

Code	Distinguishing soil/sediment properties, vegetation, landforms, or other characteristics
	Probability of Occurrence of ASS[1]
l, m, n, o, p, q	ASS[1] generally within upper 1 m in wet / riparian areas.
	Subscripts to codes
(a)	Actual acid sulfate soil (AASS) = sulfuric material.
(p)	Potential acid sulfate soil (PASS) = sulfidic material.
(q)	Monosulfidic Black Ooze (MBO) is organic ooze enriched by iron monosulfides.
	Confidence levels
(1)	All necessary analytical and morphological data are available
(2)	Analytical data are incomplete but are sufficient to classify the soil with a reasonable degree of confidence
(3)	No necessary analytical data are available, but confidence is fair, based on a knowledge of similar soils in similar environments
(4)	No necessary analytical data are available, and classifier has little knowledge or experience with ASS, hence classification is provisional

[1]Acid Sulfate Soils (ASS) are all those soils in which sulfuric acid may be produced, is being produced, or has been produced in amounts that have a lasting effect on main soil characteristics (Pons 1973). Acid sulfate soil (ASS) may include PASS or AASS + PASS. Potential acid sulfate soil (PASS) = sulfidic material. Actual acid sulfate soil (AASS) = sulfuric material.

Table 1.5.3. Hydrologic Soil Group

Code	Soil Group Characteristics
A	Soils having high infiltration rates, even when thoroughly wetted and consisting chiefly of deep, well to excessively-drained sands or gravels. These soils have a high rate of water transmission.
B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.
C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine texture. These soils have a slow rate of water transmission.
D	Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material. These soils have a very slow rate of water transmission.

1.6 GEOLOGY AND TOPOGRAPHY

Map 4 (onsite)

Geology

Map Sheet	Symbol	Formation	Group	Era	Period	Description
NSW 1:250 000 Statewide Geology	Pbh	-	Shoalhaven Group	Palaeozoic	Permian	Trachyte tuff with pebbly bands

Topography

Topography	12mAHD

Naturally Occurring Asbestos Potential

On the Property?	Within Record Search Buffer?
Not identified	Not identified

1.7 HYDROGEOLOGY AND GROUNDWATER BORES

Map 5a (500m - 2000m Buffer)

	On the Property?	Within Record Search Buffer?
Aquifer Type	Porous, extensive highly productive aquifers	Porous, extensive highly productive aquifers
Drinking Water Catchments	Not identified	Not identified
Protected Riparian Corridor	Not identified	Not identified
UPSS Environmentally sensitive zone	Southern NSW area UPSS	Southern NSW area UPSS
Wetlands	Not identified	Not identified
Groundwater Bores	Not identified	Yes, see 1.7.1 and 1.7.2

Table 1.7.1. Groundwater Bore Details

Groundwater Bore ID	Authorised Purpose	Completion Date	Drilled Depth (m)	Final Depth (m)	SWL[1] (m)	Salinity[1]	Yield[1] (L/s)	Distance (m)	Direction
GW111161	Monitoring	19-04-07	4.30	4.30	-	-	-	73.24	north-east
GW111162	Monitoring	18-04-07	7.00	7.00	-	-	-	128.99	north-east
GW111163	Monitoring	19-04-07	7.10	7.10	-	-	-	147.19	north-east
GW107387	Monitoring	18-02-04	4.50	4.50	3.80	-	-	667.03	north
GW107388	Monitoring	18-02-04	4.00	4.00	2.30	-	-	668.66	north
GW107389	Monitoring	18-02-04	3.30	3.30	-	-	-	684.75	north
GW013278	Water Supply	01-04-48	0.00	3.00	-	Good	-	787.84	south-west

[1]The most recent data available from NSW Department of Industry – Lands & Water Division.

Table 1.7.2. Groundwater Bore Driller Lithology Details

Groundwater Bore ID	From Depth (m)	To Depth (m)	Lithology	Description	Distance (m)	Direction
GW111161	0	0.8	FILL	Fill,gravelly sandy clay	73.24	north-east
	0.8	1.6	FILL	Fill,clay,mod.to high plasticity,gravels	73.24	north-east
	1.6	3	FILL	Fill.as above,clay dark brown	73.24	north-east
	3	4.3	CLAY	Clay,high plasticity,brown,gravels	73.24	north-east
GW111162	0	0.6	FILL	Fill,gravelly silty clay,angular gravels	128.99	north-east
	0.6	0.9	CLAY	Clay,high plasticity	128.99	north-east
	0.9	7	LTIT	Latite,weatheread,fine grain,red brown	128.99	north-east
GW111163	0	0.1	ASH	Asphalt	147.19	north-east
	0.1	0.6	FILL	Fill,gravelly clay,high plasticity	147.19	north-east
	0.6	7.1	LTIT	Latite,weathered to 1.1m,red/brown	147.19	north-east

GW107387	0	0.8	CLAY	Clay filling	667.03	north
	0.8	3.5	19	Silty clay	667.03	north
	3.5	4.5	SDSN	Sandstone	667.03	north
GW107388	0	0.4	GRVL	Gravel filling	668.66	north
	0.4	1.8	19	Silty clay	668.66	north
	1.8	4	SDSN	Sandstone	668.66	north
GW107389	0	0.7	CLAY	Clay filling	684.75	north
	0.7	3	19	Silty clay	684.75	north
	3	3.3	SDSN	Sandstone	684.75	north

1.8 HYDROGEOLOGY AND OTHER BOREHOLES

Map 5b (2000m Buffer)

	On the Property?	Within Record Search Buffer?
Groundwater Vulnerability	Not identified	Not identified
Groundwater Exclusion Zones (Williamtown GMZ [1])	Not identified	Not identified
Hydrogeologic Unit	Palaeozoic and Pre-Cambrian Fractured Rock Aquifers (low permeability)	Palaeozoic and Pre-Cambrian Fractured Rock Aquifers (low permeability)
Other known borehole investigations (500m buffer)	Not identified	Not identified

1 - Primary Management Zone – this area has significantly higher levels of PFAS detected and therefore, the strongest advice applies. Secondary Management Zone – this area has some detected levels of PFAS; Broader Management Zone – the topography and hydrology of the area means PFAS detections could occur now and into the future

Groundwater Dependent Ecosystems

Name	On the Property?	Within Record Search Buffer?
Ecosystems that rely on the Surface expression of Groundwater	Not identified	Not identified
Ecosystems that rely on Subsurface presence of Groundwater	Not identified	High to low potential GDE from regional studies

Table 1.8.1. Other known borehole investigations (Coal Seam Gas (CSG), Petroleum Wells and Other Boreholes) (500m buffer)

Borehole ID	Purpose	Project	Client/License	Date Drilled	Depth (m)	Distance (m)	Direction
Not identified	-	-	-	-	-	-	-

Section 2 Environmental Records Summary – Contamination and Potentially Contaminating Activities

2.1 PFAS INVESTIGATION PROGRAM

Map 5b (2000m Buffer)

Site	Address	Distance (m)	Direction
Not identified	-	-	-

2.2 CONTAMINATED LAND RECORD OF NOTICES ISSUED UNDER THE CLM ACT 1997

Map 6 (1000m Buffer)

Site Name[2]	Site ID	Address[1]	Notices	Distance (m)	Direction
Not identified	-	-	-	-	-

1. Some addresses do not contain specific street numbers. Records identified as being in the surrounding area have been added for information.
2. Former NSW EPA sites. These sites have been removed from the Record of Notices and/or the Sites Notified lists and are kept here for information purposes only.

2.3 SITES NOTIFIED AS CONTAMINATED TO THE NSW EPA

Map 6 (1000m Buffer)

Site Name[2]	Address[1]	Activity that caused Contamination	EPA Site Management Class[3]	Distance (m)	Direction
Former Gasworks	105 to 109 and 113 Shoalhaven STREET KIAMA	Gasworks	Regulation under CLM Act not required	133	west

1. Some addresses do not contain specific street numbers. Records identified as being in the surrounding area have been added for information.
2. Former NSW EPA sites. These sites have been removed from the Record of Notices and/or the Sites Notified lists and are kept here for information purposes only.
3. The EPA maintains a record of sites that have been notified to the EPA by owners or occupiers as contaminated land. The sites notified to the EPA and recorded on the register are at various stages of the assessment and/or remediation process. Table 5 outlines the possible management status that can be attributed to a registered contaminated site.

Table 2.3.1. EPA Site Management Class Explanation

EPA Site Management Class	
Under Assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Contamination currently regulated under the CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under the POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.

EPA Site Management Class	
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

2.4 OTHER CONTAMINATION ISSUES

Map 6 (1000m Buffer)

Pasminco Smelter Lead Abatement Area

Site	Location	Distance (m)	Direction
Not identified	-	-	-

Former Gasworks Sites

Site	Location	Distance (m)	Direction
Former Gasworks	Shoalhaven Street, Kiama	133	west

Military Facilities

Site name	Defence code	Description	RCIP*	Distance (m)	Direction
Not identified	-		-	-	-

*RCIP (Regional Contamination Investigation Program)

2.5 POTENTIALLY CONTAMINATING ACTIVITIES

Map 7a (500m Buffer)

Aviation Fuel Depots/Terminals

Site name	Description	Status	Distance (m)	Direction
Not identified	-	-	-	-

Aviation Rescue Fire Fighting Facilities (ARFF)

Site name	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-

Cattle Dip Sites

Site name	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-

Derelict Mines and Quarries

Deposit Name	Method	Description	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Dry Cleaners

Site name	Location	Status	Distance (m)	Direction
Ryans Drycleaning & Laundry Service	69 Shoalhaven St, Kiama NSW 2533	Operational	336	north

Historical (Legacy) Landfills

Site name	Description	Distance (m)	Direction
Not identified	- -	-	-

Note: This is not an exhaustive list of all legacy landfills.

Liquid Fuel Depots/Terminals

Site name	Owner	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Power Stations

Site name	Owner	Primary Fuel Type	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Service Stations

Site name	Owner	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Substation / Switching Stations

Site name	Owner	Location	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Telephone Exchanges

Site name	Location	Status	Distance (m)	Direction
KIAM	Manning Street Kiama	Operational	376	North-east

Waste Management Facilities

Site name	Owner	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Wastewater Treatment Facilities

Site name	Operator	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Unexploded Ordnance (UXO) Sites - Department of Defence (DoD)

Site name	Site ID	Category	Description	Distance (m)	Direction
Not identified	-		-	-	-

2.6 OTHER POTENTIALLY CONTAMINATING ACTIVITIES

Map 7b (200m Buffer)

Current Commercial and Trade Data

Site name	Category	Location	Status*	Distance (m)	Direction
South Coast Gardens & Trees	Garden supplies	100 Shoalhaven St Kiama, New South Wales	Current	138	west
Kiama Smash & Mechanical Repairs	Repair Facility	21 Barney St, Kiama NSW 2533	Current	160	South-east
Big River Group Kiama	Building materials supplier	113 Shoalhaven St, Kiama NSW 2533	Current	168	west

*Data is current as when this report was created. However due to the turnover of business locations, some addresses may be former.

Underground Storage Tank (UST)

Premises	Tank type	Status*	Distance (m)	Direction
Not identified	-	-	-	-

Note: This is not an exhaustive list of all UST's.

2.7 NPI INDUSTRIAL FACILITIES

Map 8 (500m Buffer)

Facility name	Address	Primary ANZSIC Class	Latest report	Distance (m)	Direction
Not identified	-	-	-	-	-

2.8 LICENSING UNDER THE POEO ACT 1997

Map 8 (500m Buffer)

Licences

Licence holder	EPL Number	Location Name	Premise Address	Fee Based Activity	Distance (m)	Direction
Not identified		-	-	-	-	-

Delicensed Premises still Regulated by EPA, Licences Surrendered, Clean Up and Penalty Notices

Licence holder	Nº	Name	Premise Address	Fee Based Activity	Status	Distance (m)	Direction
Not identified		-	-	-	-	-	-

2.9 PUBLIC REGISTER OF PROPERTIES AFFECTED BY LOOSE-FILL ASBESTOS INSULATION

Map 8 (onsite)

Address	Match Found
Not identified	-

1948 HISTORICAL COMMERCIAL & TRADE DIRECTORY DATA (200m Buffer)

Activity	Name	Address	Positional accuracy	Distance (m) *	Direction
Not identified	-	-	-	-	-

* If no distance is provided, address no longer exists.

1971 HISTORICAL COMMERCIAL & TRADE DIRECTORY DATA (200m Buffer)

Activity	Name	Address	Positional accuracy	Distance (m) *	Direction
Dry Cleaners & Dyers	Kiama Laundry & Dry Cleaners	98 Shoalhaven Street, Kiama	Address	66m	North West
Dairy Produce - W'sale	Jamberoo Co-op Dairy Socy Ltd	Barney Street, Kiama	Street		
Carriers - Light	Yates T T	Shoalhaven Street, Kiama	Street		
Chemists - Pharmaceutical	Virtue G P	Manning Street, Kiama	Street		
Clothing - Uniforms - Mfrs &/or W'salers	Cleo-Cladders (Kiama) Pty Ltd	Manning Street, Kiama	Street		
Motor Service Stations	Richardson T W	Manning Street, Kiama	Street		
Panel Beaters &/or Painters	South Coast Panel Beaters	off Manning Street, Kiama	Street		
Taxis	Keir C W	Manning Street, Kiama	Street		
Motor Cars & Trucks - New	McKinnon Motors (Kiama) Pty Ltd	77 Manning Street, Kiama	Street		
Motor Cars & Trucks - Used	McKinnon Motors (Kiama) Pty Ltd	77 Manning Street, Kiama	Street		

* If no distance is provided, address no longer exists.

1981 HISTORICAL COMMERCIAL & TRADE DIRECTORY DATA (200m Buffer)

Activity	Name	Address	Positional accuracy	Distance (m) *	Direction
Motor Service Stations & Garages	Surf Beach Motor Works Pty Ltd	83 Manning Street, Kiama	Address	49m	East
Nurserymen - Retail	Turner P M	89 Manning, Kiama	Address	61m	South
Hardware - Retail	Kiama Rural Co-Op & Hardware Ltd.	67 Manning, Kiama	Address	79m	North East
Stock Feeds & Supplements	Kiama Rural Co-Op & Hardware Ltd.	67 Manning, Kiama	Address	79m	North East

Motor Service Stations & Garages	Caltex Oil (Aust) Pty Ltd	Manning Street, Kiama	Street		
Motor Service Stations & Garages	Esso Australia Ltd	Manning Street, Kiama	Street		
Motor Service Stations & Garages	Shell Co of Aust Ltd The	Manning Street, Kiama	Street		
Carriers - Heavy	Gates Haulage	Barney Street, Kiama	Street		
Carriers - Heavy	Kiama Marine Service	Council Quarry, Barney Street, Kiama	Street		
Carriers - Heavy	Spindler C R	Barney Street, Kiama	Street		
Fuel Merchants	Ampol Petroleum Ltd	Barney Street, Kiama	Street		
Motor Body Builders	Vaseo Auto Engineering	Barney Street, Kiama	Street		
Motor Engineers & Repairers	Vased Auto Engineering	Barney Street, Kiama	Street		
Oil Merchants &/or Refiners	Kiama Marine Service	Barney Street, Kiama	Street		
Transport Services	Gates Haulage	Barney Street, Kiama	Street		
Building Supplies	Cukuna Pty Ltd	Shoalhaven Street, Kiama	Street		
Doors & Door Fittings	Cukuna Pty. Ltd.	Shoalhaven, Kiama	Street		
Timber Merchants	Cukuna Pty. Ltd.	Shoalhaven Street, Kiama	Street		
Hire Contractors	Hire-Ama	77 Manning Street, Kiama	Street		

* If no distance is provided, address no longer exists.

1991 HISTORICAL COMMERCIAL & TRADE DIRECTORY DATA (200m Buffer)

Activity	Name	Address	Positional accuracy	Distance (m) *	Direction
Lawn Mowers - Retail &/or Repairs	Kiama Mower & Cycle Centre	28a Bong Bong Street, Kiama	Address	0m	North East
Pump MFRs &/or Merhants	Kiama Mower & Cycle Centre	28a Bong Bong Street, Kiama	Address	0m	North East
Building Supplies	Kiama Building & Hire	67 Manning Street, Kiama	Address	79m	North East
Farm Equipment & Supplies	ACF Country Store Kiama	67 Manning, Kiama	Address	79m	North East
Fertilizers	Kiama Produce	67 Manning, Kiama	Address	79m	North East
Gates &/or Fencing Materials	Kiama Building & Hire	67 Manning, Kiama	Address	79m	North East

Hardware - Retail	Hardex Promotions Ltd. (A.C.F. Kiama)	67 Manning Street, Kiama	Address	79m	North East
Hardware - Retail	Kiama Building & Hire	67 Manning Street, Kiama	Address	79m	North East
Hire Builders', Contractors' & Handyman's Equipment	Kiama Building & Hire	67 Manning Street, Kiama	Address	79m	North East
Gas Suppliers	Gas Kiama	105 Shoalhaven, Kiama	Address	126m	West
Building Supplies	Cukuna Sales Pty. Ltd.	113 Shoalhaven Street, Kiama	Address	143m	West
Timber-Trade &/or Retail	Cukuna Sales Pty. Ltd.	113 Shoalhaven Street, Kiama	Address	143m	West
Bicycles & Accessories – Retail & Repairs	Leisure Coast Bicycles	66 Manning Street, Kiama	Address	159m	East
Fishing Nets	South Coast Commercial Fishing Supplies	64b Manning Street, Kiama	Address	171m	East
Contractors-General	Baker A J (Wollongong) Pty. Ltd.	Barney Street, Kiama	Street		
Demolition Contractors	Myco Earthmoving	Barney Street, Kiama	Street		
Excavating & /or Earth Moving Contractors	Myco Earthmoving	Barney Street, Kiama	Street		
Landscape Gardeners &/or Supplies	Kiama Landscape Supplies	Barney Street, Kiama	Street		
Panel Beaters &/or Painters	Vaseo Auto Engineering	Barney Street, Kiama	Street		
Plasterers & Plasterboard Fixers	Coastal Plaster Board Service Pty. Ltd.	Barney Street, Kiama	Street		
Sand, Soil & Gravel - Retail	Kiama Landscape Supplies	Barney Street, Kiama	Street		
Sand, Soil & Gravel - Retail	Myco Earthmoving	Barney Street, Kiama	Street		
Motor Service Stations & Garages	Caltex Oil (Aust) Pty. Ltd.	Manning Street, Kiama	Street		
Motor Service Stations & Garages	Shell Co of Aust Ltd The	Manning Street, Kiama	Street		
Mirrors	Maba Glass	71 Manning Street, Kiama	Street		
Glass Merchants &/or Glaziers	Gian & Glazing By Maba Glass	77 Manning, Kiama	Street		
Glass Merchants &/or Glaziers	Maba Glass	77 Manning Street, Kiama	Street		
Shop & Office Fitting	Maba Glass	77 Manning, Kiama	Street		
Shower Screens	Maba Glass (Showroom)	77 Manning Street, Kiama	Street		

* If no distance is provided, address no longer exists.

Land Insight and resources use a number of different address georeferencing methods and characterised them according to the following criteria: completeness (match rates) and positional accuracy. When address do not contain specific street numbers or a match is not found, records identified as being in the surrounding areas are included for reference.

Historical dataset positional accuracy and georeferencing results explanation

Positional accuracy	Georeferenced	Description
Address	Located to the address level	*When street address and names fully matched.*
Street	Located to the street centroid	*When street names match but no exact address was found. Location is approximate.*
Place	Located to the structure, building or complex	*When building, residential complex or structure name match but no exact address was found. Location is approximate.*
Suburb	Located to the suburb area	*When suburb name match but no exact address was found. Location is approximate.*
Not georeferenced	Not found	*When it was not georeferenced, and address could not be found.*

Section 3 Other Environmental Constraints

3.1 FEDERAL, STATE AND LOCAL HERITAGE

Map 9 (200m Buffer)

Local Environment Plan (LEP) Heritage

Site Name	Site ID	Significance	Class	Distance (m)*	Direction
Kiama Rail Yard Turntable	I100	Local	Item - General	2.5	North-east
Catholic Presbytery	I117	Local	Item - General	120	South-east
Gasworks (former)	I142	Local	Item - General	133	west
Inter-War Cottage	I141	Local	Item - General	144	North-west
Residence	I82	Local	Item - General	170	North-west

National Heritage List (NHL)

Site Name	Site ID	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Register of the National Estate (RNE)

Site Name	Site ID	Class	Status	Distance (m)	Direction
Catholic Presbytery	1512	Historic	Indicative Place	151	South-east
House	100101	Historic	Indicative Place	166	North-west

Non-Aboriginal heritage item (Local)

Site Name	Site ID	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

Non-Aboriginal heritage item (SHR)*

Site Name	Site ID	Listing nº	Plan nº	Distance (m)	Direction
Kiama Railway Station Group and Turntable	5012065	01176	2410	0	onsite

*State Heritage Register

Commonwealth Heritage List (CHL)

Site Name	Site ID	Class	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

World Heritage Area (WHA)

Site Name	Site ID	IUCN	Status	Distance (m)	Direction
Not identified	-	-	-	-	-

3.2 NATURAL HAZARDS & COASTAL MANAGEMENT

Map 10 (500m Buffer)

Bush Fire Prone Land (BPL)

Category	On the Property?	Within Record Search Buffer?
Not identified	-	-

Fire History (Wildfires and Prescribed Burns)

Category	On the Property?	Within Record Search Buffer?
Not identified	-	-

Flood Hazard Area

Name	On the Property?	Within Record Search Buffer?
Not identified	-	-

3.3 STATE ENVIRONMENTAL PLANNING POLICY (COASTAL MANAGEMENT)

Map 10 (500m Buffer)

Type	On the Property?	Within Record Search Buffer?
Coastal Wetlands Proximity Area	Not identified	Not identified
Coastal Wetlands	Not identified	Not identified
Coastal Environment Area Map	Not identified	Yes
Coastal Use Area Map	Not identified	Yes

LAND INSIGHT
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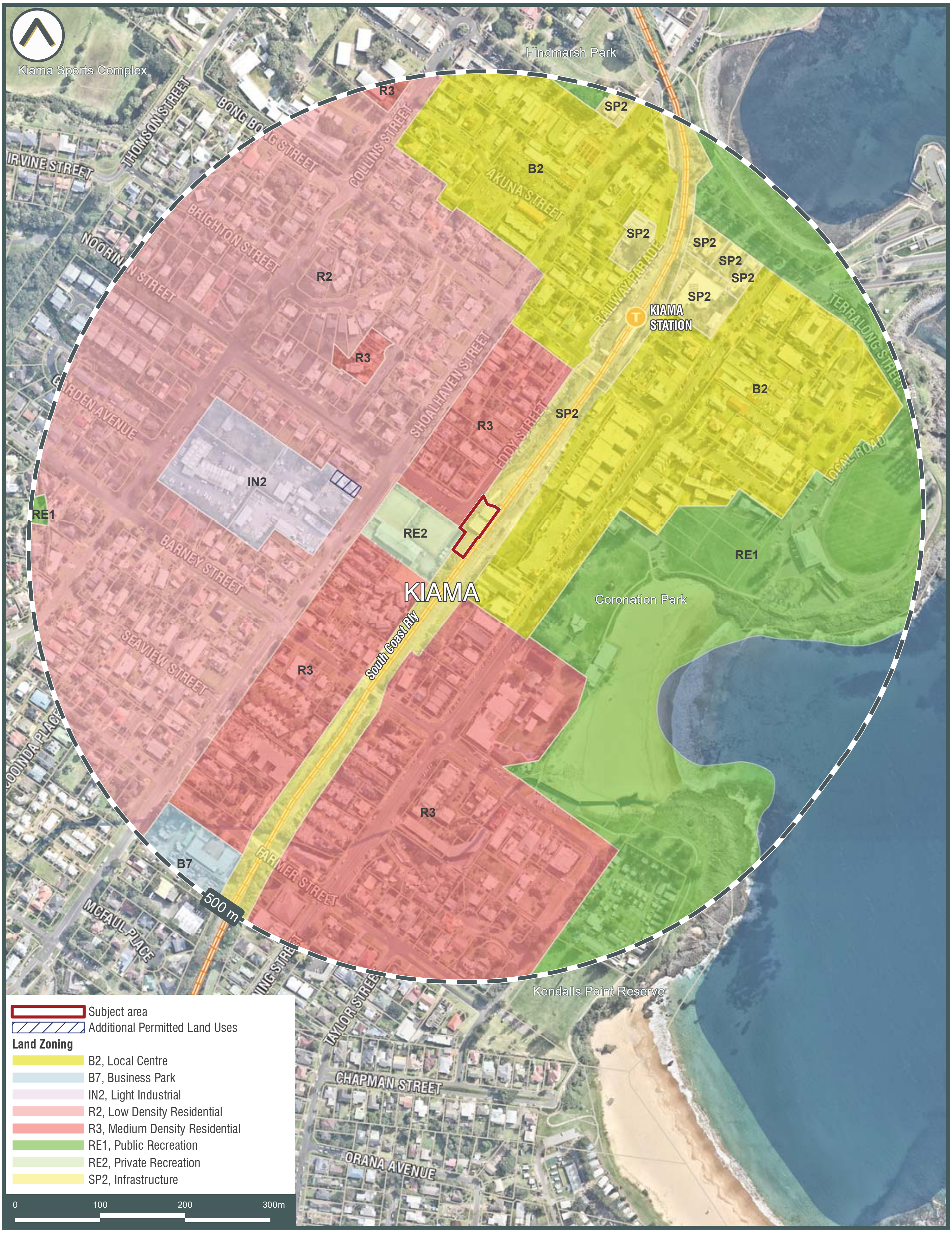
ATTACHMENT A

Report Maps

SUBJECT AREA AND SENSITIVE RECEPTORS

LAND INSIGHT & RESOURCES

MAP 1 Enviro-Screen



PLANNING CONTROLS

LAND INSIGHT & RESOURCES

MAP 2

Enviro-Screen

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SOIL LANDSCAPES AND ACID SULFATE SOIL RISK

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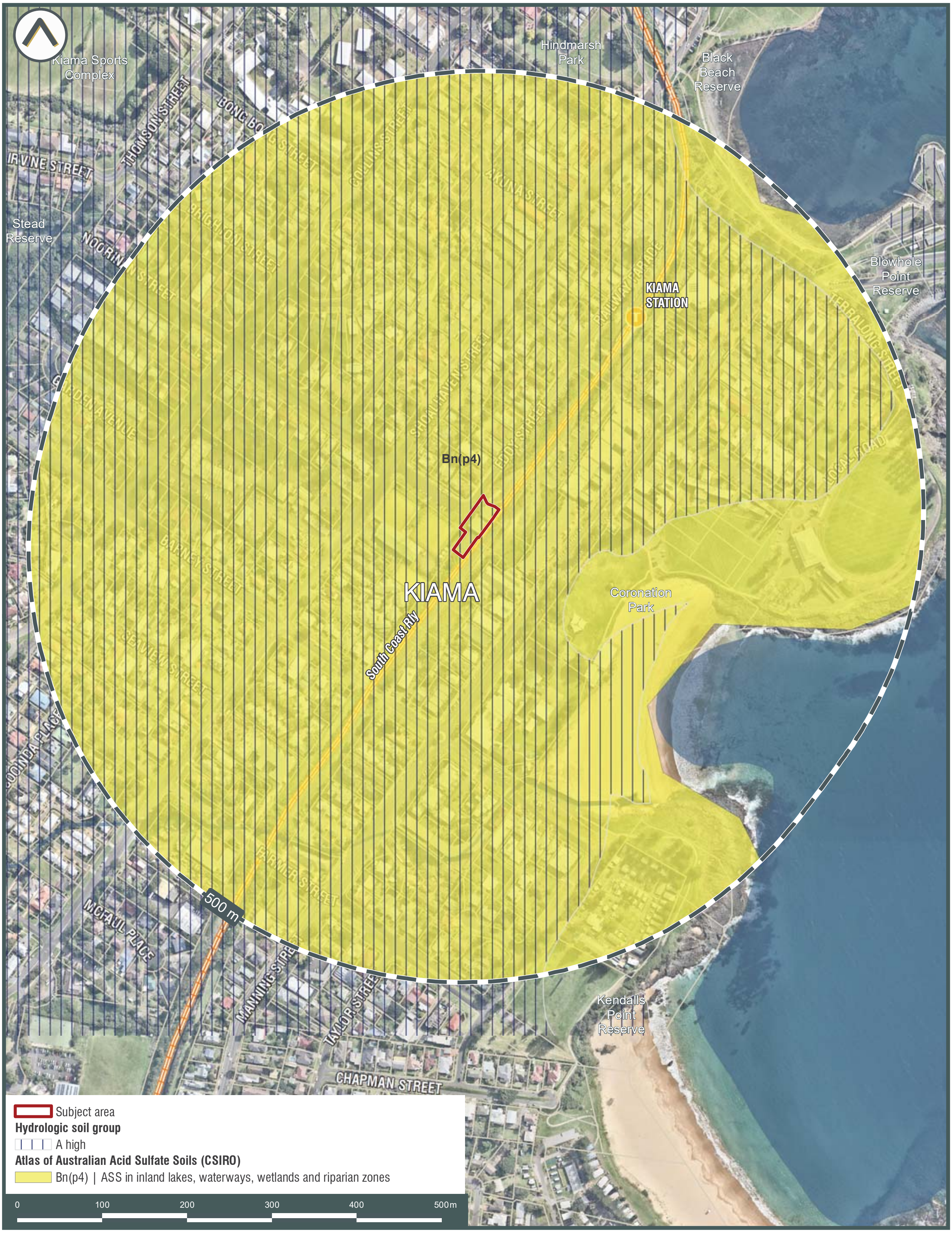
MAP 3a Enviro-Screen



ATLAS OF AUSTRALIAN ACID SULFATE SOILS AND SALINITY

LAND INSIGHT & RESOURCES

MAP 3b

Enviro-Screen

GEOLOGY AND TOPOGRAPHY

LAND INSIGHT & RESOURCES

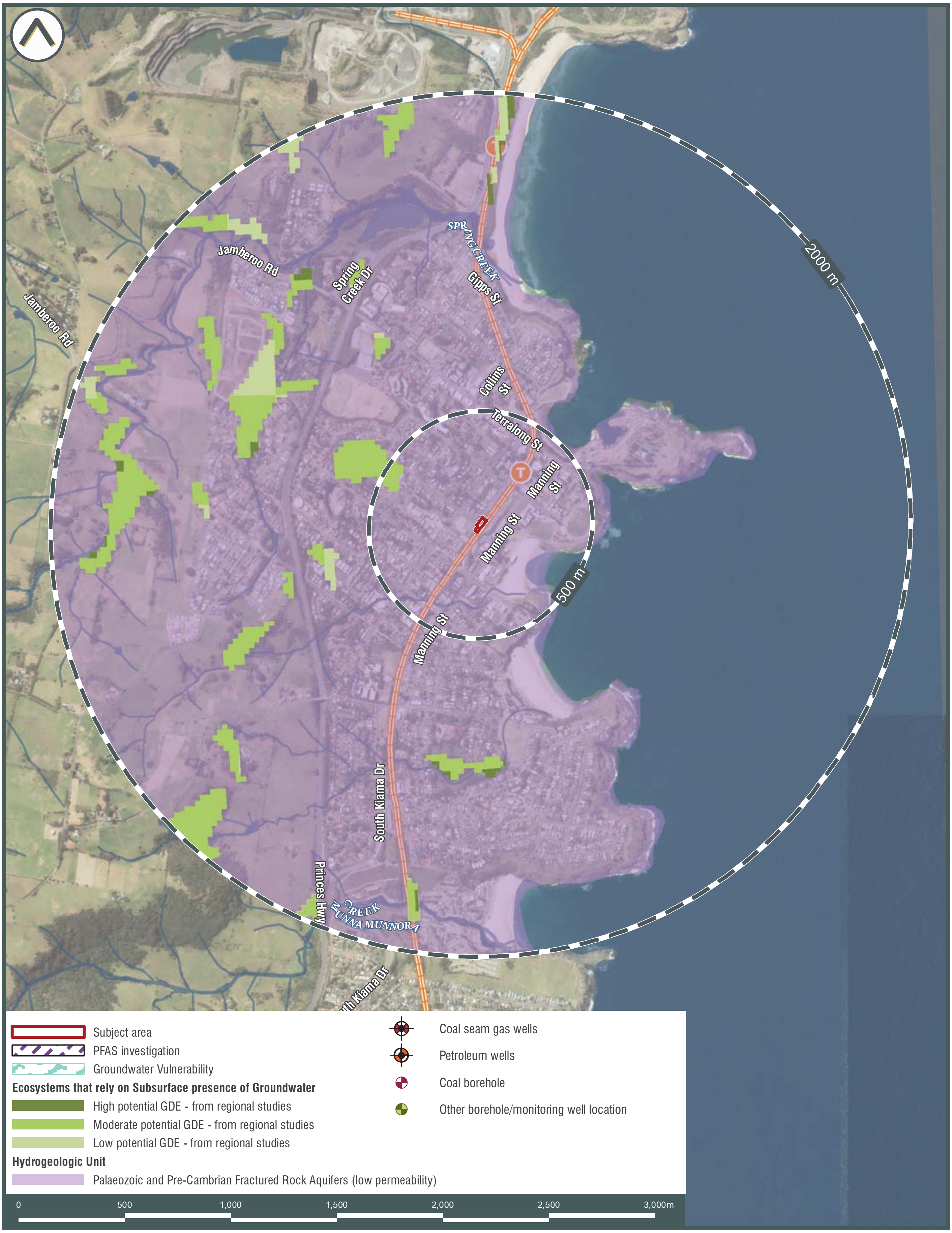
MAP 4 Enviro-Screen

HYDROGEOLOGY AND GROUNDWATER BORES

LAND INSIGHT & RESOURCES

MAP 5a

Enviro-Screen



HYDROGEOLOGY AND OTHER BOREHOLES

LAND INSIGHT & RESOURCES

MAP 5b Enviro-Screen

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EPA RECORDS AND OTHER REGULATORY CONTAMINATION ISSUES

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MAP 6

Enviro-Screen

Subject area
Historical (Legacy) Landfills
Operational Service stations
Former Service stations
Aviation fuel depots
Aviation rescue and fire fighting facilities
Cattle dip
Derelict mine/quarry
Dry cleaners
Liquid fuel depots
Liquid fuel terminals
Power stations
Substation locations
Telephone exchanges
Waste management facilities
Wastewater Treatment Facility

0 200 400 600 800 1,000 m

POTENTIALLY CONTAMINATING ACTIVITIES

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MAP 7a

Enviro-Screen

CURRENT COMMERCIAL AND TRADE DATA

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MAP 7

LICENSING UNDER THE POEO ACT 1997 AND NPI FACILITIES

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MAP 8 Enviro-Screen

HERITAGE

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MAP 9

Enviro-Screen

NATURAL HAZARD AND COASTAL MANAGEMENT

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MAP 10

Enviro-Screen

ATTACHMENT B

Historical Imagery

LIR-00664 Aerial Photograph 1963 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1963

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MAP 11

LIR-00664 Aerial Photograph 1970 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1970

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MAP 12

LIR-00664 Aerial Photograph 1974 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1974

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& RESOURCES

MAP 13

LIR-00664 Aerial Photograph 1984 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1984

LAND INSIGHT & RESOURCES

MAP 14

LIR-00664 Aerial Photograph 1984 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 1993

LAND INSIGHT & RESOURCES

MAP 15

LIR-00664 Aerial Photograph 2002 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2002

LAND INSIGHT & RESOURCES

MAP 16

LIR-00664 Aerial Photograph 2008 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2008

LAND INSIGHT & RESOURCES

MAP 17

LIR-00664 Aerial Photograph 201014 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2010

LAND INSIGHT & RESOURCES

MAP 19

LIR-00664 Aerial Photograph 2014 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2014

LAND INSIGHT & RESOURCES

MAP 20

LIR-00664 Aerial Photograph 2016 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2016

LAND INSIGHT & RESOURCES

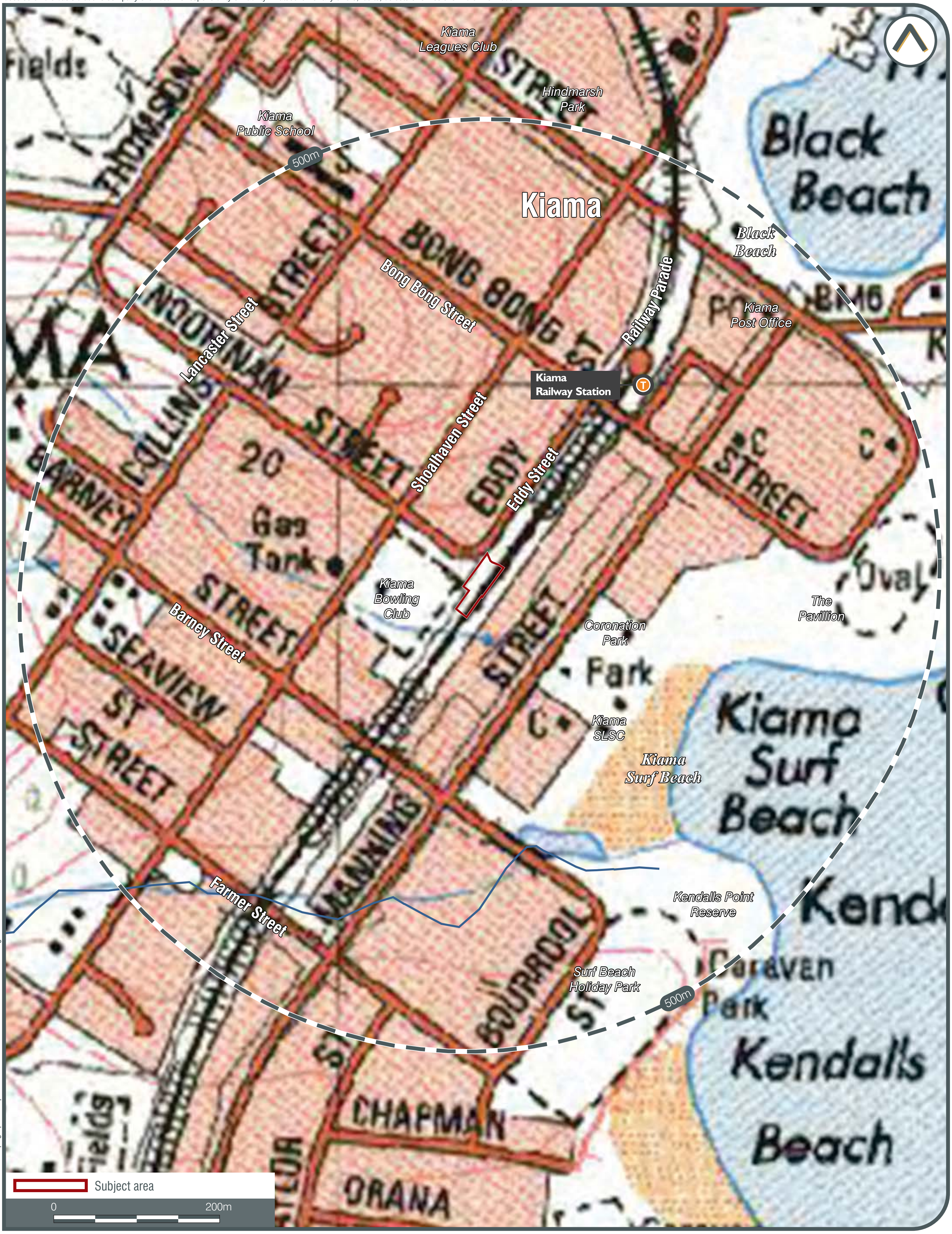
MAP 21

LIR-00664 Aerial Photograph 2018 14 05 2019. Data source: Please refer to 'Digital Data Sources' in the Product Guide

HISTORIC AERIAL PHOTOGRAPH - 2018

LAND INSIGHT & RESOURCES

MAP 22



1969 - 1991 TOPOGRAPHIC MAP SERIES (KIAMA 9028-1S)

LAND INSIGHT & RESOURCES

MAP 22

APPENDIX C

SITE PHOTOGRAPHS

	PHOTOGRAPHIC LOG	
Client Name Sydney Trains	**Site Location** 20 Eddy Street, Kiama, NSW	**Project No.** PS114138

Photo No.	Date
1	20/05/2019

Description

Southern portion of the site, facing south

Photo No.	Date
2	20/05/2019

Description

Southern extent of one of the on-site buildings, facing east

	PHOTOGRAPHIC LOG	
Client Name Sydney Trains	**Site Location** 20 Eddy Street, Kiama, NSW	**Project No.** PS114138

Photo No.	Date
3	20/05/2019

Description

Northern portion of the site, two large roller doors for the warehouse, facing north-east

Photo No.	Date
4	11/06/2019

Description

Typical ballast inclusions found within the fill material

	PHOTOGRAPHIC LOG	
Client Name Sydney Trains	**Site Location** 20 Eddy Street, Kiama, NSW	**Project No.** PS114138

Photo No.	Date
5	11/06/2019

Description

Road base gravels typically encountered during the top 0.5 mBGL

Photo No.	Date
6	11/06/2019

Description

Natural clays encountered at approximately 2.5 mBGL

APPENDIX D

BOREHOLE LOGS

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.
BH01
SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY / CONSISTENCY VS S F ST VST H FB VL L MD D VD	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA			0.00					ASPHALT	D			
			0.10	PID=2.7 ppm	J			FILL: Gravelly SAND; coarse grained, loose, dark brown, angular gravels, brick, concrete, slag.	M			
			0.60	PID=3.8 ppm; PID=5.1 ppm	J; J			FILL: Gravelly CLAY; medium plasticity, medium strength, soft, angular gravels, roadbase.	M			
AS			1.50					High increase in roadbase/asphalt.	M			
			1.90	PID=0.9 ppm	J			CLAY; high strength, medium plasticity, brown/grey mottles.	M			
			2.60					END OF BOREHOLE AT 2.60 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH02

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting: **GeoProbe** Hole Angle: **90°** Surface RL:
Borehole Diameter: Bearing: **---** Co-ords:

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA									ASPHALT	D			
				0.10	PID=4.2 ppm	J			FILL: Gravelly SAND; coarse grained loose, brown/grey, angular gravels, brick, concrete, slag inclusions	D			
				0.50	PID=3.1 ppm	J			Increasing slag, larger gravels <60mm.				
				1.00					FILL: Gravelly SAND; coarse grained loose, brown/grey, angular gravels, brick, concrete.				
AS				1.50	PID=0.8 ppm	J			CLAY; high strength, low plasticity, soft, dark brown.	M			
				2.20	PID=0.3 ppm	J			Becoming firm, brown/grey mottles.				
									END OF BOREHOLE AT 2.60 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH03

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY / CONSISTENCY VS VL S L F MD ST D VST VD H	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA								ASPHALT	D			
			0.10	PID=4.4 ppm	J			FILL: Sandy GRAVEL, loose, grey, angular gravels, <10mm, coarse grained sand.	D			
			0.50		J			<5mm gravel inclusions				
			1									
			1.20	PID=3.4 ppm	J			FILL: Gravelly CLAY, medium plasticity, medium strength, dark brown/orange, sub-angular gravels, bitumen, brick.	M			
AS												
			2									
			2.10	PID=0.3 ppm	J			CLAY; high strength, medium plasticity, firm, brown/grey mottles.	M			
								END OF BOREHOLE AT 2.60 m				
			3									

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH04

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

1 METHOD	2 SUPPORT	3 WATER	4 RL(m) / DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA			0.00					ASPHALT	D			
			0.10	PID=1.8 ppm	J			FILL: Gravelly SAND; coarse grained, loose angular gravels, <10mm, grey/brown, concrete, brick, roadbase, slag.	D			
			0.80	PID=2.1 ppm (1.0)	J			FILL: Gravelly CLAY, low plasticity, medium strength, firm, angular gravels <30mm, dark brown	M			
AS			1.50	PID=0.8 ppm	J			Reducing gravels				
			1.80	PID=0.9 ppm	J			CLAY; high strength, low plasticity, firm, moist, grey/brown mottles.	M			
			2.50					END OF BOREHOLE AT 2.50 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH05

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

1 METHOD	2 SUPPORT	3 WATER	4 RL(m)	4 DEPTH(m)	5 FIELD TEST	6 SAMPLE	7 GRAPHIC LOG	8 USC SYMBOL	9 SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	10 MOISTURE	11 RELATIVE DENSITY / CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	12 HAND PENETROMETER (kPa)	13 STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA									ASPHALT	D			
				0.10	PID=0.8 ppm	J			FILL: Gravelly SAND; coarse grained, loose, dark brown/grey, roadbase gravels, bitumen, brick, slag.	D			
					PID=0.9 ppm	J							
AS				1.50					FILL: Gravelly CLAY, low strength, medium plasticity, soft, dark brown, angular gravels, bitumen.	M			
					PID=1.8 ppm	J							
				2.80					CLAY; high strength, medium plasticity, firm, grey/brown mottles.	M			
				3.10	PID=0.2 ppm	J			Becoming wet.	W			
									END OF BOREHOLE AT 3.80 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

BH06

SHEET 1 OF 1

Client:	**Sydney Trains**	Date Commenced:	**6/11/19**
Project:	**Sydney Trains Surplus Depot ESA**	Date Completed:	**6/11/19**
Borehole Location:	**20 Eddy Street, Kiama NSW 2533**	Recorded By:	**AC**
Project Number:	**PS114138**	Log Checked By:	**BP**

Drill Model/Mounting:	**GeoProbe**	Hole Angle:	**90°**	Surface RL:	
Borehole Diameter:		Bearing:	**---**	Co-ords:	

Borehole Information						Field Material Description						
1	2	3	4	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	RL(m)	DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION (SOIL NAME; plasticity/grain size, colour, particle shape, secondary components, minor constituents, moisture, relative density/consistency) (ROCK NAME; grain size, colour, weathering, strength, minor constituents)	MOISTURE	RELATIVE DENSITY / CONSISTENCY (VS FB S VL F L ST MD VST D H VD)	HAND PENETROMETER (kPa)	STRUCTURE AND ADDITIONAL OBSERVATIONS (Defects - depth, type, orientation, spacing, planarity, roughness, thickness, coating)
HA				0.00					ASPHALT	D			
				0.10	PID=1.6 ppm	J			FILL: Gravelly SAND, coarse grained, loose, dark brown, roadbase gravels, slag, brick, concrete, ballast, gravels <80mm	M			
				0.50	PID=1.4 ppm	J			FILL: Gravelly CLAY; medium plasticity, low strength, dark brown, minor sands (10%), roadbase, gravels, brick, slag, concrete.	M			
AS				1.50	PID=0.7 ppm	J			Reducing gravel content				
				2.60					CLAY; high strength, medium plasticity, firm, grey/brown motttles.	M			
				3.10					Becoming wet.	W			
					PID=0.8 ppm	J							
				3.50					END OF BOREHOLE AT 3.50 m				

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

APPENDIX E

ANALYTICAL RESULTS TABLES

		TRH							BTEX													
		C6 - C10	C6 - C10 less BTEX (F1)	C10 - C16	C10 - C16 less Naphthalene (F2)	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Sum)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
		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	mg/kg	mg/kg	mg/kg
EQL		10	10	50	50	100	100	50	0.1	0.1	0.1	0.2	0.1	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																						
NEPM 2013 Table 1A(1) HILs Rec C Soil																						
NEPM 2013 Table 1A(1) HILs Res A Soil																						
NEPM 2013 Table 1A(1) HILs Res B Soil																						
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																						
0-1m			260#8		NL #9				3	NL #9	NL #9			230								
1-2m			370#8		NL #9				3	NL #9	NL #9			NL #9								
2-4m			630#8		NL #9				3	NL #9	NL #9			NL #9								
>=4m			NL #9		NL #9				3	NL #9	NL #9			NL #9								
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																						
0-1m			NL #9		NL #9				NL #9	NL #9	NL #9			NL #9								
1-2m			NL #9		NL #9				NL #9	NL #9	NL #9			NL #9								
2-4m			NL #9		NL #9				NL #9	NL #9	NL #9			NL #9								
>=4m			NL #9		NL #9				NL #9	NL #9	NL #9			NL #9								
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																						
0-1m			45#8		110#10				0.5	160	55			40								
1-2m			70#8		240#10				0.5	220	NL #9			60								
2-4m			110#8		440#10				0.5	310	NL #9			95								
>=4m			200#8		NL #9				0.5	540	NL #9			170								
Field ID	**Date**																					
BH1 0.7	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH1 1.5	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02 0.6	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02 2.3	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 0.1	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 1.3	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	0.8	0.9	0.6	<0.5	0.6
BH04 0.2	**11/06/2019**	<20	<20	<50	<50	<100	150	150	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH04 2.3	**11/06/2019**	<20	<20	<50	<50	<100	120	120	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05 0.6	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05 3.5	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 0.5	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 3.5	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

Comments

#1 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) & naphthalene (should meet relevant HSL)
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#3 As Chromium VI
#4 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.
#5 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.
#6 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
#7 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) & napthhalene (should meet relevant HSL)
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs Res A Soil
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1) **HILs Res A and Rec C Soil**
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs Res A, Res B and Rec C Soil**

		PAHs									Metals											
		Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin
		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	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	2	0.4	2	5	5	0.1	2	5	0.05	0.05	0.05	0.05
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil										4,000[#1]	3,000[#2]	900	3,600[#3]	240,000	1,500[#4]	730[#5]	6,000	400,000				45
NEPM 2013 Table 1A(1) HILs Rec C Soil										300[#1]	300[#2]	90	300[#3]	17,000	600[#4]	80[#5]	1,200	30,000				10
NEPM 2013 Table 1A(1) HILs Res A Soil										300[#7]	100[#2]	20	100[#3]	6,000	300[#4]	40[#5]	400	7,400				6
NEPM 2013 Table 1A(1) HILs Res B Soil										400[#1]	500[#2]	150	500[#3]	30,000	1,200[#4]	120[#5]	1,200	60,000				10
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																						
0-1m							NL[#9]															
1-2m							NL[#9]															
2-4m							NL[#9]															
>=4m							NL[#9]															
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																						
0-1m							NL[#9]															
1-2m							NL[#9]															
2-4m							NL[#9]															
>=4m							NL[#9]															
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																						
0-1m							3															
1-2m							NL[#9]															
2-4m							NL[#9]															
>=4m							NL[#9]															
Field ID	**Date**																					
BH1 0.7	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	120	<0.4	16	140	79	0.2	9.1	54	<0.05	<0.05	<0.05	<0.05
BH1 1.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	170	1	9.2	150	130	0.4	12	390	<0.05	<0.05	<0.05	<0.05
BH02 0.6	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	49	<0.4	8.8	100	78	0.1	20	48	<0.05	<0.05	<0.05	<0.05
BH02 2.3	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4	<0.4	32	56	18	<0.1	6.6	41	<0.05	<0.05	<0.05	<0.05
BH03 0.1	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	2.2	<0.4	9.9	260	8.2	<0.1	6.3	56	<0.05	<0.05	<0.05	<0.05
BH03 1.3	**11/06/2019**	0.8	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	1.2	6	*480*	<0.4	35	100	170	0.1	9.8	110	<0.05	<0.05	<0.05	<0.05
BH04 0.2	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	9.3	<0.4	<5	230	6.4	<0.1	8	62	<0.05	<0.05	<0.05	0.44
BH04 2.3	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	25	<0.4	13	140	27	<0.1	12	89	<0.05	<0.05	<0.05	<0.05
BH05 0.6	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	150	<0.4	8.5	160	45	<0.1	10	83	<0.05	<0.05	<0.05	0.39
BH05 3.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	6.8	<0.4	11	55	14	<0.1	5.1	29	<0.05	<0.05	<0.05	<0.05
BH06 0.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	74	<0.4	<5	170	25	<0.1	12	100	<0.05	<0.05	<0.05	<0.05
BH06 3.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	8.6	<0.4	10	92	12	<0.1	7.2	78	<0.05	<0.05	<0.05	<0.05

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe importa
#3 As Chromium VI
#4 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for wh
#5 Elemental mercury: HIL does not address elemental mercury. a site specific assessment
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected
#7 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs R
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1)
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs R**

		OCPs							
		b-BHC	chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I
		mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.05	100	0.05	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil			530,000				3,600		
NEPM 2013 Table 1A(1) HILs Rec C Soil			70,000				400		
NEPM 2013 Table 1A(1) HILs Res A Soil			50,000				240		
NEPM 2013 Table 1A(1) HILs Res B Soil			90,000				600		
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand									
0-1m									
1-2m									
2-4m									
>=4m									
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand									
0-1m									
1-2m									
2-4m									
>=4m									
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand									
0-1m									
1-2m									
2-4m									
>=4m									
Field ID	**Date**								
BH1 0.7	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH1 1.5	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH02 0.6	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH02 2.3	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH03 0.1	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH03 1.3	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH04 0.2	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	0.44	<0.05
BH04 2.3	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH05 0.6	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	0.39	<0.05
BH05 3.5	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH06 0.5	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
BH06 3.5	**11/06/2019**	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe importa
#3 As Chromium VI
#4 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for wh
#5 Elemental mercury: HIL does not address elemental mercury. a site specific assessment
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected
#7 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs R
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1)
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs R**

Field ID	Date	Endrin ketone	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Azinophos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos
		µg/kg	mg/kg	mg/kg	mg/kg	µg/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	0.05	0.05	0.05	50	0.05	0.05	0.05	0.05	0.2	1	0.2	0.2	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil					100			50		80	2,500	160				2,000						
NEPM 2013 Table 1A(1) HILs Rec C Soil					20			10		10	400	30				250						
NEPM 2013 Table 1A(1) HILs Res A Soil					10			6		10	300	20				160						
NEPM 2013 Table 1A(1) HILs Res B Soil					20			10		15	500	30				340						
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																						
0-1m																						
1-2m																						
2-4m																						
>=4m																						
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																						
0-1m																						
1-2m																						
2-4m																						
>=4m																						
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																						
0-1m																						
1-2m																						
2-4m																						
>=4m																						
BH1 0.7	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11/06/2019**	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe importa
#3 As Chromium VI
#4 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for wh
#5 Elemental mercury: HIL does not address elemental mercury. a site specific assessment
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected
#7 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs R
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1)
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs R**

		OPPs																				
		Dimethoate	Disulfoton	EPN	Ethoprop	Ethion	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-methyl	Pyrazophos	Ronnel	Terbufos
		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	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	2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil																						
NEPM 2013 Table 1A(1) HILs Rec C Soil																						
NEPM 2013 Table 1A(1) HILs Res A Soil																						
NEPM 2013 Table 1A(1) HILs Res B Soil																						
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																						
0-1m																						
1-2m																						
2-4m																						
>=4m																						
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																						
0-1m																						
1-2m																						
2-4m																						
>=4m																						
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																						
0-1m																						
1-2m																						
2-4m																						
>=4m																						
Field ID	**Date**																					
BH1 0.7	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11/06/2019**	<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	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe importa
#3 As Chromium VI
#4 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for wh
#5 Elemental mercury: HIL does not address elemental mercury. a site specific assessment
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected
#7 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs R
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1)
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs R**

					PCBs											
		Tetrachlorvinphos	Tokuthion	Trichloronate	Arochlor 1016	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aroclor 1221	PCBs (Sum of total)	2,4,5-trichlorophenol	2.4.6-Trichlorophenol	2,4-dichlorophenol	2,4-dinitrophenol
		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	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5	0.5	0.5	0.5	5
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil												7[#6]				
NEPM 2013 Table 1A(1) HILs Rec C Soil												1[#6]				
NEPM 2013 Table 1A(1) HILs Res A Soil												1[#6]				
NEPM 2013 Table 1A(1) HILs Res B Soil												1[#6]				
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																
0-1m																
1-2m																
2-4m																
>=4m																
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																
0-1m																
1-2m																
2-4m																
>=4m																
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																
0-1m																
1-2m																
2-4m																
>=4m																
Field ID	**Date**															
BH1 0.7	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH1 1.5	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH02 0.6	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH02 2.3	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH03 0.1	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH03 1.3	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH04 0.2	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH04 2.3	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH05 0.6	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH05 3.5	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH06 0.5	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5
BH06 3.5	11/06/2019	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe importa
#3 As Chromium VI
#4 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for wh
#5 Elemental mercury: HIL does not address elemental mercury. a site specific assessment
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected
#7 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs R
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1)
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs R**

		Phenols															
		2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol	Dinoseb	Pentachlorophenol	Phenol	tetrachlorophenols	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)
		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	0.2	0.5	0.4	5	20	0.5	5	20	1	0.5	1	1	20
NEPM 2013 Table 1A(1) HILs Comm/Ind D Soil													660	240,000			
NEPM 2013 Table 1A(1) HILs Rec C Soil													120	40,000			
NEPM 2013 Table 1A(1) HILs Res A Soil													100	3,000			
NEPM 2013 Table 1A(1) HILs Res B Soil													130	45,000			
NEPM 2013 Table 1A(3) Comm/Ind D Soil HSL for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>=4m																	
NEPM 2013 Table 1A(3) Rec C Soil HSL for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>=4m																	
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																	
0-1m																	
1-2m																	
2-4m																	
>=4m																	
Field ID	**Date**																
BH1 0.7	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH1 1.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH02 0.6	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH02 2.3	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH03 0.1	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH03 1.3	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH04 0.2	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH04 2.3	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH05 0.6	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH05 3.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH06 0.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH06 3.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20

Comments

#1 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#2 Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe importa
#3 As Chromium VI
#4 Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for wh
#5 Elemental mercury: HIL does not address elemental mercury. a site specific assessment
#6 PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected
#7 Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application shou
#8 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#9 Derived soil HSL exceeds soil saturation concentraiton
#10 To obtain F2 subtract naphthalene from the >C10 - C16 fraction.

Exceedance

	Exceedance of NEPM 2013 Table 1A(1) HILs R
ITALICS	Exceedance of **BOTH** NEPM 2013 Table 1A(1)
ITALICS/BOLD	Exceedance of NEPM 2013 Table 1A(1) **HILs R**

		C6 - C10	C6 - C10 less BTEX (F1)	C10 - C16	C10 - C16 less Naphthalene (F2)	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Sum)
		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		10	10	50	50	100	100	50	0.1	0.1	0.1	0.2	0.1	0.3
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind														
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space														
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil														
0-2m			125#7	25		-#8	-#8		8	10	1.5			10
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil														
0-2m			215#7	170		1,700	3,300		75	135	165			180
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil														
0-2m			180#9	120#10		300	2,800		50	85	70			105
Field ID	**Date**													
BH1 0.7	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH1 1.5	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH02 0.6	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH02 2.3	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH03 0.1	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH03 1.3	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH04 0.2	**11/06/2019**	<20	<20	<50	<50	<100	150	150	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH04 2.3	**11/06/2019**	<20	<20	<50	<50	<100	120	120	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH05 0.6	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH05 3.5	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH06 0.5	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3
BH06 3.5	**11/06/2019**	<20	<20	<50	<50	<100	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2 years.
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based on site-specific pH or CEC (when available). To calculate a site specific EIL, add the ABC to the ACL.
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added background concentration (ABC) to this value.
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10 Moderate reliability.

Exceedances

	Exceedance of **Comm/Ind and Urban Res & Public Open Space**
	Exceedance of **Urban Res & Public Open Space**
	Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs for **Areas of Ecological Significance, Comm/Ind and Urban Res** for Sand 0-2m
	Exceedance of NEPM 2013 Table 1B(6) ESLs for Urban Res, Sand 0-2m

Field ID	Date	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	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
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
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind															370	
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space															170	
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m						1.4										
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m						1.4										
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m						0.7										
BH1 0.7	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH1 1.5	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02 0.6	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH02 2.3	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 0.1	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH03 1.3	11/06/2019	<0.5	<0.5	<0.5	0.8	0.9	0.6	<0.5	0.6	0.8	<0.5	1.1	<0.5	<0.5	<0.5	<0.5
BH04 0.2	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH04 2.3	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05 0.6	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH05 3.5	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 0.5	11/06/2019	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
BH06 3.5	11/06/2019	<0.5	<0.5	<0.5	<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 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based or
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added l
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 f
#10 Moderate reliability.

Exceedances

Exceedance of **Comm/Ind and Urban Res & Publ**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs f
Exceedance of NEPM 2013 Table 1B(6) ESLs for U

		Pyrene	PAHs (Sum)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC
		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	2	0.4	2	5	5	0.1	2	5	0.05	0.05	0.05	0.05	0.05
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind				160#1		680	350	1,800#4		640	1,700					
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space				100#1		410	250	1,100#4		380	1,200					
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m																
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m																
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m																
Field ID	**Date**															
BH1 0.7	**11/06/2019**	<0.5	<0.5	120	<0.4	16	140	79	0.2	9.1	54	<0.05	<0.05	<0.05	<0.05	<0.05
BH1 1.5	**11/06/2019**	<0.5	<0.5	170	1	9.2	150	130	0.4	12	390	<0.05	<0.05	<0.05	<0.05	<0.05
BH02 0.6	**11/06/2019**	<0.5	<0.5	49	<0.4	8.8	100	78	0.1	20	48	<0.05	<0.05	<0.05	<0.05	<0.05
BH02 2.3	**11/06/2019**	<0.5	<0.5	4	<0.4	32	56	18	<0.1	6.6	41	<0.05	<0.05	<0.05	<0.05	<0.05
BH03 0.1	**11/06/2019**	<0.5	<0.5	2.2	<0.4	9.9	260	8.2	<0.1	6.3	56	<0.05	<0.05	<0.05	<0.05	<0.05
BH03 1.3	**11/06/2019**	1.2	6	480	<0.4	35	100	170	0.1	9.8	110	<0.05	<0.05	<0.05	<0.05	<0.05
BH04 0.2	**11/06/2019**	<0.5	<0.5	9.3	<0.4	<5	230	6.4	<0.1	8	62	<0.05	<0.05	<0.05	0.44	<0.05
BH04 2.3	**11/06/2019**	<0.5	<0.5	25	<0.4	13	140	27	<0.1	12	89	<0.05	<0.05	<0.05	<0.05	<0.05
BH05 0.6	**11/06/2019**	<0.5	<0.5	150	<0.4	8.5	160	45	<0.1	10	83	<0.05	<0.05	<0.05	0.39	<0.05
BH05 3.5	**11/06/2019**	<0.5	<0.5	6.8	<0.4	11	55	14	<0.1	5.1	29	<0.05	<0.05	<0.05	<0.05	<0.05
BH06 0.5	**11/06/2019**	<0.5	<0.5	74	<0.4	<5	170	25	<0.1	12	100	<0.05	<0.05	<0.05	<0.05	<0.05
BH06 3.5	**11/06/2019**	<0.5	<0.5	8.6	<0.4	10	92	12	<0.1	7.2	78	<0.05	<0.05	<0.05	<0.05	<0.05

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based o
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added l
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#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 f
#10 Moderate reliability.

Exceedances

	Exceedance of **Comm/Ind and Urban Res & Publ**
	Exceedance of **Urban Res & Public Open Space**
	Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs f
	Exceedance of NEPM 2013 Table 1B(6) ESLs for U

		chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endrin ketone	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide
		µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg
EQL		100	0.05	0.05	0.05	0.05	0.05	0.05	50	0.05	0.05	0.05	50	0.05	0.05	0.05
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind					640											
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space					180											
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m																
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m																
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m																
Field ID	**Date**															
BH1 0.7	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH1 1.5	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH02 0.6	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH02 2.3	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH03 0.1	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH03 1.3	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH04 0.2	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	0.44	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH04 2.3	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH05 0.6	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	0.39	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH05 3.5	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH06 0.5	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05
BH06 3.5	**11/06/2019**	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<50	<0.05	<0.05	<0.05

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2
#2 As Chromium III. Calculated using a clay content of 1%.
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Publ**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs f
Exceedance of NEPM 2013 Table 1B(6) ESLs for U

		Hexachlorobenzene	Methoxychlor	Toxaphene	Azinophos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos
		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	0.2	1	0.2	0.2	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind														
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space														
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m														
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m														
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m														
Field ID	**Date**													
BH1 0.7	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11/06/2019**	<0.05	<0.2	<1	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2
#2 As Chromium III. Calculated using a clay content of 1%.
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Publ**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs f
Exceedance of NEPM 2013 Table 1B(6) ESLs for U

		Dimethoate	Disulfoton	EPN	Ethoprop	Ethion	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
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
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind													
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space													
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m													
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m													
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m													
Field ID	**Date**												
BH1 0.7	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11/06/2019**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based or
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#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Publ**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs f
Exceedance of NEPM 2013 Table 1B(6) ESLs for U

		Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-methyl	Pyrazophos	Ronnel	Terbufos	Tetrachlorvinphos	Tokuthion	Trichloronate
		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	0.2
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind													
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space													
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m													
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m													
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m													
Field ID	**Date**												
BH1 0.7	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH1 1.5	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 0.6	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02 2.3	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 0.1	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH03 1.3	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 0.2	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH04 2.3	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 0.6	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH05 3.5	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 0.5	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06 3.5	**11/06/2019**	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Publ**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs f
Exceedance of NEPM 2013 Table 1B(6) ESLs for U

		Arochlor 1016	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aroclor 1221	PCBs (Sum of total)	2,4,5-trichlorophenol	2.4.6-Trichlorophenol	2,4-dichlorophenol	2,4-dinitrophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol
		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	0.1	0.5	0.5	0.5	0.5	5	0.5	0.5	0.5
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind																
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m																
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m																
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m																
Field ID	**Date**															
BH1 0.7	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH1 1.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH02 0.6	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH02 2.3	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH03 0.1	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH03 1.3	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH04 0.2	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH04 2.3	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH05 0.6	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH05 3.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH06 0.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5
BH06 3.5	**11/06/2019**	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<1	<1	<0.5	<5	<0.5	<0.5	<0.5

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based or
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added l
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 f
#10 Moderate reliability.

Exceedances

Exceedance of **Comm/Ind and Urban Res & Publ**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs f
Exceedance of NEPM 2013 Table 1B(6) ESLs for U

Field ID	Date	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol	Dinoseb	Pentachlorophenol	Phenol	tetrachlorophenols	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)
		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	0.5	0.4	5	20	0.5	5	20	1	0.5	1	1	20
NEPM 2013 Table 1B(5) Generic EIL - Comm/Ind														
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space														
NEPM 2013 Table 1B(6) ESLs for Areas of Ecological Significance, Coarse Soil 0-2m														
NEPM 2013 Table 1B(6) ESLs for Comm/Ind, Coarse Soil 0-2m														
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil 0-2m														
BH1 0.7	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH1 1.5	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH02 0.6	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH02 2.3	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH03 0.1	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH03 1.3	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH04 0.2	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH04 2.3	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH05 0.6	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH05 3.5	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH06 0.5	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20
BH06 3.5	**11/06/2019**	<0.2	<1	<0.4	<5	<20	<1	<5	<20	<1	<0.5	<1	<1	<20

Comments

#1 Aged values apply to arsenic contamination present in soil > 2 years. Refer Schedule B5c for < 2
#2 As Chromium III. Calculated using a clay content of 1%.
#3 Calculated using a soil pH of 7.7 and CEC of 33 meq/100g. The ACL should be adjusted based or
#4 Generic ACL value from NEPM 2013 Table 1B(4). To calculate a site specific EIL, add the added l
#5 Calculated using a CEC of 33 meq/100g.
#6 Calculated using a soil pH of 7.7 and a CEC of 33 meq/100g.
#7 To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#8 Insufficient data to availability to derive a value.
#9 Moderate reliability. To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 f
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Exceedances

Exceedance of **Comm/Ind and Urban Res & Publ**
Exceedance of **Urban Res & Public Open Space**
Exceedance of **ALL** NEPM 2013 Table 1B(6) ESLs f
Exceedance of NEPM 2013 Table 1B(6) ESLs for U

APPENDIX F

QA/QC TABLES

Sydney Trains
20 Eddy Street
Kiama, NSW 2533

Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

				TRH				BTEX						
				C6 - C10	C10 - C16	C16 - C34	C34 - C40	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Acenaphthene	Acenaphthylene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				10	50	100	100	0.1	0.1	0.1	0.2	0.1	0.5	0.5
Lab Report Numbe	**Field ID**	**Date**	**Matrix Type**											
660634	**BH06 0.5**	**6/11/2019**	**soil**	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.5	<0.5
	QC01	**6/11/2019**	**soil**	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.5	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0
660634	**BH06 0.5**	**6/11/2019**	**soil**	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.2	<0.1	<0.5	<0.5
ES1918320	**QC01A**	**6/11/2019**	**soil**	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: (1 - 10 x EQL); 30 (10 - 20 x EQL); 30 (> 20 x EQL))**
*****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**

Sydney Trains
20 Eddy Street
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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	PAH													
				Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	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
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
660634	BH06 0.5	6/11/2019	soil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
	QC01	6/11/2019	soil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ES1918320	QC01A	6/11/2019	soil	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
***Interlab Duplicates are matched on a per compound basis as methods vai

Sydney Trains
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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	Metals							
				Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
				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
660634	BH06 0.5	6/11/2019	soil	74	<0.4	<5	170	25	<0.1	12	100
	QC01	6/11/2019	soil	83	<0.4	<5	170	35	<0.1	12	140
RPD				11	0	0	0	**33**	0	0	**33**
660634	BH06 0.5	6/11/2019	soil	74	<0.4	<5	170	25	<0.1	12	100
ES1918320	QC01A	6/11/2019	soil	121	<1	5	171	44	<0.1	11	126
RPD				**48**	0	0	1	**55**	0	9	23

***RPDs have only been considered where a concentration is greater than 1 tir**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP**
*****Interlab Duplicates are matched on a per compound basis as methods va**

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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	chlordane	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endrin ketone	Endosulfan II
				OCP													
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg
EQL				0.05	0.05	0.05	0.05	0.05	100	0.05	0.05	0.05	0.05	0.05	0.05	50	0.05
660634	BH06 0.5	6/11/2019	soil	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05
	QC01	6/11/2019	soil	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.05	<0.05	<0.05	<0.05	<0.05	<100	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<50	<0.05
ES1918320	QC01A	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-	-	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 tir**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP**
*****Interlab Duplicates are matched on a per compound basis as methods va**

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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene
				mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.05	0.05	50	0.05	0.05	0.05	0.05	0.2	1
660634	BH06 0.5	6/11/2019	soil	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1
	QC01	6/11/2019	soil	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1
RPD				0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.05	<0.05	<50	<0.05	<0.05	<0.05	<0.05	<0.2	<1
ES1918320	QC01A	6/11/2019	soil	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	Azinophos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate	Disulfoton	EPN	Ethoprop
				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	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	QC01	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
ES1918320	QC01A	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-	-	-	-	-	-

***RPDs have only been considered where a concentration is greater than 1 tir**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP**
*****Interlab Duplicates are matched on a per compound basis as methods va**

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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

				OPP													
				Ethion	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimphos-methyl
				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	2	0.2	2	0.2	0.2	0.2
Lab Report Numbe	Field ID	Date	Matrix Type														
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2
	QC01	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2
ES1918320	QC01A	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
***Interlab Duplicates are matched on a per compound basis as methods vaı

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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	Pyrazophos	Ronnel	Terbufos	Tetrachlorvinphos	Tokuthion	Trichloronate	PCB: Arochlor 1016	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Aroclor 1221	PCBs (Sum of 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	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.5
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
	QC01	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
ES1918320	QC01A	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RPD				-	-	-	-	-	-	-	-	-	-	-	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
***Interlab Duplicates are matched on a per compound basis as methods vai

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Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

				Phenols													
				2,4,5-trichlorophenol	2.4.6-Trichlorophenol	2,4-dichlorophenol	2,4-dinitrophenol	2,4-dimethylphenol	2,6-dichlorophenol	2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol
				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	5	0.5	0.5	0.5	0.2	0.5	0.4	5	20	0.5	5
Lab Report Numbe	**Field ID**	**Date**	**Matrix Type**														
660634	**BH06 0.5**	**6/11/2019**	**soil**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5
	QC01	**6/11/2019**	**soil**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5
RPD				0	0	0	0	0	0	0	0	0	0	0	0	0	0
660634	**BH06 0.5**	**6/11/2019**	**soil**	<1	<1	<0.5	<5	<0.5	<0.5	<0.5	<0.2	<1	<0.4	<5	<20	<1	<5
ES1918320	**QC01A**	**6/11/2019**	**soil**	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1	-	-	<0.5	-
RPD				0	0	0	-	0	0	0	0	0	0	-	-	0	-

***RPDs have only been considered where a concentration is greater than 1 tir**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP**
*****Interlab Duplicates are matched on a per compound basis as methods va**

Sydney Trains
20 Eddy Street
Kiama, NSW 2533

Table F1 - QAQC Data
Sydney Trains Surplus Depot ESA

Lab Report Numbe	Field ID	Date	Matrix Type	Dinoseb	Pentachlorophenol	Phenol	tetrachlorophenols	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				20	1	0.5	1	1	20
660634	BH06 0.5	6/11/2019	soil	<20	<1	<0.5	<1	<1	<20
	QC01	6/11/2019	soil	<20	<1	<0.5	<1	<1	<20
RPD				0	0	0	0	0	0
660634	BH06 0.5	6/11/2019	soil	<20	<1	<0.5	<1	<1	<20
ES1918320	QC01A	6/11/2019	soil	-	<2	<0.5	-	-	-
RPD				-	0	0	-	-	-

*RPDs have only been considered where a concentration is greater than 1 tir
**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RP
***Interlab Duplicates are matched on a per compound basis as methods vai

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Table F2 - Field and Rinsate Blanks
Sydney Trains Surplus Depot ESA
20 Eddy Street

			TRH							BTEX							
			C6 - C10	C6 - C10 less BTEX (F1)	C10 - C16	C10 - C16 less Naphthalene (F2)	C16 - C34	C34 - C40	C10 - C40 (Sum)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene (Sum)	Acenaphthene	Acenaphthylene
			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
Lab Report Number	**Date**	**Matrix Type**															
660634	6/11/2019	water	<20	<20	<50	<50	<100	<100	<100	<1	<1	<1	<2	<1	<3	<1	<1
660634	6/11/2019	soil	<20	<20	-	-	-	-	-	<0.1	<0.1	<0.1	<0.2	<0.1	<0.3	-	-

Sydney Trains
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Kiama, NSW 2533

Table F2 - Field and Rinsate Blanks
Sydney Trains Surplus Depot ESA
20 Eddy Street

			PAH														
			Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b&j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Sum)
			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
Lab Report Number	Date	Matrix Type															
660634	6/11/2019	water	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
660634	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sydney Trains
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Table F2 - Field and Rinsate Blanks
Sydney Trains Surplus Depot ESA
20 Eddy Street

			Metals													
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	2,4,5-trichlorophenol	2.4.6-Trichlorophenol	2,4-dichlorophenol	2,4-dinitrophenol	2,4-dimethylphenol	2,6-dichlorophenol
			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
Lab Report Number	Date	Matrix Type														
660634	6/11/2019	water	<1	<0.2	<1	<1	<1	<0.1	<1	<5	<10	<10	<3	<30	<3	<3
660634	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sydney Trains
20 Eddy Street
Kiama, NSW 2533

Table F2 - Field and Rinsate Blanks
Sydney Trains Surplus Depot ESA
20 Eddy Street

			Phenols													
			2-chlorophenol	2-methylphenol	2-nitrophenol	3-&4-methylphenol	4,6-Dinitro-2-methylphenol	4,6-Dinitro-o-cyclohexyl phenol	4-chloro-3-methylphenol	4-nitrophenol	Dinoseb	Pentachlorophenol	Phenol	tetrachlorophenols	Phenols (Total Halogenated)	Phenols (Total Non Halogenated)
			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
Lab Report Number	Date	Matrix Type														
660634	6/11/2019	water	<3	<3	<10	<6	<30	<100	<10	<30	<100	<10	<3	<30	<10	<100
660634	6/11/2019	soil	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX G

LABORATORY REPORTS

CHAIN OF CUSTODY RECORD

☐ Sydney Laboratory
Unit F3 Bld F 16 Mars Rd

☐

Brisbane Laboratory
Unit 1 21 Smallwood Pl Murarrie QLD 4172

☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close Oakleigh VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	WSP Australia Pty Limited	Project №	PS114138	Sampler(s)	Alex Carpenter
Address	Level 27, 680 George Street Sydney, NSW 2000 Australia	Project Name	Sydney Trains - Kiama	Handed over by	
Contact Name	Alexander Carpenter			Email for Invoice	Alex.Carpenter@wsp.com, APinvoices@pb.com.au
Phone №	0415 501 846			Email for Results	Alex.Carpenter@wsp.com
Special Directions					
Purchase Order	PS114138				
Quote ID №	190408WSPN				

Turnaround Time (TAT) Requirements: ☐ Overnight (9am)* ☐ 1 Day* ☐ 2 Day* ☐ 3 Day* ☑ 5 Day ☐ Other ( ) * Surcharges apply

Containers: 1L Plastic, 250mL Plastic, 125mL Plastic, 200mL Amber Glass, 40mL VOA vial, 500mL PFAS Bottle, Jar (Glass or HDPE), Other (Asbestos AS4964, WA Guidelines)

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	B7A: TRH, BTEX, PAH, Phenols, Metals	B15: OCP, OPP, PCB		Hold	pH, cation exchange capacity and clay content	40mL VOA vial	Jar (Glass or HDPE)	Sample Comments / Dangerous Goods Hazard Warning
1	BH01 - 0.3	11/06/19	S				X			1	
2	BH01 - 0.7	11/6/19	S	X	X					1	
3	BH01 - 1.5	11/6/19	S	X	X					1	
4	BH01 - 2.4	11/6/19	S				X			1	
5	BH02 - 0.2	11/6/19	S				X			1	
6	BH02 - 0.6	11/6/19	S	X	X					1	
7	BH02 - 1.5	11/6/19	S				X			1	
8	BH02 - 2.3	11/6/19	S	X	X					1	
9	BH03 - 0.1	11/6/19	S	X	X					1	
10	BH03 - 0.5	11/6/19	S				X			1	
11	BH03 - 1.3	11/6/19	S	X	X					1	
12	BH03 - 2.2	11/6/19	S				X			1	
13	BH04 - 0.2	11/6/19	S	X	X					1	
14	BH04 - 1.0	11/6/19	S				X			1	
15	BH04 - 1.5	11/6/19	S				X			1	
16	BH04 - 2.3	11/6/19	S	X	X					1	
17	BH05 - 0.2	11/6/19	S				X			1	
18	BH05 - 0.6	11/6/19	S	X	X					1	
19	BH05 - 2.6	11/6/19	S				X			1	
20	BH05 - 3.5	11/6/19	S	X	X					1	
21	BH06 - 0.1	11/6/19	S				X			1	
22	BH06 - 0.5	11/6/19	S	X	X			X		1	
23	BH06 - 1.5	11/6/19	S							1	
	BH06 - 3.5	11/6/19	S	X	X						
	QC01	11/6/19	S	X	X					1	
	QC01A	11/6/19	S	X						1	Please forward to ALS
23	R_11062019	11/6/19	W								
24	TB01	11/6/19	S						2		
25											
	Total Counts			14	13		11	1	1	25	

Method of Shipment	☐ Courier (#) ☐ Hand Delivered ☐ Postal	Name				Date	__/__/__	Time	__:__
Eurofins | mgt Laboratory Use Only — Received By	Elvis D	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	13/8/19	Time	6.26pm	Temperature 5.3 °C
Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	__/__/__	Time	__:__	Report № 660634

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

eurofins | mgt

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name:	**WSP Australia P/L NSW**
Contact name:	Alexander Carpenter
Project name:	SYDNEY TRAINS - KIAMA
Project ID:	PS114138
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Jun 13, 2019 6:26 PM
Eurofins | mgt reference:	**660634**

Sample information

- ☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- ☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.4 degrees Celsius.
- ☑ All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- ☑ Attempt to chill was evident.
- ☑ Appropriately preserved sample containers have been used.
- ☑ All samples were received in good condition.
- ☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Appropriate sample containers have been used.
- ☑ Sample containers for volatile analysis received with zero headspace.
- ☑ Split sample sent to requested external lab.
- ☒ Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Notes

QC01A sent to ALS for analysis.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Alexander Carpenter - CarpenterA@pbworld.com.

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web : www.eurofins.com.au

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NATA # 1261 Site # 20794

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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	WSP Australia P/L NSW	**Order No.:**	PS114138
Address:	Level 27, Ernst & Young Centre Sydney NSW 2001	**Report #:**	660634
		Phone:	02 9272 5586
		Fax:	02 9272 5101
Project Name:	SYDNEY TRAINS - KIAMA	**Received:**	Jun 13, 2019 6:26 PM
Project ID:	PS114138	**Due:**	Jun 20, 2019
		Priority:	5 Day
		Contact Name:	Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	BH1 0.7	Jun 11, 2019		Soil	S19-Jn14671				X	X		X
2	BH1 1.5	Jun 11, 2019		Soil	S19-Jn14672				X	X		X
3	BH02 0.6	Jun 11, 2019		Soil	S19-Jn14673				X	X		X
4	BH02 2.3	Jun 11, 2019		Soil	S19-Jn14674				X	X		X
5	BH03 0.1	Jun 11, 2019		Soil	S19-Jn14675				X	X		X
6	BH03 1.3	Jun 11, 2019		Soil	S19-Jn14676				X	X		X
7	BH04 0.2	Jun 11, 2019		Soil	S19-Jn14677				X	X		X
8	BH04 2.3	Jun 11, 2019		Soil	S19-Jn14678				X	X		X
9	BH05 0.6	Jun 11, 2019		Soil	S19-Jn14679				X	X		X

ABN – 50 005 085 521
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web : www.eurofins.com.au

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NATA # 1261
Site # 23736

Company Name:	WSP Australia P/L NSW	**Order No.:**	PS114138
Address:	Level 27, Ernst & Young Centre Sydney NSW 2001	**Report #:**	660634
		Phone:	02 9272 5586
		Fax:	02 9272 5101
Project Name:	SYDNEY TRAINS - KIAMA	**Received:**	Jun 13, 2019 6:26 PM
Project ID:	PS114138	**Due:**	Jun 20, 2019
		Priority:	5 Day
		Contact Name:	Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
10	BH05 3.5	Jun 11, 2019		Soil	S19-Jn14680				X	X		X
11	BH06 0.5	Jun 11, 2019		Soil	S19-Jn14681	X		X	X	X	X	X
12	BH06 3.5	Jun 11, 2019		Soil	S19-Jn14682				X	X		X
13	QC01	Jun 11, 2019		Soil	S19-Jn14683				X	X		X
14	R_11062019	Jun 11, 2019		Water	S19-Jn14684		X					
15	TB01	Jun 11, 2019		Soil	S19-Jn14685		X					
16	BH01 0.3	Jun 11, 2019		Soil	S19-Jn14686		X					
17	BH01 2.4	Jun 11, 2019		Soil	S19-Jn14687		X					
18	BH02 0.2	Jun 11, 2019		Soil	S19-Jn14688		X					
19	BH02 1.5	Jun 11, 2019		Soil	S19-Jn14689		X					
20	BH03 0.5	Jun 11, 2019		Soil	S19-Jn14690		X					
21	BH03 2.2	Jun 11, 2019		Soil	S19-Jn14691		X					

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NATA # 1261
Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
Sydney
NSW 2001

Project Name: SYDNEY TRAINS - KIAMA
Project ID: PS114138

Order No.: PS114138
Report #: 660634
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jun 13, 2019 6:26 PM
Due: Jun 20, 2019
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
22	BH04 1.0	Jun 11, 2019		Soil	S19-Jn14692		X					
23	BH04 1.5	Jun 11, 2019		Soil	S19-Jn14693		X					
24	BH05 0.2	Jun 11, 2019		Soil	S19-Jn14694		X					
25	BH05 2.8	Jun 11, 2019		Soil	S19-Jn14695		X					
26	BH06 0.1	Jun 11, 2019		Soil	S19-Jn14696		X					
27	BH06 1.5	Jun 11, 2019		Soil	S19-Jn14700		X					
Test Counts						1	14	1	13	13	1	13

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

WSP Australia P/L NSW
Level 27, Ernst & Young Centre
Sydney
NSW 2001

Attention: **Alexander Carpenter**

Report	**660634-S**
Project name	SYDNEY TRAINS - KIAMA
Project ID	PS114138
Received Date	Jun 13, 2019

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**BH1 0.7** **Soil** **S19-Jn14671** **Jun 11, 2019**	**BH1 1.5** **Soil** **S19-Jn14672** **Jun 11, 2019**	**BH02 0.6** **Soil** **S19-Jn14673** **Jun 11, 2019**	**BH02 2.3** **Soil** **S19-Jn14674** **Jun 11, 2019**
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	72	91	97
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BH1 0.7 Soil S19-Jn14671 Jun 11, 2019	BH1 1.5 Soil S19-Jn14672 Jun 11, 2019	BH02 0.6 Soil S19-Jn14673 Jun 11, 2019	BH02 2.3 Soil S19-Jn14674 Jun 11, 2019
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	103	110	102	109
p-Terphenyl-d14 (surr.)	1	%	98	99	92	99
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	110	126	122	94
Tetrachloro-m-xylene (surr.)	1	%	120	127	115	101
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			BH1 0.7	BH1 1.5	BH02 0.6	BH02 2.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14671	S19-Jn14672	S19-Jn14673	S19-Jn14674
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	72	83	78	83
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	110	126	122	94
Tetrachloro-m-xylene (surr.)	1	%	120	127	115	101
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			BH1 0.7	BH1 1.5	BH02 0.6	BH02 2.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Jn14671**	**S19-Jn14672**	**S19-Jn14673**	**S19-Jn14674**
Date Sampled			**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**
Test/Reference	LOR	Unit				
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	95	60	70	70
% Moisture	1	%	24	25	21	29
Heavy Metals						
Arsenic	2	mg/kg	120	170	49	4.0
Cadmium	0.4	mg/kg	< 0.4	1.0	< 0.4	< 0.4
Chromium	5	mg/kg	16	9.2	8.8	32
Copper	5	mg/kg	140	150	100	56
Lead	5	mg/kg	79	130	78	18
Mercury	0.1	mg/kg	0.2	0.4	0.1	< 0.1
Nickel	5	mg/kg	9.1	12	20	6.6
Zinc	5	mg/kg	54	390	48	41

Client Sample ID			BH03 0.1	BH03 1.3	BH04 0.2	BH04 2.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Jn14675**	**S19-Jn14676**	**S19-Jn14677**	**S19-Jn14678**
Date Sampled			**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	60	56	< 50
TRH C29-C36	50	mg/kg	73	< 50	66	81
TRH C10-36 (Total)	50	mg/kg	73	60	122	81
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	96	88	85	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH03 0.1	BH03 1.3	BH04 0.2	BH04 2.3
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Jn14675**	**S19-Jn14676**	**S19-Jn14677**	**S19-Jn14678**
Date Sampled			**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	150	120
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	150	120
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	1.1	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	1.4	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.7	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	0.8	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	0.9	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	0.6	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	0.8	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	1.1	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	1.2	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	6	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	115	118	105	113
p-Terphenyl-d14 (surr.)	1	%	104	106	100	112
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	0.44	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1

Client Sample ID			BH03 0.1	BH03 1.3	BH04 0.2	BH04 2.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14675	S19-Jn14676	S19-Jn14677	S19-Jn14678
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	0.44	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	0.44	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	91	101	81	104
Tetrachloro-m-xylene (surr.)	1	%	100	112	97	106
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	87	91	80	92
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH03 0.1	BH03 1.3	BH04 0.2	BH04 2.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14675	S19-Jn14676	S19-Jn14677	S19-Jn14678
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	91	101	81	104
Tetrachloro-m-xylene (surr.)	1	%	100	112	97	106
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	84	85	59	81
% Moisture	1	%	4.2	15	4.3	28
Heavy Metals						
Arsenic	2	mg/kg	2.2	480	9.3	25
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	9.9	35	< 5	13
Copper	5	mg/kg	260	100	230	140
Lead	5	mg/kg	8.2	170	6.4	27
Mercury	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Nickel	5	mg/kg	6.3	9.8	8.0	12
Zinc	5	mg/kg	56	110	62	89

Client Sample ID			BH05 0.6	BH05 3.5	BH06 0.5	BH06 3.5
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S19-Jn14679**	**S19-Jn14680**	**S19-Jn14681**	**S19-Jn14682**
Date Sampled			**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**	**Jun 11, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	92	88	81
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	113	111	119	107
p-Terphenyl-d14 (surr.)	1	%	103	112	117	107

Client Sample ID			BH05 0.6	BH05 3.5	BH06 0.5	BH06 3.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14679	S19-Jn14680	S19-Jn14681	S19-Jn14682
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	0.39	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	0.39	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	0.39	< 0.2	< 0.2	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dibutylchlorendate (surr.)	1	%	83	106	104	86
Tetrachloro-m-xylene (surr.)	1	%	93	108	109	99
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	BH05 0.6 Soil S19-Jn14679 Jun 11, 2019	BH05 3.5 Soil S19-Jn14680 Jun 11, 2019	BH06 0.5 Soil S19-Jn14681 Jun 11, 2019	BH06 3.5 Soil S19-Jn14682 Jun 11, 2019
Organophosphorus Pesticides						
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	87	82	89	81
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibutylchlorendate (surr.)	1	%	83	106	104	86
Tetrachloro-m-xylene (surr.)	1	%	93	108	109	99
Phenols (Halogenated)						
2-Chlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1	< 1	< 1	< 1
Pentachlorophenol	1	mg/kg	< 1	< 1	< 1	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1	< 1	< 1	< 1
Total Halogenated Phenol*	1	mg/kg	< 1	< 1	< 1	< 1
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20	< 20	< 20	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	1	mg/kg	< 1	< 1	< 1	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
4-Nitrophenol	5	mg/kg	< 5	< 5	< 5	< 5
Dinoseb	20	mg/kg	< 20	< 20	< 20	< 20
Phenol	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20	< 20	< 20	< 20
Phenol-d6 (surr.)	1	%	68	78	76	78

Client Sample ID			BH05 0.6	BH05 3.5	BH06 0.5	BH06 3.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S19-Jn14679	S19-Jn14680	S19-Jn14681	S19-Jn14682
Date Sampled			Jun 11, 2019	Jun 11, 2019	Jun 11, 2019	Jun 11, 2019
Test/Reference	LOR	Unit				
% Clay	1	%	-	-	< 1	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	-	56	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	-	7.7	-
% Moisture	1	%	6.3	8.1	13	31
Heavy Metals						
Arsenic	2	mg/kg	150	6.8	74	8.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	8.5	11	< 5	10
Copper	5	mg/kg	160	55	170	92
Lead	5	mg/kg	45	14	25	12
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	10	5.1	12	7.2
Zinc	5	mg/kg	83	29	100	78
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	33	-

Client Sample ID			QC01
Sample Matrix			Soil
Eurofins | mgt Sample No.			S19-Jn14683
Date Sampled			Jun 11, 2019
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	20
TRH C15-C28	50	mg/kg	56
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	76
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	85
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100

Client Sample ID			QC01
Sample Matrix			Soil
Eurofins | mgt Sample No.			S19-Jn14683
Date Sampled			Jun 11, 2019
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	107
p-Terphenyl-d14 (surr.)	1	%	105
Organochlorine Pesticides			
Chlordanes - Total	0.1	mg/kg	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05
a-BHC	0.05	mg/kg	< 0.05
Aldrin	0.05	mg/kg	< 0.05
b-BHC	0.05	mg/kg	< 0.05
d-BHC	0.05	mg/kg	< 0.05
Dieldrin	0.05	mg/kg	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05
Endrin	0.05	mg/kg	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05
Heptachlor	0.05	mg/kg	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2
Toxaphene	1	mg/kg	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2
Dibutylchlorendate (surr.)	1	%	INT
Tetrachloro-m-xylene (surr.)	1	%	148

Client Sample ID			QC01
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S19-Jn14683**
Date Sampled			**Jun 11, 2019**
Test/Reference	LOR	Unit	
Organophosphorus Pesticides			
Azinphos-methyl	0.2	mg/kg	< 0.2
Bolstar	0.2	mg/kg	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2
Coumaphos	2	mg/kg	< 2
Demeton-S	0.2	mg/kg	< 0.2
Demeton-O	0.2	mg/kg	< 0.2
Diazinon	0.2	mg/kg	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2
Dimethoate	0.2	mg/kg	< 0.2
Disulfoton	0.2	mg/kg	< 0.2
EPN	0.2	mg/kg	< 0.2
Ethion	0.2	mg/kg	< 0.2
Ethoprop	0.2	mg/kg	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2
Fenthion	0.2	mg/kg	< 0.2
Malathion	0.2	mg/kg	< 0.2
Merphos	0.2	mg/kg	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2
Mevinphos	0.2	mg/kg	< 0.2
Monocrotophos	2	mg/kg	< 2
Naled	0.2	mg/kg	< 0.2
Omethoate	2	mg/kg	< 2
Phorate	0.2	mg/kg	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2
Ronnel	0.2	mg/kg	< 0.2
Terbufos	0.2	mg/kg	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2
Tokuthion	0.2	mg/kg	< 0.2
Trichloronate	0.2	mg/kg	< 0.2
Triphenylphosphate (surr.)	1	%	81
Polychlorinated Biphenyls			
Aroclor-1016	0.5	mg/kg	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5
Total PCB*	0.5	mg/kg	< 0.5
Dibutylchlorendate (surr.)	1	%	INT
Tetrachloro-m-xylene (surr.)	1	%	148

Client Sample ID			QC01
Sample Matrix			Soil
Eurofins | mgt Sample No.			S19-Jn14683
Date Sampled			Jun 11, 2019
Test/Reference	LOR	Unit	
Phenols (Halogenated)			
2-Chlorophenol	0.5	mg/kg	< 0.5
2.4-Dichlorophenol	0.5	mg/kg	< 0.5
2.4.5-Trichlorophenol	1	mg/kg	< 1
2.4.6-Trichlorophenol	1	mg/kg	< 1
2.6-Dichlorophenol	0.5	mg/kg	< 0.5
4-Chloro-3-methylphenol	1	mg/kg	< 1
Pentachlorophenol	1	mg/kg	< 1
Tetrachlorophenols - Total	1	mg/kg	< 1
Total Halogenated Phenol*	1	mg/kg	< 1
Phenols (non-Halogenated)			
2-Cyclohexyl-4.6-dinitrophenol	20	mg/kg	< 20
2-Methyl-4.6-dinitrophenol	5	mg/kg	< 5
2-Methylphenol (o-Cresol)	0.2	mg/kg	< 0.2
2-Nitrophenol	1	mg/kg	< 1
2.4-Dimethylphenol	0.5	mg/kg	< 0.5
2.4-Dinitrophenol	5	mg/kg	< 5
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	< 0.4
4-Nitrophenol	5	mg/kg	< 5
Dinoseb	20	mg/kg	< 20
Phenol	0.5	mg/kg	< 0.5
Total Non-Halogenated Phenol*	20	mg/kg	< 20
Phenol-d6 (surr.)	1	%	85
% Moisture	1	%	14
Heavy Metals			
Arsenic	2	mg/kg	83
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	< 5
Copper	5	mg/kg	170
Lead	5	mg/kg	35
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	12
Zinc	5	mg/kg	140

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B7A			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 14, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 14, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (Halogenated)	Sydney	Jun 14, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Phenols (non-Halogenated)	Sydney	Jun 14, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jun 14, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Jun 14, 2019	14 Day
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Jun 14, 2019	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Clay	Brisbane	Jun 17, 2019	0 Day
- Method: LTM-GEN-7040			
pH (1:5 Aqueous extract at 25°C as rec.)	Sydney	Jun 14, 2019	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Conductivity (1:5 aqueous extract at 25°C as rec.)	Melbourne	Jun 17, 2019	7 Day
- Method: LTM-INO-4030 Conductivity			
Cation Exchange Capacity	Melbourne	Jun 17, 2019	180 Days
- Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage			
% Moisture	Sydney	Jun 13, 2019	14 Day
- Method: LTM-GEN-7080 Moisture			

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Site # 23736

Company Name: WSP Australia P/L NSW
Address: Level 27, Ernst & Young Centre
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NSW 2001

Project Name: SYDNEY TRAINS - KIAMA
Project ID: PS114138

Order No.: PS114138
Report #: 660634
Phone: 02 9272 5586
Fax: 02 9272 5101

Received: Jun 13, 2019 6:26 PM
Due: Jun 20, 2019
Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
External Laboratory												
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**							
1	BH1 0.7	Jun 11, 2019		Soil	S19-Jn14671				X	X		X
2	BH1 1.5	Jun 11, 2019		Soil	S19-Jn14672				X	X		X
3	BH02 0.6	Jun 11, 2019		Soil	S19-Jn14673				X	X		X
4	BH02 2.3	Jun 11, 2019		Soil	S19-Jn14674				X	X		X
5	BH03 0.1	Jun 11, 2019		Soil	S19-Jn14675				X	X		X
6	BH03 1.3	Jun 11, 2019		Soil	S19-Jn14676				X	X		X
7	BH04 0.2	Jun 11, 2019		Soil	S19-Jn14677				X	X		X
8	BH04 2.3	Jun 11, 2019		Soil	S19-Jn14678				X	X		X
9	BH05 0.6	Jun 11, 2019		Soil	S19-Jn14679				X	X		X

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Address:	Level 27, Ernst & Young Centre Sydney NSW 2001	**Report #:**	660634
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		Contact Name:	Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
10	BH05 3.5	Jun 11, 2019		Soil	S19-Jn14680				X	X		X
11	BH06 0.5	Jun 11, 2019		Soil	S19-Jn14681	X		X	X	X	X	X
12	BH06 3.5	Jun 11, 2019		Soil	S19-Jn14682				X	X		X
13	QC01	Jun 11, 2019		Soil	S19-Jn14683				X	X		X
14	R_11062019	Jun 11, 2019		Water	S19-Jn14684		X					
15	TB01	Jun 11, 2019		Soil	S19-Jn14685		X					
16	BH01 0.3	Jun 11, 2019		Soil	S19-Jn14686		X					
17	BH01 2.4	Jun 11, 2019		Soil	S19-Jn14687		X					
18	BH02 0.2	Jun 11, 2019		Soil	S19-Jn14688		X					
19	BH02 1.5	Jun 11, 2019		Soil	S19-Jn14689		X					
20	BH03 0.5	Jun 11, 2019		Soil	S19-Jn14690		X					
21	BH03 2.2	Jun 11, 2019		Soil	S19-Jn14691		X					

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Received: Jun 13, 2019 6:26 PM
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Priority: 5 Day
Contact Name: Alexander Carpenter

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	HOLD	pH (1:5 Aqueous extract at 25°C as rec.)	Eurofins | mgt Suite B15	Moisture Set	Cation Exchange Capacity	Eurofins | mgt Suite B7A
Melbourne Laboratory - NATA Site # 1254 & 14271											X	
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X						
Perth Laboratory - NATA Site # 23736												
22	BH04 1.0	Jun 11, 2019		Soil	S19-Jn14692		X					
23	BH04 1.5	Jun 11, 2019		Soil	S19-Jn14693		X					
24	BH05 0.2	Jun 11, 2019		Soil	S19-Jn14694		X					
25	BH05 2.8	Jun 11, 2019		Soil	S19-Jn14695		X					
26	BH06 0.1	Jun 11, 2019		Soil	S19-Jn14696		X					
27	BH06 1.5	Jun 11, 2019		Soil	S19-Jn14700		X					
Test Counts						1	14	1	13	13	1	13

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure, April 2011 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**ug/L:** micrograms per litre
ppm: Parts per million	**ppb:** Parts per billion	**%:** Percentage
org/100mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.2 2018
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.2 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

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Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
2.4.5-Trichlorophenol	mg/kg	< 1			1	Pass	
2.4.6-Trichlorophenol	mg/kg	< 1			1	Pass	
2.6-Dichlorophenol	mg/kg	< 0.5			0.5	Pass	
4-Chloro-3-methylphenol	mg/kg	< 1			1	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Tetrachlorophenols - Total	mg/kg	< 1			1	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/kg	< 20			20	Pass	
2-Methyl-4.6-dinitrophenol	mg/kg	< 5			5	Pass	
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
2-Nitrophenol	mg/kg	< 1			1	Pass	
2.4-Dimethylphenol	mg/kg	< 0.5			0.5	Pass	
2.4-Dinitrophenol	mg/kg	< 5			5	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
4-Nitrophenol	mg/kg	< 5			5	Pass	
Dinoseb	mg/kg	< 20			20	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	80			70-130	Pass	
TRH C10-C14	%	87			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	92			70-130	Pass	
Toluene	%	92			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	91			70-130	Pass	
o-Xylene	%	93			70-130	Pass	
Xylenes - Total	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	93			70-130	Pass	
TRH C6-C10	%	76			70-130	Pass	
TRH >C10-C16	%	92			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	121			70-130	Pass	
Acenaphthylene	%	120			70-130	Pass	
Anthracene	%	129			70-130	Pass	
Benz(a)anthracene	%	110			70-130	Pass	
Benzo(a)pyrene	%	113			70-130	Pass	
Benzo(b&j)fluoranthene	%	119			70-130	Pass	
Benzo(g.h.i)perylene	%	122			70-130	Pass	
Benzo(k)fluoranthene	%	126			70-130	Pass	
Chrysene	%	124			70-130	Pass	
Dibenz(a.h)anthracene	%	122			70-130	Pass	
Fluoranthene	%	115			70-130	Pass	
Fluorene	%	125			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	118			70-130	Pass	
Naphthalene	%	112			70-130	Pass	
Phenanthrene	%	128			70-130	Pass	
Pyrene	%	119			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	101			70-130	Pass	
4.4'-DDD	%	115			70-130	Pass	
4.4'-DDE	%	108			70-130	Pass	
4.4'-DDT	%	105			70-130	Pass	
a-BHC	%	114			70-130	Pass	
Aldrin	%	110			70-130	Pass	
b-BHC	%	104			70-130	Pass	
d-BHC	%	117			70-130	Pass	
Dieldrin	%	106			70-130	Pass	
Endosulfan I	%	104			70-130	Pass	
Endosulfan II	%	114			70-130	Pass	
Endosulfan sulphate	%	107			70-130	Pass	
Endrin	%	97			70-130	Pass	
Endrin aldehyde	%	103			70-130	Pass	
Endrin ketone	%	100			70-130	Pass	
g-BHC (Lindane)	%	112			70-130	Pass	
Heptachlor	%	110			70-130	Pass	
Heptachlor epoxide	%	109			70-130	Pass	
Hexachlorobenzene	%	105			70-130	Pass	
Methoxychlor	%	99			70-130	Pass	
Toxaphene	%	83			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	95			70-130	Pass	
Dimethoate	%	95			70-130	Pass	
Ethion	%	96			70-130	Pass	
Fenitrothion	%	109			70-130	Pass	
Mevinphos	%	102			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	87			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	113			30-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2.4-Dichlorophenol	%	128			30-130	Pass	
2.4.5-Trichlorophenol	%	123			30-130	Pass	
2.4.6-Trichlorophenol	%	121			30-130	Pass	
2.6-Dichlorophenol	%	130			30-130	Pass	
4-Chloro-3-methylphenol	%	120			30-130	Pass	
Pentachlorophenol	%	94			30-130	Pass	
Tetrachlorophenols - Total	%	116			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Methylphenol (o-Cresol)	%	128			30-130	Pass	
2-Nitrophenol	%	127			30-130	Pass	
2.4-Dimethylphenol	%	95			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	118			30-130	Pass	
4-Nitrophenol	%	92			30-130	Pass	
Dinoseb	%	94			30-130	Pass	
Phenol	%	123			30-130	Pass	
LCS - % Recovery							
% Clay	%	100			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	116			70-130	Pass	
Cadmium	%	113			70-130	Pass	
Chromium	%	116			70-130	Pass	
Copper	%	114			70-130	Pass	
Lead	%	116			70-130	Pass	
Mercury	%	121			70-130	Pass	
Nickel	%	114			70-130	Pass	
Zinc	%	115			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S19-Jn14821	NCP	%	72			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S19-Jn14821	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S19-Jn16302	NCP	%	113			70-130	Pass	
Acenaphthylene	S19-Jn16302	NCP	%	114			70-130	Pass	
Anthracene	S19-Jn16302	NCP	%	113			70-130	Pass	
Benz(a)anthracene	S19-Jn16302	NCP	%	108			70-130	Pass	
Benzo(a)pyrene	S19-Jn16302	NCP	%	109			70-130	Pass	
Benzo(b&j)fluoranthene	S19-Jn16302	NCP	%	125			70-130	Pass	
Benzo(g.h.i)perylene	S19-Jn16302	NCP	%	118			70-130	Pass	
Benzo(k)fluoranthene	S19-Jn16302	NCP	%	111			70-130	Pass	
Chrysene	S19-Jn16302	NCP	%	115			70-130	Pass	
Dibenz(a.h)anthracene	S19-Jn16302	NCP	%	119			70-130	Pass	
Fluoranthene	S19-Jn16302	NCP	%	117			70-130	Pass	
Fluorene	S19-Jn16302	NCP	%	114			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S19-Jn16302	NCP	%	115			70-130	Pass	
Naphthalene	S19-Jn16302	NCP	%	111			70-130	Pass	
Phenanthrene	S19-Jn16302	NCP	%	114			70-130	Pass	
Pyrene	S19-Jn16302	NCP	%	121			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S19-Jn14263	NCP	%	127			70-130	Pass	
4.4'-DDD	S19-Jn15950	NCP	%	117			70-130	Pass	
4.4'-DDE	S19-Jn15950	NCP	%	99			70-130	Pass	
4.4'-DDT	S19-Jn14263	NCP	%	91			70-130	Pass	
a-BHC	S19-Jn15950	NCP	%	106			70-130	Pass	
Aldrin	S19-Jn14263	NCP	%	130			70-130	Pass	
b-BHC	S19-Jn14263	NCP	%	117			70-130	Pass	
d-BHC	S19-Jn15950	NCP	%	107			70-130	Pass	
Dieldrin	S19-Jn15950	NCP	%	113			70-130	Pass	
Endosulfan I	S19-Jn14263	NCP	%	124			70-130	Pass	
Endosulfan II	S19-Jn15950	NCP	%	112			70-130	Pass	
Endosulfan sulphate	S19-Jn15950	NCP	%	109			70-130	Pass	
Endrin	S19-Jn14263	NCP	%	117			70-130	Pass	
Endrin aldehyde	S19-Jn14263	NCP	%	124			70-130	Pass	
Endrin ketone	S19-Jn14263	NCP	%	126			70-130	Pass	
g-BHC (Lindane)	S19-Jn14263	NCP	%	124			70-130	Pass	
Heptachlor	S19-Jn14263	NCP	%	125			70-130	Pass	
Heptachlor epoxide	S19-Jn14263	NCP	%	128			70-130	Pass	
Hexachlorobenzene	S19-Jn14263	NCP	%	124			70-130	Pass	
Methoxychlor	S19-Jn14263	NCP	%	96			70-130	Pass	
Toxaphene	S19-Jn14263	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	S19-Jn19881	NCP	%	112			70-130	Pass	
Dimethoate	S19-Jn19881	NCP	%	105			70-130	Pass	
Ethion	S19-Jn19881	NCP	%	115			70-130	Pass	
Fenitrothion	S19-Jn10946	NCP	%	112			70-130	Pass	
Mevinphos	S19-Jn19881	NCP	%	118			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Total PCB*	S19-My49750	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Zinc	S19-Jn15960	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S19-Jn14672	CP	%	92			70-130	Pass	
Cadmium	S19-Jn14672	CP	%	93			70-130	Pass	
Chromium	S19-Jn14672	CP	%	96			70-130	Pass	
Copper	S19-Jn14672	CP	%	100			70-130	Pass	
Lead	S19-Jn14672	CP	%	86			70-130	Pass	
Mercury	S19-Jn14672	CP	%	81			70-130	Pass	
Nickel	S19-Jn14672	CP	%	103			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S19-Jn14677	CP	%	82			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S19-Jn14677	CP	%	89			70-130	Pass	
Toluene	S19-Jn14677	CP	%	87			70-130	Pass	
Ethylbenzene	S19-Jn14677	CP	%	88			70-130	Pass	
m&p-Xylenes	S19-Jn14677	CP	%	87			70-130	Pass	
o-Xylene	S19-Jn14677	CP	%	89			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total	S19-Jn14677	CP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S19-Jn14677	CP	%	76			70-130	Pass	
TRH C6-C10	S19-Jn14677	CP	%	82			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S19-Jn14678	CP	%	107			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S19-Jn17048	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S19-Jn14820	NCP	mg/kg	< 20	24	31	30%	Fail	Q15
TRH C15-C28	S19-Jn14820	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S19-Jn14820	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S19-Jn17048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S19-Jn17048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S19-Jn17048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S19-Jn17048	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S19-Jn17048	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S19-Jn17048	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S19-Jn17048	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S19-Jn17048	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S19-Jn14820	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S19-Jn14820	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S19-Jn14820	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Jn14671	CP	mg/kg	120	120	1.0	30%	Pass	
Cadmium	S19-Jn14671	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-Jn14671	CP	mg/kg	16	15	9.0	30%	Pass	
Copper	S19-Jn14671	CP	mg/kg	140	130	12	30%	Pass	
Lead	S19-Jn14671	CP	mg/kg	79	94	18	30%	Pass	
Mercury	S19-Jn14671	CP	mg/kg	0.2	0.3	<1	30%	Pass	
Nickel	S19-Jn14671	CP	mg/kg	9.1	11	17	30%	Pass	
Zinc	S19-Jn14671	CP	mg/kg	54	56	3.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Jn14674	CP	%	29	29	1.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S19-Jn14676	CP	mg/kg	0.8	0.7	20	30%	Pass	
Benzo(a)pyrene	S19-Jn14676	CP	mg/kg	0.9	0.8	19	30%	Pass	
Benzo(b&j)fluoranthene	S19-Jn14676	CP	mg/kg	0.6	< 0.5	43	30%	Fail	Q15
Benzo(g.h.i)perylene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S19-Jn14676	CP	mg/kg	0.6	0.6	3.0	30%	Pass	
Chrysene	S19-Jn14676	CP	mg/kg	0.8	0.7	19	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Dibenz(a.h)anthracene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S19-Jn14676	CP	mg/kg	1.1	1.0	15	30%	Pass	
Fluorene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S19-Jn14676	CP	mg/kg	1.2	1.0	18	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	S19-Jn14676	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	S19-Jn14676	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	S19-Jn14676	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Phenols (Halogenated)				Result 1	Result 2	RPD			
2-Chlorophenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dichlorophenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4.5-Trichlorophenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4.6-Trichlorophenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.6-Dichlorophenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chloro-3-methylphenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Pentachlorophenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Tetrachlorophenols - Total	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	

Duplicate									
Phenols (non-Halogenated)				Result 1	Result 2	RPD			
2-Cyclohexyl-4.6-dinitrophenol	S19-Jn14676	CP	mg/kg	< 20	< 20	<1	30%	Pass	
2-Methyl-4.6-dinitrophenol	S19-Jn14676	CP	mg/kg	< 5	< 5	<1	30%	Pass	
2-Methylphenol (o-Cresol)	S19-Jn14676	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
2-Nitrophenol	S19-Jn14676	CP	mg/kg	< 1	< 1	<1	30%	Pass	
2.4-Dimethylphenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2.4-Dinitrophenol	S19-Jn14676	CP	mg/kg	< 5	< 5	<1	30%	Pass	
3&4-Methylphenol (m&p-Cresol)	S19-Jn14676	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
4-Nitrophenol	S19-Jn14676	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Dinoseb	S19-Jn14676	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Phenol	S19-Jn14676	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S19-Jn14677	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S19-Jn14677	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S19-Jn14677	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S19-Jn14677	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S19-Jn14677	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S19-Jn14677	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	M19-Jn06199	NCP	%	14	15	9.0	30%	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	B19-Jn12161	NCP	uS/cm	380	350	9.4	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	M19-Jn10025	NCP	pH Units	7.0	6.9	Pass	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Emily Rosenberg	Senior Analyst-Metal (VIC)
Gabriele Cordero	Senior Analyst-Inorganic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Julie Kay	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

ALS Environmental

CERTIFICATE OF ABALYSIS

Work Order	: **ES1918320**	Page	: 1 of 6
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Alex Carpenter	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: PS114138 - Sydney Trains Kiama	Date Samples Received	: 14-Jun-2019 13:20
Order number	: PS114138	Date Analysis Commenced	: 17-Jun-2019
C-O-C number	: ----	Issue Date	: 20-Jun-2019 16:19
Sampler	: Alex Carpenter		
Site	: ----		
Quote number	: EN/008/18 B		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW
Peter Wu		Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC01A	----	----	----	----
			Client sampling date / time	11-Jun-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1918320-001	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**13.3**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**121**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**5**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**171**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**44**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**11**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**126**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)A: Phenolic Compounds								
Phenol	108-95-2	0.5	mg/kg	<0.5	----	----	----	----
2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	----	----	----	----
2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	----	----	----	----
3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	----	----	----	----
2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	----	----	----	----
2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	----	----	----	----
2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	----	----	----	----
2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	----	----	----	----
Pentachlorophenol	87-86-5	2	mg/kg	<2	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC01A	----	----	----	----
			Client sampling date / time	11-Jun-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1918320-001	--------	--------	--------	--------
				Result	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued								
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
C6 - C10 Fraction	C6_C10	10	mg/kg	<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg	<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg	<50	----	----	----	----
EP080: BTEXN								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg	<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	QC01A	----	----	----	----
			Client sampling date / time	11-Jun-2019 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1918320-001	--------	--------	--------	--------
				Result	----	----	----	----
EP080: BTEXN - Continued								
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.5	%	**92.0**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%	**95.0**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%	**97.3**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.5	%	**103**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%	**101**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%	**102**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.2	%	**106**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%	**106**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%	**104**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	Recovery Limits (%) High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1918320**	Page	: 1 of 9
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Alex Carpenter	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: PS114138 - Sydney Trains Kiama	Date Samples Received	: 14-Jun-2019
Order number	: PS114138	Date Analysis Commenced	: 17-Jun-2019
C-O-C number	: ----	Issue Date	: 20-Jun-2019
Sampler	: Alex Carpenter		
Site	: ----		
Quote number	: EN/008/18 B		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
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General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 2414343)									
ES1916981-021	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	<5	<5	0.00	No Limit
ES1918478-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	10	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	8	8	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	12	12	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	29	28	3.65	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	58	59	0.00	0% - 50%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 2409144)									
ES1918157-001	Anonymous	EA055: Moisture Content	----	0.1	%	5.8	6.0	3.58	No Limit
ES1918325-004	Anonymous	EA055: Moisture Content	----	0.1	%	19.1	19.7	3.19	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2414344)									
ES1916981-021	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1918478-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 2408084)									
ES1918444-051	Anonymous	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)A: Phenolic Compounds (QC Lot: 2408084) - continued									
ES1918444-051	Anonymous	EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
ES1918320-001	QC01A	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.00	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2408084)									
ES1918444-051	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 2408084) - continued									
ES1918444-051	Anonymous	EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
ES1918320-001	QC01A	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2407415)									
ES1918025-015	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1918321-004	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	15	16	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 2408083)									
ES1918444-051	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
ES1918320-001	QC01A	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2407415)									
ES1918025-015	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1918321-004	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	34	35	4.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2408083)									
ES1918444-051	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 2408083) - continued									
ES1918320-001	QC01A	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080: BTEXN (QC Lot: 2407415)									
ES1918025-015	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit
ES1918321-004	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2414343)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	99.4	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	99.8	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	89.9	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	96.2	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	99.3	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	101	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2414344)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	89.3	70	105
EP075(SIM)A: Phenolic Compounds (QCLot: 2408084)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	6 mg/kg	98.4	71	125
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	6 mg/kg	95.7	72	124
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	6 mg/kg	96.1	71	123
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	12 mg/kg	98.5	67	127
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	6 mg/kg	98.7	54	114
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	6 mg/kg	96.5	68	126
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	6 mg/kg	94.3	66	120
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	6 mg/kg	92.5	70	120
EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	6 mg/kg	95.4	70	116
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	6 mg/kg	99.3	54	114
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	6 mg/kg	94.0	60	114
EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	12 mg/kg	45.6	10	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2408084)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	94.1	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	93.3	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	95.0	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	96.0	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	97.4	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	92.8	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	91.7	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	95.9	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	95.3	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	91.2	75	127

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2408084) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	92.6	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	91.0	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	100	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	93.8	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	93.7	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	95.1	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2407415)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	100	68	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2408083)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	95.0	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	100	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	103	71	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2407415)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	102	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2408083)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	98.2	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	101	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	106	63	131
EP080: BTEXN (QCLot: 2407415)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	103	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	106	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	106	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	105	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	106	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	102	63	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2414343)							
ES1916981-021	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	99.0	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	101	70	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 2414343) - continued							
ES1916981-021	Anonymous	EG005T: Chromium	7440-47-3	50 mg/kg	102	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	99.2	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	99.6	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	102	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	103	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2414344)							
ES1916981-021	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.0	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 2408084)							
ES1918320-001	QC01A	EP075(SIM): Phenol	108-95-2	10 mg/kg	94.0	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	97.1	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	94.3	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	93.0	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	82.8	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 2408084)							
ES1918320-001	QC01A	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	91.7	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	89.4	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2407415)							
ES1918025-015	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	106	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 2408083)							
ES1918320-001	QC01A	EP071: C10 - C14 Fraction	----	523 mg/kg	104	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	122	53	131
		EP071: C29 - C36 Fraction	----	1714 mg/kg	132	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2407415)							
ES1918025-015	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	99.5	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 2408083)							
ES1918320-001	QC01A	EP071: >C10 - C16 Fraction	----	860 mg/kg	98.4	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	124	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	67.8	52	132
EP080: BTEXN (QCLot: 2407415)							
ES1918025-015	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	94.7	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	101	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	99.3	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	95.3	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	98.8	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	90.6	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1918320**	Page	: 1 of 4
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Alex Carpenter	Telephone	: +61 2 8784 8555
Project	: PS114138 - Sydney Trains Kiama	Date Samples Received	: 14-Jun-2019
Site	: ----	Issue Date	: 20-Jun-2019
Sampler	: Alex Carpenter	No. of samples received	: 1
Order number	: PS114138	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	*Sample Date*	*Extraction / Preparation*			*Analysis*		
Container / Client Sample ID(s)		*Date extracted*	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) QC01A	**11-Jun-2019**	**----**	----	----	**17-Jun-2019**	25-Jun-2019	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) QC01A	**11-Jun-2019**	**19-Jun-2019**	08-Dec-2019	✓	**19-Jun-2019**	08-Dec-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) QC01A	**11-Jun-2019**	**19-Jun-2019**	09-Jul-2019	✓	**20-Jun-2019**	09-Jul-2019	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**19-Jun-2019**	27-Jul-2019	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM)) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**19-Jun-2019**	27-Jul-2019	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**18-Jun-2019**	25-Jun-2019	✓
Soil Glass Jar - Unpreserved (EP071) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**19-Jun-2019**	27-Jul-2019	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**18-Jun-2019**	25-Jun-2019	✓
Soil Glass Jar - Unpreserved (EP071) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**19-Jun-2019**	27-Jul-2019	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080) QC01A	**11-Jun-2019**	**17-Jun-2019**	25-Jun-2019	✓	**18-Jun-2019**	25-Jun-2019	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES1918320**		
Client	: **WSP Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: Alex Carpenter	Contact	: Brenda Hong
Address	: ABN: 80 078 004 798 GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: alex.carpenter@wsp.com	E-mail	: Brenda.Hong@ALSGlobal.com
Telephone	: ----	Telephone	: +61 2 8784 8555
Facsimile	: ----	Facsimile	: +61-2-8784 8500
Project	: PS114138 - Sydney Trains Kiama	Page	: 1 of 2
Order number	: PS114138	Quote number	: ES2019PARBRINSW0005 (EN/008/18 B)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Alex Carpenter		

Dates

Date Samples Received	: 14-Jun-2019 13:20	Issue Date	: 15-Jun-2019
Client Requested Due Date	: 20-Jun-2019	Scheduled Reporting Date	: **20-Jun-2019**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 8.7'C
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	SOIL - EA055-103 Moisture Content	SOIL - S-27 TRH/BTEXN/PAH/Phenols/8Metals
ES1918320-001	11-Jun-2019 00:00	QC01A	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE		
- A4 - AU Tax Invoice (INV)	Email	AU.AccountsPayable@wsp.com
ACCOUNTS PAYABLE(AP INVOICES)		
- A4 - AU Tax Invoice (INV)	Email	apinvoices@pb.com.au
Alex Carpenter		
- *AU Certificate of Analysis - NATA (COA)	Email	alex.carpenter@wsp.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	alex.carpenter@wsp.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	alex.carpenter@wsp.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	alex.carpenter@wsp.com
- A4 - AU Tax Invoice (INV)	Email	alex.carpenter@wsp.com
- Chain of Custody (CoC) (COC)	Email	alex.carpenter@wsp.com
- EDI Format - ENMRG (ENMRG)	Email	alex.carpenter@wsp.com
- EDI Format - ESDAT (ESDAT)	Email	alex.carpenter@wsp.com

26/6/19

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Sydney Laboratory — Unit F3 Bld F 16 Mars Rd Lane Cove West NSW 2066 — 02 9900 8400 EnviroSampleNSW@eurofins.com
☐
Brisbane Laboratory — Unit 1 21 Smallwood Pl Murarrie QLD 4172 — 07 3902 4600 EnviroSampleQLD@eurofins.com
☐ Perth Laboratory — Unit 2 91 Leach Highway Kewdale WA 6105 — 08 9251 9600 EnviroSampleWA@eurofins.com
☐ Melbourne Laboratory — 2 Kingston Town Close Oakleigh VIC 3166 — 03 8564 5000 EnviroSampleVic@eurofins.com

Company	WSP Australia Pty Limited
Address	Level 27, 680 George Street Sydney, NSW 2000 Australia
Contact Name	Alexander Carpenter
Phone №	0415 501 846
Special Directions	
Purchase Order	PS114138
Quote ID №	190408WSPN
Project №	PS114138
Project Name	Sydney Trains - Kiama
Sampler(s)	Alex Carpenter
Handed over by	
Email for Invoice	Alex.Carpenter@wsp.com, APInvoices@pb.com.au
Email for Results	Alex.Carpenter@wsp.com

Turnaround Time (TAT) Requirements: ☐ Overnight (9am)* ☐ 1 Day* ☐ 2 Day* ☐ 3 Day* ☑ 5 Day ☐ Other ( ) * Surcharges apply

Containers: 1L Plastic; 250mL Plastic; 125mL Plastic; 200mL Amber Glass; 40mL VOA vial; 500mL PFAS Bottle; Jar (Glass or HDPE); Other

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	B7A: TRH, BTEX, PAH, Phenols, Metals	B16: OCP, OPP, PCB	Hold	pH, cation exchange capacity and clay content	40mL VOA vial	Jar (Glass or HDPE)	Sample Comments / Dangerous Goods Hazard Warning
1	BH01 - 0.3	11/06/19	S			X			1	
2	BH01 - 0.7	11/6/19	S	X	X				1	
3	BH01 - 1.5	11/6/19	S	X	X				1	
4	BH01 - 2.4	11/6/19	S			X			1	
5	BH02 - 0.2	11/6/19	S			X			1	
6	BH02 - 0.6	11/6/19	S	X	X				1	
7	BH02 - 1.5	11/6/19	S			X			1	
8	BH02 - 2.3	11/6/19	S	X	X				1	
9	BH03 - 0.1	11/6/19	S	X	X				1	
10	BH03 - 0.5	11/6/19	S			X			1	
11	BH03 - 1.3	11/6/19	S	X	X				1	
12	BH03 - 2.2	11/6/19	S			X			1	
13	BH04 - 0.2	11/6/19	S	X	X				1	
14	BH04 - 1.0	11/6/19	S			X			1	
15	BH04 - 1.5	11/6/19	S			X			1	
16	BH04 - 2.3	11/6/19	S	X	X				1	
17	BH05 - 0.2	11/6/19	S			X			1	
18	BH05 - 0.6	11/6/19	S	X	X				1	
19	BH05 - 2.8	11/6/19	S			X			1	
20	BH05 - 3.5	11/6/19	S	X	X				1	
21	BH06 - 0.1	11/6/19	S			X			1	
22	BH06 - 0.5	11/6/19	S	X	X		X		1	
23	BH06 - 1.5	11/6/19	S						1	
	BH06 - 3.5	11/6/19	S	X	X					
	QC01	11/6/19	S	X	X				1	
(1)	QC01A	11/6/19	S	X					1	Please forward to ALS
23	R_11062019	11/6/19	W							
24	TB01	11/6/19	S					2		
25										
	Total Counts			14	13	11	1	1	25	

Environmental Division
Sydney
Work Order Reference
ES1918320
Telephone : + 61-2-8784 8555

Method of Shipment	☐ Courier (#)	☐ Hand Delivered	☐ Postal	Name	Date / /	Time

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | mgt Standard Terms and Conditions unless agreed otherwise. A copy of Eurofins | mgt Standard Terms and Conditions is available on request.

Eurofins Environment Testing Australia Pty Ltd trading as Eurofins | mgt

8.7°C

Rec - scoffles 14/6/19 1500
8.7c

APPENDIX H

CALIBRATION CERTIFICATES

PID Calibration Certificate

Instrument **PhoCheck Tiger**
Serial No. **T-113994**

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation	✓				
	Filter	✓				
	Flow	✓				
	Valves, Diaphragm	✓				
PCB	Condition	✓				
Connectors	Condition	✓				
Sensor	PID	✓	10.6ev			
Alarms	Beeper	✓	**Low**	**High**	**TWA**	**STEL**
	Settings	✓	50ppm	100ppm	N/A	N/A
Software	Version	✓				
Data logger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		[illegible]	NATA	SY137		97.6ppm

Calibrated by: Srahlia Sarah Lian

Calibration date: [illegible]

Next calibration due: [illegible]