DLA Environmental Services
A Pacific Environment company

Land Use Suitability Review

Lot 12 DP 1166540
300 Manchester Road
Auburn NSW 2144

Payce Consolidated Limited

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ABBREVIATIONS

ACM	Asbestos Containing Material
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AST	Above-ground Storage Tank
ASS	Acid Sulfate Soil
B(a)P	Benzo(a)Pyrene
BGL	Below Ground Level
BH	Borehole
BTEX	Benzene, Toluene, Ethyl Benzene, Xylene
COC	Chain of Custody documentation
CLM	Contaminated Land Management
DA	Development Application
DEC	Department of Environment and Conservation (NSW)
DECC	Department of Environment and Climate Change (NSW)
DECCW	Department of Environment, Climate Change and Water (NSW)
DLA	DLA Environmental Services
DP	Deposited Plan
DQO	Data Quality Objective
EC	Electrical Conductivity
EIL	Ecological Investigation Level
EMP	Environmental Management Plan
EPA	Environment Protection Authority (NSW)
ESL	Ecological Screening Level
HIL	Health-Based Investigation Level
LOR	Limit of Reporting
MW	Monitoring Well
NATA	National Association of Testing Authorities, Australia
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NHMRC	National Health and Medical Research Council
NRMMC	Natural Resource Management Ministerial Council
NSW	New South Wales
OCP	Organochlorine Pesticides
OEH	Office of Environmental and Heritage
OPP	Organophosphorus Pesticides
OH&S	Occupational Health and Safety
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PID	Photo-Ionisation Detector
PQL	Practical Quantification Limit
QA/QC	Quality Assurance and Quality Control
RAP	Remedial Action Plan
RPD	Relative Percentage Difference
SAC	Site Acceptance Criteria
SAQP	Sampling Analysis and Quality Plan
SEPP	State Environmental Planning Policy
SWL	Standing Water Level
TCLP	Toxicity Characteristic Leaching Procedure
TRH	Total Recoverable Hydrocarbons
UCL	Upper Confidence Limit
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
WHS	Work Health Safety

EXECUTIVE SUMMARY

DLA Environmental Services (DLA) was commissioned by Payce Consolidated Limited to prepare a Land Use Suitability Review (LUSR) for containment cell materials at the property identified as lot 12 in DP1166540, 300 Manchester Road, Auburn, Sydney NSW 2000 (the Site). The southern portion of the Site is referred to as Area A and the northern portion of the Site is referred to as Area B. Area B is limited to the portion of the Site which has been designated as the containment cell and is therefore the subject of this report. The scope of works did not include a land use suitability assessment into the remainder of Lot 12 (i.e. Area A).

The purpose of this review is to consider the proposed development in the context of Clause 6 within State Environmental Planning Policy (SEPP) 55 – *Remediation of Land* and the National Environment Protection (Assessment of Site Contamination) Amendment Measure ('NEPM', NEPC, 2013). In particular, the review will determine whether the containment cell materials are suitable for the proposed land use and will pose no unacceptable risk to the human health or the environment generally.

A search of the Acid Sulfate Soils Map – Sheet ASS_002 (Auburn Local Environmental Plan 2010) indicated that the majority of the Site is not located within a category of area assessed to be affected by Acid Sulfate Soils. A minor portion of the northern corner of the Site is located within a Class 4 Acid Sulfate Soil zone. It is recommended that further testing for Potential Acid Sulfate Soils be undertaken in this area upon development which will assess the requirement of an Acid Sulfate Soil Management Plan.

A Site history summary was provided in the *Greenway & Banks Realty Pty Ltd Remediation Action Plan – Lot 12 DP1166540, Manchester Road Auburn NSW* (E3 Consulting Australia (E3), 2012), which described the use of the Site as storage for trains, box cars and containers adjacent to the rail line prior to the 1970's. The Site was used to stockpile various materials from the 1970's onwards. Previous investigations at the Site summarised in the RAP (E3, 2012) indicated that there were various variable and elevated concentrations of TRH, PAH and heavy metals. ACM were also identified in localised fill materials.

It is understood that the Site has been subject to remediation and validation by Consara for the continued commercial / industrial use of the Site which primarily consisted of the following:

- Removal of stockpiles and the excavation of contaminated *Site-Wide Fill Materials* from Area A; and,

- Transfer and placement to a designated Containment Area within Area B for consolidation and containment and long-term management.

Asbestos impaction in the form of bonded fragments was observed within the fill materials of the containment cell at the Site. Bonded ACM fragments were generally identified at a depth greater than 2.5m below the surface of the containment cell. Typically, fill containing asbestos fragments also exhibited significant quantities of foreign materials including concrete brick and ash. Quantification of the bonded fragments did not exceed the proposed land use criteria of *Residential B – Residential with Minimal Opportunities for Soil Access.*

Chemical assessment of the fill materials reported low level PAHs and a range of heavy metals below the adopted Site criteria. This indicates that when the hotspot materials were placed and compacted into the containment cell, the contaminants may have been distributed over a wider area and potentially decreased in concentration. Levels reported within the chemical assessment did not reflect the previous background data for the Site.

It is understood the proposed end land use for the Site is currently residential high rise apartments. If the material within the containment cell was excavated it could potentially be reused in areas where a physical capping area was applied such as beneath roads, below open space areas with a capping layer and below the footprint of the buildings and car park areas.

The completion of this report concludes that the LUSR objectives have been achieved in accordance with the requirements under SEPP 55 – *Remediation of Land* and the *Guidelines for Consultants Reporting on Contaminated Sites* (NSW OEH, 2011).

Assessment and quantification of bonded ACM and AF/FA within soils did not exceed the proposed land use criteria, apart from the identified hotspot areas (BH11 and BH17). Chemical assessment of the fill materials reported low level PAHs, TRH, pesticides, PCBs and a range of heavy metals all below the adopted Site criteria.

The LUSR concludes that in its current condition, the Site can be made suitable for the future intended land use, consistent with the criteria outlined in the NEPM (NEPC, 2013) for *Residential B* land use criteria, following the implementation of a Remediation Action Plan and appropriate Validation. All remediation and validation works should be undertaken in accordance with the Remediation Action Plan, which is to be prepared for the intended land use, in accordance with the master plan, once rezoning has been approved.

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1.0 INTRODUCTION

1.1.1 General

DLA Environmental Services (DLA) was commissioned by Payce Consolidated Limited to prepare a Land Use Suitability Review (LUSR) for containment cell materials at the property identified as lot 12 in DP1166540, 300 Manchester Road, Auburn, Sydney NSW 2000 (the Site). The southern portion of the Site is referred to as Area A and the northern portion of the Site is referred to as Area B. Area B is limited to the portion of the Site which has been designated as the containment cell and is therefore the subject of this report.

This report documents the condition of the containment cell materials with regards to land use suitability and assesses these materials based on analytical and quantified data. The scope of works did not include a land use suitability assessment into the remainder of Lot 12 (i.e. Area A).

1.2 Objectives

The purpose of this review is to consider the proposed development in the context of Clause 6 within State Environmental Planning Policy (SEPP) 55 – *Remediation of Land* and the National Environment Protection (Assessment of Site Contamination) Amendment Measure ('NEPM', NEPC, 2013). In particular, the review will determine whether the containment cell materials are suitable for the proposed land use and will pose no unacceptable risk to the human health or the environment generally.

1.3 Scope of Works

In achieving this end, the report will provide:

- A brief summary of the environmental setting of the Site;
- Review of previous investigations and environmental works at the Site;
- Investigation of soil chemical and asbestos concentrations relative to the NEPM (NEPC, 2013) Health Investigation Levels (HILs) and Health Screening levels (HSLs);
- Overview of any potential contamination issues;
- Preliminary remedial and management recommendations (if necessary); and,
- Conclusions on the land use suitability of the Site.

2.0 SITE DESCRIPTION

2.1 Site Identification

The Site identification details are summarised in **Table 2a** below:

Table 2a – Site Identification Summary

ITEMS	DETAILS
Site Name	NA
Address	300 Manchester Road Auburn
Local Government Authority	Auburn Council
Lot and Deposited Plan	Lot 12 DP 1166540
Development Controls	Auburn Local Environmental Plan 2010
Site Zoning	*IN1* – General Industrial
Current Use (NEPM 2013 Table 1A(1)	Commercial / Industrial
Proposed Use (NEPM 2013 Table 1A(1)	Residential B – Minimal access to Garden soils
Site Area (approx.)	61,749m^2 (6.17 ha) Assessed Area: 12,428 m2 (1.2 ha)
Locality Map	Refer to **Figure 1** – Site Location

This report is only assessing fill materials previously identified as contaminated and placed within a containment cell on a portion of the site.

2.2 Boundaries and Surrounding Land Use

The boundary and surrounding landscape features of the Site are summarised in **Table 2b** below:

Table 2b – Boundaries and Surrounding Land Use

DIRECTION	DETAILS
North	Clyde marshalling Areas and train maintenance facilities.
East	Clyde marshalling Areas and train maintenance facilities.
South	Low density residential housing.
West	Bluescope factory & carpark.

2.3 Site Geology and Soils

Review of the Geological Survey map of NSW Sydney 1:100,000 Geological Series Sheet 9130 (Edition 1) indicates that the Site is located on Quaternary age silty to peaty quartz sand silt and clay on the western half of the site and Mesozoic Winamatta group black to dark grey shale and laminate.

Review of the eSPADE NSW Environment and Heritage NSW Soil and Land information website (http://www.environment.nsw.gov.au/espadeWebApp/) lists the soil landscape profile at the site as disturbed terrain. This landscape profile consists of former wetlands, estuaries and swamps which have been typically filled and levelled.

2.4 Site Topography

The topography of the Site was generally flat with the onsite containment cell; approximately 5-6m above surface level in the north-western portion of a site. An access ramp to the raised containment area extends from the southern corner of the containment cell.

2.5 Acid Sulphate Soils

A search of the Acid Sulfate Soils Map – Sheet ASS_002 (Auburn Local Environmental Plan 2010) indicated that the majority of the Site is not located within a category of area assessed to be affected by Acid Sulfate Soils. A minor portion of the northern corner of the Site is located within a Class 4 Acid Sulfate Soil zone. It is recommended that further testing for Potential Acid Sulfate Soils be undertaken in this area upon development which will assess the requirement of an Acid Sulfate Soil Management Plan.

2.6 Hydrology and Hydrogeology

As noted, above approximately 20% of the Site consists of a raised containment cell approximately 5m high. The cell has a gravel / bituminous seal and sandstone boulder retaining wall. Drainage lines within the containment cell remove surface water from the Site and prevent surface water pooling on the containment cell surface. The remainder of the Site drains the existing stormwater system along Manchester and swale drains within the Site.

The nearest water body is Duck River approximately 220m west of the Site. Based on the regional topography and the location of the nearest surface water bodies to the Site, it was considered that groundwater flow is likely to be towards the north-west.

A groundwater works database searches indicated that five groundwater monitoring wells were located within 500m of the Site within the UGL's main train premise located to the north-east of the Site. Further information was not however detailed within the groundwater works report data.

2.7 Site History Summary

A Site history summary was provided within the report titled: *Greenway & Banks Realty Pty Ltd Remediation Action Plan – Lot 12 DP1166540, Manchester Road Auburn NSW* (E3 Consulting Australia (E3), 2012). The report details the history of the Site as storage for trains, box cars and containers adjacent to the rail line prior to the 1970's. The Site was used to stockpile various materials from the 1970's onwards. Later Site inspections also noted a disused toilet block, an old train platform, a concrete tank and temporary storage of formwork.

3.0 SUMMARY OF PREVIOUS INVESTIGATIONS

DLA was supplied with the report titled: *Greenway & Banks Realty Pty Ltd Remediation Action Plan – Lot 12 DP1166540, Manchester Road Auburn NSW* (E3 Consulting Australia (E3), 2012). The RAP listed the previous reports at the Site, titled:

- *Phase 1 Contamination Assessment of Lot 1 Manchester Road, Auburn and a Phase 1 and Phase 2 (Combined) Contamination Assessment of Lot 2 Manchester Road, Auburn* (Woodward Clyde, 13 August 1997);
- *Phase 2 Contamination Investigation of Lot 2 Manchester Road, Auburn* (Woodward Cycle, 2 March 1998);
- *Final Draft Remedial Action Plan, Lot 2 Manchester Road, Auburn NSW* (PPK, April 2000); and,
- *Remediation Action Plan, North-Western Portion Lot 2 Manchester Road, Auburn NSW* (NA, May 2009).

These reports should be referred to individually for the detailed information regarding the previous Site investigations. These reports were not available for review by DLA while undertaking this assessment.

The following summary of conclusions was provided in the RAP (E3, 2012):

- Fill materials have been placed across the entire Site to depths ranging from approximately 0.8m to 3.0m over natural clay soils, which overlie the shale bedrock;
- Concentrations of some metals and Total Recoverable Hydrocarbons (TRH) were identified in the fill materials;
- Asbestos Containing Materials (ACM) were also identified in the fill materials in the north-western part of the Site and in the centre of the Site; and,
- Assessment of groundwater quality was reported from three wells located in the southern part of the Site. The groundwater results indicated the presence of low concentrations of heavy metals.

3.1 Environmental Assessment (E3, 2011)

Following review of the previous investigations, E3 completed an environmental assessment on the Site that was designed to assess the current environmental condition of the Site by addressing the data gaps and uncertainties. The results of this environmental investigation were documented in the report titled: *Environmental Assessment, Lot 2 Manchester Road Auburn* (E3, dated 15 April 2011).

3.1.1 Site Condition

According to this report, the Site was characterised by five landscape features, consisting of:

- **Site-Wide Fill Materials:**
  - Fill materials have been historically placed over the entire Site – referred to as the "*Site-Wide Fill Materials*".
  - The Site-wide Fill Materials overlie the natural soils and shale bedrock.
  - It is understood that the Site-wide Fill Materials were placed on the Site prior to 1998.

- **Relocated Stockpile:**
  - Stockpile with an estimated volume of 30,400m^3, formerly present on the northern part of the Site, was relocated in early 2000s to the southern part of the Site – referred to as the "*Relocated Stockpile*".
  - The Relocated Stockpile has been placed on the Site-wide Fill Materials and is located on the northern to central part of Area A.

- **Asbestos-Containing Stockpile:**
  - Reported to contain asbestos containing materials (ACM) with an estimated volume of 1,150m^3, is present on the western part of Area A –referred to as the "*Asbestos-Containing Stockpile*".
  - The Asbestos-Containing Stockpile has been placed on the Site-wide Fill Materials.

- **Gravel Stockpile:**
  - Gravel stockpile with an estimated volume of 4,400m^3 – referred to as the "*Gravel Stockpile*".
  - The Gravel Stockpile has been placed on the Site-wide Fill Materials and is located on the eastern part of Area A.

- **Remnant Stockpile:**
  - Materials excavated from the neighboring property, formerly known as Lot 1 Manchester Road, were consolidated within a northern fenced area of the Site – referred to as the "*Remnant Stockpile*".
  - The Remnant Stockpile is located on Area B.

3.1.2 Soil Contamination

According to this report, the identified areas of concern which are subject to the remediation strategy developed by E3 are as follows:

- Localised contamination present within the *Site-Wide Fill Materials* containing concentrations greater than the criteria for *commercial/industrial* land use as follows:
    - Lead in TP10 and TP14 (maximum concentration of 3300mg/kg in TP10 at 0.4-0.5m below ground level (bgl));
    - Copper in TP18 (maximum concentration of 7300mg/kg in TP18 at 0.4-0.5m bgl); and,
    - Asbestos fines / fibrous asbestos (AF / FA) was found in TP08, TP10 and TP20 (maximum concentration of 1.077% w/w in TP08).

- Materials within the *Relocated Stockpile* containing concentrations greater than the criteria for *commercial/industrial* land use as follows:
    - Lead in BH2, RS14 and RS7 (maximum concentration of 7000mg/kg in BH2 at 3.4-3.5m bgl);
    - Benzo(a)Pyrene (B(a)P) in RS19 (concentration of 5.6mg/kg in RS19 at 2.0-2.1m bgl).
    - TRH (C_{10}-C_{36}) in RS16, RS4, and BH6 (maximum concentration of 2730 mg/kg in BH6 at 3.4-3.5m bgl); and,
    - AF / FA in RS5, RS20, RS10, BH9, RS18, EW9, RS17, RS16 (maximum concentration of 0.482% w/w in BH9).

- Materials within the *Asbestos-Containing Stockpile*, detecting asbestos as follows:
    - AF / FA in AS3 (concentration of 0.002% w/w); and,
    - Asbestos Containing Materials (ACM) in AS4, AS2 and AS1 (maximum concentration of 1.143% w/w in AS2).

- Materials within the *Gravel Stockpile*, containing concentrations greater than the criteria for *commercial/industrial* land use as follows:
    - TRH in GS2 (measured concentration of 4,830mg/kg in GS2 at 1.0-1.1m bgl); and,
    - ACM in GS5 (measured concentration of 0.544% w/w).

Concentrations of other potential chemicals of concern, including pesticides, Polychlorinated Biphenyls (PCBs) and BTEX were all reported within the stockpiled materials and the *Site-Wide Fill Materials* at either less than the laboratory detection limits or at less than the criteria for standard

residential land-use (most conservative criteria set out in NEPM (NEPC, 2013)). Natural clays across the Site were also observed to be unimpacted.

3.1.3 Soil Groundwater

The results of the assessment of the conditions of groundwater present beneath the Site indicated that the assessed groundwater had minor concentrations of heavy metals as encountered across this area of western Sydney and therefore were considered to be representative of background conditions.

3.2 Remediation Action Plan (E3, 2012)

At the time of preparation of this RAP, Area A was proposed to be subdivided for development for commercial/industrial units and Area B was proposed to be subdivided as one larger superlot to be used for commercial/industrial use with an access road to Area A from the south-eastern corner of Area B.

If the Site were to be designated for redevelopment in the future, remediation would be required to render the land to a standard consistent with the development scenario. It is therefore envisioned that a site remedial strategy specific to the proposed mid-high density residential land use will need to be developed and implemented. The application of the former RAP (E3, 2012) would therefore require reconsideration under the proposed land use change. The revised RAP should identify areas of remediation and establish a holistic approach to remediation which will lead to a desirable environmental outcome with regards to regulation, compliance and land use suitability.

Refer to **Appendix D** – Remediation Action Plan (E3, 2012).

3.3 Remediation and Validation Works (Consara)

DLA have not been furnished with the validation report documenting the successful remediation and validation of the Site; however, DLA understand that the Site was remediated and validated under the guidance of Consara in strict accordance with the RAP (E3, 2012). The remediation approach primarily consisted of the following:

- Removal of stockpiles and the excavation of contaminated *Site-Wide Fill Materials* from Area A; and,
- Transfer and placement to a designated Containment Area within Area B for consolidation and containment and long-term management.

Area A was remediated such that there was no requirement for a Long-term Environmental Management Plan (EMP) at Area A. After the completion of the remediation works at Area A, the materials placed into the Containment Area at Area B and the remaining surfaces of Area B were covered with an appropriate cap and a Long-term EMP was developed for this area.

4.0 SITE INVESTIGATION PLAN

4.1 Field Investigation Procedure

Field investigation was undertaken on 19 March 2015 and comprised of the following:

- Inspection of the Site;
- Excavation of 25 boreholes;
- Collection of 25 asbestos samples from fill and asbestos fragments (where identified in fill material);
- Collection of 25 primary chemical samples including three QA/QC samples; and,
- Field assessment of aesthetic conditions, including soil type, fill material depth, odours and staining (if any), visible asbestos (if any) and foreign material inclusions.

Refer to **Figure 2** – Site Layout and **Figure 3** – Sampling Locations.

4.2 Sampling Strategy

A systematic sampling strategy was employed for the assessment of asbestos and chemical contamination in accordance with Sample Design Guidelines (NSW EPA, 1995) and NEPM (NEPC, 2013) Schedule B2 (Section 6.4) with representative samples of fill materials being collected.

4.3 Analytical Strategy

Samples were analysed for a range of contaminant indicators that may be associated with past and present land uses. Soil samples were analysed by Envirolab Services Pty Ltd of Chatswood and SGS Australia Pty Ltd of Alexandria for the following parameters:

4.3.1 Inorganic

- Heavy metals: arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni), and zinc (Zn).

4.3.2 Organic

- Total Recoverable Hydrocarbons (TRH);
- Monocyclic Aromatic Hydrocarbons (BTEX);
- Volatile TRH (vTRH);

- Organochlorine Pesticides (OCs);
- Organophosphorus Pesticides (OPs);
- Polycyclic Aromatic Hydrocarbons (PAHs); and,
- Polychlorinated Biphenyls (PCBs).

No Photo Ionisation Detection (PID) assessments were undertaken as TRH analyses were performed on a range of samples.

4.4 Data Quality Objectives

The NEPM (NEPC, 2013) and Australian Standard (AS) 4482.1-2005 recommend that data quality objectives (DQOs) be implemented during the validation of remediated sites. The DQO process described in AS 4482.1-2005 *Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil Part 1: Non-Volatile and Semi-Volatile Compounds* outlines seven distinct steps to outline the project goals, decisions, constraints and an assessment of the project uncertainties and how to address these when they arise. The DQOs have been summarised in **Table 4a** below:

Table 4a – Summary of DQOs

1	State the Problem	Have previous land use affected the land use suitability of the Site for *Residential B* as defined by NEPM (NEPC, 2013)?
2	Identify the Decisions	– Do contaminant concentrations in the soil comply with the stated screening levels? – Do soils on the Site currently require any remedial action or implementation of risk management? – Have the previous land uses affected the environmental quality of the land? – Are there any identifiable risks to human health or the environment on Site?
3	Identify Inputs to Decisions	– Systematic / representative soil sampling across the Site. – The proposed land use. – Determination of the general concentrations of heavy metals, hydrocarbons, pesticides, PCBs and other chemicals across the Site. – Identifying current and future potential receptors and the likelihood of exposure to unacceptable levels of contamination both on and off the Site.
4	Define Study Boundaries	The physical study will focus on fill material within the confines of the containment cell at the Site (identified as Area B).

5	Develop Decision Rule	The Site will be considered suitable for its intended land use if concentrations of soils and groundwater comply with the screening levels provided in NEPM (NEPC, 2013), as determined by the following Site Assessment Criteria (SAC) being applied to the data: – The 95% Upper Confidence Limit (UCL) of the arithmetic mean for each Contaminant of Concern must comply with the respective screening level; – The individual contaminant concentration should not exceed the screening level by more than 250%, and; – The standard deviation of individual contaminants should not exceed 50% of the HIL.
6	Specify Limits on Decision Errors	Field and laboratory quality controls are implemented to avoid error and to ensure the action levels exceed the measurement detection limits. The performance of decision making inputs will be enhanced through the application of Data Quality Indicators (DQI), defined in **Table 4a** below.
7	Optimise Design for Obtaining Data	– Ensure access to all relevant and previous environmental data. – Identify the most resource-effective sampling and analysis design for general data that are expected to satisfy the DQOs.

Table 4b – Summary of DQIs

DATA PRECISION AND ACCURACY	
Acceptable Relative Percentage Difference (RPD)	>10 x LOR: 30% inorganics; 50% organics (Field) <10 x LOR: Assessed on individual basis (Field) >5 x LOR: 50% (laboratory) <5 x LOR: No Limit (laboratory)
Adequate Laboratory Performance	Based on acceptance criteria of laboratory as specified on certificate of analysis, includes: blank samples, matrix spikes, control samples, and surrogate spike samples. Use of analytical laboratories with adequately trained and experienced testing staff experienced in the analyses undertaken, with appropriate NATA certification.
DATA REPRESENTATIVENESS	
Sample and Analysis Selection	Representativeness of all contaminants of concern.
Trip Blanks	No detection above LOR.
Trip Spikes	Recoverable concentrations of volatiles between 60 – 140%.

Laboratory Selection	Adequate laboratory internal quality control and quality assurance methods, complying with the NEPM (NEPC, 2013).
DOCUMENTATION COMPLETENESS	
Chain of Custody Records	Laboratory sample receipt information received confirming receipt of samples intact and appropriate chain of custody.
	NATA registered laboratory results certificates provided.
DATA COMPLETENESS	
	Analysis for all contaminants of concern.
	Field duplicate sample numbers complying with NEPM (NEPC, 2013)
COMPARABILITY	
	Use of NATA registered laboratories.
	Detailed logs of all sample locations recorded.
	Test methods comparable between primary and secondary laboratory
	Acceptable RPD's between original samples and field duplicates and inter-laboratory triplicate samples.

4.5 Validation Criteria

Criteria for assessing the potential of retained soils in demonstrating compliance with the land use of the Site were derived from the following publications:

- *Schedule B1: Guideline on the Investigation Levels for Soil and Groundwater* from the NEPM (NEPC, 2013);
- Friebel and Nadebaum 2011, Health Screening Levels for Petroleum Hydrocarbons in Soil and Groundwater, *Part 1: Technical Development Document*; and,
- *Guidelines for the NSW Site Auditor Scheme* (NSW EPA, 2nd ed., 2006).

This information was used in the process of determining the need for capping, containment and ongoing environmental management. The respective soil HILs are provided in the following tables:

Table 4c – Criteria for Soils (mg/kg)

Analytes	HIL B – Residential with minimal access for soil [1]
Arsenic	500
Cadmium	150
Chromium	500
Copper	30000

Analytes	HIL B – Residential with minimal access for soil [1]
Lead	1200
Mercury	120
Nickel	1200
Zinc	60000
BaP TEQ	4
Total PAHs	400
Pesticides: **Aldrin/Dieldrin** **Chlordane** **DDT+DDE+DDD**	 10 90 600
Asbestos: **Bonded ACM[2]** **FA[3] / AF[4]** **Surface Asbestos (0.1m)**	 0.04% 0.001% No Visible
Aesthetic: **Upper 1m of soil**	No Odours No Staining <5% Anthropogenic Material

1 – NEPM (NEPC, 2013) Table 1A(1) and Table 7.

2 – Bonded ACM (bonded Asbestos) - asbestos-containing-material which is in sound condition and where the asbestos is bound in a matrix such as cement or resin (e.g. asbestos fencing and vinyl tiles). Bonded ACM refers to, in this instance, material that cannot pass a 7 mm x 7 mm sieve.

3 – Fibrous Asbestos - friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This material is in a degraded condition such that it can be broken or crumbled by hand pressure.

4 – Asbestos Fines - AF includes free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.

Table 4d – Criteria for Total Recoverable Hydrocarbons (mg/kg)

Analytes	HSL-A & B[1] (Sand) 0-1.0m	HSL- A & B[2] (Sand) 1-<2.0m	HSL- A & B[3] (Sand) 2-<4.0m
Benzene	0.5	0.5	0.5
Toluene	160	220	310
Ethylbenzene	55	NL	NL
Xylenes	40	60	95
F1: C_6-C_{10}	45	70	110
F2: C_{10}-C_{16}	110	240	440
F3: C_{16}-C_{34}	NL	NL	NL
F4: C_{34}-C_{40}	NL	NL	NL

NL = Not Limiting (i.e. the soil vapour concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario).

1 – NEPM 2013 Amendment *Table 1A(3) – Soil HSLs for vapour intrusion* – 0-1.0m

2 – NEPM 2013 Amendment *Table 1A(3) – Soil HSLs for vapour intrusion* – 1-<2.0m

3 – NEPM 2013 Amendment *Table 1A(3) – Soil HSLs for vapour intrusion* – 2-<4.0m

Table 4e – Criteria for Total Recoverable Hydrocarbons (ESL and ML)

Analytes	Ecological Screening Limits[1] (Coarse*)	Management Limits[2] (Coarse*)
Benzene	50	--
Toluene	85	--
Ethylbenzene	70	--
Xylenes	105	--
F1: C_6-C_{10}	180	700
F2: C_{10}-C_{16}	120	1,000
F3: C_{16}-C_{34}	300	2,500
F4: C_{34}-C_{40}	2800	10,000

***** 'Coarse' used as most conservative criteria applicable to Site.
1 – NEPM 2013 Amendment Table 1B(6) – ESLs for TPH fractions, BTEX and benzo(a)pyrene in soil.
2 – NEPM 2013 Amendment Table 1B(7) – Management Limits for TPH fractions F1-F4 in soil

Table 4f – Health Screening Levels for Direct Contact

Analytes	HSL-A Residential[1]
Benzene	140
Toluene	21,000
Ethylbenzene	5,900
Xylenes	17,000
F1: C_6-C_{10}	5,600
F2: C_{10}-C_{16}	4,200
F3: C_{16}-C_{34}	5,800
F4: C_{34}-C_{40}	8,100

[1] Friebel and Nadebaum 2011, Health Screening Levels for petroleum Hydrocarbons in Soil and Groundwater, Part 1: Technical Development Document, *Table A4 – Soil Health Screening Levels for Direct Contact,* Column B.

5.0 RESULTS

5.1 Field Observations

Intrusive works revealed that fill that the top 100 – 150mm of the containment cell consisted of sandy clay pale brown in colour, a geofabric marker layer was placed at approximate 150mm below the surface. Fill materials extend from the base of the marker layer to the original Site surface. Despite the highly heterogeneous nature of the fill, patterns in the type of fill were able to be recognised across the Site. The various types of fill included:

- Dark brown gravelly sandy clay with inclusions of brick, concrete, coarse angular gravel and some black ash materials;
- Large cobbles and boulders were located throughout the fill materials in particular at a depth of 1-2m below the top of the containment cell.

Natural soils at the Site were not included within the scope of the assessment.

Discrete asbestos fragments were observed within the fill materials of the containment cell. Fragments were located at a particular depth of location within the containment cell.

Refer to **Appendix E** – Borelogs.

5.2 Soil Chemical Results

The results of the samples collected by DLA at the Site are summarised below:

5.2.1 Monocyclic Aromatic Hydrocarbons, Volatile Total Recoverable Hydrocarbons and Semi Volatile Total Recoverable Hydrocarbons

Approximately half of all samples were analysed for BTEX, vTRH and TRH. There were no concentrations of BTEX fractions, vTRH or hydrocarbon compounds of the F1 or F2 fraction recorded above the Laboratory Limit of Reporting (LOR).

Five samples reported concentrations of the F3 hydrocarbon fraction ranging from 110 mg/kg to 770 mg/kg. One sample reported a concentration of the F4 hydrocarbon fraction above the LOR of 130 mg/kg. No samples were shown to exceed the screening levels prescribed for vapour intrusion or direct contact for the Open Space land use.

5.2.2 Polycyclic Aromatic Hydrocarbons

All samples were analysed for PAHs. Total PAH was recorded in most samples; however, all concentrations were for less than the HIL of 400 mg/kg. Concentrations of total PAHs ranged from 0.54 mg/kg to 8.5 mg/kg. 12 samples reported concentrations of BaP TEQ above the LOR. Reported concentrations of BaP TEQ ranged from 0.5 mg/kg to 1 mg/kg below the adopted site acceptance criteria of 4 mg/kg.

5.2.3 Pesticides

Nine samples were analysed for OC and OP pesticides. No samples reported concentrations above the LOR and therefore below the adopted site acceptance criteria.

5.2.4 Polychlorinated Biphenyls

Nine samples were analysed for PCBs. There were no concentrations of PCBs above the Laboratory LOR and therefore below the adopted site acceptance criteria.

5.2.5 Heavy Metals

All samples were analysed for all eight heavy metals as recommended by the NSW EPA. Detections were observed for all heavy metals with no samples exceeding the respective HILs.

Table 5a – Heavy Metal Detections in Soils (mg/kg)

	As	Cd	Cr VI	Cu	Pb	Hg	Ni	Zn
No. of Samples	25	25	25	25	25	25	25	25
Minimum Concentration	16	0.6	15	110	99	0.1	13	180
Maximum Concentration	48	3	24	370	260	0.3	23	620
NEPM 2013 HIL Recreational B	500	150	400	30,000	1,200	120	1,200	60,000
No. of HIL Exceedances	0	0	0	0	0	0	0	0

nd – not detected above Laboratory LOR

Refer to **Appendix A –** Data Summary Table and **Appendix B –** NATA Certified Analytical Results.

5.3 Soil Asbestos Results

Asbestos quantification analysis was undertaken on all 25 sample locations. Fill soils were field screened with suspected Asbestos Containing Materials (ACM) retained on the sieve screen in seven

boreholes. Laboratory analysis later confirmed the presence of bonded asbestos in five of the collected samples. Concentrations of ACM in soil were then determined by a gravimetric approach outlined in the NEPM 2013. Asbestos concentration calculations are based on the amount of asbestos equivalent in a measured amount of soil expressed as a % weight for weight (%w/w) and estimated using the formula:

$$\%w/w \text{ asbestos in soil} = \frac{\%\text{Asbestos Content X Bonded ACM Weight (kg)}}{\text{Soil Volume (L) X Soil Density (kg/L)}}$$

A bulk density of 1.8 kg/L was used during the assessment process. Results of the gravimetric calculation (shown in Table 8 – Gravimetric ACM Concentrations below) indicate that one sample location (K50) exceeds the 0.04% w/w criteria given for a Residential B minimal opportunities for soil access (NEPM, NEPC, 2013).

Table 5b – Gravimetric ACM Concentrations

Analytes	% Asbestos Content	Bonded ACM Weight (g)	Soil Volume (L)	Bulk Density (kg/L)	%w/w Asbestos in Soils
BH02-3.0 AS	12.9	0.37	10	1.8	0.0003
BH03-4.0 AS	10	4.8	10	1.8	0.0027
BH14-2.5 AS	11.9	4.8	10	1.8	0.0032
BH17-3.0 AS	13.8	5.8	10	1.8	0.0044
BH19-4.0 AS	11.9	4.7	10	1.8	0.0031

It is to be noted that asbestos fragments were visibly apparent in fill which contained noticeable quantities of foreign materials (e.g. crushed concrete, bricks, tiles, ash, etc.).

Following field screening, soils were laboratory tested for the presence of Asbestos Fines/Fibrous Asbestos (AF/FA). 25 soil samples were analysed for AF/FA content. AF/FA were detected in two samples above the 0.001 % w/w criteria.

Table 5c – Asbestos Fines / Fibrous Asbestos Concentrations

Analytes	Weight of AF/FA (g)	Weight of Soil Sample (g)	Soil Volume (L)	Bulk Density (kg/L)	%w/w Asbestos in Soils
BH11-3.0	0.02	877	0.5	1.8	0.0023
BH17-3.0	0.1	851	0.5	1.8	0.0118

Refer to **Appendix A –** Data Summary Tables and **Appendix B –** NATA Certified Analytical Results.

5.4 QA/QC Comments

Laboratory QA/QC on all samples analysed included calculation of %RPD, matrix spike recovery and blank determinations. All matrix spike recovery and blank determinations were within acceptable limits. Therefore, it is considered that sampling techniques and transportation of samples were appropriate. An intra-laboratory duplicate rate of 12% was achieved, greater than the 10% required by the Field Quality Plan. An inter-laboratory duplicate rate of 8% was achieved, greater than the 5% required by the Field Quality Plan. Laboratory Duplicates were tested to ensure the results meet the requirements of QA/QC. The %RPD for the majority of intra-laboratory and inter-laboratory duplicates had concentrations that complied with the criteria set for acceptable RPDs and where exceedances were noted, the heterogeneity observed in the duplicate samples was not deemed significant enough to diminish confidence in the sampling technique or laboratory results.

Refer to **Appendix C** – Quality Assurance and Quality Control.

6.0 DISCUSSION

A Site history summary was provided in the RAP (E3, 2012), which described the use of the Site as storage for trains, box cars and containers adjacent to the rail line prior to the 1970's. The Site was used to stockpile various materials from the 1970's onwards. Previous investigations at the Site summarised in the RAP (E3, 2012) indicated that there were various variable and elevated concentrations of TRH, PAH and heavy metals. ACM were also identified in localised fill materials.

It is understood that the Site has been subject to remediation and validation by Consara for the continued commercial / industrial use of the Site which primarily consisted of the following:

- Removal of stockpiles and the excavation of contaminated *Site-Wide Fill Materials* from Area A; and,
- Transfer and placement to a designated Containment Area within Area B for consolidation and containment and long-term management.

The scope of DLA's works was to assess the materials within the engineered containment cell (Area B) based on analytical and quantified data and to document the condition of the containment cell materials with regards to land use suitability.

Asbestos impaction in the form of bonded fragments was observed within the fill materials of the containment cell at the Site. Bonded ACM fragments were generally identified at a depth greater than 2.5m below the surface of the containment cell. Typically, fill containing asbestos fragments also exhibited significant quantities of foreign materials including concrete brick and ash. Quantification of the bonded fragments did not exceed the proposed land use criteria of *Residential B – Residential with Minimal Opportunities for Soil Access.*

AF/FA was noted above the proposed land use criteria of 0.001% in two samples (BH11 and BH17). Samples with AF/FA detections were collected from a depth of approximately 3m. Based on the previous remedial activities at the Site and construction of the containment cell, this would indicate that the AF/FA contaminated stockpiles and hotspots at the Site previously existing at the site, were placed at the base of the containment cell with the additional less contaminated materials placed above to complete the final capacity of the containment cell.

Field observations of the fill materials determined that it was generally comprised of gravelly sandy clay, of low to medium plasticity with coarse angular gravel to large boulders, which included sandstone, concrete, brick, ash and railway ballast.

Chemical assessment of the fill materials reported low level PAHs and a range of heavy metals below the adopted Site criteria. This indicates that when the hotspot materials were placed and compacted into the containment cell, the contaminants may have been distributed over a wider area and potentially decreased in concentration. Levels reported within the chemical assessment did not reflect the previous background data for the Site.

It is understood the proposed end land use for the Site is currently residential high rise apartments. If the material within the containment cell was excavated it could potentially be reused in areas where a physical capping area was applied such as beneath roads, below open space areas with a capping layer and below the footprint of the buildings and car park areas.

Separation of the AF /FA impacted areas for the purpose of disposal could be undertaken as a remediation option for exceeding soils. Removal of the hotspot material would require validation of the surrounding soils to verify that the AF/FA materials had been removed.

Based on the current chemical and asbestos analysis the materials within the containment mound would be either Restricted Solid Waste or Restricted Solid Waste Special Waste Asbestos. Further Toxicity Characteristic Leaching Procedure (TCLP) analysis of Lead and Nickel is likely to reduce the waste classification to a General Solid Waste / General Solid Waste Special Waste Asbestos for all fill materials. These conclusion are however preliminary in nature and would require complete characterisation at the time of disposal in accordance with the *Waste Classification Guidelines* (NSW EPA, 2014).

Validation of the area below the containment cell should be undertaken following removal of all fill materials. Reuse of fill materials from the containment mound due to their aesthetic limitations and potential asbestos impact may be possible and should be placed in areas such as roadways, building and carpark footprint areas and beneath capped landscaping areas. Fill materials are unsuitable to be placed at surface levels. Any excess materials should be assessed for waste classification and disposed of off-site.

7.0 CONCLUSION

The completion of this report concludes that the LUSR objectives have been achieved in accordance with the requirements under SEPP 55 – *Remediation of Land* and the *Guidelines for Consultants Reporting on Contaminated Sites* (NSW OEH, 2011).

Assessment and quantification of bonded ACM and AF/FA within soils did not exceed the proposed land use criteria, apart from the identified hotspot areas (BH11 and BH17). Chemical assessment of the fill materials reported low level PAHs, TRH, pesticides, PCBs and a range of heavy metals all below the adopted Site criteria.

The LUSR concludes that in its current condition, the Site can be made suitable for the future intended land use, consistent with the criteria outlined in the NEPM (NEPC, 2013) for *Residential B* land use criteria, following the implementation of a Remediation Action Plan and appropriate Validation. All remediation and validation works should be undertaken in accordance with the Remediation Action Plan, which is to be prepared for the intended land use, in accordance with the master plan, once rezoning has been approved.

8.0 REFERENCES

- *Greenway & Banks Realty Pty Ltd Remediation Action Plan, Lot 12 DP1166540, Manchester Road Auburn NSW* – E3 Consulting Australia Pty Ltd, 2012 (E3, 2012),
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* (ANZECC/NHMRC, 1992).
- *Guidelines for the Assessment of On-Site Containment of Contaminated Soil* (ANZECC, 1992).
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2000).
- Chapman, G A, Murphy, C L, Tille, P J, Atkinson, G and Morse, R J (1989), *Sydney Soil Landscapes Map, Series 9130*.
- *Contaminated Land Management Act 1997* (NSW).
- *Environmental Planning and Assessment Act 1979* (NSW).
- Geological Survey of NSW (1966), *Sydney Geological Series Sheet, S1 65-5*, 3rd Edition, NSW Department of Mines.
- *Technical Report No 3, Murray-Darling Basin Groundwater Quality Sampling Guidelines* (Groundwater Working Group, 1997).
- Langley, A and Imray, P (1996) – *Soil Investigation Levels for Human Health, National Environmental Health Forum Monograph Series No. 5.*
- *Local Government Act 1993* (NSW).
- *National Environment Protection (Assessment of Site Contamination) Measure (1999) Amended 2013, Schedule B1 – Guideline on the Investigation Levels for Soil and Groundwater* (NEPC, 2013).
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2011).
- *Contaminated Sites: Sampling Design Guidelines* (NSW EPA, 1995).
- *Guidelines for the NSW Site Auditor Scheme* (NSW EPA, 2nd Edition, 2006).
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DEC, 2007).
- *Waste Classification Guidelines* (NSW EPA, 2014).
- *Protection of the Environment Operations Act 1997* (NSW).
- *Contaminated Land Management Act 1997* (NSW).
- *Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil – Part 1: Non-Volatile and Semi-Volatile Compounds* (Standards Australia AS4482.1, 2nd Edition, 2005).
- *Guide to the Sampling and Investigation of Potentially Contaminated Soil – Part 2: Volatile Substances* (Standards Australia AS4482.2, 1999).
- *Waste Avoidance and Resource Recovery Act 2001* (NSW).
- *Code of Practice for the Safe Removal of Asbestos* (Worksafe Australia, 2005).
- *Safe Storage and Handling Information Cards for Hazardous Chemicals* (AS 2508).

FIGURE 1 – SITE LOCATION

Legend

☐ Approximate Site Area

North

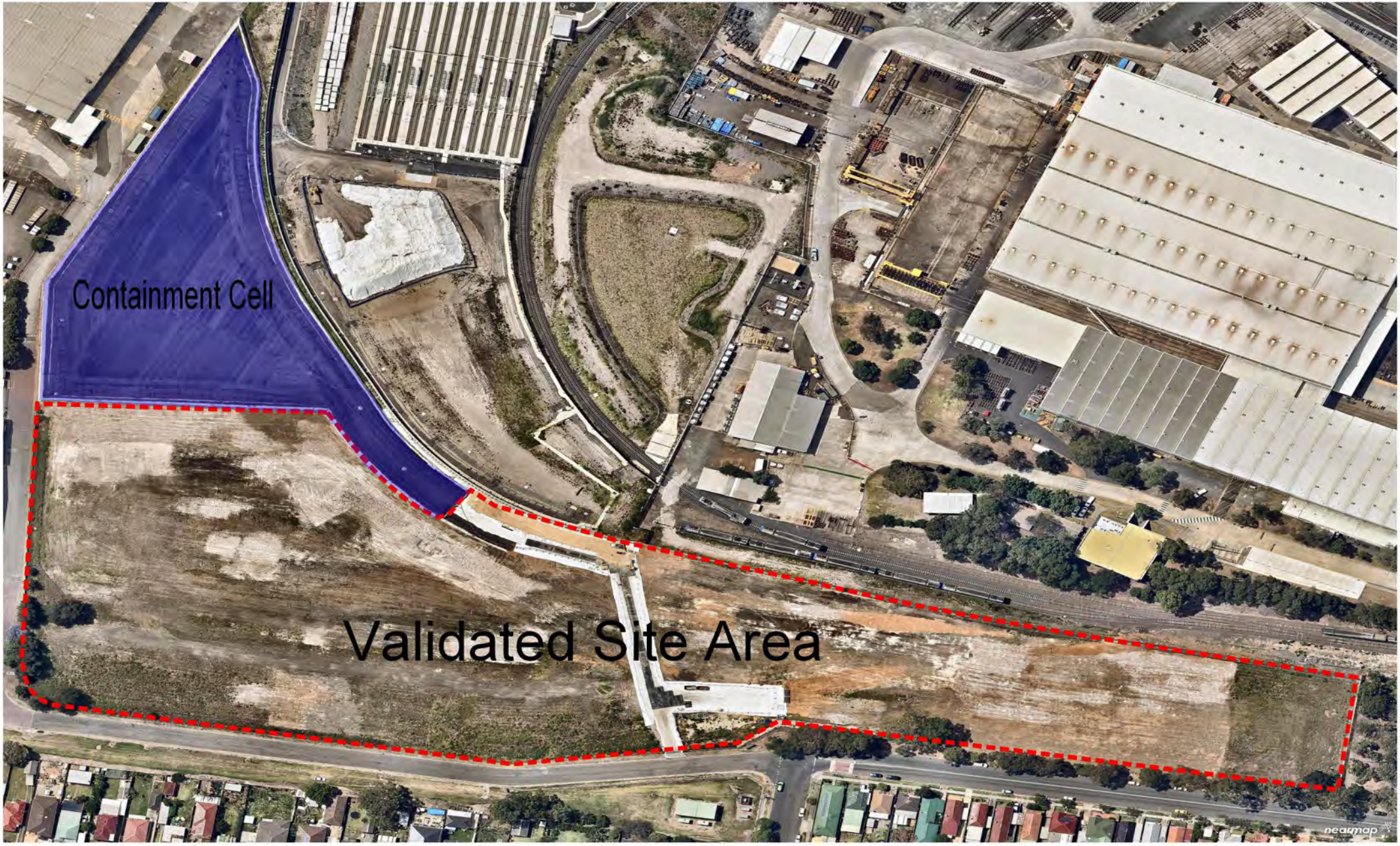
DLA environmental

Sydney Office
Phone (02) 9476 1765
Fax (02) 9476 1557

Maitland Office
Phone (02) 4933 0001

Title: Site Location			
Client: Payce Projects	Figure No: Figure 1		Date: 02/04/2015
Project No.: DL 3393	Scale: As Shown	Compiled: KH	Revision: R00

FIGURE 2 – SITE LAYOUT



Legend

- Previously Remediated Area
- Containment Cell Area

North

Approximate Scale

0m 25m 50m

DLA environmental

Sydney Office
Phone (02) 9476 1765
Fax (02) 9476 1557

Maitland Office
Phone (02) 4933 0001

Title: Site Layout & Remediated Areas

Client	Project No.	Figure No	Date
Payce Projects	DL3393	2	02/04/2015
	Scale: As Shown	Compiled: KH	Revision: R01

FIGURE 3 – SAMPLING LOCATIONS

Aerial photo from www.nearmap.com.au Aerial photo dated 26/3/2014

Legend

- Borehole Locations

North

DLA environmental

Sydney Office
Phone (02) 9476 1765
Fax (02) 9476 1557

Maitland Office
Phone (02) 4933 0001

Title			
Sample Locations			
Client	Figure No		Date
Payce Projects	Figure 3		02/04/2014
Project No.	Scale	Compiled	Revision
DL 3393	As Shown	KH	R00

FIGURE 4 – AF/FA HOTSPOTS

Legend

- Borehole Locations
- Identified AF/FA Hotspot

North

DLA environmental

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Maitland Office
Phone (02) 4933 0001

Title: Sample Locations

Client	Figure No		Date
Payce Projects	Figure 4		02/04/2014
Project No.	Scale	Compiled	Revision
DL 3393	As Shown	KH	R00

APPENDIX A – DATA SUMMARY TABLE

Table A2a - BTEX and TRH

NEPM (1999) Amended 2013 Residetial B - Minimal Opportunities for Soil Access Land Use Criteria; mg/Kg				0.5	160	55	40	3	C6-C10 45	>C10-C16 110	>C16-C34 NL	>C34-C40 NL
				BTEX - <1m					TRH <1m Sand			
Sample ID	Date	Chemical Report	Soil Desciption	Benz	Toluene	EthylBenzene	Xylene	Naph	F1	F2	F3	F4
BH01-1.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH01-1.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH02-3.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH03-1.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH03-4.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH04-2.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH05-1.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH06-1.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH07-1.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH08-1.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH08-2.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH09-1.1	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH09-1.1	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH10-0.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH11-1.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH11-3.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH12-3.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH13-2.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	180	<100
BH14-1.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH15-1.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	110	<100
BH15-4.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH16-2.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH17-3.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	0.1	-	-	-	-
BH18-2.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH18-2.5	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	<100	<100
BH19-4.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
BH20-1.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	240	<100
BH20-4.0	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
QC1	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	770	130
QC2	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	-	-	-	-	<0.1	-	-	-	-
QC3	19/03/2015	125457	Fill- Gravelly Sandy Clay - Medium plasticity dark brown with trace concrete, brick, ash and coarse angular gravels	<0.2	<0.5	<1	<2	<0.1	<25	<50	250	<100
Avge				<0.2	<0.5	<0.1	<2	0.1	<0.1	<50	310.0	<0.1
Stdev				0.0	0.0	<0.1	0.0	0.0	<0.1	<50	263.2	<0.1
95% UCL												
Proc. B Min Sample Numb												

* Depth relates to Depth below surface level

RED = Exceeds HIL Criteria

Table A2b - Semi-Volatile Organics and Metals

NEPM (1999) Amended 2013 Residetial B - Minimal Opportunities for Soil Access Land Use Criteria; mg/Kg			4	400	DDT+DDD+DDE-600	Aldrin+Dieldrin-10	Chlordane-90	Endosulfan - 400	Endrin - 20	Heptachlor - 10	HCB - 15	Methoxychlor - 500		1	500	150	400	30,000	1,200	120	1,200	60,000
Sample ID	Date	Chemical Report	PAH		Pesticides										Heavy Metals							
			BaP TEQ	Total	OC								OP	PCB	As	Cd	Cr VI	Cu	Pb	Hg	Ni	Zn
BH01-1.5	19/03/2015	125457	0.5	4.4	-	-	-	-	-	-	-	-	-	-	14	0.6	16	110	100	0.1	14	160
BH01-1.5	19/03/2015	125457	<0.5	2.3	-	-	-	-	-	-	-	-	-	-	14	0.7	16	150	140	0.2	17	200
BH02-3.0	19/03/2015	125457	0.5	3.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	18	1	18	360	200	0.2	18	320
BH03-1.0	19/03/2015	125457	<0.5	0.54	-	-	-	-	-	-	-	-	-	-	26	0.8	15	130	260	0.1	14	190
BH03-4.0	19/03/2015	125457	1	8.5	-	-	-	-	-	-	-	-	-	-	17	1	18	140	280	0.2	16	250
BH04-2.0	19/03/2015	125457	<0.5	Nil (+ve)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5	0.5	29	65	56	0.4	16	220
BH05-1.5	19/03/2015	125457	<0.5	1.3	-	-	-	-	-	-	-	-	-	-	9	0.5	17	110	120	0.3	14	140
BH06-1.0	19/03/2015	125457	<0.5	2.4	-	-	-	-	-	-	-	-	-	-	13	0.7	19	130	130	0.2	16	160
BH07-1.5	19/03/2015	125457	<0.5	1.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	10	2	19	650	230	0.3	17	250
BH08-1.0	19/03/2015	125457	<0.5	2.6	-	-	-	-	-	-	-	-	-	-	11	3	29	86	160	0.2	19	120
BH08-2.0	19/03/2015	125457	<0.5	2.6	-	-	-	-	-	-	-	-	-	-	16	1	23	250	170	0.2	18	280
BH09-1.1	19/03/2015	125457	<0.5	2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	12	0.8	21	160	440	0.2	18	410
BH09-1.1	19/03/2015	125457	<0.5	0.44	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	11	0.9	25	150	380	0.2	18	330
BH10-0.5	19/03/2015	125457	<0.5	3.3	-	-	-	-	-	-	-	-	-	-	14	1	94	120	130	0.2	51	150
BH11-1.5	19/03/2015	125457	<0.5	Nil (+ve)	-	-	-	-	-	-	-	-	-	-	6	2	27	55	51	0.3	23	79
BH11-3.0	19/03/2015	125457	0.6	3.9	-	-	-	-	-	-	-	-	-	-	25	1	18	210	180	0.2	18	290
BH12-3.0	19/03/2015	125457	0.5	3.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	16	0.7	16	140	150	0.2	18	220
BH13-2.5	19/03/2015	125457	0.6	3.8	-	-	-	-	-	-	-	-	-	-	19	1	16	200	180	0.2	17	250
BH14-1.5	19/03/2015	125457	0.6	4.1	-	-	-	-	-	-	-	-	-	-	19	1	17	200	210	0.2	20	320
BH15-1.5	19/03/2015	125457	<0.5	2.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	18	1	17	250	200	0.2	23	300
BH15-4.0	19/03/2015	125457	<0.5	2.3	-	-	-	-	-	-	-	-	-	-	24	3	16	370	220	0.2	23	620
BH16-2.0	19/03/2015	125457	<0.5	2.3	-	-	-	-	-	-	-	-	-	-	17	1	24	230	210	0.2	17	300
BH17-3.0	19/03/2015	125457	<0.5	2.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	16	0.8	15	140	130	0.2	20	200
BH18-2.5	19/03/2015	125457	0.6	3.8	-	-	-	-	-	-	-	-	-	-	16	0.7	15	120	160	0.3	13	210
BH18-2.5	19/03/2015	125457	<0.5	2.9	-	-	-	-	-	-	-	-	-	-	16	0.6	15	110	99	0.1	13	180
BH19-4.0	19/03/2015	125457	<0.5	2.4	-	-	-	-	-	-	-	-	-	-	48	1	18	250	260	0.2	20	330
BH20-1.0	19/03/2015	125457	0.6	4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	16	1	21	180	220	0.2	15	470
BH20-4.0	19/03/2015	125457	0.6	4.8	-	-	-	-	-	-	-	-	-	-	19	1	16	240	240	0.3	19	330
QC1	19/03/2015	125457	1	8.3	-	-	-	-	-	-	-	-	-	-	17	1	17	160	400	0.2	18	240
QC2	19/03/2015	125457	<0.5	1.1	-	-	-	-	-	-	-	-	-	-	20	1	16	300	430	0.3	20	410
QC3	19/03/2015	125457	0.6	4.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	14	1	14	140	150	0.1	11	410
Avge			0.6	3.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	16.6	1.1	21.2	190.5	202.8	0.2	18.5	269.0
Stdev			0.1	1.6	0.0	0.0	0.0	0.0	0.0	<0.1	<0.1	0.0	0.0	0.0	7.5	0.6	14.1	115.0	99.6	0.1	6.7	113.8
95% UCL																						
Proc. B Min Sample Numb			NA	9.63E-05	<0.1					<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.94E-06	1.99E-04	<0.1

* Depth relates to Depth below surface le\-- Not Tested; nd: Not Detected above Laboratory LOR **BOLD** = Detection above LOR **RED** = Exceeds HIL Criteria

APPENDIX B – NATA CERTIFIED ANALYTICAL DATA

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client: DLA Environmental Services	Client Project Name and Number: DL3393 - Manchester Rd, Ryde
Project Mgr: Kevin Hawtog	PO No.:
Sampler: " "	Envirolab Services Quote No. :
Address: Unit 3 38 Leighton Place Hornsby	Date results required:
Email: sydney@dlaenvironmental.com.au	Or choose: standard / 1 day / 2 day / 3 day
Phone: 94761765 Fax: 94761557	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*

Envirolab Services
12 Ashley St, Chatswood, NSW, 2067

Phone: 02 9910 6200
Fax: 02 9910 6201
E-mail: ahie@envirolabservices.com.au

Contact: Aileen Hie

Sample information | **Tests Required**

Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	PAH/m8	BTEX/TRH	OC/OP/PCB	Comments: Provide as much information about the sample as you can
1	BH01 - 1.5	11/3/13	Soil	/	/		
2	BH02 - 3.0			/	/	/	
3	BH03 - 1.0			/	/	/	
4	BH04 - 4.0			/	/		
5	BH04 - 2.0			/	/	/	
6	BH05 - 1.5			/	/		
7	BH06 - 1.0			/	/		
8	BH07 - 1.5			/	/	/	
9	BH08 - 1.0			/	/		
10	BH08 - 2.0			/	/		
11	BH09 - 1.1			/	/	/	
12	BH10 - 0.5			/	/	/	
13	BH11 - 3.0			/	/		
14	BH12 - 3.0			/	/	/	
15	BH13 - 2.0	"	"	/	/		

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
ENVIROLAB
Job No: 125457
Date Received: 20/3
Time Received: 13.00
Received by: JH
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (company):	Received by (company): ELS	Samples Received: Cool or Ambient (circle one)
Print Name:	Print Name: JITVRST	Temperature Recieved at: (if applicable)
Date & Time:	Date & Time: 20/3	Transported by: Hand delivered / courier
Signature:	Signature:	Page No:

CHAIN OF CUSTODY - Client

ENVIROLAB SERVICES

Client: DLA Environmental Services	**Client Project Name and Number:** DL3393
Project Mgr: Kanthi Senthilkumar	**PO No.:**
Sampler:	**Envirolab Services Quote No. :**
Address: Unit 3 38 Leighton Place Hornsby	**Date results required:**
Email: sydney@dlaenvironmental.com.au	**Or choose:** standard / 1 day / 2 day / 3 day
Phone: 94761765 **Fax:** 94761557	*Note: Inform lab in advance if urgent turnaround is required - surcharge applies*

Envirolab Services
12 Ashley St, Chatswood, NSW, 2067

Phone: 02 9910 6200
Fax: 02 9910 6201
E-mail: ahie@envirolabservices.com.au

Contact: Aileen Hie

Sample information | **Tests Required** | **Comments**

Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	PAH / M8	BTEX / TRH	OC / OP / PCB	Comments
16	BH14 - 2-5	13/03/15	Soil	✓			Please note job number is DL3393 not DL3392 as per jars.
17	BH15 - 1-5	19		✓	✓	✓	
18	BH15 - 4.0			✓			
19	BH16 - 2-0			✓	✓		
20	BH17 - 3.0			✓		✓	
21	BH18 - 2-5			✓			
22	BH19 - 4-0			✓	✓		
23	BH20 - 1-0			✓	✓	✓	Please note Sample date is 13/03/15 not 13/03/15 as per jars
24	BH20 - 4.0			✓			
25	QC1			✓	✓		
26	QC2			✓			
27	QC3	↓	↓	✓	✓	✓	
28	BH11 - 1.			✓			

Relinquished by (company):	**Received by (company):** ECS
Print Name:	**Print Name:** JHurst
Date & Time:	**Date & Time:** 20/3
Signature:	**Signature:**

Samples Received: Cool or Ambient (circle one)
Temperature Recieved at: (if applicable)
Transported by: Hand delivered / courier

Page No:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

CERTIFICATE OF ANALYSIS 125457

Client:

DLA Environmental Services Pty Ltd
2B, 30 Leighton Pl
Hornsby
NSW 2077

Attention: Keri Hartog

Sample log in details:

Your Reference:	**DL3393-Manchester Rd, Auburn**
No. of samples:	28 Soils
Date samples received / completed instructions received	20/3/2015 / 20/3/2016

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	27/03/15 / 27/03/15
Date of Preliminary Report:	Not Issued

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	125457-1	125457-3	125457-5	125457-7	125457-9
Your Reference	----------	BH01	BH03	BH04	BH06	BH08
Depth	----------	1.5	1.0	2.0	1.0	1.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	94	91	84	92	92

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	125457-11	125457-13	125457-15	125457-17	125457-19
Your Reference	----------	BH09	BH11	BH13	BH15	BH16
Depth	----------	1.1	3.0	2.0	1.5	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	87	78	87	87	82

vTRH(C6-C10)/BTEXN in Soil					
Our Reference:	UNITS	125457-21	125457-23	125457-25	125457-27
Your Reference	----------	BH18	BH20	QC1	QC3
Depth	----------	2.5	1.0	-	-
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015
TRHC$_6$ - C$_9$	mg/kg	<25	<25	<25	<25
TRHC$_6$ - C$_{10}$	mg/kg	<25	<25	<25	<25
vTPHC$_6$ - C$_{10}$ less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	87	87	86	88

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	125457-1	125457-3	125457-5	125457-7	125457-9
Your Reference	----------	BH01	BH03	BH04	BH06	BH08
Depth	----------	1.5	1.0	2.0	1.0	1.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	25/03/2015	25/03/2015	25/03/2015	25/03/2015	25/03/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	81	86	77	92	77

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	125457-11	125457-13	125457-15	125457-17	125457-19
Your Reference	----------	BH09	BH11	BH13	BH15	BH16
Depth	----------	1.1	3.0	2.0	1.5	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	25/03/2015	25/03/2015	25/03/2015	25/03/2015	25/03/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	120	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	180	110	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	89	81	85	81	81

svTRH (C10-C40) in Soil					
Our Reference:	UNITS	125457-21	125457-23	125457-25	125457-27
Your Reference	----------	BH18	BH20	QC1	QC3
Depth	----------	2.5	1.0	-	-
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	25/03/2015	25/03/2015	25/03/2015	25/03/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	120	450	140
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	140	370	150
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	240	770	250
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	130	<100
Surrogate o-Terphenyl	%	81	80	87	80

PAHs in Soil						
Our Reference:	UNITS	125457-1	125457-2	125457-3	125457-4	125457-5
Your Reference	----------	BH01	BH02	BH03	BH03	BH04
Depth	----------	1.5	3.0	1.0	4.0	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	25/03/2015	25/03/2015	25/03/2015	25/03/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.6	0.4	0.1	1.1	<0.1
Anthracene	mg/kg	0.2	<0.1	<0.1	0.2	<0.1
Fluoranthene	mg/kg	0.8	0.6	0.2	1.4	<0.1
Pyrene	mg/kg	0.8	0.6	0.2	1.5	<0.1
Benzo(a)anthracene	mg/kg	0.4	0.3	<0.1	0.6	<0.1
Chrysene	mg/kg	0.3	0.3	<0.1	1.0	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.5	0.6	<0.2	1	<0.2
Benzo(a)pyrene	mg/kg	0.3	0.3	0.08	0.71	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	0.2	<0.1	0.4	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.2	<0.1	0.4	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	0.9	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	1	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.5	0.5	<0.5	1.0	<0.5
Total Positive PAHs	mg/kg	4.4	3.4	0.54	8.5	NIL (+)VE
Surrogate p-Terphenyl-d14	%	113	95	93	92	95

PAHs in Soil						
Our Reference:	UNITS	125457-6	125457-7	125457-8	125457-9	125457-10
Your Reference	----------	BH05	BH06	BH07	BH08	BH08
Depth	----------	1.5	1.0	1.5	1.0	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	25/03/2015	25/03/2015	25/03/2015	25/03/2015	25/03/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.2	0.3	0.1	0.3	0.3
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	0.4	0.1	0.4	0.4
Pyrene	mg/kg	0.2	0.4	0.3	0.4	0.4
Benzo(a)anthracene	mg/kg	0.1	0.2	0.1	0.2	0.2
Chrysene	mg/kg	0.1	0.2	0.1	0.2	0.3
Benzo(b,j+k)fluoranthene	mg/kg	0.2	0.4	0.2	0.4	0.4
Benzo(a)pyrene	mg/kg	0.1	0.2	0.2	0.2	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	0.1	0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	0.1	0.1	0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	1.3	2.4	1.4	2.6	2.6
Surrogate p-Terphenyl-d14	%	96	99	98	91	99

PAHs in Soil						
Our Reference:	UNITS	125457-11	125457-12	125457-13	125457-14	125457-15
Your Reference	----------	BH09	BH10	BH11	BH12	BH13
Depth	----------	1.1	0.5	3.0	3.0	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	25/03/2015	25/03/2015	25/03/2015	25/03/2015	25/03/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.3	0.6	0.4	0.4	0.4
Anthracene	mg/kg	0.1	0.1	<0.1	0.1	<0.1
Fluoranthene	mg/kg	0.4	0.5	0.7	0.7	0.7
Pyrene	mg/kg	0.4	0.5	0.7	0.7	0.6
Benzo(a)anthracene	mg/kg	0.2	0.2	0.4	0.3	0.3
Chrysene	mg/kg	0.2	0.2	0.4	0.3	0.4
Benzo(b,j+k)fluoranthene	mg/kg	0.3	0.4	0.6	0.5	0.6
Benzo(a)pyrene	mg/kg	0.2	0.2	0.3	0.3	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	0.2	0.2	0.2
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.1	0.2	0.2	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	0.5	<0.5	0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	0.6	0.5	0.6
Total Positive PAHs	mg/kg	2.0	3.3	3.9	3.7	3.8
Surrogate p-Terphenyl-d14	%	96	95	94	95	94

PAHs in Soil						
Our Reference:	UNITS	125457-16	125457-17	125457-18	125457-19	125457-20
Your Reference	----------	BH14	BH15	BH15	BH16	BH17
Depth	----------	2.5	1.5	4.0	2.0	3.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	25/03/2015	25/03/2015	24/03/2015	24/03/2015	24/03/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.6	0.3	0.3	0.3	0.2
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.6	0.4	0.4	0.4	0.4
Pyrene	mg/kg	0.7	0.4	0.4	0.4	0.4
Benzo(a)anthracene	mg/kg	0.4	0.2	0.2	0.2	0.2
Chrysene	mg/kg	0.4	0.2	0.2	0.2	0.2
Benzo(b,j+k)fluoranthene	mg/kg	0.6	0.4	0.3	0.3	0.4
Benzo(a)pyrene	mg/kg	0.3	0.2	0.2	0.2	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	0.1	0.1	0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	0.1	0.1	0.1	0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	4.1	2.5	2.3	2.3	2.4
Surrogate p-Terphenyl-d14	%	96	93	105	103	102

PAHs in Soil						
Our Reference:	UNITS	125457-21	125457-22	125457-23	125457-24	125457-25
Your Reference	----------	BH18	BH19	BH20	BH20	QC1
Depth	----------	2.5	4.0	1.0	4.0	-
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.4	0.3	0.5	0.6	1.0
Anthracene	mg/kg	<0.1	<0.1	0.1	0.1	0.2
Fluoranthene	mg/kg	0.7	0.4	0.7	0.9	1.5
Pyrene	mg/kg	0.7	0.4	0.7	0.8	1.5
Benzo(a)anthracene	mg/kg	0.4	0.2	0.3	0.4	0.7
Chrysene	mg/kg	0.3	0.2	0.4	0.4	0.8
Benzo(b,j+k)fluoranthene	mg/kg	0.6	0.4	0.6	0.7	1
Benzo(a)pyrene	mg/kg	0.3	0.2	0.3	0.4	0.70
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	0.1	0.2	0.2	0.4
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.2	0.1	0.2	0.2	0.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	0.5	0.9
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5	<0.5	0.5	0.6	1
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6	<0.5	0.6	0.6	1.0
Total Positive PAHs	mg/kg	3.8	2.4	4.0	4.8	8.3
Surrogate p-Terphenyl-d14	%	104	102	100	102	102

PAHs in Soil				
Our Reference:	UNITS	125457-26	125457-27	125457-28
Your Reference	----------	QC2	QC3	BH11
Depth	----------	-	-	1.5
Date Sampled		19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	0.4	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.2	0.8	<0.1
Pyrene	mg/kg	0.2	0.8	<0.1
Benzo(a)anthracene	mg/kg	0.1	0.4	<0.1
Chrysene	mg/kg	0.1	0.3	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.2	0.6	<0.2
Benzo(a)pyrene	mg/kg	0.1	0.4	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	0.2	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	0.6	<0.5
Total Positive PAHs	mg/kg	1.1	4.2	NIL (+)VE
Surrogate p-Terphenyl-d14	%	100	97	107

Organochlorine Pesticides in soil						
Our Reference:	UNITS	125457-2	125457-5	125457-8	125457-11	125457-14
Your Reference	----------	BH02	BH04	BH07	BH09	BH12
Depth	----------	3.0	2.0	1.5	1.1	3.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	100	92	98	91

Organochlorine Pesticides in soil					
Our Reference:	UNITS	125457-17	125457-20	125457-23	125457-27
Your Reference	----------	BH15	BH17	BH20	QC3
Depth	----------	1.5	3.0	1.0	-
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	90	90	93

Organophosphorus Pesticides						
Our Reference:	UNITS	125457-2	125457-5	125457-8	125457-11	125457-14
Your Reference	----------	BH02	BH04	BH07	BH09	BH12
Depth	----------	3.0	2.0	1.5	1.1	3.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	100	92	98	91

Organophosphorus Pesticides					
Our Reference:	UNITS	125457-17	125457-20	125457-23	125457-27
Your Reference	----------	BH15	BH17	BH20	QC3
Depth	----------	1.5	3.0	1.0	-
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	90	90	93

PCBs in Soil						
Our Reference:	UNITS	125457-2	125457-5	125457-8	125457-11	125457-14
Your Reference	----------	BH02	BH04	BH07	BH09	BH12
Depth	----------	3.0	2.0	1.5	1.1	3.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	90	100	92	98	91

PCBs in Soil					
Our Reference:	UNITS	125457-17	125457-20	125457-23	125457-27
Your Reference	----------	BH15	BH17	BH20	QC3
Depth	----------	1.5	3.0	1.0	-
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	90	90	93

Acid Extractable metals in soil						
Our Reference:	UNITS	125457-1	125457-2	125457-3	125457-4	125457-5
Your Reference	----------	BH01	BH02	BH03	BH03	BH04
Depth	----------	1.5	3.0	1.0	4.0	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Arsenic	mg/kg	14	18	26	17	5
Cadmium	mg/kg	0.6	1	0.8	1	0.5
Chromium	mg/kg	16	18	15	18	29
Copper	mg/kg	110	360	130	140	65
Lead	mg/kg	100	200	260	280	56
Mercury	mg/kg	0.1	0.2	0.1	0.2	0.4
Nickel	mg/kg	14	18	14	16	16
Zinc	mg/kg	160	320	190	250	220

Acid Extractable metals in soil						
Our Reference:	UNITS	125457-6	125457-7	125457-8	125457-9	125457-10
Your Reference	----------	BH05	BH06	BH07	BH08	BH08
Depth	----------	1.5	1.0	1.5	1.0	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Arsenic	mg/kg	9	13	10	11	16
Cadmium	mg/kg	0.5	0.7	2	3	1
Chromium	mg/kg	17	19	19	29	23
Copper	mg/kg	110	130	650	86	250
Lead	mg/kg	120	130	230	160	170
Mercury	mg/kg	0.3	0.2	0.3	0.2	0.2
Nickel	mg/kg	14	16	17	19	18
Zinc	mg/kg	140	160	250	120	280

Acid Extractable metals in soil						
Our Reference:	UNITS	125457-11	125457-12	125457-13	125457-14	125457-15
Your Reference	----------	BH09	BH10	BH11	BH12	BH13
Depth	----------	1.1	0.5	3.0	3.0	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Arsenic	mg/kg	12	14	25	16	19
Cadmium	mg/kg	0.8	1	1	0.7	1
Chromium	mg/kg	21	94	18	16	16
Copper	mg/kg	160	120	210	140	200
Lead	mg/kg	440	130	180	150	180
Mercury	mg/kg	0.2	0.2	0.2	0.2	0.2
Nickel	mg/kg	18	51	18	18	17
Zinc	mg/kg	410	150	290	220	250

Acid Extractable metals in soil						
Our Reference:	UNITS	125457-16	125457-17	125457-18	125457-19	125457-20
Your Reference	----------	BH14	BH15	BH15	BH16	BH17
Depth	----------	2.5	1.5	4.0	2.0	3.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Arsenic	mg/kg	19	18	24	17	16
Cadmium	mg/kg	1	1	3	1	0.8
Chromium	mg/kg	17	17	16	24	15
Copper	mg/kg	200	250	370	230	140
Lead	mg/kg	210	200	220	210	130
Mercury	mg/kg	0.2	0.2	0.2	0.2	0.2
Nickel	mg/kg	20	23	23	17	20
Zinc	mg/kg	320	300	620	300	200

Acid Extractable metals in soil						
Our Reference:	UNITS	125457-21	125457-22	125457-23	125457-24	125457-25
Your Reference	----------	BH18	BH19	BH20	BH20	QC1
Depth	----------	2.5	4.0	1.0	4.0	-
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Arsenic	mg/kg	16	48	16	19	17
Cadmium	mg/kg	0.7	1	1	1	1
Chromium	mg/kg	15	18	21	16	17
Copper	mg/kg	120	250	180	240	160
Lead	mg/kg	160	260	220	240	400
Mercury	mg/kg	0.3	0.2	0.2	0.3	0.2
Nickel	mg/kg	13	20	15	19	18
Zinc	mg/kg	210	330	470	330	240

Acid Extractable metals in soil				
Our Reference:	UNITS	125457-26	125457-27	125457-28
Your Reference	----------	QC2	QC3	BH11
Depth	----------	-	-	1.5
Date Sampled		19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil
Date digested	-	23/03/2015	23/03/2015	26/03/2015
Date analysed	-	23/03/2015	23/03/2015	26/03/2015
Arsenic	mg/kg	20	14	6
Cadmium	mg/kg	1	1	2
Chromium	mg/kg	16	14	27
Copper	mg/kg	300	140	55
Lead	mg/kg	430	150	51
Mercury	mg/kg	0.3	0.1	0.3
Nickel	mg/kg	20	11	23
Zinc	mg/kg	410	410	79

Moisture						
Our Reference:	UNITS	125457-1	125457-2	125457-3	125457-4	125457-5
Your Reference	----------	BH01	BH02	BH03	BH03	BH04
Depth	----------	1.5	3.0	1.0	4.0	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Moisture	%	19	14	26	17	27

Moisture						
Our Reference:	UNITS	125457-6	125457-7	125457-8	125457-9	125457-10
Your Reference	----------	BH05	BH06	BH07	BH08	BH08
Depth	----------	1.5	1.0	1.5	1.0	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Moisture	%	15	13	17	15	15

Moisture						
Our Reference:	UNITS	125457-11	125457-12	125457-13	125457-14	125457-15
Your Reference	----------	BH09	BH10	BH11	BH12	BH13
Depth	----------	1.1	0.5	3.0	3.0	2.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Moisture	%	24	12	20	18	13

Moisture						
Our Reference:	UNITS	125457-16	125457-17	125457-18	125457-19	125457-20
Your Reference	----------	BH14	BH15	BH15	BH16	BH17
Depth	----------	2.5	1.5	4.0	2.0	3.0
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Moisture	%	21	19	16	19	20

Moisture						
Our Reference:	UNITS	125457-21	125457-22	125457-23	125457-24	125457-25
Your Reference	----------	BH18	BH19	BH20	BH20	QC1
Depth	----------	2.5	4.0	1.0	4.0	-
Date Sampled		19/03/2015	19/03/2015	19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	23/03/2015	23/03/2015	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015	24/03/2015	24/03/2015
Moisture	%	17	16	16	11	14

Moisture				
Our Reference:	UNITS	125457-26	125457-27	125457-28
Your Reference	----------	QC2	QC3	BH11
Depth	----------	-	-	1.5
Date Sampled		19/03/2015	19/03/2015	19/03/2015
Type of sample		Soil	Soil	Soil
Date prepared	-	23/03/2015	23/03/2015	23/03/2015
Date analysed	-	24/03/2015	24/03/2015	24/03/2015
Moisture	%	20	17	15

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			23/03/2015	125457-1	23/03/2015 || 23/03/2015	LCS-10	23/03/2015
Date analysed	-			24/03/2015	125457-1	24/03/2015 || 24/03/2015	LCS-10	24/03/2015
TRHC$_6$ - C$_9$	mg/kg	25	Org-016	<25	125457-1	<25 || <25	LCS-10	112%
TRHC$_6$ - C$_{10}$	mg/kg	25	Org-016	<25	125457-1	<25 || <25	LCS-10	112%
Benzene	mg/kg	0.2	Org-016	<0.2	125457-1	<0.2 || <0.2	LCS-10	111%
Toluene	mg/kg	0.5	Org-016	<0.5	125457-1	<0.5 || <0.5	LCS-10	114%
Ethylbenzene	mg/kg	1	Org-016	<1	125457-1	<1 || <1	LCS-10	109%
m+p-xylene	mg/kg	2	Org-016	<2	125457-1	<2 || <2	LCS-10	113%
o-Xylene	mg/kg	1	Org-016	<1	125457-1	<1 || <1	LCS-10	113%
naphthalene	mg/kg	1	Org-014	<1	125457-1	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	94	125457-1	94 || 97 || RPD: 3	LCS-10	97%
QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			23/03/2015	125457-1	23/03/2015 || 23/03/2015	LCS-10	23/03/2015
Date analysed	-			24/03/2015	125457-1	25/03/2015 || 25/03/2015	LCS-10	25/03/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	125457-1	<50 || <50	LCS-10	105%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	125457-1	<100 || <100	LCS-10	103%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	125457-1	<100 || <100	LCS-10	107%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	125457-1	<50 || <50	LCS-10	105%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	125457-1	<100 || <100	LCS-10	103%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	125457-1	<100 || <100	LCS-10	107%
Surrogate o-Terphenyl	%		Org-003	81	125457-1	81 || 85 || RPD: 5	LCS-10	111%
QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			23/03/2015	125457-1	23/03/2015 || 23/03/2015	LCS-10	23/03/2015
Date analysed	-			23/03/2015	125457-1	24/03/2015 || 24/03/2015	LCS-10	23/03/2015
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	<0.1 || <0.1	LCS-10	95%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	<0.1 || <0.1	LCS-10	85%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	0.6 || 0.3 || RPD: 67	LCS-10	84%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	0.2 || 0.1 || RPD: 67	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	0.8 || 0.5 || RPD: 46	LCS-10	82%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	0.8 || 0.4 || RPD: 67	LCS-10	86%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	0.4 || 0.2 || RPD: 67	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	0.3 || 0.2 || RPD: 40	LCS-10	81%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	125457-1	0.5 || 0.3 || RPD: 50	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	125457-1	0.3 || 0.2 || RPD: 40	LCS-10	102%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	125457-1	0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	101	125457-1	113 || 103 || RPD: 9	LCS-10	95%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			23/03/2015	125457-11	23/03/2015 || 23/03/2015	LCS-8	23/03/2015
Date analysed	-			24/03/2051	125457-11	24/03/2015 || 24/03/2015	LCS-8	24/03/2015
HCB	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	93%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	85%
Heptachlor	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	87%
delta-BHC	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	92%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	96%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	98%
Dieldrin	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	96%
Endrin	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	102%
pp-DDD	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	102%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	LCS-8	106%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	92	125457-11	98 || 99 || RPD: 1	LCS-8	87%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			23/03/2015	125457-11	23/03/2015 || 23/03/2015	LCS-8	23/03/2015
Date analysed	-			24/03/2015	125457-11	24/03/2015 || 24/03/2015	LCS-8	24/03/2015
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	LCS-8	103%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	LCS-8	100%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	LCS-8	103%
Dimethoate	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	LCS-8	106%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	LCS-8	86%
Malathion	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	LCS-8	87%
Parathion	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	LCS-8	126%
Ronnel	mg/kg	0.1	Org-008	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-008	92	125457-11	98 || 99 || RPD: 1	LCS-8	90%
QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			23/03/2015	125457-11	23/03/2015 || 23/03/2015	LCS-8	23/03/2015
Date analysed	-			24/03/2015	125457-11	24/03/2015 || 24/03/2015	LCS-8	24/03/2015
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	125457-11	<0.1 || <0.1	LCS-8	99%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	125457-11	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	92	125457-11	98 || 99 || RPD: 1	LCS-8	95%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			23/03/2015	125457-1	23/03/2015 || 23/03/2015	LCS-7	23/03/2015
Date analysed	-			23/03/2015	125457-1	23/03/2015 || 23/03/2015	LCS-7	23/03/2015
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	125457-1	14 || 14 || RPD: 0	LCS-7	104%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	125457-1	0.6 || 0.7 || RPD: 15	LCS-7	101%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	125457-1	16 || 16 || RPD: 0	LCS-7	103%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	125457-1	110 || 150 || RPD: 31	LCS-7	102%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	125457-1	100 || 140 || RPD: 33	LCS-7	97%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	125457-1	0.1 || 0.2 || RPD: 67	LCS-7	101%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	125457-1	14 || 17 || RPD: 19	LCS-7	99%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	125457-1	160 || 200 || RPD: 22	LCS-7	99%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	125457-21	23/03/2015 || 23/03/2015	125457-17	23/03/2015
Date analysed	-	125457-21	24/03/2015 || 24/03/2015	125457-17	24/03/2015
TRHC$_6$ - C$_9$	mg/kg	125457-21	<25 || <25	125457-17	102%
TRHC$_6$ - C$_{10}$	mg/kg	125457-21	<25 || <25	125457-17	102%
Benzene	mg/kg	125457-21	<0.2 || <0.2	125457-17	103%
Toluene	mg/kg	125457-21	<0.5 || <0.5	125457-17	104%
Ethylbenzene	mg/kg	125457-21	<1 || <1	125457-17	99%
m+p-xylene	mg/kg	125457-21	<2 || <2	125457-17	103%
o-Xylene	mg/kg	125457-21	<1 || <1	125457-17	103%
naphthalene	mg/kg	125457-21	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%	125457-21	87 || 84 || RPD: 4	125457-17	87%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	125457-21	23/03/2015 || 23/03/2015	125457-17	23/03/2015
Date analysed	-	125457-21	25/03/2015 || 25/03/2015	125457-17	25/03/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	125457-21	<50 || <50	125457-17	90%
TRHC$_{15}$ - C$_{28}$	mg/kg	125457-21	<100 || <100	125457-17	104%
TRHC$_{29}$ - C$_{36}$	mg/kg	125457-21	<100 || <100	125457-17	#
TRH>C$_{10}$-C$_{16}$	mg/kg	125457-21	<50 || <50	125457-17	90%
TRH>C$_{16}$-C$_{34}$	mg/kg	125457-21	<100 || <100	125457-17	104%
TRH>C$_{34}$-C$_{40}$	mg/kg	125457-21	<100 || <100	125457-17	#
Surrogate o-Terphenyl	%	125457-21	81 || 79 || RPD: 2	125457-17	105%
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	125457-21	23/03/2015 || 23/03/2015	125457-17	23/03/2015
Date analysed	-	125457-21	24/03/2015 || 24/03/2015	125457-17	25/03/2015
Naphthalene	mg/kg	125457-21	<0.1 || <0.1	125457-17	88%
Acenaphthylene	mg/kg	125457-21	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	125457-21	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	125457-21	<0.1 || <0.1	125457-17	83%
Phenanthrene	mg/kg	125457-21	0.4 || 0.3 || RPD: 29	125457-17	85%
Anthracene	mg/kg	125457-21	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	125457-21	0.7 || 0.4 || RPD: 55	125457-17	93%
Pyrene	mg/kg	125457-21	0.7 || 0.5 || RPD: 33	125457-17	95%
Benzo(a)anthracene	mg/kg	125457-21	0.4 || 0.3 || RPD: 29	[NR]	[NR]
Chrysene	mg/kg	125457-21	0.3 || 0.3 || RPD: 0	125457-17	83%
Benzo(b,j+k)fluoranthene	mg/kg	125457-21	0.6 || 0.5 || RPD: 18	[NR]	[NR]
Benzo(a)pyrene	mg/kg	125457-21	0.3 || 0.3 || RPD: 0	125457-17	96%
Indeno(1,2,3-c,d)pyrene	mg/kg	125457-21	0.2 || 0.2 || RPD: 0	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	125457-21	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	125457-21	0.2 || 0.1 || RPD: 67	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	125457-21	104 || 102 || RPD: 2	125457-17	92%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	125457-17	23/03/2015
Date analysed	-	[NT]	[NT]	125457-17	24/03/2015
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	125457-17	100%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	125457-17	99%
Heptachlor	mg/kg	[NT]	[NT]	125457-17	92%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	125457-17	97%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	125457-17	117%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	125457-17	103%
Dieldrin	mg/kg	[NT]	[NT]	125457-17	101%
Endrin	mg/kg	[NT]	[NT]	125457-17	108%
pp-DDD	mg/kg	[NT]	[NT]	125457-17	107%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	125457-17	110%
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	125457-17	87%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	125457-17	23/03/2015
Date analysed	-	[NT]	[NT]	125457-17	24/03/2015
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	125457-17	101%
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	125457-17	92%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	125457-17	101%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	125457-17	105%
Fenitrothion	mg/kg	[NT]	[NT]	125457-17	89%
Malathion	mg/kg	[NT]	[NT]	125457-17	94%
Parathion	mg/kg	[NT]	[NT]	125457-17	126%
Ronnel	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	125457-17	93%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	125457-17	23/03/2015
Date analysed	-	[NT]	[NT]	125457-17	24/03/2015
Arochlor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	[NT]	[NT]	125457-17	99%
Arochlor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	125457-17	98%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	125457-11	23/03/2015 || 23/03/2015	LCS-8	23/03/2015
Date analysed	-	125457-11	23/03/2015 || 23/03/2015	LCS-8	23/03/2015
Arsenic	mg/kg	125457-11	12 || 11 || RPD: 9	LCS-8	103%
Cadmium	mg/kg	125457-11	0.8 || 0.9 || RPD: 12	LCS-8	102%
Chromium	mg/kg	125457-11	21 || 25 || RPD: 17	LCS-8	103%
Copper	mg/kg	125457-11	160 || 150 || RPD: 6	LCS-8	103%
Lead	mg/kg	125457-11	440 || 380 || RPD: 15	LCS-8	97%
Mercury	mg/kg	125457-11	0.2 || 0.2 || RPD: 0	LCS-8	101%
Nickel	mg/kg	125457-11	18 || 18 || RPD: 0	LCS-8	100%
Zinc	mg/kg	125457-11	410 || 330 || RPD: 22	LCS-8	100%

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	125457-11	23/03/2015 || 23/03/2015	LCS-9	23/03/2015
Date analysed	-	125457-11	25/03/2015 || 25/03/2015	LCS-9	23/03/2015
Naphthalene	mg/kg	125457-11	<0.1 || <0.1	LCS-9	98%
Acenaphthylene	mg/kg	125457-11	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	125457-11	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	125457-11	<0.1 || <0.1	LCS-9	95%
Phenanthrene	mg/kg	125457-11	0.3 || 0.1 || RPD: 100	LCS-9	99%
Anthracene	mg/kg	125457-11	0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	125457-11	0.4 || 0.1 || RPD: 120	LCS-9	102%
Pyrene	mg/kg	125457-11	0.4 || 0.1 || RPD: 120	LCS-9	106%
Benzo(a)anthracene	mg/kg	125457-11	0.2 || <0.1	[NR]	[NR]
Chrysene	mg/kg	125457-11	0.2 || <0.1	LCS-9	91%
Benzo(b,j+k)fluoranthene	mg/kg	125457-11	0.3 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	125457-11	0.2 || 0.06 || RPD: 108	LCS-9	98%
Indeno(1,2,3-c,d)pyrene	mg/kg	125457-11	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	125457-11	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	125457-11	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	125457-11	96 || 96 || RPD: 0	LCS-9	104%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	125457-21	23/03/2015 || 23/03/2015	125457-17	23/03/2015
Date analysed	-	125457-21	23/03/2015 || 23/03/2015	125457-17	23/03/2015
Arsenic	mg/kg	125457-21	16 || 16 || RPD: 0	125457-17	82%
Cadmium	mg/kg	125457-21	0.7 || 0.6 || RPD: 15	125457-17	86%
Chromium	mg/kg	125457-21	15 || 15 || RPD: 0	125457-17	87%
Copper	mg/kg	125457-21	120 || 110 || RPD: 9	125457-17	#
Lead	mg/kg	125457-21	160 || 99 || RPD: 47	125457-17	88%
Mercury	mg/kg	125457-21	0.3 || 0.1 || RPD: 100	125457-17	100%
Nickel	mg/kg	125457-21	13 || 13 || RPD: 0	125457-17	82%
Zinc	mg/kg	125457-21	210 || 180 || RPD: 15	125457-17	#

Client Reference: DL3393-Manchester Rd, Auburn

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date digested	-	[NT]	[NT]	125457-28	26/03/2015
Date analysed	-	[NT]	[NT]	125457-28	26/03/2015
Arsenic	mg/kg	[NT]	[NT]	125457-28	105%
Cadmium	mg/kg	[NT]	[NT]	125457-28	96%
Chromium	mg/kg	[NT]	[NT]	125457-28	99%
Copper	mg/kg	[NT]	[NT]	125457-28	97%
Lead	mg/kg	[NT]	[NT]	125457-28	92%
Mercury	mg/kg	[NT]	[NT]	125457-28	101%
Nickel	mg/kg	[NT]	[NT]	125457-28	85%
Zinc	mg/kg	[NT]	[NT]	125457-28	84%

Report Comments:

METALS_S:# Percent recovery is not possible to report due to the high concentration of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Total Recoverable Hydrocarbons in soil: # Percent recovery is not possible to report due to interference from analytes (other than those being tested) in the sample/s.

PAH_S:The RPD for duplicate results is accepted due to the non homogenous nature of the sample/s.

Asbestos ID was analysed by Approved Identifier:	Not applicable for this job
Asbestos ID was authorised by Approved Signatory:	Not applicable for this job

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

ANALYTICAL REPORT

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Keri Hartog	Manager	Huong Crawford
Client	DLA ENVIRONMENTAL SERVICES PTY LTD	Laboratory	SGS Alexandria Environmental
Address	Unit 3 38 Leighton Pl HORNSBY NSW 2077	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
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Email	sydney@dlaenvironmental.com.au	Email	au.environmental.sydney@sgs.com
Project	**DL3393**	SGS Reference	**SE137451 R0**
Order Number	(Not specified)	Report Number	0000106065
Samples	2	Date Reported	25 Mar 2015
Date Started	24 Mar 2015	Date Received	20 Mar 2015

COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(4354).

SIGNATORIES

Dong Liang
Metals/Inorganics Team Leader

Ly Kim Ha
Organic Section Head

Parameter	Units	LOR	Sample Number: SE137451.001 Sample Matrix: Soil Sample Date: 19 Mar 2015 Sample Name: QC1A	Sample Number: SE137451.002 Sample Matrix: Soil Sample Date: 19 Mar 2015 Sample Name: QC3A
VOC's in Soil Method: AN433/AN434 Tested: 24/3/2015				
Monocyclic Aromatic Hydrocarbons				
Benzene	mg/kg	0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1
Polycyclic VOCs				
Naphthalene	mg/kg	0.1	<0.1	<0.1
Surrogates				
Dibromofluoromethane (Surrogate)	%	-	**70**	**82**
d4-1,2-dichloroethane (Surrogate)	%	-	**75**	**84**
d8-toluene (Surrogate)	%	-	**86**	**99**
Bromofluorobenzene (Surrogate)	%	-	**89**	**98**
Totals				
Total Xylenes*	mg/kg	0.3	<0.3	<0.3
Total BTEX*	mg/kg	0.6	<0.6	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 Tested: 24/3/2015				
TRH C6-C10	mg/kg	25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20
Surrogates				
Dibromofluoromethane (Surrogate)	%	-	**70**	**82**
d4-1,2-dichloroethane (Surrogate)	%	-	**75**	**84**
d8-toluene (Surrogate)	%	-	**86**	**99**
Bromofluorobenzene (Surrogate)	%	-	**89**	**98**

Parameter	Units	LOR	Sample Number: SE137451.001 Sample Matrix: Soil Sample Date: 19 Mar 2015 Sample Name: QC1A	Sample Number: SE137451.002 Sample Matrix: Soil Sample Date: 19 Mar 2015 Sample Name: QC3A
Volatile Petroleum Hydrocarbons in Soil Method: AN433/AN434/AN410 Tested: 24/3/2015 (continued)				
VPH F Bands				
Benzene (F0)	mg/kg	0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 24/3/2015				
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	**100**	**210**
TRH C29-C36	mg/kg	45	**54**	**150**
TRH C37-C40	mg/kg	100	<100	<100
TRH C10-C36 Total	mg/kg	110	**160**	**360**
TRH C10-C40 Total	mg/kg	210	<210	**360**
TRH F Bands				
TRH >C10-C16 (F2)	mg/kg	25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	**160**	**350**
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 24/3/2015				
Naphthalene	mg/kg	0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.4**	**0.3**
Anthracene	mg/kg	0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.4**	**0.4**
Pyrene	mg/kg	0.1	**0.4**	**0.4**
Benzo(a)anthracene	mg/kg	0.1	**0.3**	**0.3**
Chrysene	mg/kg	0.1	**0.3**	**0.3**
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.2**	**0.2**
Benzo(k)fluoranthene	mg/kg	0.1	**0.1**	**0.1**
Benzo(a)pyrene	mg/kg	0.1	**0.2**	**0.2**
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.1**	**0.2**
Dibenzo(a&h)anthracene	mg/kg	0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	**0.1**
Carcinogenic PAHs, BaP TEQ <LOR=0*	TEQ	0.2	**0.2**	**0.3**
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	TEQ (mg/kg)	0.3	**0.3**	**0.4**
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	TEQ (mg/kg)	0.2	**0.3**	**0.3**
Total PAH	mg/kg	0.8	**2.3**	**2.4**

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name SE137451.001 Soil 19 Mar 2015 QC1A	SE137451.002 Soil 19 Mar 2015 QC3A
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 24/3/2015 (continued)				
Surrogates				
d5-nitrobenzene (Surrogate)	%	-	98	100
2-fluorobiphenyl (Surrogate)	%	-	94	94
d14-p-terphenyl (Surrogate)	%	-	106	108
OC Pesticides in Soil Method: AN400/AN420 Tested: 24/3/2015				
Hexachlorobenzene (HCB)	mg/kg	0.1	-	<0.1
Alpha BHC	mg/kg	0.1	-	<0.1
Lindane	mg/kg	0.1	-	<0.1
Heptachlor	mg/kg	0.1	-	<0.1
Aldrin	mg/kg	0.1	-	<0.1
Beta BHC	mg/kg	0.1	-	<0.1
Delta BHC	mg/kg	0.1	-	<0.1
Heptachlor epoxide	mg/kg	0.1	-	<0.1
o,p'-DDE	mg/kg	0.1	-	<0.1
Alpha Endosulfan	mg/kg	0.2	-	<0.2
Gamma Chlordane	mg/kg	0.1	-	<0.1
Alpha Chlordane	mg/kg	0.1	-	<0.1
trans-Nonachlor	mg/kg	0.1	-	<0.1
p,p'-DDE	mg/kg	0.1	-	<0.1
Dieldrin	mg/kg	0.2	-	<0.2
Endrin	mg/kg	0.2	-	<0.2
o,p'-DDD	mg/kg	0.1	-	<0.1
o,p'-DDT	mg/kg	0.1	-	<0.1
Beta Endosulfan	mg/kg	0.2	-	<0.2
p,p'-DDD	mg/kg	0.1	-	<0.1
p,p'-DDT	mg/kg	0.1	-	<0.1
Endosulfan sulphate	mg/kg	0.1	-	<0.1
Endrin Aldehyde	mg/kg	0.1	-	<0.1
Methoxychlor	mg/kg	0.1	-	<0.1
Endrin Ketone	mg/kg	0.1	-	<0.1
Isodrin	mg/kg	0.1	-	<0.1
Mirex	mg/kg	0.1	-	<0.1

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE137451.001 Soil 19 Mar 2015 QC1A	SE137451.002 Soil 19 Mar 2015 QC3A
OC Pesticides in Soil Method: AN400/AN420 Tested: 24/3/2015 (continued)					
Surrogates					
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-		-	113
OP Pesticides in Soil Method: AN400/AN420 Tested: 24/3/2015					
Dichlorvos	mg/kg	0.5		-	<0.5
Dimethoate	mg/kg	0.5		-	<0.5
Diazinon (Dimpylate)	mg/kg	0.5		-	<0.5
Fenitrothion	mg/kg	0.2		-	<0.2
Malathion	mg/kg	0.2		-	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2		-	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2		-	<0.2
Bromophos Ethyl	mg/kg	0.2		-	<0.2
Methidathion	mg/kg	0.5		-	<0.5
Ethion	mg/kg	0.2		-	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2		-	<0.2
Surrogates					
2-fluorobiphenyl (Surrogate)	%	-		-	94
d14-p-terphenyl (Surrogate)	%	-		-	108
PCBs in Soil Method: AN400/AN420 Tested: 24/3/2015					
Arochlor 1016	mg/kg	0.2		-	<0.2
Arochlor 1221	mg/kg	0.2		-	<0.2
Arochlor 1232	mg/kg	0.2		-	<0.2
Arochlor 1242	mg/kg	0.2		-	<0.2
Arochlor 1248	mg/kg	0.2		-	<0.2
Arochlor 1254	mg/kg	0.2		-	<0.2
Arochlor 1260	mg/kg	0.2		-	<0.2
Arochlor 1262	mg/kg	0.2		-	<0.2
Arochlor 1268	mg/kg	0.2		-	<0.2
Total PCBs (Arochlors)	mg/kg	1		-	<1

Parameter	Units	LOR	Sample Number: SE137451.001 Sample Matrix: Soil Sample Date: 19 Mar 2015 Sample Name: QC1A	Sample Number: SE137451.002 Sample Matrix: Soil Sample Date: 19 Mar 2015 Sample Name: QC3A
PCBs in Soil Method: AN400/AN420 Tested: 24/3/2015 (continued)				
Surrogates				
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	-	113
Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: AN040/AN320 Tested: 24/3/2015				
Arsenic, As	mg/kg	3	23	23
Cadmium, Cd	mg/kg	0.3	1.1	1.4
Chromium, Cr	mg/kg	0.3	16	16
Copper, Cu	mg/kg	0.5	150	220
Lead, Pb	mg/kg	1	250	190
Nickel, Ni	mg/kg	0.5	18	20
Zinc, Zn	mg/kg	0.5	350	510
Mercury in Soil Method: AN312 Tested: 24/3/2015				
Mercury	mg/kg	0.01	0.16	0.13
Moisture Content Method: AN002 Tested: 23/3/2015				
% Moisture	%	0.5	21	17

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in Soil **Method: ME-(AU)-[ENV]AN312**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB074402	mg/kg	0.01	<0.01	0%	108%	103%

Moisture Content **Method: ME-(AU)-[ENV]AN002**

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB074356	%	0.5	3%

OC Pesticides in Soil **Method: ME-(AU)-[ENV]AN400/AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Hexachlorobenzene (HCB)	LB074371	mg/kg	0.1	<0.1	0%	NA
Alpha BHC	LB074371	mg/kg	0.1	<0.1	0%	NA
Lindane	LB074371	mg/kg	0.1	<0.1	0%	NA
Heptachlor	LB074371	mg/kg	0.1	<0.1	0%	101%
Aldrin	LB074371	mg/kg	0.1	<0.1	0%	102%
Beta BHC	LB074371	mg/kg	0.1	<0.1	0%	NA
Delta BHC	LB074371	mg/kg	0.1	<0.1	0%	96%
Heptachlor epoxide	LB074371	mg/kg	0.1	<0.1	0%	NA
o,p'-DDE	LB074371	mg/kg	0.1	<0.1	0%	NA
Alpha Endosulfan	LB074371	mg/kg	0.2	<0.2	0%	NA
Gamma Chlordane	LB074371	mg/kg	0.1	<0.1	0%	NA
Alpha Chlordane	LB074371	mg/kg	0.1	<0.1	0%	NA
trans-Nonachlor	LB074371	mg/kg	0.1	<0.1	0%	NA
p,p'-DDE	LB074371	mg/kg	0.1	<0.1	0%	NA
Dieldrin	LB074371	mg/kg	0.2	<0.2	0%	99%
Endrin	LB074371	mg/kg	0.2	<0.2	0%	104%
o,p'-DDD	LB074371	mg/kg	0.1	<0.1	0%	NA
o,p'-DDT	LB074371	mg/kg	0.1	<0.1	0%	NA
Beta Endosulfan	LB074371	mg/kg	0.2	<0.2	0%	NA
p,p'-DDD	LB074371	mg/kg	0.1	<0.1	0%	NA
p,p'-DDT	LB074371	mg/kg	0.1	<0.1	0%	98%
Endosulfan sulphate	LB074371	mg/kg	0.1	<0.1	0%	NA
Endrin Aldehyde	LB074371	mg/kg	0.1	<0.1	0%	NA
Methoxychlor	LB074371	mg/kg	0.1	<0.1	0%	NA
Endrin Ketone	LB074371	mg/kg	0.1	<0.1	0%	NA
Isodrin	LB074371	mg/kg	0.1	<0.1	0%	NA
Mirex	LB074371	mg/kg	0.1	<0.1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB074371	%	-	122%	5%	104%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

OP Pesticides in Soil **Method: ME-(AU)-[ENV]AN400/AN420**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Dichlorvos	LB074371	mg/kg	0.5	<0.5	127%
Dimethoate	LB074371	mg/kg	0.5	<0.5	NA
Diazinon (Dimpylate)	LB074371	mg/kg	0.5	<0.5	70%
Fenitrothion	LB074371	mg/kg	0.2	<0.2	NA
Malathion	LB074371	mg/kg	0.2	<0.2	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	LB074371	mg/kg	0.2	<0.2	83%
Parathion-ethyl (Parathion)	LB074371	mg/kg	0.2	<0.2	NA
Bromophos Ethyl	LB074371	mg/kg	0.2	<0.2	NA
Methidathion	LB074371	mg/kg	0.5	<0.5	NA
Ethion	LB074371	mg/kg	0.2	<0.2	81%
Azinphos-methyl (Guthion)	LB074371	mg/kg	0.2	<0.2	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
2-fluorobiphenyl (Surrogate)	LB074371	%	-	82%	90%
d14-p-terphenyl (Surrogate)	LB074371	%	-	96%	100%

PAH (Polynuclear Aromatic Hydrocarbons) in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Naphthalene	LB074371	mg/kg	0.1	<0.1	0%	103%
2-methylnaphthalene	LB074371	mg/kg	0.1	<0.1	0%	NA
1-methylnaphthalene	LB074371	mg/kg	0.1	<0.1	0%	NA
Acenaphthylene	LB074371	mg/kg	0.1	<0.1	0%	97%
Acenaphthene	LB074371	mg/kg	0.1	<0.1	0%	94%
Fluorene	LB074371	mg/kg	0.1	<0.1	0%	NA
Phenanthrene	LB074371	mg/kg	0.1	<0.1	0%	106%
Anthracene	LB074371	mg/kg	0.1	<0.1	0%	102%
Fluoranthene	LB074371	mg/kg	0.1	<0.1	0%	103%
Pyrene	LB074371	mg/kg	0.1	<0.1	0%	101%
Benzo(a)anthracene	LB074371	mg/kg	0.1	<0.1	0%	NA
Chrysene	LB074371	mg/kg	0.1	<0.1	0%	NA
Benzo(b&j)fluoranthene	LB074371	mg/kg	0.1	<0.1	0%	NA
Benzo(k)fluoranthene	LB074371	mg/kg	0.1	<0.1	0%	NA
Benzo(a)pyrene	LB074371	mg/kg	0.1	<0.1	0%	78%
Indeno(1,2,3-cd)pyrene	LB074371	mg/kg	0.1	<0.1	0%	NA
Dibenzo(a&h)anthracene	LB074371	mg/kg	0.1	<0.1	0%	NA
Benzo(ghi)perylene	LB074371	mg/kg	0.1	<0.1	0%	NA
Carcinogenic PAHs, BaP TEQ <LOR=0*	LB074371	TEQ	0.2	<0.2	0%	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR*	LB074371	TEQ (mg/kg)	0.3	<0.3	0%	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2*	LB074371	TEQ (mg/kg)	0.2	<0.2	0%	NA
Total PAH	LB074371	mg/kg	0.8	<0.8	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
d5-nitrobenzene (Surrogate)	LB074371	%	-	122%	6%	92%
2-fluorobiphenyl (Surrogate)	LB074371	%	-	128%	8%	98%
d14-p-terphenyl (Surrogate)	LB074371	%	-	126%	8%	96%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

PCBs in Soil Method: ME-(AU)-[ENV]AN400/AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Arochlor 1016	LB074371	mg/kg	0.2	<0.2	0%	NA
Arochlor 1221	LB074371	mg/kg	0.2	<0.2	0%	NA
Arochlor 1232	LB074371	mg/kg	0.2	<0.2	0%	NA
Arochlor 1242	LB074371	mg/kg	0.2	<0.2	0%	NA
Arochlor 1248	LB074371	mg/kg	0.2	<0.2	0%	NA
Arochlor 1254	LB074371	mg/kg	0.2	<0.2	0%	NA
Arochlor 1260	LB074371	mg/kg	0.2	<0.2	0%	126%
Arochlor 1262	LB074371	mg/kg	0.2	<0.2	0%	NA
Arochlor 1268	LB074371	mg/kg	0.2	<0.2	0%	NA
Total PCBs (Arochlors)	LB074371	mg/kg	1	<1	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB074371	%	-	122%	5%	98%

Total Recoverable Metals in Soil by ICPOES from EPA 200.8 Digest Method: ME-(AU)-[ENV]AN040/AN320

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB074369	mg/kg	3	<3	19 - 22%	97%	
Cadmium, Cd	LB074369	mg/kg	0.3	<0.3	0 - 23%	96%	
Chromium, Cr	LB074369	mg/kg	0.3	<0.3	0 - 4%	98%	
Copper, Cu	LB074369	mg/kg	0.5	<0.5	4%	98%	
Lead, Pb	LB074369	mg/kg	1	<1	0 - 20%	98%	86%
Nickel, Ni	LB074369	mg/kg	0.5	<0.5	1 - 13%	98%	
Zinc, Zn	LB074369	mg/kg	0.5	<0.5	2 - 13%	99%	

TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C10-C14	LB074371	mg/kg	20	<20	0%	100%	85%
TRH C15-C28	LB074371	mg/kg	45	<45	0%	98%	90%
TRH C29-C36	LB074371	mg/kg	45	<45	0%	80%	80%
TRH C37-C40	LB074371	mg/kg	100	<100	0%	NA	NA
TRH C10-C36 Total	LB074371	mg/kg	110	<110	0%	NA	NA
TRH C10-C40 Total	LB074371	mg/kg	210	<210	0%	NA	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH >C10-C16 (F2)	LB074371	mg/kg	25	<25	0%	98%	88%
TRH >C10-C16 (F2) - Naphthalene	LB074371	mg/kg	25	<25	0%	NA	NA
TRH >C16-C34 (F3)	LB074371	mg/kg	90	<90	0%	93%	85%
TRH >C34-C40 (F4)	LB074371	mg/kg	120	<120	0%	75%	NA

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

VOC's in Soil Method: ME-(AU)-[ENV]AN433/AN434

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB074383	mg/kg	0.1	<0.1	0%	70%	72%
Toluene	LB074383	mg/kg	0.1	<0.1	0%	74%	76%
Ethylbenzene	LB074383	mg/kg	0.1	<0.1	0%	81%	78%
m/p-xylene	LB074383	mg/kg	0.2	<0.2	0%	79%	76%
o-xylene	LB074383	mg/kg	0.1	<0.1	0%	78%	77%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB074383	mg/kg	0.1	<0.1	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB074383	%	-	83%	11 - 22%	81%	93%
d4-1,2-dichloroethane (Surrogate)	LB074383	%	-	79%	12 - 22%	85%	99%
d8-toluene (Surrogate)	LB074383	%	-	90%	12 - 22%	105%	116%
Bromofluorobenzene (Surrogate)	LB074383	%	-	91%	11 - 24%	104%	104%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Xylenes*	LB074383	mg/kg	0.3	<0.3	0%	NA	NA
Total BTEX*	LB074383	mg/kg	0.6	<0.6	0%	NA	NA

Volatile Petroleum Hydrocarbons in Soil Method: ME-(AU)-[ENV]AN433/AN434/AN410

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C10	LB074383	mg/kg	25	<25	0%	85%	83%
TRH C6-C9	LB074383	mg/kg	20	<20	0%	75%	81%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dibromofluoromethane (Surrogate)	LB074383	%	-	83%	11 - 22%	81%	93%
d4-1,2-dichloroethane (Surrogate)	LB074383	%	-	79%	12 - 22%	85%	99%
d8-toluene (Surrogate)	LB074383	%	-	90%	12 - 22%	105%	116%
Bromofluorobenzene (Surrogate)	LB074383	%	-	91%	11 - 24%	104%	104%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB074383	mg/kg	0.1	<0.1	0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB074383	mg/kg	25	<25	0%	103%	102%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analsysis by ASS or ICP as per USEPA Method 200.8.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN088	Orbital rolling for Organic pollutants are extracted from soil/sediment by transferring an appropriate mass of sample to a clear soil jar and extracting with 1:1 Dichloromethane/Acetone. Orbital Rolling method is intended for the extraction of semi-volatile organic compounds from soil/sediment samples, and is based somewhat on USEPA method 3570 (Micro Organic extraction and sample preparation). Method 3700.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN400	OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependant on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433/AN434	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN433/AN434/AN410	VOCs and C6-C9/C6-C10 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	This analysis is not covered by the scope of accreditation.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
^	Performed by outside laboratory.	NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here:
http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

AUSTRALIAN SAFER ENVIRONMENT & TECHNOLOGY PTY LTD

ABN 36 088 095 112

O
ur ref : ASET43609/ 46789 / 1 - 33
Your ref : DL3392 - Auburn
NATA Accreditation No: 14484

24 March 2015

DLA Environmental Services Pty Ltd
2B/30 Leighton Street
Hornsby NSW 2077

Accredited for compliance with ISO/IEC 17025.

Attn: Mr David Lane

Dear David

Asbestos Identification
This report presents the results of thirty-three samples, forwarded by DLA Environmental Services Pty Ltd on 20 March 2015, for analysis for asbestos.

1.Introduction: Thirty-three samples forwarded were examined and analysed for the presence of asbestos.

2. Methods : The samples were examined under a Stereo Microscope and selected fibres were analysed by Polarized Light Microscopy in conjunction with Dispersion Staining method **(Safer Environment Method 1 and Australian Standard AS 4964 - 2004).**

The report also provides approximate weights and percentages, categories of asbestos forms appearing in the sample, such as **AF**(Asbestos Fines), **FA**(Friable Asbestos and **ACM** (Asbestos Containing Material), also satisfying the requirements of the WA/ NEPM Guidelines)

3. Results :

Sample No. 1. ASET43609 / 46789 / 1. BH 01 - 1.5.
Approx dimensions 10.0 cm x 10.0 cm x 5.8 cm
Approx total weight of soil sample = 628.0g
The sample consisted of a mixture of clayish soil, stones, plant matter, fragments of plaster, cement and brick like material.
No asbestos detected.

Sample No. 2. ASET43609 / 46789 / 2. BH 01 - 1.5 AS.
Approx dimensions 2.8 cm x 1.8 cm x 0.2 cm
The sample consisted of fibrous mass of organic fibres containing plant matter, sand and plastic.
No asbestos detected.

Sample No. 3. ASET43609 / 46789 / 3. BH 02 - 3.0.
Approx dimensions 11.0 cm x 10.0 cm x 5.9 cm
Approx total weight of soil sample = 641.0g
The sample consisted of a mixture of clayish soil, stones, plant matter and fragments of plaster, cement and brick.
No asbestos detected.

Sample No. 4. ASET43609 / 46789 / 4. BH 02 - 3.0 AS.
Approx dimensions 1.3 cm x 0.8 cm x 0.3 cm
The sample consisted of a fragment of a fibre cement material.
Chrysotile (Estimated approximate weight= 0.044g) asbestos and Amosite (Estimated approximate weight= 0.0037g) asbestos detected.
Estimated approximate total weight of asbestos = 0.0477g
Approximate total weight of ACM = 0.37g
Estimated approximate w/w % = 12.9%

Sample No. 5. ASET43609 / 46789 / 5. BH 03 - 1.0.
Approx dimensions 12.0 cm x 10.0 cm x 6.0 cm
Approx total weight of soil sample = 780.0g
The sample consisted of a mixture of clayish soil, stones, plant matter and fragments of plaster, cement and brick.
No asbestos detected.

Sample No. 6. ASET43609 / 46789 / 6. BH 03 - 4.0
Approx dimensions 12.0 cm x 10.0 cm x 5.9 cm
Approx total weight of soil sample = 842.0g
The sample consisted of a mixture of clayish soil, stones, plant matter, fragments of plaster, cement and glass.
No asbestos detected.

Sample No. 7. ASET43609 / 46789 / 7. BH 03 - 4.0 AS.
Approx dimensions 4.5 cm x 3.2 cm x 0.4 cm
The sample consisted of a fragment of a fibre cement material.
Chrysotile (Estimated approximate weight= 0.48g) asbestos detected.
Estimated approximate total weight of asbestos = 0.48g
Approximate total weight of ACM = 4.8g
Estimated approximate w/w % = 10%

Sample No. 8. ASET43609 / 46789 / 8. BH 04 - 2.0.
Approx dimensions 11.0 cm x 10.0 cm x 6.2 cm
Approx total weight of soil sample = 780.0g
The sample consisted of a mixture of clayish sandy soil, stones, plant matter, fragments of plaster, cement, bitumen and glass.
No asbestos detected.

Sample No. 9. ASET43609 / 46789 / 9. BH 05 - 1.5.
Approx dimensions 12.0 cm x 12.0 cm x 5.8 cm
Approx total weight of soil sample = 880.0g
The sample consisted of a mixture of clayish sandy soil, stones, plant matter, fragments of plaster, cement and glass.
No asbestos detected.

Sample No. 10. ASET43609 / 46789 / 10. BH 06 - 1.0.
Approx dimensions 12.0 cm x 11.0 cm x 5.7 cm
Approx total weight of soil sample = 823.0g
The sample consisted of a mixture of clayish sandy soil, stones, plant matter, fragments of plaster, cement and brick.
No asbestos detected.

Sample No. 11. ASET43609 / 46789 / 11. BH 07 - 1.5.
Approx dimensions 12.0 cm x 10.0 cm x 6.0 cm
Approx total weight of soil sample = 858.0g
The sample consisted of a mixture of clayish sandy soil, stones, plant matter, fragments of plaster, cement and brick.
No asbestos detected.

Sample No. 12. ASET43609 / 46789 / 12. BH 08 - 1.0.
Approx dimensions 12.0 cm x 10.0 cm x 5.5 cm
Approx total weight of soil sample = 768.0g
The sample consisted of a mixture of clayish sandy soil, sandstone, stones, plant matter, fragments of plaster, cement, coal like material and glass
No asbestos detected.

Sample No. 13. ASET43609 / 46789 / 13. BH 08 - 2.0
Approx dimensions 12.0 cm x 10.0 cm x 5.6 cm
Approx total weight of soil sample = 747.0g
The sample consisted of a mixture of clayish soil, stones, plant matter, fragments of plaster, bitumen, glass and corroded metal
No asbestos detected.

Sample No. 14. ASET43609 / 46789 / 14. BH 09 - 1.1.
Approx dimensions 12.0 cm x 11.0 cm x 5.0 cm
Approx total weight of soil sample = 752.0g
The sample consisted of a mixture of clayish soil, stones, plant matter and fragments of plaster, cement, corroded metal and brick.
No asbestos detected.

Sample No. 15. ASET43609 / 46789 / 15. BH 10 - 0.5.
Approx dimensions 12.0 cm x 11.0 cm x 5.5 cm
Approx total weight of soil sample = 892.0g
The sample consisted of a mixture of clayish sandy soil, stones, fragments of plaster, cement, glass and brick.
No asbestos detected.

Sample No. 16. ASET43609 / 46789 / 16. BH 11- 1.5.
Approx dimensions 12.0 cm x 11.0 cm x 5.6 cm
Approx total weight of soil sample = 780.0g
The sample consisted of a mixture of clayish sandy soil, stones, sandstone, plant matter , fragments of plaster, cement and brick.
No asbestos detected.

Sample No. 17. ASET43609 / 46789 / 17. BH 11 - 3.0.
Approx dimensions 12.0 cm x 10.0 cm x 6.5 cm
The sample consisted of a mixture of clayish sandy soil, stones, plant matter, fragments of plaster, fibre cement^, cement and brick.
Chrysotile^ (Approximate weight= 0.02g) asbestos detected.
Approximate total weight of asbestos (AF/loose fibres) = 0.02g
Approximate total weight soil = 877.0g
Approximate total % w/w = 0.002%

Sample No. 18. ASET43609 / 46789 / 18. BH 12 - 3.0.
Approx dimensions 11.0 cm x 11.0 cm x 6.5 cm
Approx total weight of soil sample = 940.0g
The sample consisted of a mixture of clayish sandy soil, stones, sandstone, plant matter, fragments of plaster, cement, coal like material and brick.
No asbestos detected.

Sample No. 19. ASET43609 / 46789 / 19. BH 13 - 2.0.
Approx dimensions 12.0 cm x 12.0 cm x 5.5 cm
Approx total weight of soil sample = 971.0g
The sample consisted of a mixture of clayish sandy soil, stones, plant matter, fragments of plaster, cement, glass and brick.
No asbestos detected.

Sample No. 20. ASET43609 / 46789 / 20. BH 14 - 2.5.
Approx dimensions 12.0 cm x 12.0 cm x 6.0 cm
Approx total weight of soil sample = 1020.0g
The sample consisted of a mixture of clayish sandy soil, stones, plant matter , fragments of plaster, paint flakes, cement, glass and brick.
No asbestos detected.

Sample No. 21. ASET43609 / 46789 / 21. BH 09 - AS
Approx dimensions 6.5 cm x 4.2 cm x 0.3 cm
The sample consisted of a fibrous mass of organic fibres
No asbestos detected.

Sample No. 22. ASET43609 / 46789 / 22. BH 15 - 1.5.
Approx dimensions 12.0 cm x 10.0 cm x 6.2 cm
Approx total weight of soil sample = 870.0g
The sample consisted of a mixture of clayish sandy soil, stones, fragments of plaster, brick, cement, bitumen and glass.
No asbestos detected.

Sample No. 23. ASET43609 / 46789 / 23. BH 15 - 4.0.
Approx dimensions 12.0 cm x 12.0 cm x 5.0 cm
Approx total weight of soil sample = 905.0g
The sample consisted of a mixture of clayish sandy soil, stones, plant matter, fragments of plaster, brick, cement, and glass
No asbestos detected.

Sample No. 24. ASET43609 / 46789 / 24. BH 15 - 4.0 AS.
Approx dimensions 0.8 cm x 0.6 cm x 0.1 cm
The sample consisted of a fibrous mass of organic fibres.
No asbestos detected.

Sample No. 25. ASET43609 / 46789 / 25. BH 16 - 2.0.
Approx dimensions 12.0 cm x 11.0 cm x 6.5 cm
Approx total weight of soil sample = 938.0g
The sample consisted of a mixture of clayish sandy soil, stones, plant matter , fragments of plaster, cement, coal like material and brick.
No asbestos detected.

Sample No. 26. ASET43609 / 46789 / 26. BH 17 - 3.0.
Approx dimensions 12.0 cm x 10.0 cm x 6.0 cm
The sample consisted of a mixture of clayish sandy soil, stones, plant mater, fibres^, fragments of plaster, cement, glass and brick.
Chrysotile^ (Approximate weight= 0.1g) asbestos detected.
Approximate total weight of asbestos (AF / Loose fibres) = 0.1g
Approximate total weight of soil = 851.0g
Estimated approximate w/w % = 0.01 %

Sample No. 27. ASET43609 / 46789 / 27. BH 17 - 3.0 AS.
Approx dimensions 4.8 cm x 3.2 cm x 0.4 cm
The sample consisted of a fragment of a fibre cement material.
Chrysotile (Estimated approximate weight= 0.69g) asbestos and Amosite (Estimated approximate weight= 0.11g) asbestos detected.
Estimated approximate total weight of asbestos = 0.8g
Approximate total weight of ACM = 5.8g
Estimated approximate w/w % = 13.8%

Sample No. 28. ASET43609 / 46789 / 28. BH 18 - 2.5.
Approx dimensions 12.0 cm x 12.0 cm x 5.8 cm
Approx total weight of soil sample = 738.0g
The sample consisted of a mixture of clayish sandy soil, stones, fragments of plaster, cement, coal like material, glass and brick.
No asbestos detected.

Sample No. 29. ASET43609 / 46789 / 29. BH 19 - 4.0.
Approx dimensions 11.0 cm x 10.0 cm x 5.2 cm
Approx total weight of soil sample = 770.0g
The sample consisted of a mixture of clayish soil, stones, plant matter, fragments of plaster, cement, coal like material, glass and brick .
No asbestos detected.

Sample No. 30. ASET43609 / 46789 / 30. BH 19 - 4.0 AS .
Approx dimensions 1.9 cm x 0.8 cm x 0.2 cm
The sample consisted of a fragment of a fibre cement material.
Chrysotile (Estimated approximate weight= 0.47g) asbestos and Amosite (Estimated approximate weight= 0.09g) asbestos detected.
Estimated approximate total weight of asbestos = 0.56g
Approximate total weight of ACM = 4.7g
Estimated approximate w/w % = 11.9%

Sample No. 31. ASET43609 / 46789 / 31. BH 20 - 1.0.
Approx dimensions 10.0 cm x 10.0 cm x 7.0 cm
The sample consisted of a mixture of clayish sandy soil, stone, plant matter, fragments of cement, bitumen and plaster.
No asbestos detected.

Sample No. 32. ASET43609 / 46789 / 32. BH 20 - 4.0.
Approx dimensions 12.0 cm x 12.0 cm x 5.2 cm
Approx total weight of soil sample = 829.0g
The sample consisted of a mixture of clayish sandy soil, stones, plant matter, fragments of plaster, cement, coal like material, glass and brick
No asbestos detected.

Sample No. 33. ASET43609/ 46789/ 33. BH 14 - AS.
Approx dimensions 1.8 cm x 1.5 cm x 0.4 cm
The sample consisted of a fragment of a fibre cement material.
Chrysotile (Estimated approximate weight= 0.57g) asbestos detected.
Estimated approximate total weight of asbestos = 0.57g
Approximate total weight of ACM = 4.8g
Estimated approximate w/w % = 11.9%

Analysed and reported by,

Chamath Annakkage. BSc
Environmental Technician/Approved Identifier

Mahen De Silva. BSc, MSc, Grad Dip (Occ Hyg)
Occupational Hygienist / Approved Signatory

Accredited for compliance with ISO/IEC 17025.

This report is consistent with the analytical procedures and reporting recommendations in the Western Australia Guidelines for the Assessment Remediation and Management of Asbestos contaminated sites in Western Australia and it also satisfies the requirements of the current NEPM Guidelines. NATA Accreditation does not cover the performance of this service (NATA ISO/IEC17025 AUG 2014).

Disclaimers;

The approx; weights given above can be used only as a guide. They do not represent absolute weights of each kind of asbestos, as it is impossible to extract all loose fibres from soil and other asbestos containing building material samples using this method. However above figures may be used as closest approximations to the exact values in each case. Estimation and/ or reporting of asbestos fibre weights in asbestos containing materials and soil is out of the Scope of the NATA Accreditation. NATA Accreditation only covers the qualitative part of the results reported.

ACM - Asbestos Containing Material - Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Here taken to be sound material, even as fragments and not fitting through a 7mm X 7 mm sieve.

AF -Includes asbestos free fibres, small fibre bundles and also ACM fragments that pass through a 7mm X 7 mm sieve.

FA -Friable asbestos material such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products.

^ denotes loose fibres of relevant asbestos types detected in soil/dust and fragments of ACM smaller than 7mm diameter.
*** denotes asbestos detected in ACM in bonded form.**
 # denotes AF.

All samples indicating "No asbestos detected" are assumed to be less than 0.001 % unless the actual approximate weight is given.

The results contained in this report relate only to the samples submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample is representative.

APPENDIX C – QUALITY ASSURANCE / QUALITY CONTROL

Appendix C1 – Field Quality Control

During the assessment of contaminated sites, the integrity of data collected is considered paramount. With the assessment of the Site, a number of measures were taken to ensure the quality of the data. These included:

Sample Containers

Soil samples collected during the investigation were placed immediately into laboratory prepared glass jars with Teflon lid inserts. Standard identification labels were adhered to each individual container and labelled according to depth, date, sampling team and media collected.

Decontamination

All equipment used in the sampling program which includes a hand auger, spades and mixing bowl was decontaminated prior to use and between samples to prevent cross contamination. Decontamination of equipment involved the following procedures:

- Cleaning equipment in potable water to remove gross contamination;
- Cleaning in a solution of Decon 90; and,
- Rinsing in clean demineralised water then wiping with clean lint free cloths.

Sample Tracking, Identification and Holding Times

All samples were forwarded to Envirolab Services and SGS Australia under recognised chain of custodies with clear identification outlining the date, location, sampler and sample ID. All samples were recorded by the laboratory as meeting their respective holding times. The sample tracking system is considered adequate for the purposes of sample collection.

Sample Transport

All samples were packed into an esky with ice from the time of collection. These were transported under chain of custody from the site to Envirolab Services Pty Ltd and SGS Australia, NATA registered laboratories located in Chatswood and Alexandria respectively. During the project, the laboratory reported that all the samples arrived intact and were analysed within holding times for the respective analytes. Samples were kept below 4°C at all times. All Trip Spike results were within acceptance criteria providing validation that the transport procedures were satisfactory.

Field Duplicate Samples

Field duplicate samples for soil were prepared in the field through the following process:

- A larger than normal quantity of soil is recovered from the sample location selected for duplication;
- The sample is placed in a decontaminated stainless bowl and mixed as thoroughly as practicable before being divided into equal parts;
- Two portions of the sub-sample are immediately transferred, one for an intra-laboratory duplicate and another as a sample; and,
- Samples are placed into a labelled, laboratory supplied 250ml glass jar and sealed with an airtight, Teflon screw top lid. The fully filled jars are labelled as the sample and duplicate and immediately placed in a chilled esky.

Duplicate samples were prepared on the basis of sample numbers recovered during the field work. The duplicate sample frequency was computed using the total number of samples analysed as part of this assessment. The duplicate sample frequencies are shown below:

Soil Samples	25 Samples	3 intra-laboratory duplicates	12%
		2 inter-laboratory duplicates	8%

An intra-laboratory duplicate rate of 12% was achieved, greater than the 10% required by the Field Quality Plan. An inter-laboratory duplicate rate of 8% was achieved, greater than the 5% required by the Field Quality Plan. The QC sampling frequencies were therefore above the nominated rate.

Comparisons were made of the laboratory test results for the duplicate samples with the original samples and the Relative Percentage Difference (RPD) calculated as difference / average in order to assess the accuracy of the sampling and laboratory test procedures. The comparisons between the duplicates and original samples indicate acceptable RPDs when they comply with criteria which are commonly set at:

- Less than 30% for inorganics and 50% for organics;
- Less than five times the Laboratory LOR; and,
- The difference between concentrations is less than 5% of the relevant HIL concentration.

RPDs are included in table C2. Minor RPD exceedances were reported for 2 samples, however as both concentrations were below the adopted site criteria it does not affect the outcome of the assessment.

Appendix C2 – Laboratory Analytical and Quality Plan

The integrity of analytical data provides the second step in the QA/QC process for total data compliance. The data validation techniques adopted by DLA are based upon techniques published by the USEPA and in line with methods and guidelines adopted by the NSW EPA and outlined in the NEPM (NEPC, 2013). Descriptions are provided of the specific mechanisms used in the assessment of accuracy, precision and useability of analytical data within the project.

Blanks

Blanks were used for the identification of false positive data. Laboratory blank samples were analysed. No cross contamination of samples is said to have occurred as a result of laboratory techniques provided all blanks show concentrations below the levels of detection. No results on blank samples were above the level of reporting for any determination during the project.

Spikes and Control Samples

Control sample spikes were utilised for determination of matrix recovery analysis. This involves analysis of spiked control samples and their duplicates, spiked with a known concentration of relative analyte. Accuracy was assessed by calculation of the percent recovery (%R). The duplicate sample spikes were used to assess the precision of the methods used. The recoveries for all matrix spike analysis were within the acceptance criteria of 60-140%.

Duplicates

Laboratory Duplicates are tested to ensure the results meet the requirements of QA/QC. The %RPD for the majority of the intra-laboratory and inter-laboratory duplicates had concentrations that complied with the criteria set for acceptable RPDs. Where deviation from the parameters set for RDPs were noted, the effects on the sampling methods and accuracy were not deemed significant.

Surrogates

To assess the performance of individual organic analysis the laboratory used surrogates. Recoveries were calculated for each surrogate providing an indication of analytical accuracy. Surrogate recoveries for soil samples were all within recommended control limits, indicating that there was an acceptable degree of accuracy in analysing for organic compounds.

Laboratory Detection Limits

Laboratory detection limits for soil and water analyses by Envirolab and SGS are outlined in **Table C1** below:

Table C1 – Method of Soil Analysis: Envirolab

Analyte	Method	Level of Reporting Soil mg/kg	
PAH	USEPA SW-846 Method 8270,	0.1 (Ind. Analyte)	
Metals	USEPA 200.7 USEPA 7471A	Hg	<0.10
		As-Cd-Cr-Cu	<0.10
		Ni-Pb-Zn	<0.5
Pesticides	USEPA SW-846 Method 8081 USEPA SW-846 Method 8140 USEPA SW-846 Method 8080 USEPA SW-846 Method 8870	OCP	0.10
		OPP	0.10
PCB	USEPA SW-846 Method 8080 USEPA SW-846 Method 8081	PCB	0.10
BTEX	USEPA SW-846 Method 8260	Benzene	1.0
		Toluene	1.0
		Ethylbenzene	1.0
		Total Xylene	3.0
TRH	USEPA SW-846 Method 8260 USEPA SW-846 Method 8000	C6-C9	25
		C10-C14	50
		C15-C28	100
		C29-C36	100

Table C2 – Method of Soil Analysis: SGS

Analyte	Method	Level of Reporting Soil mg/kg	
PAH	US EPA SW 846 Method 8270C SGS Method ID SEO-030 - In house method.	Ind. Analyte Benzo[b+k] fluoranthene Benzo(a)Pyrene	0.1 0.5 0.05
Metals	SGS Method ID SEM-005 - In house method. ICP-OES US EPA SW 846 Method 6010B SGS Method ID SEM-010 - In house method.	Hg Ni Cd-Cr Cu-Zn Pb As	0.05 0.5 0.3 0.5 2 3
Pesticides	US EPA SW 846 Method 8081B SGS Method ID SEO-005 - In house method.	OCP OPP	0.1 0.1
PCB	US EPA SW 846 Method 8082A SGS Method ID SEO-005 - In house method.	PCB	0.1
BTEX	US EPA SW 846 Method 8260 SGS Method ID SEO-017 - In house method.	Benzene Toluene Ethylbenzene Total Xylene	0.5 0.5 0.5 1.5
TRH	US EPA SW 846 Method 8260 SGS Method ID SEO-017 - In house method. US EPA SW 846 Methods 8015B SGS Method ID SEO-020 - In house method.	C6-C9 C10-C14 C15-C28 C29-C36	20 20 50 50

APPENDIX D – REMEDIATION ACTION PLAN (E3, 2012)

Greenway & Banks Realty Pty Ltd

Remediation Action Plan
Lot 12 DP1166540, Manchester Road, Auburn, NSW

Greenway & Banks Realty Pty Ltd
Remediation Action Plan Lot 12 DP1166540, Manchester Road, Auburn, NSW

9 July 2012

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Appendix C – Tables from E3 Report
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1 INTRODUCTION

E3 Consulting Australia Pty Ltd (E3) has been engaged by Greenway & Banks Realty Pty Ltd (Greenway & Banks) on behalf of Janyon Pty Ltd (Janyon) to prepare this Remediation Action Plan (RAP) for the remediation and validation of the property owned by Janyon and referred to as Lot 12 DP1166540 Manchester Road, Auburn NSW (the Site).

The remediation strategy adopted in this RAP has been developed as part of the overall strategy for the redevelopment of the Site for commercial/industrial purposes. For the purposes of the redevelopment works, and as adopted in this RAP, the southern portion of the Site is referred to as' Area A' and the northern portion of the Site is referred to as 'Area B'. The location of the Site is presented in Figure 1 and the layout of the Site and Areas A and B are presented on Figure 2.

Previous investigations conducted on the Site since 1995 identified concentrations of lead, benzo(a)pyrene (BaP), total polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) and asbestos(both bonded and friable) in stockpiles and in surface and near surface fill materials greater than the criteria for commercial/industrial land use across the Site. In order for the Site to be suitable for the proposed redevelopment, this identified contamination requires remediation.

This RAP sets out the requirements for remediation and validation works that are required to be undertaken to ensure that the Site will be suitable for the proposed use. It is understood that the remediation works contemplated in this RAP will be undertaken during the redevelopment of the Site. The remediation strategy adopted in this RAP details a series of measures including the requirements for remediation and validation works including, material tracking requirements during the remediation works, the design parameters for the proposed remedial measures and the program for the validation works to be undertaken to confirm the suitability of the Site for the commercial/industrial land use.

The overall approach to the remediation of the Site involves the relocation of stockpiles from Area A, as well the remediation of fill materials present across the Area A, identified to contain concentrations of contaminants greater than the criteria for commercial/industrial land use, and placement of these materials onto Area B for long-term containment.

This RAP has been prepared, where possible and relevant, with reference to the requirements of the NSW Office of Environment and Heritage (NSW OE&H) (2011) *Guidelines for Consultants Reporting on Contaminated Sites*.

Janyon, who are the owners of the Site, have engaged a NSW EPA Accredited Site Auditor, Mr Andrew Lau of JBS Environmental Pty Ltd, to endorse this RAP and ultimately certify the suitability of the Site for the proposed use. E3 understand that the Site is not required and has not been notified to NSW OE&H under Section 60 of the *Contaminated Land Management Act* 1997 (the CLM Act) and is not being regulated under the CLM Act.

1.1 Definition of areas referenced in this RAP

The following areas are referred to within this RAP:

- The Site comprising the entire Lot 12 DP1166540 located on Manchester Road, Auburn NSW, formerly known as Lot 2 Manchester Road excluding the area of land transferred to the Transport Construction Authority (TCA) in August 2011 as shown on the survey plan presented in Appendix A;
- Area A comprising the southern portion of Lot 12 DP1166540 and an area of 49372 m^2 that is proposed to be ultimately subdivided into smaller lots for commercial/industrial development, as shown on Figure 2;
- Area B comprising the northern portion of Lot 12 DP1166540 and a strip of land from the south-eastern corner of this northern portion and an area of 11669 m^2, that is proposed to be subdivided into a single lot, referred to as a Superlot, as shown on Figure 2;
- The Transport for New South Wales (TfNSW) Section, comprising the area of the former Lot 2 Manchester Road, Auburn NSW acquired by the TCA in August 2011 and now identified as Lot 15 DP1166540;
- The TfNSW Easement, comprising a narrow strip of land located within the Site that is an easement for the purposes of construction of rail facilities and ongoing maintenance on the TfNSW Section as shown on subdivision plan presented in Appendix A.

The location of the Site is presented on Figure 1 and the layout of the areas defined above is presented on Figure 2.

1.2 Site Description

The Site has an irregular triangular shape of approximately 6.1041 ha (calculated from Registered Survey plan of the Site as presented in Appendix A) onto which;

- Fill materials have been historically placed over the entire Site – referred to as the "Site-wide Fill Materials". The Site-wide Fill Materials overlie the natural soils and Wianamatta Shale bedrock. It is understood that the Site-wide Fill Materials were placed on the Site prior to 1998;
- A stockpile, approximately (by survey) 140 m long x 90m wide (at the widest point) x 3-4 m high with an estimated volume of 30,400 m^3, formerly present on the northern part of the Site, was relocated in early 2000s to the southern part of the Site – this stockpile is referred to as the "Relocated Stockpile". The Relocated Stockpile has been placed on the Site-wide Fill Materials and is located on the northern to central part of Area A;
- A stockpile, reported to contain asbestos containing materials (ACM), approximately (by survey) 55 m long x 25 m wide x from 1.5 to 2 m high with an estimated volume of 1,150 m^3, is present on the western part of Area A – this stockpile is referred to as the "Asbestos-containing Stockpile". The Asbestos-containing Stockpile has been placed on the Site-wide Fill Materials;

- A gravel stockpile, approximately (by survey) 85 m long x 45 m wide and from 1 m (western side) to 3 m high (north-eastern side) with an estimated volume of 4,400 m^3,– this stockpile is referred to as the “Gravel Stockpile”. The Gravel Stockpile has been placed on the Site-wide Fill Materials and is located on the eastern part of Area A; and
- In the northern part of the Site, a fenceline encloses an area of 0.5772 ha on which, based on information provided by Greenway & Banks, materials excavated from the neighbouring property, formerly known as Lot 1 Manchester Road, were placed. These materials are referred to as the “Remnant Stockpile” and are located on Area B.

The location of these stockpiles are presented on Figure 2.

1.3 Persons referred to in this RAP

Within this RAP the following persons are referred to:

- Janyon Pty Ltd (Janyon) – Land Owner and Developer;
- Greenway & Banks Realty Pty Ltd (Greenway & Banks) – Realtor working on behalf of Janyon
- Remediation Contractor – the party contracted to undertake the remediation works and responsible for undertaking the remediation excavations as described in this RAP and following the guidance given in this RAP;
- Remediation Consultant – the environmental consultant contracted to undertake investigation works and validation of the remediation works as specified in this RAP;
- E3 (Environmental Consultant) – the environmental consultant engaged by Janyon to prepare this RAP;
- NSW EPA Accredited Site Auditor (Site Auditor) – Andrew Lau of JBS Environmental Pty Ltd has been engaged by Janyon to certify the suitability of the Site for the proposed land use at the completion of the remediation works. This RAP will be subject to the review and endorsement of the Site Auditor and the Site Auditor will be required to issue a Section B Site Audit Statement on the RAP prior to the commencement of the remediation works; and
- Auburn City Council (Council) – Local Council who would issue the DA for the redevelopment of the Site, for which this RAP comprises one part of the application.

1.4 Objectives of the Remediation Works

The objective of the remediation works are to ensure that the Site, being separated as Area A and Area B, are suitable for commercial/industrial land use.

1.5 Objectives of the RAP

The objectives of this RAP are to:

- Define the remedial goals;
- Identify any regulatory approvals or licences required by the proposed works;
- Document the remediation and validation strategy and provide an outline of the remediation works required; and
- Document the outline of the contingency, environmental management and occupational health and safety procedures to be implemented during the remedial works.

1.6 Scope of this RAP

The scope of this RAP is to:

- Summarise the history of use of the Site;
- Summarise the previous environmental investigations conducted on the Site;
- Identify the requirements for a pre-remediation groundwater monitoring event on the monitoring wells present across the Site to assess the pre-remediation groundwater conditions;
- Identify the requirements for additional investigations required to be conducted prior to remediation works;
- Identify areas and contaminants of concern that require remediation;
- Evaluate the feasible remediation option/s for the Site;
- Detail the preferred remediation option/s;
- Detail the remediation approach and strategy;
- Detail the scope of the remediation works;
- Describe operational procedures that will be undertaken by the Remediation Contractor, such as excavation, stockpiling of material, materials management and transportation of material to the proposed placement site being part of Area B;
- Define the validation sampling, analytical and quality plan to be developed and implemented by the Remediation Consultant to demonstrate the successful completion of the remediation works, including the requirement for a post-remediation groundwater monitoring event; and
- Set out occupational health and safety and environmental management plan for the remediation and validation works so that the appropriate plans can be developed and implemented by the Remediation Contractor during the remediation works.

2 BACKGROUND INFORMATION

The Site was used as railway land, with train movements and storage on-site from the earliest recorded operations in 1951 through till some point prior to September 1991 (Woodward Clyde, 1997). Between 1970 and 1978 a stockpile of material was placed on the northern part of the Site (Area B). At some point between 2000 and 2010 a significant portion of this stockpile was moved to the southern part of the Site (Area A).

A number of investigations have taken place at the Site since 1995 to characterise the stockpiled materials and sub-surface soils across the Site. The results of the previous investigations on the Site have identified concentrations of TPH, lead, and PAHs in stockpiled and sub-surface soils that were greater than the criteria for commercial/ industrial land use and as such require remediation in order for the Site to be suitable for the proposed land use.

A brief summary of the previous investigations undertaken which provide the context for development of the remediation goals and of the scope of the remediation works presented in later sections of this RAP, is provided below.

2.1 Previous Investigations

In 2010 E3 were engaged by Greenway & Banks to conduct a review of a number of reports provided by Greenway & Banks of the previous investigations and remedial planning completed for the Site as follows:

- '*Phase 1 Contamination Assessment of Lot 1 Manchester Road, Auburn and a Phase 1 and Phase 2 (Combined) Contamination Assessment of Lot 2 Manchester Road, Auburn*' prepared by Woodward Clyde, dated 13 August 1997 – Complete report provided to E3 for review;
- '*Phase 2 Contamination Investigation of Lot 2 Manchester Road, Auburn*' prepared by Woodward Clyde dated 2 March 1998 – Incomplete report provided to E3 for review – Identified missing information part of one final laboratory analytical report;
- '*Final Draft Remedial Action Plan, Lot 2 Manchester Road, Auburn NSW*', prepared by PPK, dated April 2000 – Incomplete report provided to E3 for review. Identified missing information - Figure 2; and
- '*Remediation Action Plan, Northwestern Portion Lot 2 Manchester Road, Auburn NSW*', prepared by NA, dated May 2009 – Complete report provided to E3 for review.

The reports on the previous investigations indicated that the Site was formerly used for railways purposes and that fill materials have been placed across the entire Site to depths ranging from approximately 0.8 m to 3 m over natural clay soils, which overlie the shale bedrock. Concentrations of some metals and TPH have been identified to be present in the Site-wide Fill Materials. ACM were also identified in the Site-wide Fill Materials in the north-western part of the Site and in the centre of the Site.

A large stockpile of fill materials was present in the northern portion of the Site, referred to in this RAP as Area B, during each investigation conducted to 2000, but only a small number of samples were collected and analysed from these materials. Information from Greenway & Banks confirmed that this stockpile was relocated to the southern portion of the Site, referred to in this RAP as Area A, after 2000 (referred to as the Relocated Stockpile).

Assessment of groundwater quality was reported from three wells located in the southern part of the Site by Woodward Clyde. The groundwater results indicated the presence of low concentrations of heavy metals.

Following review of the previous investigations, E3 completed an environmental assessment on the Site that was designed to assess the current environmental condition of the Site by addressing the data gaps and uncertainties identified by review of previous investigations that had been conducted on the Site since 1997, and by addressing changes to the condition of the Site that had occurred since 2000. The results of this environmental assessment were reported within '*Environmental Assessment, Lot 2 Manchester Road Auburn*' prepared by E3, dated 15 April 2011 (the E3 Report).

A summary of the history of activities undertaken on the Site and the results of the E3 environmental assessment is provided below. The figures from the E3 Report are provided in Appendix B and the tables are provided in Appendix C.

2.2 History of activities at the Site

The E3 review of the previous investigations conducted at the Site identified the following historical uses of the Site:

- Prior to 1911 the Site was not industrially developed, though some residential development may have occurred in the eastern end of the Site;
- Between 1911 and 1915 the Site was purchased by the Chief Commissioner for Railways and Tramways, to add extra shunting yards for the nearby Clyde Workshops and Marshalling Yards. The Site was used for storage of trains, box cars and containers on or adjacent to railway lines and for parking;
- Between 1970 and 1978 a large stockpile of material was placed within the Northern Section. and
- In 1989 the Site was transferred to Janyon.

In 1997 a site inspection undertaken by Woodward Clyde (Ref) reported that the Site contained a disused toilet block, an old train platform, a concrete tank stand and the Site was used for temporary storage of formwork. A set of goal posts and usage of an area as a sports field was also reported but it is unclear from the report whether this is in reference to the Site or an adjacent area.

2.3 Results of E3 Environmental Site Assessment (E3 Report)

The results of the environmental assessment conducted by E3 (see Appendix B and C) identified that the Site was vacant land that was covered with a variety of vegetation types, including grasses, reeds, small shrubs and larger stands of trees in the south-western corner of the Site and some larger well-established trees present along the south-eastern boundary of the Site parallel with Manchester Road. The surface of the Site was noted to be generally uneven with filled areas in the eastern and northern portions of the Site. Three significant stockpiles were identified to be present on Site as follows:

- The Relocated Stockpile, located in the centre of the Site on Area A, was approximately 4 m higher than the ground surface;
- The Asbestos-containing Stockpile, located to the west of the Site on Area A, was approximately 2 m higher than the ground surface; and
- The Gravel Stockpile, located to the east of the Relocated Stockpile on Area A, was approximately 2 m higher than the ground surface.

A fenceline was also noted to enclose a smaller area in the northern part of the Site, on Area B, referred to as the Remnant Stockpile. Based on information provided by Greenway & Banks it was understood that materials were excavated from Lot 1 Manchester Road (now known as Lot 11 DP 1166540) and were placed in the area of the Site bound by this fenceline. For the purpose of the E3 environmental assessment the materials within the area defined as the Remnant Stockpile were referred to as fill materials, rather than stockpile materials.

The sampling and analytical plan completed for the intrusive investigations conducted on the Site during the environmental assessment works by E3 are detailed in the E3 Report, are shown on Figure 3 and summarised in the table below. It is noted that for the purposes of the E3 environmental assessment, the Site was divided into the Northern Portion of the Site and the Southern Portion of the Site, which in general correspond to division of the Site for the redevelopment and this RAP as Area B and Area A, respectively. It is noted that since the E3 environmental assessment the total surface area of the Site has decreased due to the acquisition of a strip of land along the northern boundary of the Site by TfNSW (as shown in Figure 2). The surface areas presented in the table below are as they were at the time of the E3 environmental assessment. For the purpose of comparison and to ensure completeness, the current surface areas for the division of the Site that applies to this RAP, and the corresponding sampling locations completed during the E3 environmental assessment are also presented in the table below in the rows highlighted in grey.

Table 1: Sampling and Analytical Plan

Location	Number of Sampling Locations and Sampling Density	Number of Analyses
Southern Portion of Site – 53585 m^2		

Location	Number of Sampling Locations and Sampling Density	Number of Analyses
Area of Southern Portion of Site not covered by stockpiles – 29385 m^2	20 Test-pits – TP1 to TP20 (completed on a 40 m grid and into natural soil materials) 2 Existing Groundwater wells – MW01 and MW02 (screened through the natural clays) 1 Installed Groundwater wells to replace missing MW03 – EW06 (screened through the natural clays)	**Site-wide Fill Materials** – 26 Primary, 4 Intra-lab Dups, 2 Inter-lab Dups for variable analysis for TPH, BTEX, metals, PAHs, OCPs, PCBs; 13 Primary for asbestos **Natural soils** – 5 Primary, 1 Intra-lab Dup for variable analysis for TPH, BTEX, metals, PAHs, OCPs, PCBs 4 Primary for asbestos
Area A - 49372 m^2		
Area of Area A not covered by stockpiles – 31597 m^2	As above for Southern Portion of the Site with exception of the addition of 1 test-pit – TP21	
Stockpiled Materials		
Relocated Stockpile - 19000 m^2 Volume – 33300 m^3	20 Test pits – RS1 to RS20 (completed on a 25 m grid around flanks of stockpile and into natural soil materials) 9 Boreholes – BH1 to BH9 (completed on a 25 m across the top of the stockpile and into natural soil materials) 1 Installed Groundwater Well – EW9 (screened through the stockpiled material only)	**Stockpiled Material and Site-wide Fill Materials** – 43 Primary, 9 Intra-lab Dups, 4 Inter-lab Dups for variable analysis for TPH, BTEX, metals, PAHs, OCPs, PCBs; 31 Primary for asbestos **Natural soils** – 5 Primary - TPH, BTEX, metals and PAHs 2 Primary for asbestos
Relocated Stockpile – 12600 m^2 Volume – 30400 m^3	As above for Relocation Stockpile with exception of the removal of RS12, RS11, RS10 all of which are now located within Area B boundaries	
Asbestos-containing Stockpile – 1375 m^2 Volume – 1150 m^3	8 Test pits – AS1 to AS8 (completed on a 12 m grid across whole of stockpile and into natural soil materials)	**Stockpiled Material and Site-wide Fill Materials** – 11 Primary, 1 Intra-lab Dups for variable analysis for TPH, BTEX, metals, PAHs, OCPs, PCBs; 12 Primary for asbestos **Natural soils** – 2 Primary - TPH, BTEX, metals and PAHs 2 Primary for asbestos

Location	Number of Sampling Locations and Sampling Density	Number of Analyses
Asbestos-containing Stockpile – 1375 m^2 Volume – 1150 m^3	As above for Asbestos-containing Stockpile, no change	
Gravel Stockpile – 3825 m^2 Volume – 5300 m^3	6 Test pits – GS1 to GS6 (completed on a 22 m grid across whole of stockpile and into natural soil materials)	**Stockpiled Material and Site-wide Fill Materials** – 9 Primary, 3 Intra-lab Dups, 1 Inter-lab Dup for variable analysis for TPH, BTEX, metals, PAHs, OCPs, PCBs; 2 Primary for asbestos **Natural soils** – 3 Primary - TPH, BTEX, metals and PAHs
Gravel Stockpile – 3800 m^2 Volume – 4440 m^3	As above for Gravel Stockpile, no change	
Northern Portion - 11660 m^2		
Northern Portion of Site – 11660 m^2	21 Test-pits – TP21 to TP42 (completed on a 25 m grid and into natural soil materials)	**Site-wide Fill Materials** – 44 Primary, 8 Intra-lab Dups, 5 Inter-lab Dup for variable analysis for TPH, BTEX, metals, PAHs, OCPs, PCBs; 44 Primary for asbestos **Natural soils** – 8 Primary - TPH, BTEX, metals and PAHs 4 Primary for asbestos
Area B – 116699 m^2		
Area B – 116699 m^2	As for Northern Portion of Site with the exception of the addition of RS12, RS11, RS10 and removal of TP21	

The results of the intrusive investigations conducted as part of the environmental assessment identified the presence of significantly heterogeneous fill materials (Site-wide Fill Materials) across the Site, including underlying the stockpiles, that in general did not contain concentrations of chemical of potential concern that were greater than the adopted criteria for commercial/industrial land use, however, asbestos containing materials and fibrous asbestos was identified to be present in the fill materials on the Site.

The materials present in the stockpiles on the Site were identified to be significantly heterogeneous and, similar to the Site-wide Fill Materials, generally contained concentrations of chemicals of potential concern that were less than the adopted criteria

for commercial/industrial land use, however, in many locations asbestos containing materials and fibrous asbestos has been identified.

Much of the fill materials and stockpiled materials contained a significant volume of foreign materials, of which a high proportion, appeared to be associated with railway uses and includes, gravels, railway tracks, train brake pads, glass and scrap metal.

Natural clay soils were encountered across the Site underlying the Site-wide Fill Materials. No staining or odours were observed in the natural clays sampled and analysis of samples of natural clay soils from across the Site reported concentrations of chemicals of potential concern that were less than the adopted criteria for commercial/industrial land use. ACM or asbestos fibres were not observed or identified in the natural clay soils on the Site.

Groundwater was identified during the environment assessment to be present in a perched system within the Site-wide Fill Materials and stockpiled materials and also in a shallow system present within the underlying natural clays that overlie the shale bedrock. Groundwater encountered in the Site-wide Fill Materials, the Relocated Stockpile and in the natural clay soils did not appear to contain concentrations of chemical of potential concern that were considered to be of significance.

A summary of the types of materials present on Area A and Area B, the underlying groundwater and their condition with respect to the proposed commercial/industrial land use as identified by the E3 investigations is provided below.

2.3.1 Area A

Across the southern part of the Site, that within this RAP is referred to as Area A, the Site-wide Fill Materials ranged from approximately 0.3 m to 1.6 m in thickness and comprise a dark-grey/black coloured ash and a sandy gravel fill matrix containing some rubble including brick, timber, wire and glass and asbestos cement fragments were identified at four locations, including one location that contained a large asbestos pipe.

The stockpile materials present on Area A are described below:

- **Relocated Stockpile**:
  - Comprised a dominant heterogeneous fill matrix comprising sandy clays, gravel clays and sandy gravels containing abundant rubble, including pieces of brick, timber, metal, glass, fabric, plastic and some asbestos-cement sheet fragments throughout. The fill and rubble matrix was interspersed with discontinuous layers of fine, blue/grey and coarse, black ash materials;
  - During the E3 investigations it was noted that the precise boundary between the stockpiled materials and Site-wide Fill Materials was difficult to determine due to the similarities of the materials. The Site-wide Fill Materials beneath the Relocated Stockpile were underlain by natural clays that were generally firm and of medium plasticity and were encountered generally 4 to 5 m below the top of the stockpile;

- Groundwater was present within voids and higher permeability fill materials within the Relocated Stockpile and in many locations was present at depth above the interface of the base of the stockpiled materials and the Site-wide Fill Materials. As part of E3's environmental assessment program a groundwater monitoring well was installed into the Relocated Stockpile and screened through the stockpiled materials.

- **Asbestos-containing Stockpile**
  - Comprised fairly uniform sandy clays and sandy gravels with rubble throughout, followed by a layer of combined fine, blue/grey and coarse, black ash. Rubble encountered in the fill matrix included pieces of timber, bricks, metal pins and train brake pads, metal sheeting, glass, fibreglass, fabric and steel plates. Many asbestos-cement sheet fragments were identified in all test pits;
  - The Asbestos-containing Stockpile was underlain by Site-wide Fill Materials that were dominated by sandy gravels and clays. During the E3 investigations it was noted that the precise boundary between the stockpiled materials and Site-wide Fill Materials was difficult to determine due to the similarities of the materials. The Site-wide Fill Materials beneath the Asbestos-containing Stockpile were underlain by natural clays that were generally firm and of medium plasticity and were encountered generally 1.5 to 2 m below the top of the stockpile;
  - No groundwaters or accumulated perched waters were encountered within the Asbestos-containing Stockpile during the investigation works;

- **Gravel Stockpile:**
  - Comprised generally homogeneous sandy gravel fill containing large boulders and concrete with some building demolition rubble, followed by a layer of coarse, black ash material. Rubble encountered in the fill materials consisted of pieces of wire, ballast, occasional slag, ceramic, plastic and bricks. Loose railway sleepers and segments of railway tracks were present on the top of the stockpile at the western end. Only one asbestos-cement sheet fragment, approximately 40 mm across, was observed at one location;
  - The Gravel Stockpile was underlain by Site-wide Fill Materials that were dominated by sandy gravels and clays. The Site-wide Fill Materials beneath the Gravel Stockpile were underlain by natural clays that were generally quite hard and of low to medium plasticity with some red ironstone present at approximately 2.3 m below the top of the stockpile.

As noted above, natural clay soils were encountered across Area A underlying the Site-wide Fill Materials and stockpiled materials. The natural clays were uniform, comprising buff to light brown clay that ranged from very soft, with high plasticity, to very hard, with low plasticity and was friable. No staining or odours were observed in the natural clays sampled from Area A

Groundwater was identified to be present beneath Area A within in a perched system within the Site-wide Fill Materials and stockpiled materials and also in a shallow system present within the underlying natural clays that overlie the shale bedrock as follows:

- The perched groundwater encountered in the Site-wide Fill Materials and in the stockpiled materials on Area A appeared to have accumulated in voids or in materials of higher permeability and at the interface of the fill materials and natural clay soils. Due to the highly unconsolidated and heterogeneous nature of the fill materials, it was considered that this perched groundwater would have limited lateral hydraulic connectivity and its movement would be primarily influenced by the permeability of the surrounding fill materials and the presence of preferential pathways. It was considered that the perched groundwater present in the Site-wide Fill Materials and in the stockpiled materials on Area A is likely to have some hydraulic connection with the underlying natural clays, although, any vertical migration of the perched groundwater to the underlying shallow groundwater would be restricted by the low permeability of the underlying natural clays; and
- The shallow groundwater was identified to be present within the underlying natural clays that overlie the shale bedrock and inferred groundwater contours indicated that groundwater in the natural clays generally flows in a westerly direction towards Duck River. Based on field observations during sampling the lateral migration of the groundwater present in the natural clays is very low due to the low permeability of the clays.

2.3.1.1 Results of Soil Analysis for Area A

Stockpile Materials

Analysis of samples from the stockpile materials within Area A (see Tables T2 to T10 in Appendix C) identified the following:

- **Relocated Stockpile:**
  - Concentrations of organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs) and benzene, toluene, ethylbenzene and total xylenes (BTEX) were reported at concentrations less than the EQLs at all locations analysed;
  - Concentrations of total TPHs (C_{10}-C_{36}) were greater than the adopted assessment criteria (NSW EPA, 1994 – considered to be conservative for commercial/industrial land use – see Section 4.4.1) at three locations in fill materials present between 0.4 and 3.5 m bgs;
  - Concentrations of metals that were greater than the adopted criteria for commercial/industrial land use were as follows:
    - Concentrations of lead at three locations in fill materials present between 1.2 and 3.5 m bgs.
  - Concentrations of PAHs that were greater than the adopted criteria for commercial/industrial use were as follows:

  - Concentrations of Benzo(a)pyrene at one location in fill materials present between 2.0 and 2.1m bgs;
- Asbestos fibres were reported at greater than the adopted criteria in eight locations with weight by weight analysis ranging from 0.003% to 0.482%;
- Fragments of ACM were observed to be present at a number of locations in volumes that were greater than the adopted criteria;

- **Asbestos-containing Stockpile:**
  - Concentrations of TPH, BTEX, PAHs, OCPs, PCBs and Metals were less than the criteria for commercial/industrial land use in all samples analysed;
  - Asbestos fibres were identified to be present in volumes that were greater than the adopted criteria at a number of locations;
  - Fragments of ACM were observed to be present at a number of locations in volumes that were greater than the adopted criteria;
- **Gravel Stockpile:**
  - Concentrations of TPH, BTEX, PAHs, OCPs, PCBs and Metals were less than the criteria for commercial/industrial land use in all samples analysed; and
  - Fragments of ACM were observed to be present at a number of locations in volumes that were greater than the adopted criteria.

Site-wide Fill Materials

Analysis of samples from the Site-wide Fill Materials within Area A (see Tables T2, T4, T6, T8, T9 and T10 in Appendix C) identified the following:

- Concentrations of BTEX, OCPs and PCBs were reported at concentrations less than the EQLs at all locations analysed across Area A;
- Concentrations of PAHs were not reported at concentrations greater than the adopted criteria for commercial/industrial use in any location analysed from Area A;
- Concentrations of TPH were not reported at concentrations greater than the adopted assessment criteria (NSW EPA, 1994 – considered to be conservative for commercial/industrial land use – see Section 4.4.1) in any location analysed from Area A;
- Concentrations of metals that were greater than the adopted criteria for commercial/industrial land use were as follows:
  - Concentrations of lead at two locations in fill materials present between 0.2 and 0.5 m bgs;
  - Concentrations of copper at one location in fill materials present between 0.4-0.5 m bgs;
- Fibrous asbestos was reported at greater than the adopted criteria in four locations with weight by weight analysis ranging from 0.003% to 1.077%;
- Asbestos fragments were visually identified at four locations in Area A.

In addition to the above, leachate analysis was undertaken on one sample of Site-wide Fill Materials from the one test pit location (TP18) on Area A (see Table T14 in Appendix B) which identified the following:

- Concentrations of PAHs in leachates conducted under acidic conditions on a sample of Site-wide Fill Materials containing containing slag (TP18B) were less than the laboratory detection limits.
    - Whilst the leachate analysis that had been conducted was limited, E3 considered that if these materials were not leaching PAHs under acidic conditions then there was no or negligible potential for them to leach PAHs under neutral conditions expected to be present due to rainfall or surface water infiltration. It was also noted that in the shallow groundwater present in the natural clays at monitoring well EW6, proximal to the location from which the sample of Site-wide Fill Materials was selected for leachate analysis, and in the other monitoring wells across the Site, reported concentrations of PAHs were less than the laboratory detection limits. The groundwater results combined with the low concentrations of PAHs reported in the Site-wide Fill Materials and the results of the leachate analysis indicated that there was no or negligible migration or potential migrations of PAHs from the Site-wide Fill Materials to groundwater within Area A on the Site;
- Concentrations of some metals in the leachate conducted under acidic and neutral conditions on Site-wide Fill Materials containing slag (TP18B) were greater than the adopted criteria. Significantly higher concentrations were reported in leachate completed under acidic conditions compared to the leachate completed under neutral conditions. Under neutral conditions the sample reported concentrations of copper, lead and zinc greater than the adopted criteria.
    - Whilst the leachate analysis that had been conducted was limited, E3 compared these results to the shallow groundwater present in the natural clays at monitoring well EW6 proximal to the locatios from which the sample of Site-wide Fill Materials was selected for leachate analysis. At EW6 the groundwater concentrations of copper, nickel and zinc were reported to be greater than the adopted criteria and that whilst concentrations of copper in groundwater were generally less than that reported in the neutral leachate, the concentrations of zinc in groundwater were similar to that reported in the neutral leachate. It was considered that these results, in combination with the absence of detectable concentrations of lead in groundwater and the absence of detectable concentrations of nickel in the neutral leachates, indicate that whist some metals in the Site-wide Fill Materials have the potential to leach under neutral conditions expected to be present due to rainfall or surface water infiltration, it was unlikely that there is a high potential for these metals to have migrated or to migrate to shallow groundwater on Area A.

Natural Clays

Analysis of samples of natural clay soils from across Area A (see Tables T9 and T10 in Appendix C) reported concentrations of TPH, BTEX, Metals, OCPs and PCBs that were less than the criteria for commercial/industrial land use. ACM or asbestos fibres were not observed or identified in the natural clay soils on Area A.

2.3.1.2 Results of Groundwater Analysis for Area A

Analysis of groundwater samples from the two existing monitoring wells (MW1 and MW2) and the two monitoring wells installed within Area A (EW6, EW9) (see Table T13 in Appendix C) identified the following:

- Concentrations of metals that were reported at greater than the adopted assessment criteria as follows:
    - Perched Groundwater present in Relocated Stockpile:
        - EW9 - – Copper, Nickel and Zinc.
    - Shallow Groundwater present in natural clays:
        - MW1 - Copper
        - MW2– Zinc
        - EW6 – Nickel and Zinc

      It is noted that the highest concentrations of metals reported were in the perched groundwater sampled from EW9.
- Concentrations of remaining metals were reported at either less than the adopted assessment criteria or less than the EQLs; and
- Concentrations of TPHs, BTEX, PAHs and Volatile Organic Compounds (VOCs) were reported at concentrations less than the EQLs at all four monitoring well locations.

The concentrations of heavy metals reported in the perched groundwater sampled from the Relocated Stockpile were noted to be higher than those reported in the shallow groundwater present in the natural clays but that only concentrations of copper, nickel and zinc were greater than the adopted criteria. The concentrations of heavy metals, particularly copper, nickel and zinc, identified in the groundwater present in the natural clays beneath Area A were considered to be typical of the concentrations reported in uncontaminated Ashfield Shale. The concentrations of copper, nickel and zinc that were reported to be greater than the adopted criteria are not considered to be significant and are considered to be typical of the groundwater present in the Ashfield Shales.

In addition, based on the limited leachate results (under neutral conditions) and the groundwater results for Area A, it was considered that the Site-wide Fill Materials are not a potential source of contamination to groundwater. No significant contamination of groundwater by the contaminants identified in the fill materials was identified on Area A.

2.3.2 Area B

Across the northern part of the Site, that within this RAP is referred to as Area B, including across the Remnant Stockpile, the Site-wide Fill Materials were identified to be relatively consistent and comprised a homogeneous topsoil layer of silty clay loams that were underlain by significantly thicker horizon of fill materials than identified in the southern parts of the Site (Area A), ranging from 1.6 m thick to 3.8 m thick overlying the natural clays, and were noted to be very heterogeneous. Fill materials comprising large quantities of fine, soft blue/grey ash material, which varied in proportion from location-to-location, was the dominant matrix.

Rubble encountered within the Site-wide Fill Materials on Area B was similar to the remainder of the Site and included pieces of brick, timber, glass, and plastic, however a significantly greater quantity of waste materials related to railways use, was present including sleepers, segments of rails, brake pads (containing asbestos in a bonded matrix), springs and many hundreds of bolts and metal pins. ACM sheet fragments were identified in 13 test pits across Area B and it is likely that there is more present due to the high frequency of the train debris through the fill materials. Fragments of ACM observed ranged from 5mm to 120mm in size.

The Site-wide Fill Materials within Area B also contained a quantity of homogeneous sandy fill materials that were not encountered elsewhere on the Site, comprising a white sandy aggregate, with properties consistent with foundry sands, and a pink/red crushed brick-like sand interspersed with sinter and brick fragments.

Natural clay soils were encountered across Area B underlying the Site-wide Fill Materials (including Remnant Stockpile). The natural clays were uniform, comprising buff to light brown clay that ranged from very soft, with high plasticity, to very hard, with low plasticity and was friable. No staining or odours were observed in the natural clays sampled from Area B.

Groundwater was identified to be present beneath Area B within a shallow system present within the underlying natural clays that overlie the shale bedrock and inferred groundwater contours indicated that groundwater in the natural clays generally flows in a westerly direction towards Duck River. Based on field observations during sampling the lateral migration of the groundwater present in the natural clays is very low due to the low permeability of the clays.

2.3.2.1 Results of Soil Analysis for Area B

Site-wide Fill Materials

Analysis of samples from the Site-wide Fill Materials within Area B (see Tables T2, T4, T6, T8, T9 and T10 in Appendix C) identified the following:

- Concentrations of BTEX, OCPs and PCBs were reported at concentrations less than the EQLs at all locations analysed across Area B;

- Concentrations of PAHs were not reported at concentrations greater than the adopted criteria for commercial/industrial use in any location analysed from Area B;
- Concentrations of total TPHs (C_{10}-C_{36}) were greater than the adopted assessment criteria (NSW EPA, 1994 – considered to be conservative for commercial/industrial land use – see Section 4.4.1) at two locations in fill materials present between 1.2 and 2.1 m bgs;
- Concentrations of metals that were greater than the adopted criteria for commercial/industrial land use were as follows:
    - Concentrations of copper at two locations in fill materials present between 0.5 and 1.0 m bgs; and
    - Concentrations of lead at four locations in fill materials present between 0.0 and 1.2 m bgs.
- Fibrous asbestos was reported at greater than the adopted criteria in fifteen locations with weight by weight analysis ranging from 0.002% to 0.246%;
- Asbestos fragments were visually identified at thirteen locations in Area B.

In addition to the above, leachate analysis was undertaken on two samples of Site-wide Fill Materials from the one test pit location (TP38) on Area B (see Table T14 in Appendix B) which identified the following:

- Concentrations of PAHs in leachates conducted under acidic conditions on a sample of Site-wide Fill Materials containing ash (TP38D) and general sandy gravelly fill (TP38A) were less than the laboratory detection limits.
    - Whilst the leachate analysis that had been conducted was limited, E3 considered that if these materials were not leaching PAHs under acidic conditions then there was no or negligible potential for them to leach PAHs under neutral conditions expected to be present due to rainfall or surface water infiltration. It was also noted that in the shallow groundwater present in the natural clays at monitoring wells EW4, proximal to the location from which samples of Site-wide Fill Materials were selected for leachate analysis, and in the other monitoring wells across the Site, reported concentrations of PAHs were less than the laboratory detection limits. The groundwater results combined with the low concentrations of PAHs reported in the Site-wide Fill Materials and the results of the leachate analysis indicated that there was no or negligible migration or potential migrations of PAHs from the Site-wide Fill Materials to groundwater within Area B on the Site;
- Concentrations of some metals in leachates conducted under acidic and neutral conditions on Site-wide Fill Materials containing ash (TP38D) and general sandy gravelly fill (TP38A) were greater than the adopted criteria. The highest concentrations were reported in the materials that contained ash and that significantly higher concentrations were reported in leachate completed under acidic conditions compared to the leachate completed under neutral conditions. Under neutral conditions the sample containing ash reported concentrations of lead and zinc greater than the adopted criteria.

- Whilst the leachate analysis that had been conducted was limited, E3 compared these results to the shallow groundwater present in the natural clays at monitoring well EW4 proximal to the locations from which samples of Site-wide Fill Materials were selected for leachate analysis. At EW4 the groundwater concentrations of copper, nickel and zinc were reported to be greater than the adopted criteria and that whilst concentrations of copper in groundwater were generally less than that reported in the neutral leachate, the concentrations of zinc in groundwater were similar to that reported in the neutral leachate. It wass considered that these results, in combination with the absence of detectable concentrations of lead in groundwater and the absence of detectable concentrations of nickel in the neutral leachates, indicate that whist some metals in the Site-wide Fill Materials have the potential to leach under neutral conditions expected to be present due to rainfall or surface water infiltration, it was unlikely that there is a high potential for these metals to have migrated or to migrate to shallow groundwater on Area B.

Natural Clays

Analysis of samples of natural clay soils from across Area B (see Tables T9 and T10 in Appendix C) reported concentrations of TPH, BTEX, Metals, OCPs and PCBs that were less than the criteria for commercial/industrial land use. ACM or asbestos fibres were not observed or identified in the natural clay soils on Area B.

2.3.2.2 Results of Groundwater Analysis for Area B

Analysis of groundwater samples from the four monitoring wells installed within Area B (EW4, EW5, EW7, EW8) (see Table T13 in Appendix C) identified the following:

- Concentrations of metals that were reported at greater than the adopted assessment criteria as follows:
  - EW4 & EW5 – Copper, Nickel and Zinc;
  - EW7 – Cadmium, Copper, Nickel and Zinc;

  Concentrations of remaining metals were reported at either less than the adopted assessment criteria or less than the EQLs; and
- Concentrations of TPHs, BTEX, PAHs and VOCs were reported at concentrations less than the EQLs at all four monitoring wells;

The concentrations of heavy metals, particularly copper, nickel and zinc, identified in the groundwater present beneath Area B were considered to be typical of the concentrations reported in uncontaminated Ashfield Shale. The concentrations of cadmium, copper, nickel and zinc that were reported to be greater than the adopted criteria are not considered to be significant and are considered to be typical of the groundwater present in the Ashfield Shales.

In addition, based on the limited leachate results (under neutral conditions) and the groundwater results for Area B, it was considered that the Site-wide Fill Materials are not a

potential source of contamination to groundwater. No significant contamination of groundwater by the contaminants identified in the fill materials was identified on Area B.

3 SITE CONDITIONS AND SURROUNDING ENVIRONMENT

3.1 Stage 1 Site Identification

Details relating to the identification of the Site are presented in Table 2, below. The location of the Site is shown on Figure 1 and the current layout of the Site is shown on Figure 2.

Table 2: Site Details

Item	Detail
Street Address	Manchester Road, Auburn, NSW
Site Area	6.105 ha
Area A Area	4.9372 ha
Area B Area	1.1669 ha
Title for Site	Lot 12 DP1166540
Current Land Use Zoning	4(a) General Industrial
Local Government Area	Auburn City Council

3.2 Site Condition

At the time of preparation of this RAP the Site was vacant and unoccupied and was secured by a 2 m high chain wire mesh fence that was padlocked at the entrance to the Site at Manchester Road. The Site was unsealed and was covered with grasses and weeds, with some larger well-established trees present along the south-eastern boundary of the Site parallel with Manchester Road and in the south-western corner of the Site.

The only above-ground improvement present on the Site was a disused building near the central part of the Site near the northern boundary, and which was used previously for ablutions.

A large stockpile (referred to in this report as the Relocated Stockpile) was present in the northern to central part of Area A and was covered with grasses and weeds. The surface of the Relocated Stockpile was noted to be uneven and it appeared that some minor subsidence had occurred.

A smaller stockpile (referred to as the Asbestos-containing Stockpile) was present to the west of the Relocated Stockpile and was covered with grasses and weeds.

A stockpile of crushed concrete and gravels (referred to in this report as the Gravel Stockpile) was present in the eastern area of Area A. The Gravel Stockpile was generally bare, with some grasses and weeds growing in limited areas across the surface and the sides.

A fenceline forming a circular shape was present in the centre of Area B and enclosed an area of 0.5772 ha on which, based on information provided by Greenway & Banks, materials excavated from the neighbouring property, formerly known as Lot 1 Manchester Road, were placed (referred to as the “Remnant Stockpile”).

A grassed, open drainage channel was present along the south-western boundary of the Site and a large concrete pipe, opening to an underground stormwater culvert was present adjacent to the western fenceline approximately 120 m from Manchester Road. The concrete opening was noted to be more than 3 m deep. The direction of stormwater flow and the discharge from this culvert is unknown.

A retaining wall was noted to be present along the southern part of the western boundary of the Site. In this area, the surface is approximately 1 m lower than the surface of the property to the west.

No evidence of stress to plants, unexplained bare patches, unexplained odours in drains, unusually coloured or odourous pooled storm water or areas of significant staining were noted across the Site. No storm water drains from any facilities located on the Site were identified.

Eight monitoring wells are present across the Site with four monitoring wells located on Area A comprising two monitoring wells installed by Woodward Clyde (MW01 and MW02) and two monitoring wells installed by E3 (EW6 and EW9) and four monitoring wells located on Area B all installed by E3 (EW4, EW5, EW7 and EW8) (see Figure 3 and Figures in Appendix B).

3.3 Proposed Land Use

At the time of preparation of this RAP, Area A is proposed to be subdivided for development for commercial/industrial units and Area B is proposed to be subdivided as one larger Superlot to be used for commercial/industrial use with an access road to Area A from the south-eastern corner of Area B.

3.4 Surrounding Land Use

At the time of the preparation of this RAP, the land uses directly surrounding the Site were as follows:

- To the north and north-east of the Site there are railway yards and facilities understood to be occupied by Railcorp and part of the Clyde Marshalling Yards;
- To the west, a property previously identified as Lot 1 DP 775808, but now identified as Lot 11 DP1166540 which is owned by Janyon and is occupied by industrial and commercial land uses and includes a number of concrete and brick buildings and warehouses. Lot 11 is bound at its west by a private road (owned by Railcorp) which adjoins Duck River which is located approximately 200 m from the western boundary of the Site;

- Land to the east is vacant and appears to be occupied partially by Railcorp; and
- To the south, Manchester Road is present and across which standard residential dwellings are present.

3.5 Topography, Drainage and Surface Water

The Site is generally elevated at approximately 7 to 9 m AHD (LPI, 2001), and the top of the Relocated Stockpile has an elevation of generally 11 m AHD (see survey plan Appendix A). The northern and north-western parts of the Site have been subject to extensive filling and it is likely that the natural topography of the Site would fall from the south-east to the west to north-west towards Duck River.

No constructed underground stormwater system was observed on the Site, however, a grassed open drainage channel was present along the south western boundary of the Site, but did not appear to connect to a constructed drainage pit or system. It is expected that if a sufficient volume of surface water accumulates in this channel it may flow to the south towards Manchester Road, however, lower volumes would not flow across the surface of the channel but would be likely to infiltrate into the underlying soil.

Water present in the open drainage channel did not appear to be flowing and the accumulated surface water across other areas of the Site was not flowing. Given the surface topography of the lower areas of the Site and its vegetated and unsealed surface, it is unlikely that significant flows of surface water would originate from the central parts of the Site to discharge to the west, north-west or south-west towards Duck River.

The potential for minor localised flooding in the lower areas of the Site, particularly on Area A, under high rainfall conditions is considered to be high, due mainly to the unsealed and vegetated surface and the absence of any drainage systems. It is considered that across the Site where surface water accumulates, it would be dissipated by evaporation and evapotranspiration and/or by infiltration into the soil. However, given the elevation of the Site, the risk of significant flooding of the Site from Duck River is considered to be low.

3.6 Geology and Hydrogeology

The Site is underlain by the Triassic aged Ashfield Shale of the Winamatta Shale Group (DMR, 1991), which comprises black to dark grey shale and laminites, carbonaceous claystone and claystone. Across the Site, the base of the Winamatta Shale is expected to be approximately 10 to 20 m below ground surface (m bgs), dependent on surface elevation, and is underlain by Hawkesbury Sandstone.

Bedrock is likely to be overlain by clay soils formed as a result of the weathering of the shale bedrock, and closer to Duck River the clay soils are overlain by alluvial deposits of silty to peaty quartz sand and clay with common shell layers deposited during the Holocene in both alluvial and estuarine environments (DMR, 1991). Prior to filling, the Site and the surrounding area may have been part of lower-lying swampy area and the 1:100 000 Sydney Soil Landscape Series Sheet (SCS, 1983) indicates that the region

immediately east of the Duck River is level or hummocky disturbed terrain where the natural soils profile is overlain by man-made fill materials. The Site and surrounding area are also indicated to have been extensively filled with materials comprising dredged estuarine sand and mud, demolition rubble, industrial and domestic waste. However, no dredged materials or domestic waste have been identified on the Site (E3, 2011).

The 1:25 000 Prospect/Parramatta River Acid Sulfate Soil Risk Map (DLWC, 1997) indicates that there is no known occurrence of acid sulfate soils within the soil profile located on the Site.

Regional groundwater is expected to be present at depth within the Ashfield Shale underlying the Site and to correspond generally to the level of water in Duck River. Regionally, the Ashfield Shale has a low hydraulic conductivity and transmits water primarily by flow through fractures such as joints and bedding plane partings. Thus, the transmissivity of the shale aquifer is dependent on the frequency, openness and orientation of the fracturing present. Groundwater within the Ashfield Shale is known to be saline and to be characterised by low concentrations of a number of heavy metals and is not known to be used for any purpose.

Locally, transient groundwater was identified as perched within fill materials at the Site and also within the underlying natural clay soils (E3, 2011).

Groundwater flow in both the fill materials, natural clays and shale units is likely to be topographically controlled, with some structural influence and is expected to be in a generally westerly to north-westerly direction towards Duck River.

3.7 Areas and Contaminants of Concern

The areas and contaminants of concern on the Site that have been identified by the previous E3 investigation and reported in the E3 Report are as follows:

- Localised contamination present within the Site-wide Fill Materials (E3, 2011), containing concentrations greater than the criteria for commercial/industrial land use as follows:
  - Lead in TP10 and TP14 (maximum of 3300 mg/kg in TP10 at 0.4 – 0.5 m below ground surfaces (m bgs));
  - Copper in TP18 (maximum of 7300 mg/kg in TP18 at 0.4 – 0.5 m bgs);
  - In addition, fibrous asbestos was found in TP08, TP10, and TP20 (maximum of 1.077% in TP08);
- Materials within the Relocated Stockpile (E3, 2011), containing concentrations greater than the criteria for commercial/industrial land use as follows:
  - Lead in BH2, RS14 and RS7 (maximum of 7000 mg/kg in BH2 @ 3.4 – 3.5 mbgs);
  - Benzo(a)pyrene in RS19 (measured concentration of 5.6 mg/kg in RS19 @ 2.0 – 2.1 mbgs);

- TPH (C_{10}-C_{36}) in RS16, RS4, and BH6 (maximum concentration of 2730 mg/kg in BH6 @ 3.4 – 3.5 mbgs);
- In addition, fibrous asbestos in RS5, RS20, RS10, BH9, RS18, EW9, RS17, RS16 (maximum of 0.482% in BH9);

- Materials within the Asbestos-containing Stockpile (E3, 2011), containing asbestos as follows:
  - Fibrous asbestos in AS3 (measured concentration of 0.002%);
  - Asbestos containing materials in AS4, AS2 and AS1 (maximum concentration of 1.143% in AS2);
- Materials within the Gravel Stockpile (E3, 2011), containing concentrations greater than the criteria for commercial/industrial land use as follows:
  - TPH in GS2 (measured concentration of 4,830 mg/kg in GS2 @ 1.0 – 1.1 mbgs);
  - In addition, asbestos containing materials in GS5 (measured concentration of 0.544%);

Concentrations of other potential chemicals of concern, OCPs, PCBs and BTEX were all reported within the stockpiled materials and the Site-wide Fill Materials at either less than the laboratory detection limits or at less than the criteria for standard residential land-use (most conservative criteria set out in NSW DEC (2006) and less than the criteria for commercial/industrial land use).

Concentrations of all potential chemical of concerns analysed within the natural clay soils across the Site reported concentrations at either less than the laboratory detection limits or at less than the criteria for standard residential land-use (most conservative criteria set out in NSW DEC (2006) and less than the criteria for commercial/industrial land use). In addition, no asbestos (bonded or friable) was identified in the natural clay soils at the locations analysed.

E3 notes that the results of the assessment of the conditions of groundwater present beneath the Site indicated that the groundwater that was able to be sampled had low concentrations of heavy metals as encountered across this area of western Sydney and therefore were considered to be representative of background conditions.

3.8 Requirement for Remediation

Based on the results of the previous investigations and the E3 environmental assessment, E3 considered that the requirements for remediation and/or management on the Site in order to ensure that the Site is suitable for commercial/industrial land use were triggered by the following:

- Presence of concentrations of heavy metals, PAHs and TPH in the stockpiled materials that are greater than the criteria for commercial/industrial land use;
- Presence of asbestos, in both bonded and friable forms, within the Site-wide Fill Materials and stockpiled materials;

- Presence of concentrations of heavy metals in Site-wide Fill Materials in limited locations on Area A that are greater than the criteria for commercial/industrial land use; and
- Potential presence of concentrations of heavy metals, PAHs, TPH and asbestos within the Site-wide Fill Materials greater than the criteria for commercial/industrial land use.

No remediation or management of groundwater was considered necessary given the results of the previous investigations, however, in developing a remediation approach and this RAP, protection of groundwater has been considered.

Given the results of the E3 environmental assessment and Janyon's requirement to use Area A for commercial/industrial land use without the requirement for a Long-term Environmental Management Plan, additional investigations are required to be undertaken as part of the remediation scope of works, to address identified data gaps in the existing data set for Area A and to delineate previously identified contaminated Site-wide Fill Materials to determine the extent of remediation required at these locations.

The results of the additional investigations will be utilised to determine any further requirements for remediation of the Site-wide Fill Materials on Area A. If the results do not identify the requirement for further remediation, then the results of the additional investigation will be used as part of the validation of Area A. If the results do identify the requirement for further remediation, then a Remedial Works Plan (RWP) will need to be prepared to detail the vertical and lateral extent of the required remediation and to confirm the validation approach.

4 REMEDIATION ACTION PLAN

4.1 Remediation Objective

The objective of the remediation is to ensure that the Site is suitable for redevelopment for commercial/industrial land use. It is the preference of the Site owners, Jaynon, to have the majority of the Site remediated in such a way that allows the majority of the Site area to be redeveloped for this use without the restrictions of long-term environmental management plans or similar.

4.2 Remediation Extent

The extent of remediation works is limited to the remediation of the identified contamination in soils across the Site as follows:

- Remediation of contaminated stockpiled materials; and
- Remediation of contaminated soils that are identified to be present within the Site-wide Fill Materials, where necessary.

Whilst the characterisation of the contamination present in the stockpiled materials on the Site is considered to be adequate for the purposes of this RAP, in order to determine the extent of remediation required for the Site-wide Fill Materials additional investigations are required to be undertaken by the Remediation Consultant across Area A to provide an adequate assessment of the conditions of the Site-wide Fill Materials and determine the extent of remediation required as follows:

- Delineation investigations across Area A in locations identified in the E3 Report to contain concentrations of heavy metals and/or asbestos in the Site-wide Fill Materials that requires remediation. The results of these works would determine the extent of remediation that would be required around these locations;
- Additional investigation on parts of Area A on which the stockpiles are located (after stockpiles have been remediated) to assess for the presence of asbestos, heavy metal, TPH and/or PAH contamination in the underlying Site-wide Fill Materials that may require remediation.

The required scope of works and decision making process to be undertaken for these additional investigation works on the Site-wide Fill Materials is discussed in detail in Section 4.8.4.1.

In addition to the above, the Gravel Stockpile has been identified to contain some materials that maybe of use in roadways or to establish levels during the redevelopment of Area A, however, additional investigations are required to be undertaken within the Gravel Stockpile to determine the extent of the previously identified contamination so as to determine which areas of this stockpile require remediation and which materials can be beneficially re-used elsewhere on the Site. The required scope of works and decision making process to be undertaken for these additional investigation works on the Gravel Stockpile is discussed in detail in Section 4.8.2.1.

4.3 Remediation Options

The current policy of the Australian and New Zealand Environment Conservation Council (ANZECC) and National Health and Medical Research Council (NHMRC) is provided within the Australian and New Zealand *Guidelines for the Assessment and Management of Contaminated Sites* (1992) and is endorsed in NSW DEC (2006) *Guidelines for the NSW Site Auditor Scheme (2nd edition)*. The policy requires that soil remediation and management in NSW is conducted with reference to following requirements:

- Remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the Site undisturbed;
- The preferred order of options for soil remediation and management is:
    1. On-Site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level.
    2. Off-Site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the Site.
    3. Removal of contaminated soil to an approved Site or facility, followed where necessary by replacement with clean fill.
    4. Consolidation and isolation of the soil on-Site by containment within a properly designed barrier.

Where there are large quantities of soil with low levels of contamination, alternative remedial/management strategies are required to be considered or developed.

With respect to the above, Table 3 below lists possible options available to remediate contaminated surface and shallow subsurface soil materials identified at the Site.

Table 3: Soil Remediation Options

Option	Assessment	Outcome
1. Do nothing/ongoing management	Not appropriate for the Site given the presence of contaminated materials in stockpiled materials, surface and near-surface locations which render the Site unsuitable for the proposed commercial/industrial use	Not a suitable option for the Site due to the primary land use for commercial / industrial purposes
2. On-Site treatment of the soil so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level.	Due to the relatively intractable nature of the contaminants within the soils, there are no proven, cost effective or reliable treatment processes which are able to destroy the contaminants or reliably reduce the hazards to acceptable levels	Not a suitable option

Option	Assessment	Outcome
3. Off-Site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the Site.	As above (Option 2), however, there are reductions in noise and dust emissions on Site in comparison to on-Site treatment (Option 2), which are offset by increased truck movements. Typically, the costs associated with returning the treated materials to Site often result in them being disposed to landfill. This strategy will incur additional costs, such as transport (to and from Site) and approval would be required from consent authorities.	Not a suitable option
4. Removal of contaminated soil to an approved Site or facility, followed where necessary by replacement with clean fill	There are currently suitably licensed waste facilities in the Sydney region capable of accepting the identified contaminants. This option generates additional truck movements and associated fuel/emissions over Option 2 and Option 5, but less than Option 3, since materials are not returned to Site. This option also generates the highest quantity of waste, since the materials are disposed to landfill rather than treated and reused (i.e., Options 2 & 3) or retained on Site (Option 5).	Not a suitable option given the significant volume of contaminated stockpiled materials present on the Site and the significant costs that would be incurred in order to dispose of these materials off-site to landfill.

Option	Assessment	Outcome
5. Consolidation and isolation of the contaminated soil materials by containment within a properly designed barrier.	The identified contaminants are broadly suitable for consolidation and isolation within an on-Site containment structure, given that they are relatively immobile and are not volatile.	This option presents as the most feasible option for the contaminated soils at the Site due to the quantities of soil that will require remediation. This strategy would require the implementation of a Long-term Environmental Management Plan (EMP) for the part of the Site that would have the containment area but allows the remaining area of the Site to be suitable without the requirement for a Long-term EMP.

4.3.1 Preferred Remediation Option

In consideration of the hierarchy for soil remediation options, the specific contaminants identified on the Site, the environmental setting of the Site and the sensitivity of use proposed for the Site (commercial / industrial land use) and the commercial constraints, the preferred remediation option is the removal of stockpiles and the excavation of contaminated Site-wide Fill materials from Area A, and their transfer and placement to a designated Containment Area within Area B for consolidation and containment and long-term management.

Area A will be remediated such that there will be no requirement for a Long-term EMP on Area A. After the completion of the remediation works on Area A, the materials placed into the Containment Area on Area B and the remaining surfaces of Area B will be covered with an appropriate cap and a Long-term EMP will be developed for Area B.

4.4 Remediation Assessment Criteria (RAC)

The current assessment criteria used in NSW to assess soil and groundwater quality are based on the following guidelines:

- NSW EPA *Guidelines for Assessing Service Station Sites* (NSW EPA, 1994);
- NSW DEC *Guidelines for the NSW Site Auditor Scheme-2nd Edition* (NSW DEC, 2006);
- NSW DEC *Guidelines for the Assessment and Management of Groundwater Contamination* (NSW DEC, 2007);
- NSW DECC *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act* 1997 (NSW DECC, 2009);
- National Environment Protection (Assessment of Site Contamination) Measure (NEPC, 1999);

- National Health and Medical Research Council & Natural Resource Management Ministerial Council. *Australian Drinking Water Guidelines* (NHMRC & NRMMC, 2004);
- National Health and Medical Research Council. *Guidelines for managing risk in recreational water* (NHMRC, 2008);
- Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC & ARMCANZ, 2000); and
- Western Australian Department of Health *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (WA DOH, 2009) – referred to in this document as the *WA Asbestos Guidelines*

Application of these guidelines to the remediation and validation of the Site is briefly described below.

In addition to the above it is noted that the NEPM (1999) is currently under review and a draft of a revised NEPM "*Draft Variation to the National Environment Protection (Assessment of Site Contamination) Measure*" dated September 2010 has been issued and is expected to be finalised in late 2012. The draft NEPM has not yet been endorsed by NSW EPA, however, under the requirements of the *National Environment Protection Council (New South Wales) Act* 1995 (NEPC (NSW) Act) the NSW EPA will endorse the finalised NEPM under Section 105 of the *Contaminated Land Management Act* 1997. As such the draft NEPM is not currently applied in NSW to determine the suitability of sites or to determine the requirements for remediation/management, however, on its finalisation it will supercede the NEPM (1999). Given that the remediation and validation works contemplated in this RAP will be undertaken in mid to late 2012, it maybe likely that the revised NEPM will be finalised prior to completion of the works. As such the criteria that is referred to in this RAP that is derived from the NEPM (1999) and other guidance issued by NSW EPA will be required to be replaced with the relevant criteria that is set out in the new revised NEPM. This is likely to affect the criteria for concentrations of TPH, PAHs and metals within validation soil samples. Currently the draft revised NEPM adopts the Western Australian Department of Health (2009) "*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*" which is already adopted within this RAP and as such it is expected that the criteria for asbestos in validation soil samples is unlikely to vary from what is set out in this RAP.

Soil Assessment Criteria

The guidelines to evaluate soil analytical results currently applied in NSW, as listed in above, presents a range of Health-Based Soil Investigation Levels (HILs), Provisional Phytotoxicity-Based Investigation Levels (PILs), Ecological Investigation Levels (EILs), sensitive land use thresholds and expected background concentration ranges for urban redevelopment sites in NSW. Application of these guidelines is briefly described below.

SILs

The SILs described by the NSW DEC (2006), NSW DECC (2009) and NEPC (1999) guidelines are based on the National Environmental Health Forum (NEHF) levels devised by Imray and Langley (1996). A series of guideline levels are provided for various substances for the protection of human health based on four specific land use and exposure scenarios including:

$SIL_{(Column\ 1)}$ Residential with gardens and accessible soil (home-grown produce contributing less than 10% fruit and vegetable intake; no poultry), including children's day care centres, preschools and primary schools, or town houses or villas.

$SIL_{(Column\ 2)}$ Residential with minimal access to soil including high-rise apartments and flats.

$SIL_{(Column\ 3)}$ Parks, recreational open space, playing fields including secondary schools.

$SIL_{(Column\ 4)}$ Commercial or industrial.

For the assessment of petroleum hydrocarbon contamination, the NSW DEC (2006) guidelines refer to the use of the *Guidelines for Assessing Service Station Sites* NSW EPA (1994), which contain threshold concentrations for hydrocarbon contaminants in soil and provide for the protection of human and environmental health assuming a sensitive land use. SILs specifically for the lower volatility aliphatic and aromatic petroleum hydrocarbon components are also provided in NEPC (1999) for the various land use scenarios described above.

The NSW OE&H endorsed contaminated site assessment process also stipulates that the impact of contaminants on ground and surface water, potential degradation of building structures and affects of chemical mixtures need to be considered.

PILs & EILs

The PILs (NSW DEC, 2006) and EILs (NEPC 1999) have been devised for the protection of plant health, and are designed to be applied as single number criteria indicative of environmental effect. Their use has significant limitations since phytotoxicity depends on soil and species parameters in ways that are not fully understood and are intended for use as a screening guide only. The NSW EPA decision process for assessing urban redevelopment sites stipulates that the PILs need to be considered on sites used for either residential purposes, or land uses including parks, recreational open space and secondary schools.

E3 notes that the PILs relate to sandy loams with a pH 6 to 8. PILs are not required to be adopted on land used for commercial/industrial purposes.

Where no specific criteria are provided by NSW OEH:

USEPA (2004) Region 9 Preliminary Remediation Goals

Where the NSW OEH endorsed guidelines do not specify criteria for the assessment of concentrations of some COPC in soil, reference is made to the USEPA Region 9 Preliminary Remediation Goals (PRGs) (USEPA, 2009). USEPA (2009) presents criteria for residential and industrial land use settings. E3 notes that these criteria have not been endorsed by NSW OEH and are considered conservative for commercial/industrial land use.

Asbestos

With respect to asbestos, no numerical guidelines relating to human health or environmental investigation have been endorsed by NSW OEH. However, NSW DEC (2006) *Guidelines for the NSW Site Auditor Scheme (2nd edition)* state "*until such guidelines become available, auditors must exercise professional judgment when assessing whether a site is suitable for a specific use in the light that asbestos be a contaminant of concern*".

Some guidance with respect to asbestos has been developed by the "enHealth Council", which comprises "*…top Environmental Health officials at the Federal and State/Territory level along with representation from the Australian Institute of Environmental Health, the environment and public health sectors, the Indigenous community, local government, and the wider community*". In 2005, enHealth published "*Management of asbestos in the non-occupational environment*", which provided guidelines for assessment and risk management of asbestos on contaminated sites.

Asbestos, which comprises a number of very stable natural silicate minerals, has no impact to the environment. Risk is posed to human health by inhalation of "respirable" asbestos fibres, which can enter the lungs and chest cavity. Respirable fibres are characterised by lengths of a few micrometres (μm – millionths of a metre). Asbestos bundles present in cement-bonded ACM products generally range from 2 to 5 millimetres (mm – thousandths of a metre) in length and are not respirable unless pulverized by high speed impact from cutting, drilling, sanding and the like.

In 2009, the Western Australian Department of Health published "*Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*" which expanded on the guidance provided by enHealth and derived soil asbestos investigation criteria for the following classes of asbestos materials:

- Asbestos containing materials (ACM) – asbestos bound in a matrix, such as fibro or vinyl tiles, that cannot pass through a 7 mm x 7 mm sieve.
- Fibrous asbestos (FA) – comprising materials such as severely weathered ACM and asbestos in the form of loose fibrous materials such as insulation products. FA can be broken or crumbled by hand pressure. ACM and FA can often be detected visually.

- Asbestos fines (AF) – comprising free fibres of asbestos, small fibre bundles and ACM fragment that pass through a 7 mm x 7 mm sieve.

The above guideline derived "*soil asbestos investigation criteria*" for the sites uses referred to in NEPM (1999), as follows:

- FA and AF 0.001 % w/w All site uses
- ACM 0.01 % w/w Residential, day care, preschools
- ACM 0.04 % w/w Residential, minimal soil access
- ACM 0.02 % w/w Parks, open spaces, Playing fields
- ACM 0.05 % w/w Commercial/industrial

Although the above investigation criteria for asbestos have not been endorsed by NSW OEH, in the absence of endorsed criteria in NSW, the criteria developed by the WA Department of Health are commonly used in NSW because the criteria have been developed by a reputable public health authority using methods compatible with those adopted by NEPC (1999) in assessing risk posed by contaminants. Application of the Western Australian guidance is compatible with NSW EPA Site Auditors responsibility to exercise professional judgment when assessing the impact of asbestos to the suitability of a site for one or more uses. It should be noted that the investigation criteria are not remediation standards. The Western Australian guidance has also been adopted in the draft of the revised NEPM (2010).

Where appropriate and if required, it is proposed to seek endorsement from NSW Health of any measures proposed for remediation or management of ACM on the Site.

4.4.1 Soil Remediation Acceptance Criteria

The Site is to be redeveloped for commercial/industrial purposes. Consequently, the soil analytical results obtained during the remediation works will be assessed against the following criteria:

- Metals and PAHs results - NEPM (1999) Health-based Investigation Levels presented in NSW DEC (2006)
  SIL ($_{\text{Column 4}}$) (NEHF F - Commercial/industrial land use).
- TPH results –NSW EPA (1994) Guidelines, although these values are considered conservative for commercial/industrial land uses; and
- Asbestos results – the soil asbestos investigation criteria provided in the Western Australian Department of Health (2009) Guidelines:
  FA and AF 0.001 % w/w (All uses) and no visible FA and/or AF in surface soils.
  ACM 0.05 % w/w (Commercial/industrial usage) and no visible ACM in surface soils.

As noted in Section 4.4, if the revised NEPM is finalised prior to the completion of the remediation and validation works, the criteria set out above, particularly for TPH, metals and PAHs, will no longer apply and the criteria set out in the revised NEPM will be applied.

4.4.2 Off-Site Disposal Criteria

As described earlier, the remediation approach includes the excavation of the contaminated soils for transfer and placement onto Area B. It is therefore not expected that there will be a requirement for the off-site disposal of excavated material. However, if during the course of the remediation works, excavated materials are required to be disposed off-site, they must be classified in accordance with NSW DECC (2009) *Waste Classification Guidelines. Part 1: Classifying Waste*.

4.4.3 Imported Materials Criteria

Validation and certification of materials proposed to be imported onto the Site for the purposes of re-instatement or landscaping is to be assessed in accordance with the following criteria:

- Virgin excavated natural materials (VENM) must satisfy the criteria stated in NSW DECC (2009) and NSW DEC (2006) guidelines and be demonstrated to be:
  - Natural material (such as clay, gravel, sand, soil or rock fines);
  - Materials that has been excavated or quarried from areas that are not contaminated with manufactured chemicals or process residues, as a result of industrial, commercial, mining or agricultural activities; and
  - Materials that do not contain any sulfidic ores or soils or any other waste.
- Topsoils, growing media, mulch etc for landscaping purposes must be visually inspected (at source and upon delivery at the Site) for foreign substances, suspicious staining and/or odours;
- Any materials proposed to be imported to the Site must not contain any of the following:
  - Marine mud, peat, vegetation, timber, organic, soluble or perishable materials,
  - Dangerous or toxic material or material susceptible to combustion;
  - Metal, rubber, plastic or synthetic material or other forms of general rubbish; and/or
  - Construction/demolition debris.

If the imported material sampling/analyses has not been conducted by the Remediation Consultant or in strict accordance with the requirements set out above then the results of the additional inspection and sampling/analyses of the imported materials that verifies the suitability of the materials as they are received at the Site must be provided to the Site Auditor for review and endorsement prior to their placement on the Site.

4.4.4 Beneficial Re-use Criteria

Validation and certification of materials proposed to be beneficially re-used on the Site for the purposes of construction of roadways or to achieve final levels to be assessed in accordance with the following criteria:

- The RAC set out in Section 4.4.1;
- Must not contain any of the following:
  - Marine mud, peat, vegetation, timber, organic, soluble or perishable materials,
  - Dangerous or toxic material or material susceptible to combustion; and/or
  - Metal, rubber, plastic or synthetic material or other forms of general rubbish; and
- Must be visually inspected for and confirm that the materials do not contain foreign substances, suspicious staining and/or odours.

4.4.5 Groundwater Assessment Criteria

Based on the previous investigations undertaken at the Site, and the location of the Site, as well as observations made during field investigations, groundwater was identified to be present perched within the fill materials and in the underlying natural clays and shales and may flow to the north-east towards Duck River or the north toward the Parramatta River. Both these waterways are known to be highly degraded.

Given that the Site and off-site areas are located in an industrial precinct within a wider industrial and urban area, and that ready access is available to a reticulated, potable water supply system, the potential for groundwater to be used for drinking water or for other beneficial purposes is currently considered to be negligible. Consequently, the NHMRC & NRMMC (2004) guidelines for drinking water are not considered applicable to the Site and with respect to human use, groundwater immediately down-gradient of the Site is known to be unsuitable for any beneficial purpose and groundwater was not assessed with respect to drinking water quality. Similarly, the receiving waters of the Duck River and the Parramatta River, proximal to the Site, are not known to be used for recreational purposes and consequently the NHMRC (2008) guidelines for recreational waters are not considered applicable to the Site.

In proximity to the Site, the Parramatta River is tidally influenced and is saline and Duck River, in proximity to the Site, is expected to be fresh to brackish. ANZECC & ARMCANZ (2000) states that for such conditions and considering the nature of the ultimate receiving environment that the Trigger Levels for Marine Waters should be applied. However, should the groundwater results on the Site indicate the presence of a freshwater environment, the Trigger Levels for Fresh Waters may be applied.

Trigger Levels with a 95% level of species protection has been adopted for assessing the quality of groundwater on the Site due to the highly disturbed nature of the regional groundwater, Duck River and the Parramatta River in proximity to the Site. It is noted that

where the Trigger Levels at 95% levels do not apply to slightly – moderately disturbed systems, the Trigger Levels at 99% that do apply have been adopted. The analytical results for leachate concentrations under neutral conditions will also be compared to these trigger levels.

E3 notes that the high-reliability trigger level for some analytes for both marine and freshwater environments presented in ANZECC & ARMCANZ (2000) are currently less than the detection limits that can be provided by the analytical laboratories. Consequently, in these instances E3 considers that the laboratory Estimated Quantitation Level (EQL), which is the lowest level of detection that can be routinely achieved by the laboratory and which is sometimes referred to as the "detection limit" of the analytical method is suitable for use as a screening value for concentrations of analytes in groundwater where trigger values provided in ANZECC & ARMCANZ (2000) cannot be applied.

4.5 Regulatory and Planning Requirements

The remediation works required to be undertaken on the Site must be conducted in accordance with the requirements of the NSW legislative and regulatory frameworks provided by the *Environmental Planning and Assessment Act* (EP&A Act 1979), the *Contaminated Land Management Act* (CLM Act, 1997) and *Protection of the Environment Operations Act* (POEO Act, 1997). The regulatory and planning requirements that the remediation works on the Site must meet are presented in detail below.

4.5.1 State Environmental Planning Policy 55 (SEPP 55)

SEPP 55 specifies when remediation work does and does not require development consent from the consent authority. Remediation works that require development consent are classified as Category 1 remediation works and remediation works that do not require development consent are Category 2 remediation works.

Clause 9 of SEPP 55 defines Category 1 remediation works as:

1) Designated development; or
2) Being carried out or to be carried out on land declared to be critical habitat; or
3) Likely to have significant effect on a critical habitat or a threatened species, population or ecological community; or
4) Development for which another State environmental policy or regional environmental plan requires development consent; or
5) Carried out or to be carried out in an area or zone to which any classifications to the following effect apply under an environmental planning instrument;
    a) coastal protection;
    b) conservation or heritage conservation;
    c) habitat area, habitat protection area, habitat or wildlife corridor;
    d) environment protection;
    e) escarpment, escarpment protection or escarpment preservation;
    f) floodway;

g) littoral rainforest;
h) nature reserve;
i) scenic area or scenic protection; or
j) wetland.

6) is "carried out or to be carried out on any land in a manner that does not comply with a policy made under the contaminated land planning guidelines by the council for any local government area in which the land is situated".

In consideration of the requirements of SEPP55, it is considered that the remediation works proposed at the Site are classified as Category 2 remediation works as the trigger for Category 1 remediation works do not apply to the Site, particularly in relation to designated development (see Section 4.5.2 below). However, it is understood that the remediation works and this RAP have been included as part of a Development Application for the subdivision and redevelopment of the Site.

4.5.2 POEO Act 1997

Schedule 1 of the POEO Act set out the types of activities that constitute a "Scheduled Activity" and as such require licensing by NSW EPA under the POEO Act and consequently trigger requirements under the EP&A Act. Consideration has been given to whether the remediation works constitute the activities set out in clause 15 of Schedule 1 of the POEO Act which states the following:

"15 Contaminated soil treatment:

(1) This clause applies to *contaminated soil treatment*, meaning the on site or off site treatment of contaminated soil (including, in either case, incineration or storage of contaminated soil but excluding excavation for treatment at another site).

(2) The activity to which this clause applies is declared to be a scheduled activity if:

(a) in any case, it has the capacity to treat more than 1,000 cubic metres per year of contaminated soil received from off site, or

(b) where it treats contaminated soil originating exclusively on site, it has a capacity:

(i) to incinerate more than 1,000 cubic metres per year of contaminated soil, or

(ii) to treat (otherwise than by incineration) and store more than 30,000 cubic metres of contaminated soil, or

(iii) to disturb more than an aggregate area of 3 hectares of contaminated soil."

The remediation works require the relocation of approximately 35 000m^3 of material from Area A to a designated area within Area B for consolidation, capping and long-term containment and to be managed under a Long-term EMP. A Section A Site Audit Statement, under the CLM Act, will be issued at the completion of the remediation works to certify the suitability of Area B for commercial/industrial use, subject to the implementation of the Long-term EMP. The remediation works require the disturbance of approximately 1.8 ha within Area A due to the excavation and relocation of the stockpiled materials.

It is considered that the remediation works proposed to be conducted on the Site do not constitute "Contaminated Soil Treatment" set out in clause 15 of Schedule 1 of the POEO Act as follows:

- (1) - DOES NOT SATISFY THE DEFINITION OF CONTAMINATED SOIL TREATMENT SET OUT IN SECTION (1):
  - No incineration works are required on the stockpiled soils as part of the remediation works;
  - No other physical or chemical treatment works are required on the stockpiled soils to destroy, stabilise or immobilise any contaminants as part of the remediation works;
  - Storage of the stockpiled materials is not contemplated. The stockpiled materials are being relocated within the Site for consolidation and long-term containment which will be managed by the implementation of a Long-term EMP that will be made legally enforceable, likely by notification on the Section 149 Certificate. The long-term containment of such materials and the controls that are instituted for this containment are not considered to be an activity that would classify as "storage" within its meaning under the POEO Act;

- (2) (a) – DOES NOT SATISFY.
  - No treatment of soils originating from off-site will be undertaken on the Site
- (2) (b) (i) – DOES NOT SATISFY.
  - No incineration of soils will be undertaken on the Site
- (2) (b) (ii) – DOES NOT SATISFY.
  - No treatment and storage of more than 30,000 cubic metres of contaminated soil will be undertaken on the Site.
- (2) (b) (iii) – DOES NOT SATISFY.
  - Aggregate area of Site to be disturbed during remediation works is less than 3 ha.

Consequently, it is considered that the remediation activities to be conducted on the Site do not satisfy the definition of treatment of contaminated soils set out in clause 15 of Schedule 1 of the POEO Act and as such do not constitute a Scheduled Activity under Schedule 1 of the POEO Act.

It is also noted that E3 requested the NSW EPA's advice in relation to this matter. The Sydney Industry and Waste Sections of the NSW EPA (Mr Trevor Wilson – 02 9995 5907),

have provided verbal confirmation to E3 that the remediation works to be conducted on the Site do not constitute a Scheduled Activity under Schedule 1 of the POEO Act.

The remediation works to be conducted on the Site are not considered to be a Scheduled Activity under Schedule 1 of the POEO Act. Consequently, the remediation works as part of the proposed development do not constitute "integrated development" or "designated development" under the EP&A Act.

4.5.2.1 Protection of the Environment Operations (Waste) Regulation 2005

It is noted that whilst the proposed remediation approach does not include the removal and disposal of material off-site, should such works be required, the provisions of the Protection of the Environment Operations (Waste) Regulation 2005 would apply to remediation works. All material to be excavated that is determined to require removal from the Site would be required to be undertaken in strict accordance with the requirements of the POEO (Waste) Regulation which includes, but are not limited, to the following:

- Ensuring waste is classified appropriately and in accordance with relevant guidelines (NSW DECC (2009) *Waste Classification Guidelines. Part 1: Classifying Waste*;
- Ensuring that waste materials are transported from the Site by an appropriately licensed transporter to a landfill facility licensed to accept the type of waste;
- Ensuring that the requirements relating to the handling and transportation of asbestos waste as stated in the regulation are met;
- Other materials are removed to facilities lawfully able to accept such materials; and
- Ensuring that waste tracking records are kept for the remediation works, including copies of the waste transport and disposal certificates.

The remediation works to be conducted on the Site do not fall within the categories of work that require licensing under the POEO Act. It is noted that whilst the remediation works will require the disturbance of a couple of hectares on the Site, primarily due to the relocation of over 30 000 m3 of materials from Area A onto Area B for consolidation and long-term containment, the NSW OEH, specifically the Sydney Industry and Waste Sections, have confirmed to E3 that this activity does not constitute a Scheduled Activity under Schedule 1 of the POEO Act (see correspondence provided as Appendix D).

It is noted that whilst the proposed remediation approach does not include the removal and disposal of material off-site, should such works be required, the provisions of the Protection of The Environment Operations (Waste) Regulation 2005 would apply to remediation works.

All material to be excavated and removed from the Site (including associated activities such as classification) would be required to be undertaken in strict accordance with the requirements of the POEO (Waste) Regulation which includes, but are not limited, to the following:

- Ensuring waste is classified appropriately and in accordance with relevant guidelines (NSW DECC (2009) *Waste Classification Guidelines. Part 1: Classifying Waste*;
- Ensuring that waste materials are transported from the Site by an appropriately licensed transporter to a landfill facility licensed to accept the type of waste;
- Ensuring that the requirements relating to the handling and transportation of asbestos waste as stated in the regulation are met;
- Other materials are removed to facilities lawfully able to accept such materials; and
- Ensuring that waste tracking records are kept for the remediation works, including copies of the waste transport and disposal certificates.

4.6 Remediation Approach

The remediation approach to be adopted on the Site is to excavate from Area A the identified stockpiled materials and contaminated Site-wide Fill materials to the lateral and vertical extent defined by the previous investigations and the additional investigations. The excavated materials will be moved and placed onto Area B.

The approach to the remediation for the Site is required to be undertaken in a number of stages of work as follows:

1) Conduct the groundwater monitoring works pre-remediation, as required by Section 4.8.1 of this RAP;
2) Undertake preparatory works as described in Section 4.8.2 of this RAP;
3) Conduct the additional investigation and remediation works on the stockpiles to the extent described in Section 4.8.3 of this RAP;
4) Conduct the required additional investigations and remediation (if required) of the Site-wide Fill Materials as described in Section 4.8.4 of this RAP;
5) Conduct validation works, as required as set out in Section 4.8.5;
6) Conduct the groundwater monitoring works post-remediation, as required by Section 4.8.6 of this RAP;
7) Based on outcomes of the works undertaken make an assessment of the suitability of Area A and Area B for the proposed use.

4.7 Remediation Scope of Work

The scope of remediation works that is required to be undertaken on the Site under this RAP comprises the following:

- Preparatory works:
  - Pre-remediation Groundwater Monitoring Event on monitoring wells present across the Site;
  - Site Establishment;
  - Buildings and services protection (where required);
  - Placement of temporary road surfaces;

- Decommissioning of monitoring wells were required;
- Establishment of Containment Area within Area B;

- Stockpile remediation works:
  - Undertake investigation of the Gravel Stockpile to determine the extent of remediation required as defined in Section 4.8.3.1 of this RAP;
  - Excavation of contaminated stockpile materials, as defined in Section 4.8.3.2;
  - Transfer and placement of excavated materials onto the designated Containment Area within Area B as defined in Section 4.8.2.4;
  - Retention of materials from Gravel Stockpile to be determined to be suitable for beneficial re-use on the Site;
- Site-wide Fill Materials remediation works;
  - Undertake investigation of the Site-wide Fill Materials to determine the extent of remediation required on the Site-wide Fill Materials as defined in Section 4.8.4.1 of this RAP;
  - If the additional investigations determine that remediation of Site-wide Fill Materials on Area A is required, a Remediation Works Plan (RWP) is to be prepared to set out the detail of the required remediation and validation works. The RWP must be provided to the Site Auditor for review and approval prior to undertaking the remediation of the Site-wide Fill Materials;
  - Excavation of identified contaminated Site-wide Fill Materials, as determined by the additional investigation and as set out in the RWP;
  - Transfer and placement of excavated materials to Area B, as defined in Section 4.8.2.4;
- Validation works
  - Validation of the Site, including all resultant excavation surfaces in Area A and the containment and capping of Area B, in accordance with Section 8 of this RAP;
  - Post-remediation Groundwater Monitoring Event on retained monitoring wells present across the Site; and
- Site completion works
  - Re-instatement of excavations, where required, with suitable imported materials; and
  - Removal of all temporary infrastructure.

4.8 Remediation Methodology

The methodologies to be undertaken on the Site for the various components of the remediation works are presented in detail in the sections below.

4.8.1 Pre-Remediation Groundwater Monitoring Event

Groundwater monitoring is required to be undertaken by the Remediation Consultant from the eight existing monitoring wells on the Site (as shown on Figure 3) prior to commencement of the remediation works to assess the current groundwater conditions

and obtain a data set that can then be compared to post-remediation groundwater monitoring to confirm that the remediation works have not impacted the quality of groundwater across the Site.

The groundwater samples will be analysed for total and dissolved heavy metals, PAHs, TPH and BTEX and will be compared to the results of the groundwater monitoring previously conducted by E3 (E3, 2011) and the adopted groundwater assessment criteria set out in Section 4.4.5.

The methodology adopted during the pre-remediation monitoring event undertaken on the Site must be consistent with the methodology to be adopted during the post-remediation monitoring event and must in accordance with the procedures set out below.

4.8.1.1 Groundwater Monitoring Methodology

Groundwater Sampling

At commencement of works each well will be gauged using an electronic interface probe to measure and record the standing water level (SWL) and the thickness of any non-aqueous phase liquids (NAPLs), if present. Wells will then be purged using dedicated 'medical grade' silicon tubing and a 'low flow' peristaltic pump of at least three well volumes (where practicable) prior to sampling. Field parameters including temperature, electrical conductivity, dissolved oxygen, and pH will be measured and recorded during purging using a calibrated water quality meter. Purging will continue until the field parameters stabilise, generally to +/- 10 %.

Groundwater sampling will then be completed using dedicated 'medical grade' silicon tubing and a 'low flow' peristaltic pump. Where the peristaltic pump does not operate effectively, samples may be collected using dedicated Teflon bailers. Samples for total heavy metal analysis will be collected into appropriately preserved laboratory supplied bottles. Samples for dissolved heavy metal analysis will first be field filtered through 0.45 μm filters and then transferred directly into appropriately preserved laboratory supplied bottles. New single-use nitrile gloves will be used at each well.

Field intra-laboratory duplicates will be prepared on-site by collecting discrete groundwater samples at a rate of one per 10 primary samples. Samples for duplicate analyses will be selected from monitoring well locations showing the highest probability of being contaminated.

Sampling Equipment Decontamination

During the monitoring works the following equipment will be decontaminated:

- Water quality meter; and
- Interface probe.

Decontamination procedures will be performed before initial use and after each subsequent use as follows:

- The water quality meter and interface probe will be decontaminated between each sample location by scrubbing with a solution of Decon 90, followed by a rinse in potable water.

For each day of sampling, following decontamination procedures, a rinsate blank will be collected by running laboratory prepared deionised water over a piece of decontaminated sampling equipment directly into laboratory-prepared sampling containers for analysis for heavy metals.

Sample Labelling, Storage and Transport

All sample containers will be clearly labelled with unique sample identification numbers consisting of the date, sample location and samplers initials. In the case of field intra-laboratory duplicates and other field quality control samples, the sample containers will be labelled so as to not reveal their purpose or sample location to the laboratory. All samples will be kept chilled in an ice-filled esky prior to dispatch and during transport to the nominated laboratories under chain-of-custody procedures.

By prior arrangement with the laboratories, samples will be analysed as soon as practicable after receipt by the laboratories.

Analytical Laboratory

The groundwater samples for the monitoring event are to be submitted to a commercial laboratory NATA certified for the analysis required.

Quality Assurance and Quality Control Plan

The field and laboratory quality assurance and quality control plan to be adopted for the groundwater monitoring works has been designed to achieve pre-determined data quality indicators that will demonstrate the precision, accuracy, representativeness, completeness and comparability of the data set and that the data set is of acceptable quality to meet the objectives of the works.

The specific quality assurance and quality control plan for the field and laboratory components of the groundwater monitoring works have been developed based on Appendix V of the NSW DEC (2006) and are detailed below.

Field QA/QC

The field quality assurance procedures to be adopted and the field quality control samples to be collected during the groundwater monitoring works and the corresponding acceptable control limits are presented in Table 4 below.

Table 4: Field QA/QC for Groundwater Monitoring

Data Type	Comments and Acceptable Control Limits
Field personnel	Use appropriately trained field personnel employing procedures listed in this RAP
Field data collection	All data collection to be undertaken in accordance with the methods set out in this RAP Site conditions and sample locations properly described. Information to be recorded in field notes. Field notes are appropriately completed and included in the report on the works.
Sample handling (storage and transport)	Groundwater samples will be collected into the sample jars/bottles supplied by the analytical laboratory and each sample will be characterised by a unique number. The filled jars will be stored on ice in a chilled, insulated container until received by the analysing laboratory. Sample numbers, dates, preservation and analytical requirements will be recorded on COC documentation, which will also be delivered to the analytical laboratory. All samples are required to be documented as received by the laboratory chilled and intact.
Calibration of Field Equipment	The Water Quality Meter will be calibrated in the field at the start of each day using appropriate calibration fluids. Based on previous investigations, extreme water quality conditions are not expected on the Site that are likely to create imbalances of the probes (i.e. no low or high pH or high salinity). As such it is not considered necessary to calibrate the Water Quality Meter during each day of sampling. However, if extreme conditions are encountered that are likely to affect the accuracy of the probes then calibration will be conducted during each day of sampling. A record of the calibrations undertaken will be kept and included in the report.

Data Type	Comments and Acceptable Control Limits
Field Intra-laboratory Duplicates Field Inter-laboratory Duplicates	Intra-laboratory duplicates will be collected and analysed at a rate of 1 in every 10 primary samples. Inter-laboratory duplicates will be collected and analysed at a rate of 1 in every 20 primary samples. Duplicate samples will be labelled so as to conceal their relationship to the primary sample from the laboratory. It is expected that RPD's would be less than 50%, and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.
Rinsate Blanks	Rinsate blank samples (from an item of sampling equipment) will be collected and analysed at a rate of one per piece of re-useable equipment per day of sampling. Concentrations of analytes to be less than the laboratory detection limits.
Trip Spikes	Laboratory prepared Trip Spikes will be utilised during the groundwater sampling program. The Trip Spike will be used to assess for the potential of loss of volatile constituents from the groundwater samples whilst in transit from the Site to the laboratory. The spike sample will be prepared by the laboratory, transported to the Site under COC protocol and returned to the laboratory with the primary samples being submitted for analysis. Trip Spikes will be analysed for VOCs. Concentrations of analytes in Trip Spike recoveries to be greater than 90% of original concentrations of the spiked constituents.

Laboratory QA/QC

The laboratory quality assurance procedures to be adopted and the internal laboratory quality control samples to be analysed and the corresponding acceptable control limits are presented in Table 5 below.

Table 5: Laboratory QA/QC for Groundwater Monitoring

Data Type	Comments and Acceptable Control Limits
Sample Analysis	All sample analyses to be conducted using NATA certified laboratories which will implement a quality control plan in accordance with NEPM (1999c).
Holding times	Maximum acceptable sample holding times for water samples: Metals:3 months Mercury: 28 days TPH/PAHs/BTEX: 7 days
Laboratory detection limits	All laboratory detection limits to be less than the RAC. Ultra-trace methods to be applied for PAHs, at a minimum.
Laboratory Blanks	Laboratory blanks to be analysed at a rate of 1 in 20, with a minimum of one analysed per batch. Concentration of analytes to be less than the laboratory detection limits.
Laboratory Duplicates	Laboratory duplicates to be analysed at a rate of 1 in 20, with a minimum of one analysed per batch. RPDs to be less than 50%.
Laboratory Control Samples (LCS)	LCSs to be analysed at a rate of 1 in 20, with a minimum of one analysed per analytical batch. Control limits: Control limits: 70 to 130 % Acceptable Recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.

Data Type	Comments and Acceptable Control Limits
Matrix spikes	Matrix spikes and matrix spike duplicates prepared by dividing a field sample into two aliquots, then spiking each with identical concentrations of the analytes at a rate of 1 in 20. Matrix spike control limits: 70–130 % Acceptable recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required. Matrix spike duplicates: RPDs <50% and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.
Surrogates	Surrogates are generally spiked into all sample aliquots prior to preparation and analysis by chromatogaphic methods. Percent recoveries are calculated for each surrogate, providing an indication of analytical accuracy. Surrogate Recovery limits: 70-130% Acceptable recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.

Data Quality Indicators

Acceptance limits on field and laboratory data collected for the groundwater monitoring works have been established in Table 5 above. A summary of the data quality indicators (DQIs) and the corresponding measures to be applied for the investigation are presented in Table 6 below.

Table 6: Summary of DQIs for Groundwater Monitoring

DQI	Field	Laboratory	Acceptability Limits
Precision	Sampling methodologies appropriate and complied with. Collection of intra-laboratory duplicate and inter-laboratory duplicate samples	Analysis of: Field intra-laboratory duplicate samples (1 in 10 samples) Field inter-laboratory duplicate samples (1 in 20 samples) Laboratory duplicate samples Laboratory prepared trip spikes	 RPD of < 50% RPD of < 50% RPD of < 50% Recovery >90%
Accuracy	Sampling methodologies appropriate and complied with. Collection of rinsate blanks	Analysis of: Rinsate blanks (1/day/equipment) Method blanks Matrix spikes Matrix spike duplicates Surrogates Laboratory control samples Laboratory prepared spikes Reagent blanks Reference materials	 Non-detect for CoC Non-detect for CoC 70 to 130% RPD of <50% 70 to 130 % 70 to 130 % 70 to 130% Non-detect for CoC Varies
Representativeness	Appropriate media sampled according to RAP All media identified in RAP sampled.	All samples analysed according to RAP	All samples analysed according to RAP

DQI	Field	Laboratory	Acceptability Limits
Comparability	Same sampling methodologies used on each day of sampling Experienced sampler Climatic conditions Same types of samples collected	Same analytical methods used (including clean-up) Sample laboratory detection limits (justify/quantify if different) Same laboratories (NATA accredited) Same units	As per NEPC (1999c) < nominated criteria
Completeness	All critical locations and media sampled All samples collected Sampling methodologies appropriate and complied with Experienced sampler Documentation correct	All critical samples analysed and all analytes analysed according to RAP Appropriate methods Appropriate laboratory detection limits Sample documentation complete Sample holding times complied with	 As per NEPC (1999c) As per NEPC (1999b)

In the event that a DQI is not met by laboratory analyses, the field observations relating to the nature of the samples will be reviewed and if no obvious source for the non-conformance is identified, such as an error in sampling, preservation of sample/s or heterogeneity of sample/s, liaison with the laboratories will be undertaken in an effort to identify the issue that has given rise to the non-conformance and additional analyses will be undertaken on the original sample/s, on duplicate samples or on other samples, if required.

If no explanation for the non-conformance is identified, the concentrations for the affected samples will be marked as estimates.

Results and Reporting

The results of the pre-remediation groundwater monitoring event are to be presented in a summary report that will be prepared in general accordance with the requirements of the NSW OE&H (2011) and NSW DEC (2006) and will include the following:

- Site conditions;
- Details of fieldworks undertaken;

- Determination of the reliability of the field and laboratory programs, by reference to the project DQOs and DQIs;
- Identify any "non-conformances" and how they were addressed or how they affect the reliance on the data;
- Results of fieldworks and laboratory analytical results;
- Provision of data tables and records and other supporting information;
- Discussion of the results of the assessment with respect to the results of the previous monitoring undertaken by E3 (E3, 2011); and
- Confirmation of the position that remediation/management of groundwater is not required to ensure the suitability of the Site at the completion of the remediation and validation works.

This summary report will be provided to the Site Auditor for review prior to the commencement of remediation works on the Site.

4.8.2 Preparatory Works

4.8.2.1 Protection of Services

The Remediation Contractor is to determine any need for protection of services. Identified services on-site include a surface water drain as detailed in Section 3.5.

4.8.2.2 Site Access and Temporary Roads

Due to the poor ground drainage there is a high risk of creation and distribution of mud across the Site. The Remediation Contractor is to design and install a temporary access and temporary road surfaces to stabilise the ground in highly trafficked areas.

A single entry/exit point will be provided for the Site that is stabilised to reduce the tracking of sediment off the site on to Council's road and the stormwater system.

The stabilised access will comprise:

- Compacted subgrade;
- Cover area with needle punched geotextile;
- Construct a 200mm thick pad over geotextile using aggregate of at least 40mm in size or alternate materials approved by the Superintendent. Length ideally from kerb to site perimeter; and
- Construct diversion hump 300mm thick immediately within boundary to divert water to a sediment fence or other sediment trap.

Aggregates suitable for establishing temporary access during works include:

- Recovered aggregates that meets the requirements detailed in the General Exemption under Part 6, Clause 51 and 51A of the POEO (Waste) Regulation 2005 *The recovered aggregate exemption 2010*;

- Excavated natural material (ENM) that meets the requirements detailed in the General Exemption under Part 6, Clause 51 and 51A of the POEO (Waste) Regulation 2005 *The excavated natural material exemption 2008*; or
- Virgin excavated natural materials (VENM) that satisfies the criteria stated in NSW DECC (2009) and NSW DEC (2006) guidelines.

4.8.2.3 Decommissioning of monitoring wells

Groundwater monitoring wells present on the Site either within stockpiled material (EW09) or proximal to stockpiles (EW6), that are likely to be damaged or removed as part of the remediation work will need to be decommissioned prior to the commencement of earthworks in order to avoid creating potential vertical migration pathways. The decommissioning works must be undertaken by or under the supervision of the Remediation Consultant in accordance with relevant guidance.

4.8.2.4 Containment Area on Area B Design Parameters and Construction

It is understood that the lateral area onto which contaminated materials will be placed for containment within Area B, herein referred to as the Containment Area, will be across the majority of the Area B footprint, with the exception of the strip of land that extends from the south-eastern corner of Area B that will form a roadway onto Area A. The cut and fill plans prepared for the Site indicate that the resultant highest areas will be located within the north-western part of Area B, as shown on the plan presented in Appendix D.

In determining the design parameters for the Containment Area on Area B the following factors have been considered:

- The estimated volume of materials to be placed into the Containment Area of approximately 35 000 m^3;
- The nature of the fill materials and then natural clays present underlying the area of the Site on which the Containment Area is to be located;
- The depth to groundwater being at least 4 to 5 m or greater below the current ground surface of Area B and that at this depth the groundwater has low hydraulic conductivity and its hydraulic connectivity to groundwater in lower and down-gradient topographic areas of the Site and to the nearest surface water receiving environment is considered to be limited;
- The absence of a groundwater aquifer beneath Area B and the Site as whole, that is utilised for beneficial purposes;
- The baseline quality of groundwater that was able to be sampled from the Site and specifically Area B, that indicated low to less than detectable concentrations of most heavy metals with the exception of zinc, nickel, cadmium and copper the concentrations of which are considered to be at background levels (E3, 2011);
- The location of the Containment Area with a proposed Superlot, which will be owned and operated by a single owner and on which future development will be restricted to activities that will not require the sub-surface to be disturbed;

- The construction of a hardstand across the surface and surface water drainage diversions around the proposed Containment Area which will minimise surface water flows across the top of the Containment Area by diverting the flow around the Containment Area; and
- The requirement for the integrity of the Containment Area to be retained in perpetuity with the requirement for the development and implementation of a long-term environmental management plan.

Based on the above considerations the Containment Area is required to be design and constructed to meet the following parameters:

- The current ground surface is not significantly disturbed with the exception of minor earthworks required to establish the surface onto which the materials will be placed;
- At a minimum the capping of the Containment Area must comprise materials that meet or exceed a permeability of 1 x 10^{-9} m/s and areas proposed to remain unsealed for vegetation to be established must be constructed so as to allow for an overlying growing medium of sufficient depth to allow for grasses to medium sized shrubs to establish without the root zones affecting the integrity of the cap. If clay or similar soil/fill materials are to be used, these materials must be assessed by the Remediation Consultant to be VENM and must have a minimum thickness of 150 mm;
- A marker layer, comprised of geofabric or geotextile or similar, must be placed between the capping layer and the growing medium layer and the top of the contaminated materials;
- During placement appropriate compaction works must be undertaken to a minimum of 95% compaction; and
- Requirement for survey , by a Registered Surveyor, of the lateral extent and relative levels of the following:
    - Surface prior to placement of materials within the Containment Area;
    - Final surface of the placed materials;
    - Final surface of the marker layer;
    - Final surface of the capping layer; and
    - Final surface of the Containment Area and Area B.

Based on the parameters outlined above the Remediation Contractor is to prepare a detailed specification and design drawings for the Containment Area prior to its construction on the Site which will include the location and footprint of the Containment Area and show that the Containment Area has been designed to accept up to 40000 m^3 of contaminated materials should additional volumes of contaminated materials be generated during the remediation works. The detailed specification and design drawings for the Containment Area must be provided to the Site Auditor for endorsement prior to the commencement of the placement of materials onto Area B.

4.8.3 Stockpile Remediation Works

The remediation of the stockpiles located on Area A is to be undertaken via excavation and placement onto Area B. The results of previous investigations (E3, 2011) have identified that all materials (with the exception of larger pieces of railway associated waste materials which may be removed prior to placement works) present within Relocated Stockpile and the Asbestos-containing Stockpile are required to be removed from Area A and placed onto Area B. Further investigations of the Gravel Stockpile are required to be undertaken, prior to it's excavation, to determine the extent of materials that are required to be placed onto Area B from this stockpile.

The works required for the remediation of the stockpiles are presented in further detail below.

4.8.3.1 Additional Investigation of Gravel Stockpile

Additional investigations are to be conducted by the Remediation Consultant across the Gravel Stockpile either prior to, during or after the removal of the Relocated Stockpile and the Asbestos-containing Stockpile to Area B. The results of the works will be used to identify which areas of the Gravel Stockpile are required to be removed to Area B and if any materials within the Gravel Stockpile are potentially suitable for beneficial re-use on the Site.

If the results of this additional investigation, together with the results of the E3 environmental assessment on the stockpile, identify discrete areas of the Gravel Stockpile that could potentially be suitable for beneficial re-use on the Site, further sampling and analysis would be undertaken (in accordance with the methods set out below) to demonstrate this suitability. With respect to asbestos, the sampling and analytical density will be conducted to meet the 14 samples per 1000m^3 set out in the WA DoH (2009). With respect to heavy metals; (Arsenic, Cadmium, Copper, Chromium, Nickel, Lead, Zinc and Mercury), PAHs, TPH and BTEX, the sampling and analytical density will be conducted to meet 1 per 100 m^3 . If the results of this further sampling and analysis indicate that the materials are suitable for beneficial re-use then the results would be provided to the Site Auditor for review and endorsement prior to the materials being beneficially re-used on the Site.

The objectives and scope of work and methodology for additional investigation of the Gravel Stockpile is detailed below.

Objective

The objective of the additional investigation of the Gravel Stockpile is to address the identified data gaps and uncertainties on this material in order to determine the requirements, if any, for the remediation of these materials as part of the remediation works being undertaken for the Site and to also assess if any of the materials are potentially suitable for beneficial re-use on the Site.

Scope of Work

The scope of works to be undertaken in order to achieve the objectives is as follows:

- Completion of intrusive investigations on the Gravel Stockpile as follows;
  - Ten testpits to be completed on a general grid based pattern completed into the Site-Wide Fill Material or natural soil materials to expected depths of between 2 to 4 m bgs;
  - Collection of soil samples from each testpit at depth intervals commencing from the surface at 0-0.05 m bgs and 0.1-0.15 m bgs and then at 0.5 m bgs, at 1.0 m bgs and then at 0.5 m intervals or at changes in lithology into the Site-Wide Fill Material or natural soil;
  - For each soil sample collected undertake field screening for fibrous asbestos and ACM as follows:
    - One 10 L and one 0.5L sample shall be collected as detailed above,
    - The 10 L sample shall be screened manually on-site through a < 7 mm sieve or spread out for inspection on a contrasting colour material;
    - Identified potential ACM > 7 mm and/or FA from the 10 L sample shall be bagged and sent to a laboratory NATA accredited for asbestos analysis and for weighing to calculate asbestos soil concentration for individual samples. The remaining sample will also be sent to a laboratory NATA accredited for asbestos analysis and for weighing;
    - The 0.5 L sample shall be sent to a laboratory NATA accredited for asbestos analysis to determine the presence of asbestos fibres;
  - Analysis of selected soil samples by a laboratory NATA accredited for heavy metals; (Arsenic, Cadmium, Copper, Chromium, Nickel, Lead, Zinc and Mercury), PAHs, TPH and BTEX;
- Data preparation, reporting and analysis, including analytical data tables, detailed field logs and records and other supporting information, including overall data analysis using the data collected for this stockpile as presented in the E3 Report;
- Assessment of the requirement for remediation and an assessment of the potential for beneficial re-use of the materials and, if beneficial re-use is contemplated, the requirements for further investigations to demonstrate the suitability of the material for beneficial re-use; and
- Preparation of a summary report on the works undertaken for provision to the Site Auditor.

Methodology

Intrusive works – Testpits

Test pits will be completed using a track mounted excavator or backhoe. Test pits will be excavated through the fill materials and completed into the natural soils. During the excavation activities, excavated soil will be stockpiled adjacent to the test pit. On completion, each test pit will be backfilled in reverse order (i.e. final materials excavated out are the first to be re-instated into test pit) before excavation of the next test pit commences. Reinstatement of the test pits will be limited to backfilling with the excavated soil and compaction using the excavator/backhoe.

The locations of each test pit will be marked by driving a wooden or metal stake into the centre of the test pit and marking the stake with the unique number of the test pit.

Soil Sampling

Soil samples will be collected from each testpit from the surface at 0-0.05 m bgs and 0.1-0.15 m bgs and then at 0.5 m bgs, at 1.0 m bgs and then at 0.5 m intervals or at changes in lithology into the Site-Wide Fill Material or natural soil.

Soil samples for chemical analysis will be collected from undisturbed materials at the centre of the excavator bucket or directly from the wall of the testpit by a hand protected by nitrile gloves. New nitrile gloves will be used for the collection of each sample. The soil samples will be immediately transferred into 125 mL glass jars with Teflon-lined lids supplied by the laboratory and immediately stored on ice in a secured esky, or similar.

One 10 L and one 0.5 L soil sample will be collected from undisturbed materials at the centre of the excavator bucket or directly from the wall of the testpit by a hand protected by nitrile gloves. New nitrile gloves will be used for the collection of each sample. The 10L soil samples will be collected into plastic buckets for field screening for FA and ACAM (as described below). Identified potentially asbestos contaminated materials (FA and ACM) will be immediately transferred into clean plastic bags and immediately stored in a secured esky, or similar. The 0.5 L soil sample shall be collected into glass or plastic containers and immediately stored in a secured esky, or similar.

All samples will be sent to a laboratory NATA accredited for the required analysis.

Field intra-laboratory and inter-laboratory duplicates of the soil samples for both chemical and asbestos analysis will be prepared in the field by collecting separate samples from the testpit from the same depth as the primary sample at a rate of one per 10 primary samples and one per 20 primary samples, respectively. Samples will not be mixed or homogenised during collection or splitting. Samples for duplicate analyses will be selected from sampling locations showing the highest probability of containing contaminants of concern, i.e. samples characterised by elevated photoionisation detector (PID) readings or the presence of ACM.

Field Screening of soil samples

In accordance with the WA DoH (2009), the 10 L sample shall be screened manually on-site through a < 7 mm sieve or spread out for inspection on a contrasting colour material (recommended for FA). Samples in which potential ACM (<7mm) and FA are identified shall be sent to a laboratory NATA accredited for asbestos analysis. If ACM is identified at greater than 7 x 7 mm the pieces from each 10 L sample will be placed in a sealed plastic bag and sent to laboratory NATA accredited for weighing and asbestos analysis. The remaining 10L sample will also be sent to a laboratory NATA accredited for weighing and asbestos analysis.

Field screening of the 5 L sample is not contemplated, however, each 5 L sample collected will be submitted to laboratory NATA accredited for weighing and asbestos analysis.

Additional soil from each sample depth range will be placed in a sealed plastic bag for field screening purposes. After waiting approximately 5 minutes for the sample and the headspace to equilibrate the headspace in the bagged samples was assessed by a calibrated (100 ± 3 parts per million (ppm) isobutylene) PID with a 10.6 eV lamp to measure the presence of total VOCs.

Field Logging

Recording of logs for testpits will be conducted in the field in accordance with Australian Standard 1726-1993: *Geotechnical site investigations* and soils will be classified in accordance with the Unified Soil Classification System (USCS), including observation of any anthropogenic material (i.e. stained soil, hydrocarbon or other chemical odours, asbestos cement (AC) sheeting etc). Descriptions will be recorded on E3's standard test pit field log sheets for uniformity in descriptions, presentation and to aid in any future interpretations. The results of the field screening using the PID will also be recorded on the logs.

The American Society for Testing and Materials (ASTM) system and the USCS are the general standards used by E3 in classifying soil by visual and manual examination. The reference for the USCS system is *Procedure for Determining Unified Soil Classification (Visual Method)*, United States Department of the Interior, Bureau of Reclamation (USBR) 5005-86. The reference for the ASTM system is *Description and Identification of Soils (Visual-Manual Procedure)*, ASTM Standard Practice D2488-90. A comparison of USBR 5005-86 and ASTM D 2488-90 indicates no technical differences between the two methods except for the size of the soil samples used for the manual dry strength test (6.35 mm for USCS and 12.7 mm for ASTM).

Sampling Equipment Decontamination

During the assessment works the following equipment will be decontaminated:

- Excavator bucket

Decontamination procedures will be performed before initial use and after each subsequent use as follows:

- Given the likely unconsolidated composition of the stockpiled materials it is likely that emptying and shaking of the excavator bucket between sampling locations will be sufficient to remove loose materials between sampling locations that could cross-contaminate subsequent samples. Where samples are collected from the excavator bucket, discrete samples will be collected from undisturbed materials in the centre of the bucket. A new pair of disposable nitrile gloves was worn to collect each sample. As such no other decontamination procedures are considered to be necessary

Sample Labelling, Storage and Transport

All sample containers will be clearly labelled with unique sample identification numbers consisting of the date, sample location, depth of sample (where relevant) and samplers initials. In the case of field intra-laboratory duplicates and other field quality control samples, the sample containers will be labelled so as to not reveal their purpose or sample location to the laboratory. All samples will be kept chilled in an ice-filled esky prior to dispatch and during transport to the nominated laboratories under chain-of-custody procedures.

By prior arrangement with the laboratories, samples will be analysed as soon as practicable after receipt by the laboratories.

All samples collected will be stored at the laboratory for a maximum of three months, and could potentially be selected for analysis if further vertical delineation of identified contamination is required.

Surveying of Testpit Locations

A registered surveyor will survey the locations of testpit with reference to the Australian Height Datum (AHD) and Australia Map Grid (AMG).

Analytical Laboratories

Samples must be submitted for analysis to a laboratory certified by NATA for the analysis required. Primary, intra-laboratory duplicate and rinsate samples must be submitted to the nominated primary laboratory and inter-laboratory duplicate samples must be submitted to the nominated secondary laboratory.

Laboratory analysis will be conducted in accordance with the requirements of NEPM and are referenced to USEPA and American Public Health Association (APHA) methods. The analytical schedule, laboratory methods, laboratory limits of reporting (LORs) and reference methods to be applied for the validation works must be appropriate to meet the project DQOs and DQIs.

Quality Assurance and Quality Control Plan

The field and laboratory quality assurance and quality control plan to be adopted for the investigation has been designed to achieve pre-determined data quality indicators that will demonstrate the precision, accuracy, representativeness, completeness and comparability of the data set and that the data set is of acceptable quality to meet the objectives of the investigation.

The specific quality assurance and quality control plan for the field and laboratory components of the investigation have been developed based on Appendix V of the NSW DEC (2006) and are detailed below.

Field QA/QC

The field quality assurance procedures to be adopted and the field quality control samples to be collected during the investigation and the corresponding acceptable control limits are presented in Table 7 below.

Table 7: Field QA/QC for Additional Investigations

Data Type	Comments and Acceptable Control Limits
Field personnel	Use appropriately trained field personnel employing procedures listed in this RAP
Field data collection	Site conditions and sample locations properly described. Information to be recorded in field notes and logs. Field notes are appropriately completed and included in the report on the environmental assessment.

Data Type	Comments and Acceptable Control Limits
Sample handling (storage and transport)	Soil and water (rinsate) samples will be collected into the sample jars, vials and bottles supplied by the analytical laboratory. The filled containers and bottles will be stored on ice in a chilled, insulated container until received by the analysing laboratory. Sample numbers, dates, preservation and analytical requirements will be recorded on Chain-of-Custody (COC) documentation, which will also be delivered to the analytical laboratory. All samples are required to be documented as received by the laboratory chilled and intact.
Calibration of Field Equipment	PID will be calibrated using iso-butylene gas (100 ppm) at the start of each day of sampling and at a number of times during each day. A record of the calibrations undertaken will be kept and included in the report.
Field Intra-laboratory Duplicates Field Inter-laboratory Duplicates	Intra-laboratory duplicates will be collected and analysed at a rate of 1 in every 10 primary samples. Inter-laboratory duplicates will be collected and analysed at a rate of 1 in every 20 primary samples. Duplicate samples will be labelled so as to conceal their relationship to the primary sample from the laboratory. It is expected that RPD's would be less than 50%, and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.

Data Type	Comments and Acceptable Control Limits
Rinsate Blanks	Rinsate blank samples (from an item of sampling equipment) will be collected and analysed at a rate of one per piece of re-useable equipment per day of sampling. Concentrations of analytes to be less than the laboratory detection limits.

Laboratory QA/QC

The laboratory quality assurance procedures to be adopted and the internal laboratory quality control samples to be analysed and the corresponding acceptable control limits are presented in Table 8 below.

Table 8: Laboratory QA/QC for Additional Investigations

Data Type	Comments and Acceptable Control Limits
Sample Analysis	All sample analyses to be conducted using NATA certified methods by laboratories which will implement a quality control plan in accordance with NEPM (1999c).
Holding times	Maximum acceptable sample holding times for analysis is: Metals: Soil and Water-6 mths (Hg-28 days) TPH, BTEX, PAHs: 14 days
Laboratory Detection Limits	Where possible, laboratory detection limits to be less than the adopted RAC.
Laboratory Blanks	Laboratory blanks to be analysed at a rate of 1 in 20, with a minimum of one analysed per batch. Concentration of analytes to be less than the laboratory detection limits.
Laboratory Duplicates	Laboratory duplicates to be analysed at a rate of 1 in 20, with a minimum of one analysed per batch. RPDs to be less than 50% and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.

Data Type	Comments and Acceptable Control Limits
Laboratory Control Samples (LCS)	LCSs to be analysed at a rate of 1 in 20, with a minimum of one analysed per analytical batch. Control limits: 70 to 130 % Acceptable Recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.
Matrix spikes	Matrix spikes and matrix spike duplicates prepared by dividing a field sample into two aliquots, then spiking each with identical concentrations of the analytes at a rate of 1 in 20. Matrix spike control limits: 70–130 % Acceptable recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required. Matrix spike duplicates: RPDs <50% and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.
Surrogates	Surrogates are generally spiked into all sample aliquots prior to preparation and analysis by chromatogaphic methods. Percent recoveries are calculated for each surrogate, providing an indication of analytical accuracy. Surrogate Recovery limits: 70-130% Acceptable recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.

Data Quality Indicators

Acceptance limits on field and laboratory data collected as part of the soil and groundwater investigation have been established in Tables 7 and 8 above. A summary of the data quality indicators (DQIs) and the corresponding measures to be applied for the investigation are presented in Table 9 below.

Table 9: Summary of DQIs for Additional Investigations

DQI	Field	Laboratory	Acceptability Limits
Precision	Sampling methodologies appropriate and complied with. Collection of intra-laboratory duplicate and inter-laboratory duplicate samples	Analysis of: Field intra-laboratory duplicate samples (1 in 10 samples) Field inter-laboratory duplicate samples (1 in 20 samples) Laboratory duplicate samples	 RPD of < 50% RPD of < 50% RPD of < 50% RPD of < 50%
Accuracy	Sampling methodologies appropriate and complied with. Collection of rinsate blanks	Analysis of: Rinsate blanks (1/day) Method blanks Matrix spikes Matrix spike duplicates Surrogates Laboratory control samples Reagent blanks Reference materials	 Non-detect for CoC Non-detect for CoC 70 to 130% 70 to 130 % RPD of <50% 70 to 130 % Non-detect for CoC, Varies
Representativeness	Appropriate media sampled according to RAP All media identified in RAP sampled.	All samples analysed according to RAP	All samples analysed according to RAP

DQI	Field	Laboratory	Acceptability Limits
Comparability	Same sampling methodologies used on each day of sampling Experienced sampler Climatic conditions Same types of samples collected	Same analytical methods used (including clean-up) Sample laboratory detection limits (justify/quantify if different) Same laboratories (NATA accredited) Same units	As per NEPC (1999c) < nominated criteria
Completeness	All critical locations and media sampled All samples collected Sampling methodologies appropriate and complied with Experienced sampler Documentation correct	All critical samples analysed and all analytes analysed according to RAP. Appropriate methods Appropriate laboratory detection limits Sample documentation complete Sample holding times complied with	 As per NEPC (1999c) As per NEPC (1999b)

In the event that a DQI is not met by laboratory analyses, the field observations relating to the nature of the samples will be reviewed and if no obvious source for the non-conformance is identified, such as an error in sampling, preservation of sample/s or heterogeneity of sample/s, liaison with the laboratories will be undertaken in an effort to identify the issue that has given rise to the non-conformance and additional analyses will be undertaken on the original sample/s, on duplicate samples or on other samples, if required.

If no explanation for the non-conformance is identified, the concentrations for the affected samples will be marked as estimates.

Reporting

The results of the investigation will be presented in a summary report that will be prepared in general accordance with the requirements of the NSW OE&H (2011) and NSW DEC (2006) and will include the following:

- Site conditions;
- Details of field investigations undertaken;

- Determination of the reliability of the field and laboratory programs, by reference to the project DQOs and DQIs;
- Identify any "non-conformances" and how they were addressed or how they affect the reliance on the data;
- Results of field investigations and laboratory analytical results;
- Survey data;
- Statistical calculations (if required);
- Discussion of the results of the assessment with respect to the objectives of the investigation;
- Provision of data tables, detailed field logs and records and other supporting information; and
- Conclusions and recommendations on the requirement for remediation and/or beneficial re-use. If the results indicate that beneficial re-use is possible, recommendations on the further sampling and analysis to be undertaken to demonstrate suitability for this purpose will be set out in accordance with requirements set out at beginning of Section 4.8.3.1.

The report on these works will be provided to the Site Auditor for review and endorsement of any recommendations prior to their implementation during the remediation works.

If further sampling and analysis is undertaken and the results indicate that the materials are suitable for beneficial re-use then the results would be provided to the Site Auditor in a letter report for review and endorsement prior to the materials being beneficially re-used on the Site.

4.8.3.2 Excavation of Contaminated Stockpiled Materials

The general principle for the removal of contaminated soils is that contaminated soils must be excavated for transfer and placement within Area B.

In order to limit the volume of materials to be placed in Area B efforts will be undertaken by the Remediation Contractor to limit the volumes of soils excavated during the remediation works by application of detailed excavation methods. This may include the option requirement to adopt the coarse screening of some stockpile materials to remove larger pieces of railway associated waste materials such as sleepers, railway tracks, brake pads that are present in the stockpiled material for off-site disposal to an appropriate facility.

The stockpile, materials tracking and waste management measures are detailed in the Remediation Works Environmental Management Plan (RWEMP) set out in Section 6 of this RAP. Excavation works will comprise the following:

- Implementation of necessary environmental protection measures in accordance with the requirements of the RWEMP;
- Excavation of contaminated materials to lateral and vertical extents so that validation is achieved; and
- Documenting and recording the works.

The Remediation Consultant or Remediation Contractor will conduct inspections at the following stages of the works:

- Following setting out, but prior to the commencement of any excavations;
- Following the implementation of any environmental control measures; and
- At the completion of the excavation to the desired levels.

The results of the previous investigations indicate that base of the stockpiles can be determined as a transition from materials comprising a gravel clay or sandy clay to an ash fill or to natural materials comprising either clay or shale bedrock. The final excavation surface following removal of stockpiles has been interpreted from the survey plan presented in Appendix A.

The complete removal of contaminated stockpiled materials will be required to be demonstrated by adopting the Validation Approach and Validation Sampling, Analysis and Quality Plan set out in Sections 8.3 and 8.5, respectively of this RAP.

Where the Validation Approach, as set out in this RAP, has been adopted and the contaminated soils are considered to have been removed and the excavation to have been validated, no further excavations for remedial purposes will be deemed to be required.

Where the Validation Approach, as set out in this RAP, has been adopted and contaminated soils are determined to be still present, further excavation is required until validation is achieved. Where further excavation is required the extent of the re-excavation will be limited to the nearest surrounding validated sample locations.

Where further excavation is prevented due to the retention of trees or other unexpected obstructions encountered, then samples from this area will be collected and analysed and the results from these samples will be used for characterisation purposes for inclusion in the Validation Report.

4.8.3.3 Stockpiling of Stockpile Materials

Following the excavations, if the excavated contaminated material requires stockpiling prior to transfer to Area B, stockpiles will be established in designated areas of Area A, to be nominated by the Remediation Contractor and approved by the Remediation Consultant. All stockpiles will be maintained in an orderly and safe condition according to the requirements of the RWEMP. The movement of stockpiles will need to be undertaken in accordance with the materials tracking requirements of the RWEMP.

The stockpiles will be established in areas that have not yet been subject to remedial excavation. Where this is not practical, and the Remediation Contractor considers it necessary to locate stockpiles on areas which have already been subject to excavation and validation or that are not required to be remediated. The Remediation Contractor is required to establish a ground cover using HDPE plastic or similar, to protect the ground surface, prior to the placement of the stockpiled materials. If such an approach were

undertaken, confirmation sampling would not be required after removal of the stockpiled material.

Where stockpiling is required the stockpiling of excavated material will comprise the following:

- Establishment of stockpiles as a result of the excavated material;
- Implementation of necessary environmental protection measures in accordance with the requirements of the RWEMP; and
- Documenting the location and observations of stockpiles and any other activities relevant to the works.

The Remediation Consultant and Remediation Contractor will conduct inspections at the following stages of the works:

- Inspection of the area prior to the establishment of stockpiles;
- Inspection of the area post relocation of the material to Area B;
- Following the implementation of any environmental control measures; and
- Following storm/rainfall events to assess the potential for sediment (and contaminant) laden run-off.

4.8.3.4 Placement of Excavated Stockpile Material on Containment Area within Area B

The placement of the excavated and stockpiled material within the Containment Area within Area B is the responsibility of the Remediation Contractor. Prior to the commencement of placement activities, the Remediation Contractor must ensure that the surface and lateral extent of the Containment Area within Area B is surveyed by a Registered Surveyor.

Tracking of the volume and source location of the material as it is placed into Area B is also required to be undertaken by the Remediation Contractor and records kept in the Materials Tracking Plan as set out in the RWEMP. The materials must be placed and compacted to 95% level. The design parameters for the Containment Area within Area B are set out in Section 4.8.4.2 above and the health and safety measures to be undertaken during this work, particularly with respect to asbestos, are set out in the RWEMP in Section 6 of this RAP.

4.8.3.5 Materials for Beneficial Re-use

As set out in Section 4.8.3.1, if the additional investigation of the Gravel Stockpile, identify materials that are suitable for beneficial re-use on the Site for the establishment of roadways or final levels, these materials will be segregated via excavation and stockpiled separately to the stockpile materials that are required to be removed to Area B. The stockpiles of materials proposed to be suitable for beneficial re-use must be established and maintained in accordance with the requirements of Section 4.8.3.3.

These materials are to be subject to validation prior to their beneficial re-use in accordance with Section 8.5.1 of this RAP and must meet the criteria set out in Section 4.4.4 of this RAP.

4.8.4 Site-wide Fill Materials Remediation Works

The remediation of the Site-wide Fill Materials on Area A is to be undertaken via excavation and placement onto Area B. After completion of the stockpile remediation works on Area A, further investigations are required to determine the extent of remediation required on the Site-wide Fill Materials.

The works required for the remediation of the Site-wide Fill Materials on Area A are presented in further detail below.

4.8.4.1 Additional Investigation of Site-wide Fill Materials

Additional investigations are to be conducted by the Remediation Consultant in order to determine the extent of remediation required for the Site-wide Fill Materials as follows:

- Delineation investigations across Area A in locations identified in the E3 Report to contain concentrations of heavy metals and/or asbestos in the Site-wide Fill Materials that requires remediation. The results of these works would determine the extent of remediation that would be required around these locations;
- Additional investigation on parts of Area A on which the stockpiles were located to assess for the presence of asbestos, heavy metal, TPH and/or PAH contamination in the Site-wide Fill Materials that requires remediation.

The objectives and scope of work for additional investigation of the Site-wide Fill Materials is detailed below. The methodology and reporting to be applied for this investigation work is the same as that presented in Section 4.8.3.1.

Objective

The objective of the additional investigation of the Site-wide Fill Materials is to address the identified data gaps and uncertainties in order to determine the requirements, if any, for the remediation of these materials as part of the remediation works being undertaken for the Site and, specifically, Area A.

Scope of Work

The scope of works to be undertaken in order to achieve the objectives is as follows:

- Completion of intrusive investigations as follows;
  - Four testpits to be completed around each of the following locations, as presented on Figure 3, to delineate the extent of contamination previously identified:
    - TP8 (fibrous asbestos);

  - TP10 (fibrous asbestos, lead);
  - TP14 (lead);
  - TP18 (copper);
  - TP20 (fibrous asbestos);
- Twenty-five testpits to be completed on a general grid based pattern across the footprints of the former Relocated Stockpile, Asbestos-containing Stockpile and Gravel Stockpile (as shown on Figure 3);
- Each testpit is to extend into the natural soil materials to expected depths of between 2 to 3 m bgs;
- Collection of soil samples from each testpit at depth intervals commencing from the surface at 0-0.05 m bgs and 0.1-0.15 m bgs and then at 0.5 m bgs, at 1.0 m bgs and then at 0.5 m intervals or at changes in lithology into the natural soil;
- For each soil sample collected undertake field screening for fibrous asbestos and ACM as follows:
  - One 10 L and one 0.5L sample shall be collected as detailed above,
  - The 10 L sample shall be screened manually on-site through a < 7 mm sieve or spread out for inspection on a contrasting colour material;
  - Identified potential ACM > 7 mm and/or FA from the 10 L sample shall be bagged and sent to a laboratory NATA accredited for asbestos analysis and for weighing to calculate asbestos soil concentration for individual samples. The remaining sample will also be sent to a laboratory NATA accredited for asbestos analysis and for weighing;
  - The 0.5 L sample shall be sent to a laboratory NATA accredited for asbestos analysis to determine the presence of asbestos fibres;
- Analysis of selected soil samples by a laboratory NATA accredited for heavy metals; (Arsenic, Cadmium, Copper, Chromium, Nickel, Lead, Zinc and Mercury), PAHs, TPH;

- Data preparation, reporting and analysis, including analytical data tables, detailed field logs and records and other supporting information, including overall data analysis using the data collected for the Site-wide Fill Materials as presented in the E3 Report;
- Assessment of the requirement for remediation ; and
- Preparation of a summary report on the works undertaken for provision to the Site Auditor.

Where the results of the additional investigations on the Site-wide Fill Materials do not identify the requirement for remediation, then these results will be utilised as part of the validation of Area A. However it is noted that the validation sampling plan set out in Section 8.5.1 is required to be satisified.

Where the results of the additional investigations on the Site-wide Fill Materials do identify the requirement for remediation, then the lateral and vertical extent of the remediation required will need to be set out in a RWP, as detailed in Section 4.8.4.2 below.

4.8.4.2 Remediation Works Plan (RWP) for Site-wide Fill Materials

If remediation of Site-wide Fill Materials is identified to be required as a result of the additional investigation works conducted in accordance with Section 4.8.4.1 of this RAP, then a RWP for the remediation of the Site-wide Fill Materials is required to be prepared and provided to the Site Auditor for approval prior to the commencement of the remediation of the Site-wide Fill Materials.

The RWP must detail the lateral and vertical extent of the remediation required on the Site-wide Fill Materials and the remediation and validation methodology to be adopted during this work. This methodology must be consistent with the methods and approach set out in this RAP. If variations to this methodology are proposed then they must be appropriately justified within the RWP.

4.8.4.3 Excavation of Contaminated Site-wide Fill Materials

The general principle for the removal of contaminated soils is that contaminated soils must be excavated for transfer and placement within the Containment Area on Area B.

In order to limit the volume of materials to be placed on Area B efforts will be undertaken by the Remediation Contractor to limit the volumes of soils excavated during the remediation works by application of detailed excavation methods.

The stockpile and waste management measures are detailed in the Remediation Works Environmental Management Plan (RWEMP) set out in Section 6 of this RAP. Excavation works will comprise the following:

- Implementation of necessary environmental protection measures in accordance with the requirements of the RWEMP;
- Excavation of contaminated materials to lateral and vertical extents so that validation is achieved; and
- Documenting and recording the works.

The Remediation Consultant or Remediation Contractor will conduct inspections at the following stages of the works:

- Following setting out, but prior to the commencement of any excavations;
- Following the implementation of any environmental control measures; and
- At the completion of the excavation to the desired levels.

The complete removal of contaminated Site-wide Fill Materials will be required to be demonstrated by adopting the Validation Approach and Validation Sampling, Analysis and Quality Plan set out in Sections 8.3 and 8.5, respectively of this RAP.

Where the Validation Approach, as set out in this RAP, has been adopted and the contaminated soils are considered to have been removed and the excavation to have been validated, no further excavations for remedial purposes will be deemed to be required.

Where the Validation Approach, as set out in this RAP, has been adopted and contaminated soils are determined to be still present, further excavation is required until validation is achieved. Where further excavation is required the extent of the re-excavation will be limited to a point 50% of the distance between the identified contamination and the nearest surrounding validated sample locations.

Where further excavation is prevented due to the retention of trees or other unexpected obstructions encountered, then samples from this area will be collected and analysed and the results from these samples will be used for characterisation purposes for inclusion in the Validation Report.

4.8.4.4 Stockpiling of Contaminated Site-wide Fill Materials

Following the excavations, if the excavated contaminated material requires stockpiling prior to transfer to Area B, stockpiles will be established in designated areas of Area A to be nominated by the Remediation Contractor and approved by the Remediation Contractor. All stockpiles will be maintained in an orderly and safe condition according to the requirements of the RWEMP.

The stockpiles will be established in areas of Area A that have not yet been subject to remedial excavation. Where this is not practical, and the Remediation Contractor considers it necessary to locate stockpiles on areas which have already been subject to excavation and validation or that are not required to be remediated, upon relocation of the stockpile material to Area B. The Remediation Contractor is required to establish a ground cover using HDPE plastic or similar, to protect the ground surface, prior to the placement of the stockpiled materials. If such an approach were undertaken, confirmation sampling would not be required after removal of the stockpiled material.

Where stockpiling is required the stockpiling of excavated material will comprise the following:

- Establishment of stockpiles as a result of the excavated material;
- Implementation of necessary environmental protection measures in accordance with the requirements of the RWEMP; and
- Documenting the location and observations of stockpiles and any other activities relevant to the works.

The Remediation Consultant and Remediation Contractor will conduct inspections at the following stages of the works:

- Inspection of the area prior to the establishment of stockpiles;
- Inspection of the area post relocation of the material to Area B;

- Following the implementation of any environmental control measures; and
- Following storm/rainfall events to assess the potential for sediment (and contaminant) laden run-off.

4.8.4.5 Placement of Excavated Material to the Containment Area on Area B

The placement of the excavated Site-wide Fill Materials within the Containment Area within Area B is the responsibility of the Remediation Contractor. Tracking of the volume and source location of the material as it is placed into Area B is also required to be undertaken. The materials must be placed and compacted to 95% level. The design parameters for the Containment Area within Area B are set out in Section 4.8.4.2 above and the health and safety measures to be undertaken during this work are set out in the RWEP in Section 6 of this RAP.

4.8.5 Capping of Containment Area on Area B

On completion of the placement of materials to the Containment Area on Area B, the Remediation Contractor is responsible for the construction and installation of the marker layer, capping layer and final surface finishing across the Containment Area. These works are to be undertaken in accordance with the detailed specifications and design drawings that are required to be prepared by the Remediation Contractor and approved by the Project Manager, Remediation Consultant and the Site Auditor, in accordance with Section 4.8.2.4 of this RAP.

The validation of the capping works is set out in Section 8.6 of this RAP.

4.8.6 Validation Plan

On completion of the remediation works, validation of the resultant surfaces, such as the base and/or walls will be required to be undertaken in accordance with the Validation Approach set out in Section and Validation Sampling, Analysis and Quality Plan set out in Sections 8.3 and 8.5, respectively of this RAP.

The approach to the validation of the resultant excavation surfaces requires the application of asbestos field screening methodologies and asbestos and chemical analysis. It is also noted that where the results of the additional investigation of the Site-wide Fill Materials, as set out in Section 4.8.4.1 do not identify the requirement for remediation, these results will be used for validation purposes.

Sampling and analysis will also be required to be undertaken on any materials to be imported onto the Site for use in re-instatement of the excavations on the Site should this be required and on any materials excavated from Area A proposed to be beneficially re-used elsewhere on the Site.

Details of the requirements for the Validation Plan including the field and laboratory methods to be undertaken to be implemented on the Site are provided in Section 8 of this RAP

4.8.7 Post-Remediation Groundwater Monitoring Event

Groundwater monitoring is required to be undertaken by the Remediation Consultant from the monitoring wells that are retaining and accessible across the Site at the completion of the remediation works on the Site to assess the groundwater conditions and compared the results to the results of the pre-remediation groundwater monitoring event and previous investigations (E3, 2011).

The groundwater samples will be analysed for total and dissolved heavy metals, PAHs, TPH and BTEX and will be compared to the results of the groundwater monitoring previously conducted by E3 (E3, 2011), the pre-remediation groundwater monitoring event and the adopted groundwater assessment criteria set out in Section 4.4.5

If the results of the post-remediation works monitoring event indicate an increase in concentrations of heavy metals in the groundwater sampled, compared to the concentrations previously reported then additional groundwater monitoring events may be required to be undertaken at an appropriate frequency until a sufficient data set is established that can be used to justify a reduction in the groundwater monitoring frequency. The results of the post-remediation monitoring would firstly be presented to the Site Auditor for discussion on the requirement, if any, for further monitoring and for endorsement of any proposed additional groundwater monitoring.

The methodology adopted during each monitoring event undertaken on the Site must be consistent and must in accordance with the procedures set out in Section 4.8.1.

5 REMEDIATION WORKS CONTINGENCY PLAN (RWCP)

The purpose of the Remediation Works Contingency Plan (RWCP) is to outline procedures for the identification and management of unexpected issues or events that may occur during the remediation works

The key risks that have the potential to arise during the remediation works include:

- Unexpected finds;
- Excavation works fail to achieve the remediation criteria and goals; and to a lesser extent; and
- Heritage Items.

The contingency measures that will be implemented to ensure that the remediation criteria are met are discussed below.

5.1 Unexpected Finds

The RAP is developed through a review of the previous investigations and historical activities that have been undertaken at the Site to determine the potential contaminants of concern. However, the possibility remains for unanticipated contamination (i.e. contaminated soil, water or debris) and/or potential source structures such as underground fuel storage tanks to be encountered.

The nature of residual material and the associated hazards are generally detectable through visual or olfactory means such as:

- Ash or slag contaminated soils through visual observation;
- Hydrocarbon impacted materials through staining and odours;
- Construction /demolition/railway associated waste through visual observation; and
- Waste material associated with illegal dumping through visual observation.

In the event that one or more of the above mentioned substances are encountered, the following steps should be undertaken:

STEP 1: Immediately cease work and contact the Remediation Contractor or Project Manager.

STEP 2: Remediation Contractor personnel to form an exclusion zone through the use of barricading or similar to prevent access and exposure by workers.

STEP 3: Remediation Contractor to contact Remediation Consultant (if not already on Site) to arrange for inspection of encountered material.

STEP 4: Remediation Consultant to undertake detailed inspection and sampling and analysis of unexpected material. The sampling density requirements will be determined on-Site in accordance with the requirements of the NSW EPA (1995) *Sampling Design Guidelines*

STEP 5: Remediation Consultant to assess analytical results against RAC.

STEP 6: Where results exceed the RAC assess the appropriateness of the remediation approach (i.e. excavation and placement on Area B) with respect to the unexpected material encountered.

STEP 7: Where the unexpected material is considered suitable for adopted remediation approach, the material should be removed in accordance with the remediation methodology outlined in this RAP.

STEP 8: Where the unexpected material is not considered appropriate for removal and placement on Area B, undertake an assessment of potential remediation options and develop a separate RAP to address the requirements of remediation for material.

STEP 9: Remediation Consultant to supervise remediation and undertake validation in accordance with the RAP.

STEP 10: Remediation Contractor to remove barricades for exclusion zone.

STEP 11: Remediation Consultant to submit Validation Report to Greenway & Banks and the Site Auditor

5.2 Excavation Works Fail to Achieve Remediation Criteria

Where the excavation works result in the RAC not being met, the following contingency measures should be implemented:

- Review the results of the validation works;
- Determine the lateral and vertical extent of contamination which remains on-Site and requires further remediation;
- Mark out the spatial boundaries on-Site and communicate the depth boundaries to Remediation Contractor/Civil Contractor for further remediation within the required areas through additional excavations;
- Upon completion of the additional remediation works, undertake validation works in accordance with this RAP; and
- Where the validation works returns successful results, remediation is considered to have been completed.

5.3 Heritage Items

Cultural heritage sites are easily damaged or destroyed by natural processes such as erosion, as well as disturbance. While it is not possible to prevent the slow destruction of cultural heritage sites, it is possible to prevent unnecessary damage by the implementation of careful work practices.

Due to the location and nature of the Site within an industrial and residential area, it considered unlikely that heritage items will be encountered during the remediation works. However, given the nature of the disturbing activities that will be undertaken during the remediation works, should potential heritage items be encountered unexpectedly, the following contingency measures should be implemented:

STEP 1: Immediately cease all activities that could in any way interfere with or disturb the encountered site and/or object(s).

STEP 2: Promptly report the discovery to the Remediation Contractor where available who will in turn notify the Remediation Consultant, Council and/or the relevant regulatory authorities. Until further instructions are received:

- DO NOT disturb the Site;
- DO NOT collect any artefacts as this may alter the scientific value;
- DO NOT touch or interfere with painted art as this may cause the pigmentation to deteriorate, and similarly,
- DO NOT touch up painted art or enhance engravings for the purposes of photographs.

STEP 3: Details of the find should be documented including:

- Location of find;
- Person(s) whom encountered the find;
- Time and date of find;
- Description of find including number of objects, shape, colour etc.
- Actions taken; and
- Without touching or interfering with the site and/or objects, obtain photograph for record of find.

6 REMEDIATION WORKS ENVIRONMENTAL MANAGEMENT PLAN (RWEMP)

Disturbance of sub-surface environments for the purpose of remediation brings with it the potential of risk to the surrounding environment, associated with migration of contamination off-site or within a site, as well as to site personnel. To ensure the protection of the environment, measures need to be implemented during the remediation of a contaminated site.

The RWEMP to be implemented on the Site during the works is presented in detail below. Where conditions required by the development consent conditions from Local Council contradict what is set out below, the development consent conditions take precendent.

6.1 Hours of Operation

The works associated with the remediation are able to be conducted during the following hours:

- Monday to Friday: 7:00 am to 6:00 pm
- Saturdays: 8:00 am to 5:00 pm
- Sundays and Public Holidays: No work permitted.

Emergency work is permitted to be completed outside of these hours.

The works are not expected to include such activities that would result in restricted operational hours such as large scale concrete cutting, heavy duty vacuum extraction and transferring of contaminated materials into steel skip bins. In the event that such activities were required on Site, these are to occur with during hours which are considered to minimise the potential impact to sensitive receptors (i.e. adjacent residential development).

6.2 Soil and Water Management

All works shall be conducted in strict accordance with the soil and water management measures outlined in this section.

To prevent the migration of any waters generated during the works, geosocks or similar will be placed around the stockpiles to prevent sediment and contaminant laden runoff into nearby stormwater drains or surface water bodies

Any material which is collected behind the sediment control structures shall be incorporated back into the stockpiled material from which it was generated.

Any materials that require disposal off-site will require the Remediation Consultant to conduct appropriate sampling and analysis to determine the requirements for off-site disposal in accordance with NSW DECC (2009) guidelines or equivalent.

6.2.1 Asbestos management

Due to the known presence of FA and ACM within the stockpiles and the Site-wide Fill Materials, control measures will be required to prevent release of asbestos fibres and to ensure:

- The health of neighbouring occupants is being protected;
- The health of workers is being protected.

The NSW *Work Health and Safety Regulation* 2011 sets out the requirements for working with and removing asbestos. Additional guidance is found in the NSW WorkCover *Guide Working with Asbestos* 2008 and the Safe Work Australia *How to manage and control asbestos in the workplace. Code of Practice.* 2009. The Remediation Contractor must be appropriately licenced and shall prepare and implement an Asbestos Management Plan (AMP) in accordance with the requirements of the relevant OH&S regulations and NSW Workcover and containing the following:

- Health, safety and environmental management controls during excavation, transportation, stockpiling and placement of materials containing or potentially containing asbestos, FA or ACM;
- Waste management practices for asbestos materials;
- Actions in the event of identification of significant asbestos contamination;
- An asbestos air monitoring program and dust monitoring program designed to meet the following objectives:
    - Determine if the health of occupants and workers is being protected;
    - Determine if control measures and preventative actions are effective;
    - Determine changes in airborne asbestos fibre levels;
    - Determine if changes to work practices and procedures result in increased levels of airborne asbestos fibre;
    - Promote the implementation of more effective preventative measures; and
    - Assess compliance with workplace and environmental goals.

Water blasting of asbestos-containing material is prohibited. The compaction of soils potentially containing asbestos during the placement of soils into Area B must be undertaken in a manner that mitigates the potential release of fibres. Those contracted to carry out the work must be informed of the dangers involved and the precautions that should be taken. It is the Remediation Contractor's responsibility to determine that the protocols to be undertaken during placement and compaction works are appropriate to protect worker health. Such measures must include appropriate dust control, suppression and monitoring.

Excavated soils containing or suspected of containing potentially friable asbestos must not be left unattended. If it is necessary to leave the Site unattended, the fill materials or soils are required to be dampened to prevent generation of dust, and placed back in the excavation and the surface cover reinstated so that exposure to these materials cannot be gained by casual users of the Site.

Small Quantities of ACM Fragments

ACM that is encountered during major works at the Site, as a precautionary measure, are to be considered as friable (meaning the materials can be reduced to a powder between the fingers), until it is proven not to be friable. However, common sense is required to be exercised. For example, if a few fragments of bonded asbestos cement materials (fibro) are present, it is safe to pick them up if the PPE requirements outlined above are adopted, and to place them in double plastic bags for disposal in a dedicated container and subsequent disposal at a landfill licensed to receive this class of material.

However, if a large number of ACM fragments or friable material is encountered, the possibility of friable asbestos being present is increased, and the procedure described below is required to be implemented.

Large Quantities of Asbestos Materials

A bonded asbestos licence is required to be issued by NSW Workcover to remove, repair or disturb more than 10 square metres of bonded asbestos material such as fibro, corrugated cement sheeting and asbestos cement pipes. A friable asbestos licence is required to be issued by NSW Workcover to remove, repair or disturb any amount of friable asbestos, such as sprayed limpet, asbestos cloth, millboard and pipe lagging. This licence also allows the removal of bonded asbestos.

NSW WorkCover must be notified seven days before removing bonded asbestos and a work site permit from NSW WorkCover is required to be obtained before removing any friable asbestos. Applications must be lodged at least seven days before the proposed work is due to start. If such licences are required for the remediation works then these licences must be obtained by the Remediation Contractor prior to the commencement of such works on the Site.

If either a large quantity of ACM fragments and/or friable asbestos are identified or suspected during intrusive activities, excavation works should stop and the materials should be covered with substantial plastic sheeting that is securely anchored to the ground surface and be enclosed within a barrier to prevent access. Appropriate signage should be displayed to warn of the presence of these materials.

At the earliest practical time after the identification of a large number of ACM fragments and/or potentially friable asbestos materials, the works supervisor should contact the Project Manager for advice on how to proceed. A suitably qualified Occupational Hygienist or Remediation Consultant would be contacted by the Project Manager to provide further advice.

Any materials excavated from the Site must be handled with care and in accordance with the requirements of the AMP.

Works on the Site must not commence until the AMP is prepared and provided to the Remediation Consultant, the Site Auditor and Greenway & Banks for review and approval.

6.2.2 Excess/Accumulated Waters

During the previous E3 investigations, waters were noted to have accumulated in pockets of more porous materials at depth within the Relocated Stockpile. During the excavation of the Relocated Stockpile, excess waters may be encountered that may require pumping out for temporary storage for disposal off-site. Any accumulated waters encountered require handling with appropriate PPE as set out in Section 7 of this RAP. Large volumes of excess waters are not to be disposed onto unsealed areas of the Site and must be disposed off-site. Any liquids that require disposal off-site will require the Remediation Consultant to conduct appropriate sampling and analysis to determine the requirements for off-site disposal in accordance with NSW DECC (2009) guidelines or equivalent.

6.3 Site Access

During remediation works, barriers will be installed which will restrict access to the designated works area. Only authorised persons will be able to enter the work area.

Vehicle access shall be limited to the nominated contractors and equipment. Any collected materials shall be treated as potentially contaminated and handled as per the classification/reuse/disposal requirements outlined in this RWEMP.

6.4 Noise and Vibration

The Site is located immediately adjacent to residential dwellings and therefore the remediation works will be controlled by the following means:

- Ensure works are undertaken within the hours of operation set out above;
- Restricting the activities that generate the highest levels of noise to within the restricted hours of operation (where required) as set out above;
- Ensuring that no vehicles, machinery or equipment generate noise levels beyond applicable guidelines; and
- The proposed works will not generate vibration such that any control measures will be required.

6.5 Ambient Air Monitoring

Given the nature of the asbestos contamination, combined with setting of the Site in an outdoor open space, asbestos control monitoring is considered necessary. As stipulated in Section 6.2.1, the Remediation Contractor shall be required to prepare an AMP that shall include an air monitoring program for asbestos. It is also required that the AMP include a program for dust monitoring and dust monitoring equipment should demonstrate that dust levels are kept as low as reasonably possible.

At a minimum the AMP must adopt the requirements of the NEPM, and as adopted by WA DoH (2009), that perimeter monitoring should be conducted to ensure compliance with the ambient air 24 hour PM goal of 50 µg/m^3 with no exceedances.

The chemical contaminants including heavy metals, TPH and BaP are not considered to present a risk such that ambient air monitoring for these contaminants would be required. However, if volatile organic odours are detected during remediation works a calibrated PID monitor will be made available on Site should this be considered necessary.

6.6 Odour

Given the nature of the contamination, comprising heavy metals, limited concentrations of TPH, BaP and asbestos, combined with setting of the Site in an outdoor open space, odours of the nature that would require management measures are not likely to be generated.

6.7 Material Transporting

The movement of materials within the Site must be tracked and the Remediation Contractor is required to prepare a Materials Tracking Plan, in which records of any materials movement and placement within the Site is to be kept and maintained.

The remediation methodology requires the transferring of the excavated contaminated soils from Area A to the Containment Area on Area B.

Transfer of the material will occur via the use of either off-road articulated dump trucks or scrapers. During the transfer of the materials between the stockpile locations and Area B, due care will be taken to ensure that the loads do not exceed the capacity of the trucks/or scrapers, and that spillages of the contaminated material are prevented.

All appropriate site rules shall be observed during the transfer of material including obeying restricted speed limits, vehicles to proceed in a forward direction only (i.e. reversing to be avoided where practicable) and trucks to remain on designated site routes where possible.

6.8 Placement of Contaminated Soil to Area B

As described above, the contaminated soil material will be excavated and transferred to the Containment Area on Area B with no material intended for off-Site disposal.

Details of the placement of excavated and stockpiled material to Area B including the volumes and source of the materials and timing of their placement into Area B will be required to be tracked by the Remediation Contractor in the Materials Tracking Plan.

6.9 Complaint Reporting and Resolution

Complaints from any parties will be directed initially to the Remediation Contractor. Following that, discussion with the Remediation Consultant and/or Greenway & Banks and the complainant will investigate the issue and remedy it as required or applicable.

7 OCCUPATIONAL HEALTH AND SAFETY PLAN

The site-specific Occupational Health and Safety Plan (OH&S Plan) that will be implemented during the works is presented below and contains procedures and requirements that are to be implemented as a minimum during the remediation works.

7.1 Objectives

The objectives of the OH&S Plan are:

- To apply standard procedures that reduce risks resulting from the remediation works;
- To ensure all employees are provided with appropriate training, equipment and support to consistently perform their duties in a safe manner; and
- To have procedures to protect other site workers and the users of the basement areas of the building.

These objectives will be achieved by:

- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards and mandatory safety practices and procedures; and
- Provision for contingencies that may arise while operations are being conducted at the site.

Contractors will be required to prepare their own Safe Work Method Statements (SWMS) for their work activities. All parties working on the Site shall comply with all applicable Health and Safety legislation, regulations, codes and guidelines. All contractors working on the Site will undergo a specific Induction provided by the Remediation Contractor.

7.2 Asbestos Management

The NSW *Work Health and Safety Regulation* 2011 sets out the requirements for working with and removing asbestos. Additional guidance is found in the NSW WorkCover Guide *Working with Asbestos* 2008 and the Safe Work Australia *How to manage and control asbestos in the workplace. Code of Practice.* 2009. The requirements for the management of asbestos containing or potentially asbestos containing materials will be set out in the AMP as described in Section 6.2.1.

Any fill materials excavated from the Site must be handled with care and in accordance with the requirements of the AMP and Section 6.2.1

7.3 Responsibilities

Roles and responsibilities during the remediation works are described in the table below.

Table 10: Roles and Responsibilities

Role	Responsibilities
Project Manager	Ensure field personnel are suitably familiar with the requirements of the OH&S Plan before commencing works on Site. Ensure contractors are suitably qualified and safe work method statements have been supplied and approved prior to commencing works on Site. Responsible for the day to day implementation of the health and safety plan in all phases of work. Ensure that any required modifications to the OH&S Plan are noted, communicated to all project staff and are implemented.

Role	Responsibilities
Remediation Contractor	Inductions for personnel and contractors in accordance with the Site-specific Induction requirements. Ensure communication and notification of the remediation works to the Site owners, leaseholders and operators. Provision of copy of the RWP to Site owners, leaseholders and operators. Induction of sub-contractors and/or other Field Personnel in accordance with the requirements of this OH&S Plan and the Site-specific Induction. Ensure they are personally familiar with the requirements of the OH&S Plan before commencing works on Site. Ensure that they appropriately induct sub-contractors and visitors to the Site and that all persons inducted sign an acknowledgement form. Ensure the on-site activities and deliverables conform to the OH&S Plan. Ensure that appropriate Personal Protective Equipment (PPE) is worn. Report any incidents or accidents as soon as possible.

Role	Responsibilities
Sub-contractors/Remediation Consultant	Ensure they are familiar with the requirements of the Site-specific Induction and OH&S Plan before commencing works on Site and have signed an acknowledgement form. Responsible for abiding by this OH&S Plan. Provide H&S P's and/ or SWMS's for work to be undertaken. Ensure they are suitably qualified and trained to complete the tasks required including operation of equipment. Ensure the on-site activities and deliverables conform to the OH&S Plan. Ensure that appropriate PPE is worn. Report any incidents or accidents to the Remediation Contractor as soon as possible. Contractors should demonstrate to the Remediation Contractor and Project Manager appropriate OHS knowledge and performance, be able to identify risks associated with the work they are doing and provide suitable work methods to minimize the risks to themselves and others.

7.4 Contact Details

A list of emergency contact names and number is provided in the table below.

Table 11: Contact Details

Contact	Name	Telephone number
Local Contacts		
Local Council	Auburn City Council Civic Precinct Centre 1 Susan Street PO Box 118 Auburn NSW 1835	(02) 9735 1222
Emergency '000' – use 112 on a mobile		

Contact	Name	Telephone number
Hospital	Auburn Hospital & Community Health Services Hargrave Rd, Auburn, New South Wales	(02) 8759 3000
Police	Flemington LAC Corner of Queen and Susan Streets AUBURN 2144	02 9646 8699
Fire	Silverwater Fire Station 122 Adderley St AUBURN, NSW, 2141	02 9647 1246
Poison Infoline		13 11 26

7.5 Anticipated Hazards

The anticipated onsite hazards are provided in the table below:

Table 12: Anticipated On-site Hazards

	Chemical		Physical		Biological
✔	Dusts		Pressure		Rats, rodents, dogs
	Mists	✔	Temperature		Poisonous plants
✔	Fumes		Heat Stress	✔	Insects
	Gases		Cold Stress		Microbes, viruses, bacteria
✔	Vapours	✔	Noise+Vibration	✔	Snakes
✔	Liquids		Oxygen deficiency		Sanitation
	Sludge	✔	Fire	✔	Other
✔	Solids		Engulfment		
✔	Unspecified materials	✔	Crushed/run over		
✔	Other: Potential contaminants in soil include heavy metals, TPH, PAHs, asbestos.				

	Ergonomic		General Safety
✔	Stress	✔	First aid
✔	Fatigue	✔	Access / egress
	Driver Fatigue	✔	Trenching / shoring
✔	Biomechanics (i.e., pushing, pulling, carrying, hand tools)		Services not cleared
	Work place design	✔	Walking surfaces (uneven ground, holes, ditches)
	Other		Unstable stacking or storage

		✔	Sharp objects (i.e., nails, glass, metal, etc)
		✔	Slippery surfaces (trips)
		✔	Wet surfaces (trips and falls)
		✔	Electrical (underground/overhead)
		✔	Materials handling (manual handling)
		✔	Heavy equipment
		✔	Machinery (moving parts)
		✔	Moving Plant Equipment
		✔	Poorly visible supports
		✔	Underground utility services
		✔	Other (fire extinguisher)

7.6 Potential Hazards and Prevention

The anticipated hazard prevention is provided in the table below. Any accidents or near misses will be reported to the Remediation Contractor and the Project Manager.

Table 13: Potential Hazards and Prevention

Hazard	Prevention
Use of mobile phone whilst driving	Personnel will be prohibited from using a mobile phone or hands free device whilst driving and/or operating machinery.
Potentially contaminated soil or surface water coming into contact with skin	Wear gloves and long sleeve clothing. Wash hands before eating, smoking, drinking and leaving Site.
Inhalation/ingestion of contaminated soil or surface water.	Wear gloves when sampling. Wash hands after sampling complete and/or before handling food. If odours are significant but not dangerous for comfort use appropriate PPE – half face respirators with organic filters.
Asbestos inhalation	The Remediation Contractor shall prepare an Asbestos Management Plan which shall set out measures for the protection of workers. Measures within this Asbestos Management Plan shall be implemented on-site.
Corrosive sample preservatives coming in contact with skin or eyes.	Wear latex or nitrile gloves for skin protection. Safety sunglasses will be worn while collecting and handling sample jars/bottles filled with corrosive acid preservatives.
Heavy Machinery and Plant	See Contractors Safe Work Method Statements
Site Traffic (Movement of Plant/Equipment)	An exclusion zone will be set up around any sedentary work area to protect the safety of the work party.

Hazard	Prevention
Noise	Use noise attenuation equipment and as necessary provide silencers on noisy equipment. All Site personnel will carry earmuffs or plugs for use during excessive noise.
Manual Handling and Lifting	Heavy loads, are not to be lifted alone. If possible use mechanical aids. When handling rough jagged or sharp objects use gloves or hand tools.
Fatigue	Regular breaks, use equipment where possible to reduce heavy physical labour.
Contact with contaminated soils	Remediation Consultant and Remediation Contractor working at the Site must have training in handling contaminated soil samples. All staff are aware about the human health and ecological risks posed by contaminants. Appropriate PPE will be worn while in contact with contaminants.
Contact with fire and explosion	Access to fire fighting equipment at the Site will be identified during Site induction. All field staff PPE is rated for fire protection.

7.7 Sub-Contractors

Sub-contractors must provide safe work method statements for the works to be undertaken, which must be approved by the Remediation Contractor prior to works commencing at the Site. Sub-contractors must be suitably qualified and trained in the operation of any equipment necessary to complete the works.

Sub contractors will be inducted by the Remediation Contractor in accordance with the Site-specific Induction and in accordance with the OH&S Plan requirements and this OH&S Plan and must read and adhered to at all times when on the Site. Sub-contractors will be required to sign the OH&S Plan acknowledging that they have read and agree to adhere to the requirements of the OH&S Plan. The Remediation Contractor must ensure that a copy of this OH&S Plan is available on Site at all times.

7.8 Personal Protective Equipment

Personnel working on Site must wear Level D PPE at all times as follows:

- Steel toe-capped safety boots;
- Long pants and long sleeved shirt; and
- High visibility vest, shirt or jacket.

In addition, the following PPE is required to be worn when in the vicinity of operational machinery or when in contact with soil/water:

- Hard hat;
- Hearing protection;
- Safety glasses;
- Gloves.

A half–face respirator or dust-masks will be available for use at the Site in the event that significant odours or dust is generated during the works.

As stipulated in Section 6.2.1 the Remediation Contractor shall prepare an Asbestos Management Plan which shall set out PPE requirements for safe working at the Site. These measures shall be implemented, including any PPE requirements.

If during remediation works, volatile organic odours are noted by any personnel, a PID monitor will be made available on Site to monitor the breathing zone of operator/Remediation Consultant. A half–face respirator fitted with organic filters and coveralls/tyvex (chemical resistant) will also be made available for use at the Site in the event that significant contamination/odours are encountered. If the MUL Action levels and PPE requirements for benzene (most conservative and PID measures benzene equivalents) as presented in the table below are to be applied within the breathing zone during the works.

Table 14: Potential Hazards and Prevention

Chemical Hazards:	Risk: H - High M - Med L - Low	TWA (mg/m^3)	STEL (mg/m^3)	IE (eV)	MUL Action levels (75% safety margin worked into MUL)				LEL (%)
					No APR	½ face APR	full face APR	IDLH reached	
☒ Benzene	H	16	-	-	5	37.5	187.5	3000	1.3-
** Remember - Max Use Limit (MUL) = (Protection Factor x Exposure Limit) x 75% ** PF= 10 for ½ face, 50 for full face, 10000 for SCBA									

7.9 Emergency Response

The Remediation Contractor Site Induction shall detail the emergency response procedures for the Site and will be restated prior to commencing works. In addition to the procedures outlined in the Remediation Contractor Site Induction in the event of an emergency personnel will follow the emergency response procedures described below:

- Remain calm;
- Assist persons in immediate danger if safe to do so;
- Retreat to a safe distance;
- Raise the alarm – call '000' in the event of fire, spill or medical emergency;
- Shut down ignition sources / remove power supply if safe to do so;
- Provide first aid to injured parties if trained and safe to do so;
- In the event of fire, use fire extinguisher if trained and safe to do so;

- Notify project manager / director, client and complete incident report form.

7.10 Incident Reporting

All incidents and near-misses must be reported to the Remediation Contractor, as well as through the relevant company incident reporting system.

8 VALIDATION PLAN

A Validation Plan is required to be implemented on the Site by the Remediation Consultant to ensure that RAP has been followed and that the remediation objectives have been achieved. The purpose of the Validation Plan is to develop a framework for the validation of the Site, specifically Area A and Area B to verify the suitability of each Area for the proposed use.

Requirements for the data quality objectives, sampling and analytical plan, sampling methodology and quality control/quality assurance procedures to be adopted for the validation works are presented below.

8.1 Data Quality Objectives

In determining the type, quantity and quality of data needed to support decisions relating to the validation of the Site, the seven-step DQO approach has been undertaken in accordance with Appendix IV of the NSW DEC *Guidelines for the NSW Site Auditor Scheme (2nd Edition)*, 2006. The DQO's are presented in detail in the following sections.

Step 1 State the Problem

The owners of the Site intend to redevelop the Site into a commercial / industrial allotments. The Site comprises currently unused land that has previous usage as a railway storage yard and has been subject to uncontrolled filling.

Investigations completed across the Site have identified concentrations of lead, asbestos, TPH and BaP within stockpiled materials, and concentrations of lead, copper and asbestos in Site-wide Fill materials that would require remediation in order for the Site, being separated as Area A and Area B, as suitable for commercial/industrial land use.

The owners of the Site wish to subdivide Area A for use as commercial/industrial allotments without the property titles being incumbered with a Long-term EMP, however, Area B is proposed to be subdivided as a single Superlot, on which a Long-term EMP will apply.

Remediation of identified contamination is to be undertaken in accordance with Section 4 of this RAP. Validation is required to confirm the success of the remediation works.

Step 2 Identify the Decisions

The decisions to be made in order to validate the Site are as follows:

- Confirm that the remediation works have been undertaken in accordance with this RAP, in particular confirm that the construction/installation of the capping measures have been completed in accordance with the design specification;
- Confirm the proposed land use and appropriate RAC;

- Confirm the requirement, if any, for additional data to determine and support validation; and
- Confirm that the validation analytical results meet the validation criteria (RAC).

Step 3 Identify Inputs to the Decisions

The inputs required to make the above decisions are as follows:

- Appropriate guidelines endorsed by NSW OE&H;
- Proposed land use;
- Remediation objectives;
- Results of pre-remediation groundwater monitoring and post-remediation groundwater monitoring to assess whether the remediation works have had any impact on the quality of groundwater beneath the Site and if further monitoring is required;
- Results of the completed additional investigations on the Gravel Stockpile in accordance with Section 4.8.3.1 of this RAP;
- Results of the completed additional investigations on the Site-wide Fill Materials across the Stage 1 Site in accordance with Section 4.8.4.1 of this RAP;
- Based on the outcomes of the above, assess the requirement for remediation and validation sampling of the Site-wide Fill Materials and detail this in a RWP;
- Assessment of whether the concentrations of the contaminants of concern within validation soil samples are greater than or equal to or less than the RAC; and
- Determination of whether the remediation works have been successfully completed.

Step 4 Define the boundaries

The boundaries of the validation works have been identified as follows:

- Spatial boundaries – the Validation Plan applies to the Site as presented on Figure 2;
- Vertical boundaries – expected to be up to 2 m into the Site-wide fill areas, but relocation of the stockpiles will require excavation up to 4-5 m above the current ground level. The vertical extent of the additional investigations in the Gravel Stockpile and the Site-wide Fill material is into natural soil materials. The remediation works do not require the remediation of groundwater;
- Temporal boundaries – the temporal boundary is limited to the data collected during the additional investigation and validation works, however, the results of the previous E3 investigation (E3, 2011) will be referred to and utilised where relevant; and
- Constraints within the study boundaries – The following issues present limitations upon the validation strategy for the Site:
    - Unexpected finds during the remediation works.

Step 5 Develop a Decision Rule

The decision rules for the validation works are as follows:

1. If the validation works do not meet the RAC set out in this RAP, further remediation of those materials will be considered necessary and will be conducted in accordance with the requirements of Section 4.8.4.2 of this RAP.

2. If the construction/installation of the capping layer across the Containment Area on Area B is not completed in accordance with the design specification, as identified by the Project Manager, the Remediation Consultant and/or the Remediation Contractor or other relevant persons, the Remediation Contractor will be required to rectify to ensure compliance with the design specification.

3. If the results of the post-remediation works groundwater monitoring event indicate an increase in concentrations of heavy metals in the groundwater sampled, compared to the concentrations previously reported then additional groundwater monitoring events may be required to be undertaken at an appropriate frequency until a sufficient data set is established that can be used to justify a reduction in the groundwater monitoring frequency. The results of the post-remediation monitoring would firstly be presented to the Site Auditor for discussion on the requirement, if any, for further monitoring and for endorsement of any proposed additional groundwater monitoring.

Step 6 Specify Limits on Decision Errors

The acceptable limits on decision errors to be applied in the validation works 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 8.5.4 of this RAP.

The potential for significant decision errors are to be minimised by:

- Completing a robust QA/QC assessment of the validation data and application of the probability that 95% of data will satisfy the DQIs, therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect;
- Assessing whether appropriate sampling and analytical density for the purposes of validation have been applied; and
- Ensuring that the criteria set for the validation works are appropriate for the proposed use of the Site.

The potential for significant decision errors are to be minimised by completing a robust QA/QC program and by completing a validation program that has an appropriate sampling and analytical frequency for the purposes of the validation works and that representative sampling is undertaken.

Step 7 Develop the Plan for Validation for theSite

The design of the validation plan is based on satisfying the remediation objective to ensure that the Site, specifically as Area A and Area B, are suitable for the proposed uses. The validation works are required to confirm that the remediation works contemplated in this RAP have been completed successfully.

The Validation Sampling, Analytical and Quality Plan (Validation SAQP) is presented in detail in Section 8.5 of this RAP.

8.2 Validation Criteria

The validation criteria to be implemented for the validation of soil during the remediation works are required to be the same as the Remediation Acceptance Criteria (RAC) as described in Section 4.4 of this RAP.

8.3 Validation Approach

The validation approach on the Site will involve a program of validation soil sampling and analysis across Area A and the compilation of survey, materials tracking and as-built plans for the Containment Area and capping across Area B.

The remediation and validation approach with respect to Area A and the stockpiled materials is to excavate to the existing surrounding surface level of the Site (as defined in m AHD on the survey plan presented in Appendix A).

Site-wide Fill materials that are identified by the additional investigations and the previous E3 investigation (E3, 2011) to require remediation within Area A will be excavated to the following extents:

- Lateral Extent will be limited to a point 50% of the distance between the identified contamination and the nearest surrounding validated sample locations;
- Vertical Extent will be limited to a point 50% of the distance between the identified contamination and the deepest validated sample location and/or into natural clay soils (whichever comes first).

The resultant excavations will require validation in accordance with the Validation SAQP set out in Section 8.5 below.

Given the known heterogeneous nature of the Site-wide Fill Materials the validation approach will adopt a relatively high sampling frequency to ensure that the resulting data set is representative of the materials to be retained on Area A. As stated previously, where relevant, the approach to the validation of Area A Site is to utilise the results from the additional investigations of the Site-wide Fill Materials as part of the validation works.

8.4 Scope of the Validation Works

The scope of work that is required to be undertaken during the validation on the Site comprises the following:

- Pre-remediation Groundwater Monitoring Event (as set out in Section 4.8.1 of this RAP);
- Assessment of the results from samples collected as part of the Additional Investigation of the Site-wide Fill Materials within Area A (as set out in Section 4.8.3 of this RAP) and determine if any of the results can be utilised for the validation works;
- Validation sampling of areas of Area A where results of the additional investigation did not provide a sufficient sampling density;
- Validation sampling of excavations formed as a result of remediation works on Area A;
- Assessment of the suitability of materials from the Gravel Stockpile for beneficial re-use on the Site, if any;
- Assessment of the suitability of materials to be imported onto the Site for use of reinstatement of excavations on Area A (where required) or as capping materials on Area B;
- Periodic inspections during materials placement works within Containment Area on Area B and during capping works across Area B;
- Receipt and review of materials tracking and placement documentation, detail design drawings and final as-built specifications of the Containment Area and other capping completed on Area B from the Remediation Contractor;
- Post-remediation Groundwater Monitoring Event (as set out in Section 4.8.7 of this RAP); and
- Preparation of a Validation Report.

8.5 Validation Sampling, Analytical and Quality Plan

The Validation Sampling, Analytical and Quality Plan (VSAQP) for the remediation and validation works has been developed based on the objectives of the remediation and with respect to the DQOs, the subsurface conditions and the requirements of the remediation works.

The VSAQP includes the sampling location and analytical plan and the specific quality assurance and quality control measures to be undertaken during the remediation and validation works and is presented in detail below.

8.5.1 Sampling Plan

8.5.1.1 Validation Soil Sampling

Areas of Area A where no remediation of Site-wide Fill Materials has been required to be undertaken.

The validation sampling plan to be adopted for validation soil samples collected from the surface of Area A, where remediation of the Site-wide Fill Materials has not been required to be undertaken will apply the use of an approximately 44 m x 44 m grid and the use of a combination of chemical analysis, asbestos analysis and field screening for ACM of the soil samples collected and in accordance with the decision making process set out below. This grid based sampling pattern is considered to be appropriate based on the following:

- The area of Area A is 4.9372 ha;
- Jaynon have indicated to E3 that the likely range of areas of individual lots for proposed commercial/industrial uses across Area A will range from 1500 m^2 to 2500 m^2 and that the designated roadways will comprise approximately 7500 m^2 . E3 understand that a subdivision plan has not been finalised nor has received planning consent and maybe subject to change, therefore a subdivision plan indicating the layout of the lots and roadways cannot be used for the purposes of setting a validation sampling plan;
- Based on the above, it is estimated that the average lot size across Area A is approximately 2000 m^2 ;
- The minimum sampling density recommended in the NSW EPA (1995) *Sampling Design Guidelines* for a site of between 0.1 to 0.2 ha is six to seven sampling locations;
- In determining the suitability of Area A for commercial/industrial purposes with an average commercial/industrial lot being 2000 m^2 the adoption of 44 m x 44m sampling grid across Area A is considered to be appropriate for the purposes of the validation works; and
- In each sampling grid six validation locations equally spaced (where practicable) will be required to be sampled, with samples being collected at each location at two depths; between the surface and 0.2 m bgs and then at 0.5 m bgs. It is noted that this grid will be adopted across areas of Area A proposed to be used for roadways, and as such both the grid size and the number of samples to be collected per grid is considered to be conservative. This sampling plan provides a number of sampling locations that is more than double that set out for an area of 5 ha in NSW EPA (1995) and WA DoH (2009).

Areas of Area A where remediation of Site-wide Fill Materials has been required to be undertaken.

The validation sampling plan to be adopted for validation soil samples collected from the areas of Area A that have undergone excavation for remediation of Site-wide Fill Materials will be set out in the RWP, which is required to meet, at a minimum, the sampling plan set out below. Validation soil samples will be required to be collected from the walls (if deeper

than 0.2 m) and the base of the resultant excavation surfaces at the following sampling rates:

- If excavation area is less than 20 m x20 m, then two base sample and wall samples (where excavation is deeper than 0.2 m) wall samples (where excavation is deeper than 0.2 m) are to be collected at a rate of 1 per 5 m are to be collected;
- If excavation area is greater than 20 x20 m but less than 40m x 40 m then the collection of base samples needs to be conducted at a frequency that satisfies the sampling plan set out above for the areas where remediation of the Site-wide Fill Materials has not been required to be undertaken. Wall samples (where excavation is deeper than 0.2 m) are to be collected at a rate of 1 per 5 m; and
- If excavation area is greater than 40m x 40 m then the collection of base samples needs to be conducted at a frequency that satisfies the sampling plan set out above for the areas where remediation of the Site-wide Fill Materials has not been required to be undertaken. Wall samples (where excavation is deeper than 0.2 m) are to be collected at a rate of 1 per 5 m).

8.5.1.2 Materials imported onto the Site

Materials proposed to be imported onto the Site:

- Samples of Recovered Aggregates, VENM and ENM, proposed to be imported to the Site will be conducted at a rate of 1 per 100 m^3 with appropriate documentation; and
- Samples of non-VENM material (such as topsoils, growing media, mulch etc) will be conducted at a rate of 1 per 100 m^3.

The results must meet the criteria presented in Section 4.4.3 of this RAP. As stated in Section 4.4.3 if the imported material sampling/analyses has not been conducted by the Remediation Consultant or in strict accordance with the requirements Section 4.4.3 then the results of the additional inspection and sampling/analyses of the imported materials that verifies the suitability of the materials as they are received at the Site must be provided to the Site Auditor for review and endorsement prior to their placement on the Site.

8.5.1.3 Materials from Gravel Stockpile for beneficial re-use

Materials assessed as part of the Additional Investigations of the Gravel Stockpile (see Section 4.8.3.1) as being potentially suitable for beneficial re-use must be subject to confirmation sampling and analysis as follows:

- With respect to asbestos, the sampling and analytical density will be conducted to meet the 14 samples per 1000m^3 set out in the WA DoH (2009);
- With respect to heavy metals; (Arsenic, Cadmium, Copper, Chromium, Nickel, Lead, Zinc and Mercury), PAHs, TPH and BTEX, the sampling and analytical density will be conducted to meet 1 per 100 m^3.

The results must meet the criteria presented in Section 4.4.3 of this RAP. If the results of this further sampling and analysis indicate that the materials are suitable for beneficial re-use then the results would be provided to the Site Auditor for review and endorsement prior to the materials being beneficially re-used on the Site.

8.5.1.4 Materials to be disposed off-site

It is not anticipated that any materials will require disposal off-site, however, if this were to occur these materials need to be sampled and analysed at a rate of one per 250 m^3.

The results must be compared to the criteria presented in Section 4.4.2 of this RAP to determine the waste classification for off-site disposal.

8.5.1.5 Groundwater Monitoring

Groundwater Monitoring will be undertaken in accordance with the requirements and methodologies set out in Section 4.8.1 of this RAP and as follows:

- Groundwater samples will be collected at a rate of one groundwater sample per well per groundwater monitoring event. It is anticipated that only one post-remediation groundwater monitoring event will be required to be undertaken completion of the remediation.

Groundwater results are to be compared to the criteria presented in Section 4.4.5 of this RAP.

8.5.2 Field Methodology

8.5.2.1 Soil Sampling

Soil sampling for the validation works will be undertaken in accordance with the following methodologies:

- Validation soil samples
  - Validation soil samples will be collected at the frequencies set out in the sampling plan in Section 8.5.1 and will be collected using an excavator either directly from undisturbed materials in the centre of the excavator bucket or directly from the validation surface using a stainless steel trowel. Samples will be collected by a hand protected by a nitrile glove to direct the collected soil material into the sample containers. A clean pair of disposable gloves will be worn to collect each sample.
  - The samples will be collected into containers as follows:
    - Samples for analysis for heavy metals, TPH, BTEX and PAHs in laboratory-supplied 150 mL glass jars with Teflon-lined lids, which will be carefully filled to minimise the amount of headspace in the sample jars;

- Samples for asbestos field screening and/or analysis, one10 L and one 0.5L samples, shall be placed into clean buckets;
- Duplicates of the soil samples will be prepared in the field by splitting a primary sample. Samples will not be mixed or homogenised during splitting.
- Samples for laboratory analysis for asbestos shall be placed immediately in a secured esky or similar;
- Samples for laboratory analysis for chemical analysis shall be placed immediately on ice in a secured esky or similar;

- Imported material samples:
  - Imported material samples will be collected directly from the source/supplier of the material (either from the near-surface or from stockpiles or similar, but at a minimum of 10 cm below the surface) by hand protected by a disposable nitrile glove;
  - A clean pair of disposable gloves will be worn to collect each sample. The samples will be collected into laboratory-supplied 150 mL glass jars with Teflon-lined lids, which will be carefully filled to minimise the amount of headspace in the sample jars;
- Materials for beneficial re-use samples:
  - Samples will be collected directly from the stockpile of the material (either from the near-surface or from stockpiles or similar, but at a minimum of 10 cm below the surface) by hand protected by a disposable nitrile glove;
  - A clean pair of disposable gloves will be worn to collect each sample. The samples will be collected into containers as follows:
    - Samples for analysis for chemical analysis in laboratory-supplied 150 mL glass jars with Teflon-lined lids, which will be carefully filled to minimise the amount of headspace in the sample jars;
    - Samples for asbestos field screening and/or analysis, one10 L and one 0.5L samples, shall be placed into clean buckets;
- Materials for off-site disposal:
  - Samples will be collected directly from the stockpile of the material (either from the near-surface or from stockpiles or similar, but at a minimum of 10 cm below the surface) by hand protected by a disposable nitrile glove;
  - A clean pair of disposable gloves will be worn to collect each sample. The samples will be collected into containers as follows:
    - Samples for chemical analysis in laboratory-supplied 150 mL glass jars with Teflon-lined lids, which will be carefully filled to minimise the amount of headspace in the sample jars;
    - Samples for asbestos field screening and/or analysis, one10 L and one 0.5L samples, shall be placed into clean buckets.

8.5.2.2 Field Screening of Soil Samples

In accordance with the WA DoH (2009), the 10 L sample shall be screened manually on-site through a < 7 mm sieve or spread out for inspection on a contrasting colour material (recommended for FA). Samples in which potential ACM (<7mm) and FA are identified

shall be sent to a laboratory NATA accredited for asbestos analysis. If ACM is identified at greater than 7 x 7 mm the pieces from each 10 L sample will be placed in a sealed plastic bag and sent to a laboratory NATA accredited for weighing and asbestos analysis. The remaining 10L sample will also be sent to a laboratory NATA accredited for weighing and asbestos analysis.

Field screening of the 5 L sample is not contemplated, however, each 5 L sample collected will be submitted to laboratory NATA accredited for weighing and asbestos analysis.

Additional soil from each sample depth range will be placed in a sealed plastic bag for field screening purposes. After waiting approximately 5 minutes for the sample and the headspace to equilibrate the headspace in the bagged samples was assessed by a calibrated (100 ± 3 parts per million (ppm) isobutylene) PID with a 10.6 eV lamp to measure the presence of total VOCs.

8.5.2.3 Field Logging

Recording of logs for the samples collected in the field will be conducted in accordance with Australian Standard 1726-1993: Geotechnical site investigations and soils will be classified in accordance with the Unified Soil Classification System (USCS), including observation of any anthropogenic material (i.e. hydrocarbon odours, unusual coloured materials, ACM etc). Descriptions will be recorded on standard test pit/trench field log sheets for uniformity in descriptions, presentation and to aid in any future interpretations.

The American Society for Testing and Materials (ASTM) system and the USCS are the general standards used by E3 in classifying soil by visual and manual examination. The reference for the USCS system is Procedure for Determining Unified Soil Classification (Visual Method), United States Department of the Interior, Bureau of Reclamation (USBR) 5005 86. The reference for the ASTM system is Description and Identification of Soils (Visual-Manual Procedure), ASTM Standard Practice D2488 90. A comparison of USBR 5005 86 and ASTM D 2488 90 indicates no technical differences between the two methods except for the size of the soil specimens for the manual dry strength test (6.35 mm for USCS and 12.7 mm for ASTM).

8.5.2.4 Sample Labelling, Storage and Transport

Sample jars and bottles will be clearly labelled with unique identification numbers consisting of the date, sample location, depth of sample (for soil samples only) and samplers initials. In the case of field intra-laboratory and inter-laboratory duplicates, sample containers will be labelled so as to not reveal their purpose or sample location to the laboratory. Samples for chemical analysis will be kept chilled in an ice-filled esky prior to dispatch and during transport to the NATA registered laboratory under chain-of-custody procedures. Samples for analysis for asbestos will be kept in an esky prior to dispatch and during transport to the NATA registered laboratory under chain-of-custody procedures.

8.5.2.5 Sampling Equipment Decontamination

During the validation sampling works the following equipment will need to be decontaminated:

- Stainless steel trowel or similar; and/or
- Excavator bucket

No other re-useable sampling equipment is proposed to be used during the soil sampling.

Decontamination procedures will be performed before initial use and after each subsequent use. The stainless steel trowel and other re-useable sampling equipment will be decontaminated using a pressurised water cleaner between each well location. Re-usable sampling equipment will be decontaminated between each sample location by scrubbing with a solution of Decon 90 (a phosphate-free detergent) followed by a rinse in potable water. For each day of sampling, following decontamination procedures, a rinsate blank will be collected by running laboratory prepared deionised water over the equipment directly into laboratory prepared sampling containers for analysis.

Given the likely unconsolidated composition of the soil materials it is likely that emptying and shaking of the excavator bucket between sampling locations will be sufficient to remove loose materials between sampling locations that could cross-contaminate subsequent samples. Where samples are collected from the excavator bucket, discrete samples will be collected from undisturbed materials in the centre of the bucket. A new pair of disposable nitrile gloves was worn to collect each sample. As such no other decontamination procedures are considered to be necessary with respect to the excavator bucket.

8.5.3 Analytical Plan

The following sample analysis schedule will be adopted for the validation works:

- Validation soil samples:
  - Samples for validation of removal of ACM and FA/AF will be assessed as follows:
    - 10L samples will be assessed in the field for the presence of ACM and FA using the methodology set out above in Section 8.5.2.2 and then if required submitted for laboratory analysis for asbestos using the decision making process set out in Section 8.5.2.2;
    - 5L samples will be submitted for laboratory analysis for asbestos (for each sampling interval);
  - Samples for validation of remediation of materials containing heavy metals, TPH and PAHs will be submitted for laboratory analysis of heavy metals,TPH and PAHs;
  - Intra-laboratory duplicate samples will be analysed at a rate of one per ten primary samples (10%) for the suite of analytes as listed above;

- Inter-laboratory duplicates samples will be analysed at a rate of one per twenty primary samples (5%) for the suite of analytes as listed above; and
- Rinsate samples (if required) will be analysed for heavy metals (lead, arsenic, copper, chromium, cadmium, mercury, nickel and zinc), TPH and PAHs.

- Imported Material samples:
  - Samples of material to be imported to the Site shall be submitted for analysis of metals Arsenic, Cadmium, Copper, Chromium, Nickel, Lead, Zinc and Mercury), TPH, BTEX, PAHs, OCPs, PCBs, asbestos and any other analytes that may be specifically required depending on the source of the materials;
  - Intra-laboratory duplicate samples will be analysed at a rate of one per ten primary samples (10%) for the suite of analytes as listed above; and
  - Inter-laboratory duplicates samples will be analysed at a rate of one per twenty primary samples (5%) for the suite of analytes as listed above.
- Materials for off-site disposal:
  - Samples of material to be disposed offsite shall be submitted for analysis of metals Arsenic, Cadmium, Copper, Chromium, Nickel, Lead, Zinc and Mercury), TPH, BTEX, PAHs, OCPs, PCBs, asbestos and Toxicity Characteristic Leachate Procedures (TCLPs) as required;
  - Intra-laboratory duplicate samples will be analysed at a rate of one per ten primary samples (10%) for the suite of analytes as listed above;
  - Inter-laboratory duplicates samples will be analysed at a rate of one per twenty primary samples (5%) for the suite of analytes as listed above;
- Materials proposed for beneficial re-use on the Site:-
  - Samples for validation of removal of ACM and FA/AF will be assessed as follows:
    - 10L samples will be assessed in the field for the presence of ACM and FA using the methodology set out above in Section 8.5.2.2 and then if required submitted for laboratory analysis for asbestos using the decision making process set out in Section 8.5.2.2;
    - 5L samples will be submitted for laboratory analysis for asbestos (for each sampling interval);
  - Samples collected shall be submitted for analysis of heavy metals (lead, arsenic, copper, chromium, cadmium, mercury, nickel and zinc), TPH and PAHs and asbestos;
  - Intra-laboratory duplicate samples will be analysed at a rate of one per ten primary samples (10%) for the suite of analytes as listed above; and
  - Inter-laboratory duplicates samples will be analysed at a rate of one per twenty primary samples (5%) for the suite of analytes as listed above;
- Groundwater samples, as per requirements set out in Section 4.8.1 and 4.8.7 of this RAP:
  - Groundwater samples collected shall be submitted for analysis of heavy metals (total and filtered Arsenic, Cadmium, Copper, Chromium, Nickel, Lead, Zinc and Mercury), TPH, BTEX and PAHs (ultra trace).

8.5.3.1 Laboratory Methodology

Samples must be submitted for analysis to a laboratory certified by NATA for the analysis required. Primary, intra-laboratory duplicate and rinsate samples must be submitted to the nominated primary laboratory and inter-laboratory duplicate samples must be submitted to the nominated secondary laboratory.

Laboratory analysis will be conducted in accordance with the requirements of NEPM and are referenced to USEPA and APHA methods. The analytical schedule, laboratory methods, laboratory LORs and reference methods to be applied for the validation works must be appropriate to meet the project DQOs and DQIs.

8.5.4 Quality Assurance and Quality Control Plan

The field and laboratory quality assurance and quality control plan to be adopted for the remediation and validation works has been designed to achieve pre-determined data quality indicators that will demonstrate the precision, accuracy, representativeness, completeness and comparability of the data set and that the data set is of acceptable quality to meet the objectives of the works.

The specific quality assurance and quality control plan for the field and laboratory components of the investigation have been developed based on Appendix V of the NSW DEC (2006) and are detailed below.

8.5.4.1 Field QA/QC

The field quality assurance procedures to be adopted and the field quality control samples to be collected during the remediation and validation works and the corresponding acceptable control limits are presented in Table 15 below.

Table 15: Validation Field QA/QC

Data Type	Comments and Acceptable Control Limits
Field personnel	Use appropriately trained field personnel employing procedures listed in the VSAQP and RWP (if required and if different)
Field data collection	All data collection to be undertaken in accordance with the methods set out in this RAP and in the RWP (if required and if different) Site conditions and sample locations properly described. Information to be recorded in field notes. Field notes are appropriately completed and included in the report on the works.

Data Type	Comments and Acceptable Control Limits
Sample handling (storage and transport)	Soil samples will be collected into the sample jars supplied by the analytical laboratory and each sample will be characterised by a unique number. Samples for chemical analysis will be kept chilled in an ice-filled esky prior to dispatch and during transport to the NATA registered laboratory under chain-of-custody procedures. Samples for analysis for asbestos will be kept in an esky prior to dispatch and during transport to the NATA registered laboratory under chain-of-custody procedures. Sample numbers, dates, preservation and analytical requirements will be recorded on COC documentation, which will also be delivered to the analytical laboratory. All samples are required to be documented as received by the laboratory chilled(where required) and intact.
Rinsate Blanks	Rinsate blank samples (from an item of sampling equipment) will be collected and analysed at a rate of one per piece of re-useable equipment per day of sampling. Concentrations of analytes to be less than the laboratory detection limits.

8.5.4.2 Laboratory QA/QC

The laboratory quality assurance procedures to be adopted and the internal laboratory quality control samples to be analysed and the corresponding acceptable control limits are presented in Table 16 below.

Table 16: Validation Laboratory QA/QC

Data Type	Comments and Acceptable Control Limits
Sample Analysis	All sample analyses to be conducted using NATA certified methods by laboratories which will implement a quality control plan in accordance with NEPM (1999c).

Data Type	Comments and Acceptable Control Limits
Holding times	Maximum acceptable sample holding times for analysis Soil – (excluding asbestos):14 days; Water (inc. rinsate samples): 7 days
Laboratory Detection Limits	Where possible, laboratory detection limits to be less than the adopted RAC.
Laboratory Blanks	Laboratory blanks to be analysed at a rate of 1 in 20, with a minimum of one analysed per batch. Concentration of analytes to be less than the laboratory detection limits.
Laboratory Duplicates	Laboratory duplicates to be analysed at a rate of 1 in 20, with a minimum of one analysed per batch. RPDs to be less than 50% and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.
Laboratory Control Samples (LCS)	LCSs to be analysed at a rate of 1 in 20, with a minimum of one analysed per analytical batch. Control limits: 70 to 130 % Acceptable Recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.

Data Type	Comments and Acceptable Control Limits
Matrix Spikes	Matrix spikes and matrix spike duplicates prepared by dividing a field sample into two aliquots, then spiking each with identical concentrations of the analytes at a rate of 1 in 20. Matrix spike control limits: 70–130 % Acceptable recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required. Matrix spike duplicates: RPDs <50% and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.
Surrogates	Surrogates are generally spiked into all sample aliquots prior to preparation and analysis by chromatogaphic methods. Percent recoveries are calculated for each surrogate, providing an indication of analytical accuracy. Surrogate Recovery limits: 70-130% Acceptable recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required
Matrix spikes	Matrix spikes and matrix spike duplicates prepared by dividing a field sample into two aliquots, then spiking each with identical concentrations of the analytes at a rate of 1 in 20. Matrix spike control limits: 70–130 % Acceptable recovery and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required. Matrix spike duplicates: RPDs <50% and if not, liaison with the laboratory will be undertaken and samples will be reanalysed, if required.

8.5.4.3 Data Quality Indicators

Acceptance limits on field and laboratory data collected for the remediation and validation works have been established in Table 15 above. A summary of the data quality indicators (DQIs) and the corresponding measures to be applied for the validation are presented in Table 17 below.

Table 17: Summary of DQIs for Validation

DQI	Field	Laboratory	Acceptability Limits
Precision	Sampling methodologies appropriate and complied with. Collection of intra-laboratory duplicate and inter-laboratory duplicate samples	Analysis of: Field intra-laboratory duplicate samples (1 in 10 samples) Field inter-laboratory duplicate samples (1 in 20 samples) Laboratory duplicate samples	 RPD of < 50% RPD of < 50% RPD of < 50% RPD of < 50%
Accuracy	Sampling methodologies appropriate and complied with. Collection of rinsate blanks	Analysis of: Rinsate blanks (1/day) Method blanks Matrix spikes Matrix spike duplicates Surrogates Laboratory control samples Reagent blanks Reference materials	 Non-detect for CoC Non-detect for CoC 70 to 130% 70 to 130 % RPD of <50% 70 to 130 % Non-detect for CoC, Varies

DQI	Field	Laboratory	Acceptability Limits
Representativeness	Appropriate media sampled according to RAP and RWP (if required and if different) All media identified in RAP sampled.	All samples analysed according to RAP and RWP (if required and if different)	All samples analysed according to RAP and RWP (if required and if different)
Comparability	Same sampling methodologies used on each day of sampling Experienced sampler Climatic conditions Same types of samples collected	Same analytical methods used (including clean-up) Sample laboratory detection limits (justify/quantify if different) Same laboratories (NATA accredited) Same units	As per NEPC (1999c) < nominated criteria
Completeness	All critical locations and media sampled All samples collected Sampling methodologies appropriate and complied with Experienced sampler Documentation correct	All critical samples analysed and all analytes analysed according to RAP. Appropriate methods Appropriate laboratory detection limits Sample documentation complete Sample holding times complied with	 As per NEPC (1999c) As per NEPC (1999b)

In the event that a DQI is not met by laboratory analyses, the field observations relating to the nature of the samples will be reviewed and if no obvious source for the non-conformance is identified, such as an error in sampling, preservation of sample/s or heterogeneity of sample/s, liaison with the laboratories will be undertaken in an effort to identify the issue that has given rise to the non-conformance and additional analyses will be undertaken on the original sample/s, on duplicate samples or on other samples, if required.

If no explanation for the non-conformance is identified, the concentrations for the affected samples will be marked as estimates.

8.6 Validation of Containment and Capping on Area B

Prior to the commencement of the placement of the materials within the Containment Area on Area B, the Remediation Contractor must ensure a survey of the lateral extent and relative levels of the surface of the Containment Area is to be undertaken by a Registered Surveyor.

As part of the relocation and placement of materials from Area A into the Containment Area on Area B the Remediation Contractor is required to establish and maintain records of the origin of materials that are transferred onto Area B and the location of their placement within the Containment Area on Area B. The Remediation Consultant will undertake periodic inspections of the placement works being conducted on Area B and of the records being kept by the Remediation Contractor to ensure that the records have been maintained and are up to date. These records will be utilised by the Remediation Consultant as part of the overall validation of the remediation works conducted on the Site.

On completion of the transfer and placement activities onto the Containment Area on Area B the capping works across the Containment Area and the remainder of Area B will be undertaken. The Remediation Contractor is required to keep and maintain a record of these works. The Remediation Contractor must ensure that a survey of the lateral extent and relative levels at the final surface of the placed materials, the marker layer, the capping layer and the final surface of the Containment Area and Area B is undertaken by a Register Surveyor. The results of the survey are to be presented in as-built plans that will form the final stages of the record of works to be kept and maintained by the Remediation Contractor.

During the capping works, the Remediation Consultant will undertake periodic inspections to ensure that the capping works are being undertaken in manner that satisfies the requirements of this RAP and of the records being kept by the Remediation Contractor. These records will be utilised by the Remediation Consultant as part of the overall validation of the remediation works conducted on the Site.

At the completion of the capping works on Area B the Remediation Contractor must provide to Janyon and the Remediation Consultant detailed drawings and as-built plans of the Containment Area on Area B and of the cap placed across Area B and records demonstrating that the cap has been installed in accordance with the detailed specification and drawings that were prepared in accordance with Section 4.8.2.4 of this RAP.

8.7 Validation Report

At the completion of the remediation and validation of the Site a Validation Report is required to be completed by the Remediation Consultant. The Validation Report is required to written in compliance with the relevant requirements of the NSW OE&H (2011) and NSW DEC (2006) and other applicable guidelines endorsed by NSW OE&H.

The Validation Report must contain information including, but not limited, to the following:

- Details of the remediation works conducted across the Site;
- Information demonstrating that the objectives of the remediation and validation works have been achieved, in particular the validation results and assessment of the data against both the pre-defined data quality objectives and the remediation acceptance (validation) criteria;
- Information demonstrating compliance with appropriate regulations and guidelines;
- Any variations to the strategy undertaken during the implementation of the remedial works and justification for the variation to the strategy;
- Results of all environmental monitoring undertaken during the course of the remedial works;
- Details of any environmental incidents occurring during the course of the remedial works and the actions undertaken in response to these incidents;
- Detail design drawings and final as-built specifications of the construction of the Containment Area and capping across the Containment Area and remaining areas of Area B;
- Information demonstrating compliance with appropriate regulations and guidelines;
- Details on material tracking and placement into Area B;
- Details on the capping works undertaken on Area B;
- Details on materials imported to the Site (if required);
- Details on materials disposed off-site (if undertaken);
- Details on materials beneficially re-used on the Site (if undertaken);
- Detail on how the presence of a Containment Area on Area B will not affect the suitability of Area A for its proposed use;
- Clear statement of the suitability of Area A for commercial/industrial use without the need for a Long-term Environmental Management Plan;
- Clear statement on the suitability of Area B for commercial/industrial use with the requirement for a Long-term Environmental Management Plan; and
- Other information as appropriate, that will apply to the Site.

Notwithstanding the above, it is noted that at the completion of the works, Janyon may require that a separate validation report is prepared for Area A and Area B. If this were to be undertaken the contents of each report would contain the information above as it applies to the works conducted on that Area during the remediation and validation works and would have a clear statement on suitability for that Area only. Each report would also detail the affect on how the presence of a Containment Area on Area B will not affect the suitability of Area A. It is noted that the preparation of two separate validation reports for each Area may make the issue of a separate Site Audit Report and Site Audit Statement a more straight forward process.

Each of the relevant matters listed in NSW DEC (2006) is required to be addressed in the Validation Report/s.

Assessment of the reliability of the field and laboratory programs is required to be addressed in accordance with Appendices IV and V of NSW DEC (2006) and as set in Section 8.5.4 of this RAP.

Statistical summaries of validation data, tables and figures in the Validation Report are required to be in compliance with the requirements of NEPC (1999) *Schedule B (2) Guideline on Data Collection, Sample Design and Reporting.*

The overall suitability of Area A and Area B will be assessed in compliance with the Decision-making process for assessing urban development sites as set out in Appendix I of NSW DEC (2006).

9 LONG-TERM ENVIRONMENTAL MANAGEMENT PLAN

A Long-term Environmental Management Plan (Long-term EMP) will be implemented to set out the requirements for the management of Area B on which the Containment Area is to be located to ensure that Area B is suitable for commercial/industrial land use. It is required to be developed in accordance with the requirements of NSW DEC (2006) and to be written in plain English to be understood by non-professionally trained personnel.

The Long-term EMP must address the following:

- *Why* the Long-term EMP is required;
- *Who* is responsible for implementing the Long-term EMP;
- *Where* the Long-term EMP applies;
- *How* the Long-term EMP will be implemented, including corrective actions and reporting requirements; and
- *When* the Long-term EMP is required to be implemented and its duration.

The Long-term EMP must include the following information:

- The objective/s;
- Description of the Containment Area and capping across Area B, with as-built drawings showing the location, the depth, construction, depth to marker layer and description of the contents of the Containment Area;
- A survey plan at A3 scale showing the locations of:
    - The cadastral boundaries of the Containment Area and Area B as it applies to the area on which it is located;
- Description of the nature of the contaminated materials within the Containment Area and Area B;
- Description of the restrictions and controls for the area on which the Containment Area is located;
- Descriptions of what measures should be taken if the marker layer of the Containment Area is breeched;
- Descriptions of what measures should be taken if the capping layer of the Containment Area or across Area B is breeched;
- Description of responsibilities for persons implementing various elements of the Long-term EMP and the person/s responsible for ensuring the its overall management;
- Detail on how the Long-term EMP will be legally enforceable;
- Timeframe that applies to the Long-term EMP; and
- Health and safety requirements each relevant element required by the Long-term EMP.

10 CONCLUSIONS

Previous investigations conducted on the Site since 1995 identified concentrations of lead, benzo(a)pyrene (BaP), total polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPH) and asbestos(both bonded and friable) in stockpiles and in surface and near surface fill materials greater than the criteria for commercial/industrial land use across the Site. This RAP sets out the requirements for remediation and validation works that are required to be undertaken to ensure that the Site will be suitable for the proposed use. The remediation strategy adopted in this RAP has been developed as part of the overall strategy for the redevelopment of the Site for commercial/industrial purposes.

The overall approach to the remediation of the Site involves the relocation of stockpiles from Area A, as well the remediation of fill materials present across the Area A, identified to contain concentrations of contaminants greater than the criteria for commercial/industrial land use, and placement of these materials onto Area B for long-term containment and management under a Long-term EMP.

The remediation works contemplated in this RAP will be undertaken during the redevelopment of the Site. This RAP details a series of measures including the requirements for remediation and validation works including, material tracking requirements during the remediation works, the design parameters for the proposed remedial measures and the program for the validation works to be undertaken to confirm the suitability of Area A for commercial/industrial land use without the requirement for a Long-term EMP and the suitability of Area B for commercial/industrial land use with the requirement for a Long-term EMP.

Overall, it is considered that the if the remediation and validation works set out in this RAP are implemented the remedial objectives will be achieved and Area A will be suitable for commercial/industrial land use without the requirement for a Long-term EMP and Area B will be suitable for commercial/industrial land use with the requirement for a Long-term EMP.

11 LIMITATIONS

This RAP has been prepared for the sole purpose of providing a plan for the remediation of the Site in accordance with generally accepted consulting practice. No other warranty or guarantee, expressed or implied is made as to the advice indicated in this report.

This report should not be used for any other purpose without our prior written consent. Accordingly, neither E3 nor any member or employee of E3 accepts responsibility or liability in any way whatsoever for the use of this report for any purpose other than that for which it has been prepared.

This report should not be released to any other party, in whole or in part, without the express written consent of E3. E3 accepts no liability or responsibility whatsoever for or in respect of any use or reliance upon this report by any third party.

E3 has relied upon and presumed accurate information provided by Greenway & Banks Realty Pty Ltd and/or any third party (or absence thereof) in making the assumptions made in this report. Nothing in this report should be taken to imply that E3 has verified or audited any of the information supplied to us other than as expressly stated in this report. We have assumed this information to be both adequate and accurate for the purposes of this report.

Where findings, observations and conclusions are based solely upon information provided by Greenway & Banks Realty Pty Ltd and/or a third party and E3 do not accept, to the maximum extent permitted by law, any liability for any losses, claims, costs, expenses, damages (whether in statute, in contract or tort for negligence or otherwise) suffered or incurred by Greenway & Banks Realty Pty Ltd or any third party as a result of or in connection with E3's reliance on any such the information to the extent that such information is false, misleading or incomplete and E3 give no warranty or guarantee, express or implied as to such findings, observations and conclusions.

If further information becomes available, or additional assumptions need to be made, E3 reserves its right to amend any statements or opinions made in this report

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12 REFERENCES

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FIGURES

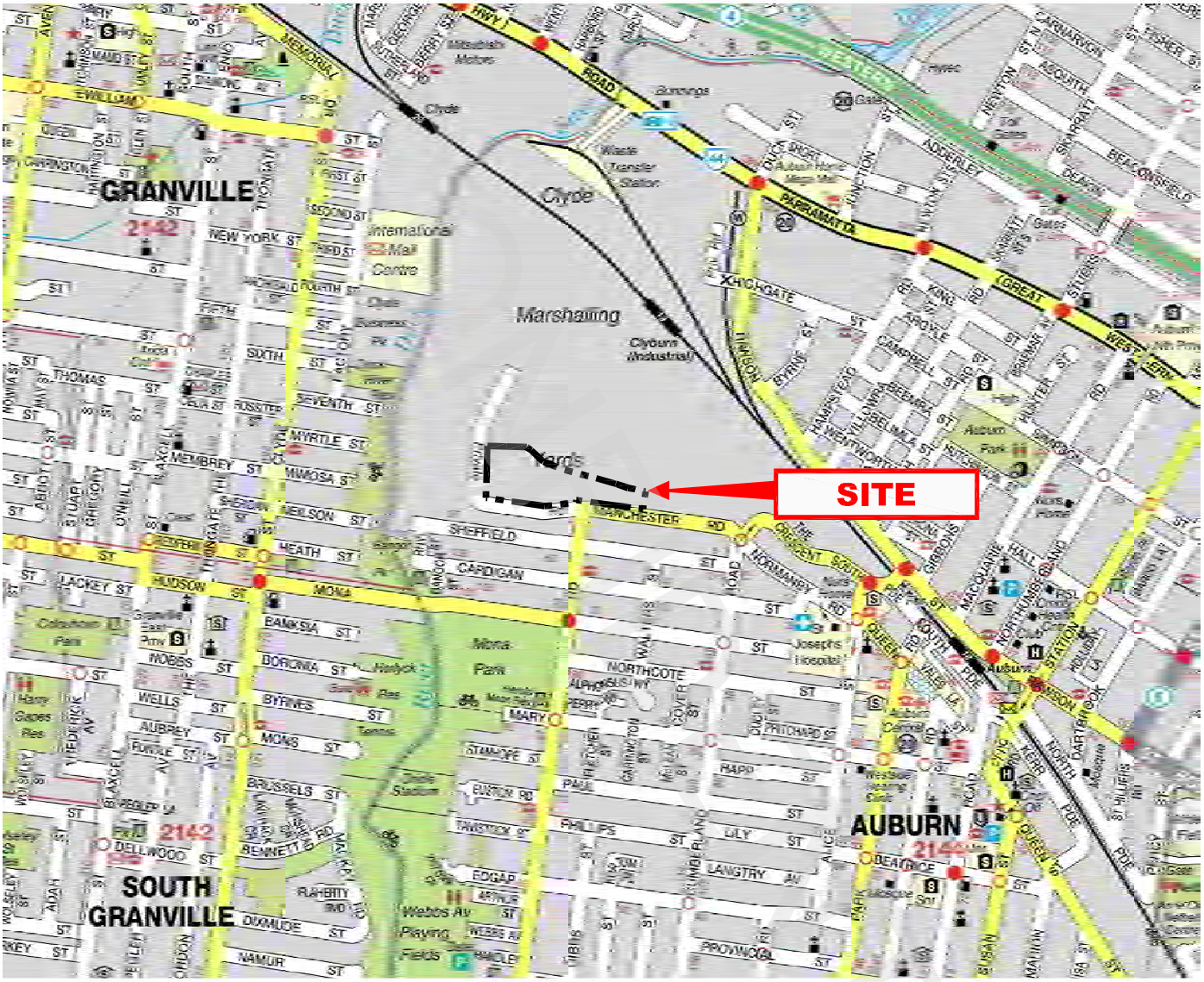
Figure 1: Site Location

Figure 2: Site Layout

Figure 3: Additional Investigation – Sampling Location Plan

A4

PROJECT-FILE NAME: **S10233-02-F001**
DATE: **5/03/2012**
DRAWN: **RR**
APPROVED: **RO**



CLIENT
Greenway and Banks

PROJECT
REMEDIATION ACTION PLAN
LOT 12 DP116540, MANCHESTER ROAD, AUBURN, NSW

TITLE
SITE LOCATION PLAN

FIGURE
1

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A3

REMNANT STOCKPILE

4
D.P. 1007656

AREA B

FENCE

RELOCATED STOCKPILE

1
D.P. 833989

AREA A

GRAVEL STOCKPILE

2

6
D.P. 1007656

SEC. B
D.P. 27975

ASBESTOS - CONTAINING STOCKPILE

CHISHOLM RD

MANCHESTER ROAD

PROJECT-FILE NAME	S10233-02-F002
DATE	5/03/2012
DRAWN	RR
APPROVED	RO

LEGEND

- AREA A SITE BOUNDARY
- AREA B SITE BOUNDARY
- RECENT TfNSW ACQUISITION
- TfNSW 2.0m WIDE EASEMENT

N

0 10 20 30 40
(metres)

CLIENT
Greenway and Banks

PROJECT
REMEDIATION ACTION PLAN
LOT 12 DP116540, MANCHESTER RD, AUBURN, NSW

TITLE
SITE LAYOUT

FIGURE
2

E3 consult

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Plot Date: 04/07/12 - 19:01
Plotted By: ReynoldsR

A3

REMNANT STOCKPILE

AREA B

RELOCATED STOCKPILE

AREA A

GRAVEL STOCKPILE

ASBESTOS - CONTAINING STOCKPILE

4 D.P. 1007656

1 D.P. 833989

6 D.P. 1007656

SEC. B S D.P. 2797

FENCE

MANCHESTER ROAD

CHISHOLM RD

TP1 TP2 TP3 TP3B TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP23 TP24 TP25 TP26 TP27 TP28 TP29 TP30 TP31 TP32 TP33 TP34 TP35 TP36 TP37 TP38 TP39 TP40 TP41 TP42

EW4 EW5 EW6 EW7 EW8 EW9

BH1 BH2 BH3 BH4 BH5 BH6 BH7 BH8 BH9

MW1 MW2

GS1 GS2 GS3 GS4 GS5 GS6

RS1 RS2 RS3 RS4 RS5 RS6 RS7 RS8 RS9 RS10 RS11 RS12 RS13 RS14 RS15 RS16 RS17 RS18 RS19 RS20

AS1 AS2 AS3 AS4 AS5 AS6 AS7 AS8

PROJECT-FILE NAME S10233-02-F003
DATE 5/03/2012
DRAWN RR
APPROVED RO

LEGEND

- AREA A SITE BOUNDARY
- AREA B SITE BOUNDARY
- RECENT TfNSW ACQUISITION
- TfNSW 2.0m WIDE EASEMENT
- PROPOSED TEST PIT LOCATION - GRAVEL STOCKPILE INVESTIGATION
- PROPOSED TEST PIT LOCATION - SITE WIDE FILL INVESTIGATIONS
- PROPOSED TEST PIT LOCATION - DELINEATION INVESTIGATIONS
- TP1 E3 TEST PIT LOCATION
- BH5 E3 BOREHOLE LOCATION
- EW8 E3 MONITORING WELL LOCATION
- MW2 MONITORING WELL LOCATION (WOODWARD CLYDE, 1998)

N

0 10 20 30 40
(metres)

CLIENT
Greenway and Banks

PROJECT
REMEDIATION ACTION PLAN
LOT 12 DP116540, MANCHESTER RD, AUBURN, NSW

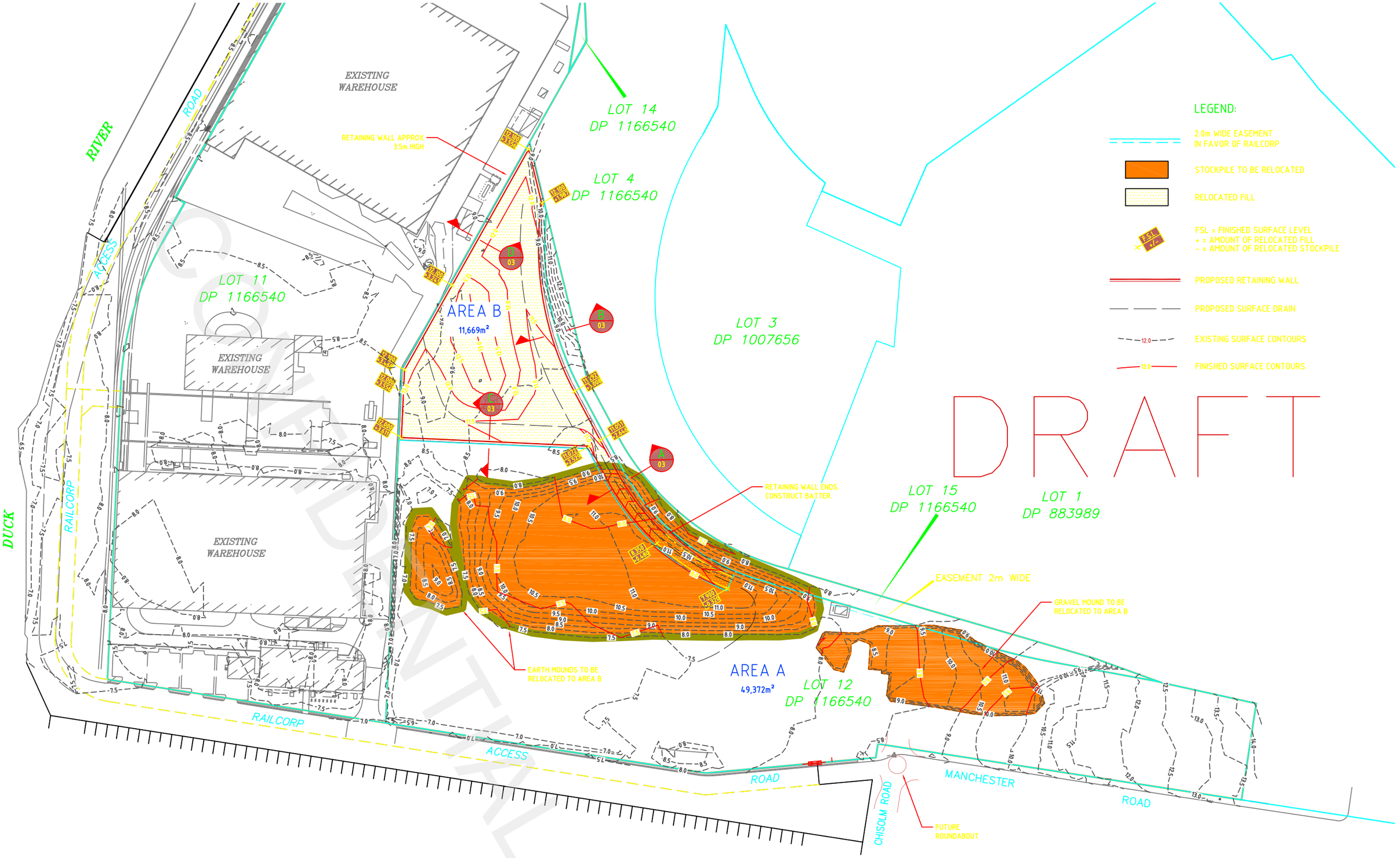
TITLE
ADDITIONAL INVESTIGATIONS SAMPLING LOCATION PLAN

FIGURE
3

E3 consult

Plotted By: ReynoldsR Plot Date: 04/07/12 - 18:59 Cad File: E:\personal_CAD R2\E3Consult_PROJECTS\Auburn\FIGURES\S10233-02-F003.dwg

Appendix A – Registered Survey Plan of Lot 12 Dp1166540



No.	Amendments	Drawn	Design	Appd	Certified	Reg No.	Date
B	ISSUED FOR DEVELOPMENT APPROVAL	PDW	PDW	PH			13.04.12
A	ISSUED FOR APPROVAL	PDW	PDW	PH			04.04.12

Level 3
3 The Crescent Homebush Bay NSW 2127
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ABN 23 010 743 692

Civil Engineers • Structural Engineers • Project Managers • Water Servicing Co-ordinators
brisbane • cairns • emerald • gladstone • gold coast • mackay • sydney • townsville

Client: JANYON PTY. LTD.
Project: MANCHESTER ROAD, AUBURN
Title: RELOCATION OF EXISTING FILL MOUNDS WITHIN LOT 12 DP 1166540

Datum: AHD
SSM 91938
RL 8.668
MGA

NOT FOR CONSTRUCTION

Project No.	Drawing No.	Rev
H00031	DA001	B

Appendix B – Figures from E3 Report

FIGURES

Figure 1: Site Location

Figure 2: Site Layout and Sampling Location Plan

Figure 3: Cross Section A-A'

Figure 4: Cross Section B-B'

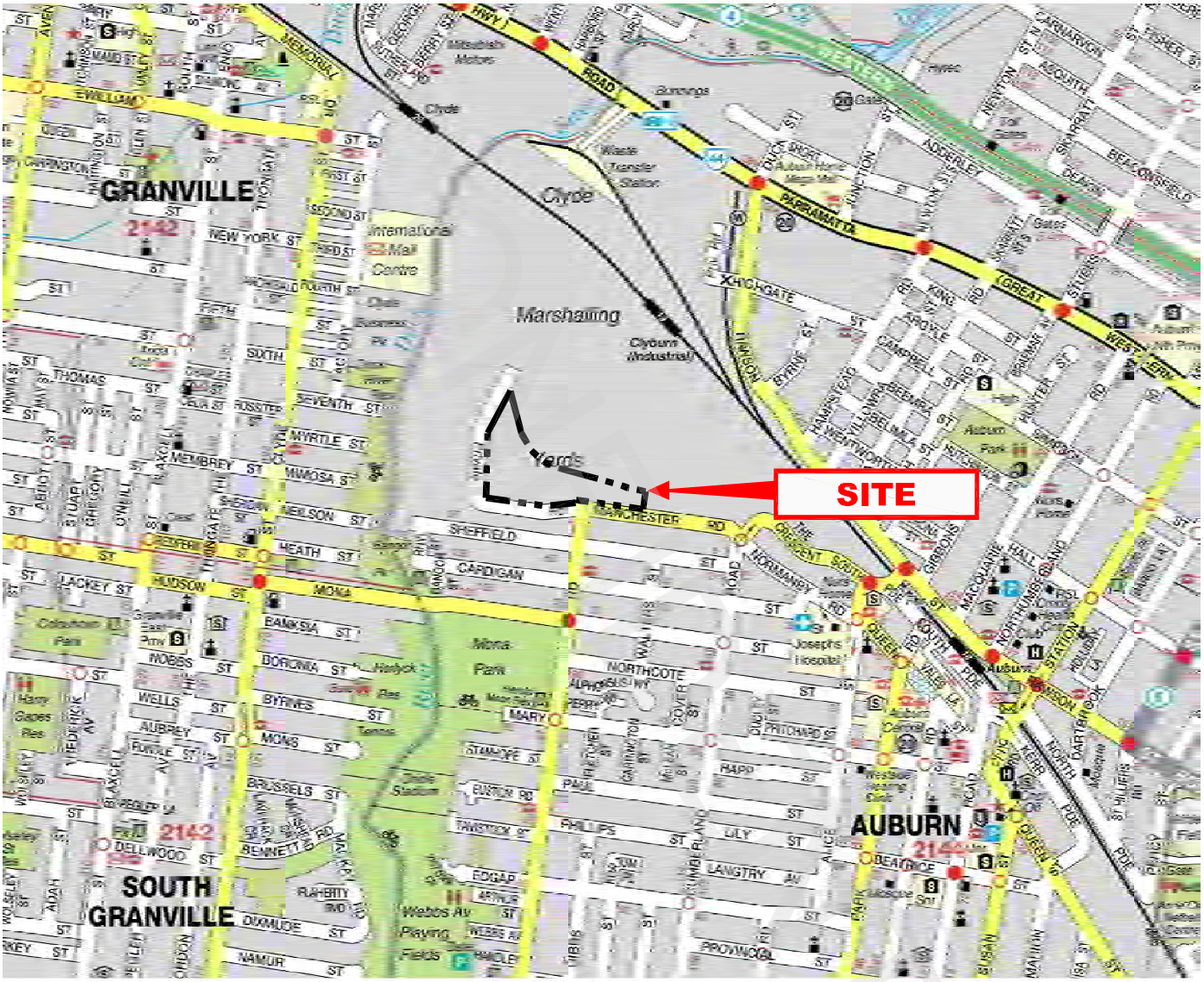
Figure 5: Soil Analytical Results – Concentrations greater than Commercial/Industrial Criteria

Figure 6: Soil Analytical Results - Asbestos

Figure 7: Inferred Groundwater Flow Direction

A4

PROJECT-FILE NAME: **S10233-01-F011**
DATE: **07/11/2010**
DRAWN: **RR**
APPROVED: **RO**



CLIENT
Greenway and Banks

PROJECT
ENVIRONMENTAL ASSESSMENT
LOT 2, MANCHESTER RD
AUBURN, NSW

TITLE
SITE LOCATION PLAN

FIGURE
1

Plotted By: ReynoldsR Plot Date: 07/11/10 - 18:32 Cad File: E:\personal_CAD R2\E3Consult_PROJECTS\Auburn\FIGURES\S10233-01-F011.dwg

A3

REMNANT STOCKPILE

NORTHERN PART OF SITE

RELOCATED STOCKPILE

SOUTHERN PART OF SITE

GRAVEL STOCKPILE

ASBESTOS - CONTAINING STOCKPILE

4 D.P. 1007656

1 D.P. 833989

6 D.P. 1007656

SEC. B D.P. 2797

MANCHESTER ROAD

CHISHOLM RD

FENCE

TP1 TP2 TP3 TP3B TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP23 TP24 TP25 TP26 TP27 TP28 TP29 TP30 TP31 TP32 TP33 TP34 TP35 TP36 TP37 TP38 TP39 TP40 TP41 TP42

GS1 GS2 GS3 GS4 GS5 GS6

RS1 RS2 RS3 RS4 RS5 RS6 RS7 RS8 RS9 RS10 RS11 RS12 RS13 RS14 RS15 RS16 RS17 RS18 RS19 RS20

AS1 AS2 AS3 AS4 AS5 AS6 AS7 AS8

BH1 BH2 BH3 BH4 BH5 BH6 BH7 BH8 BH9

EW4 EW5 EW6 EW7 EW8 EW9

MW1 MW2

B B'

PROJECT-FILE NAME	S10233-01-F005
DATE	03/11/2010
DRAWN	RR
APPROVED	RO

LEGEND

- TP1 — E3 TEST PIT LOCATION
- BH5 — E3 BOREHOLE LOCATION
- EW8 — E3 MONITORING WELL LOCATION
- MW2 — MONITORING WELL LOCATION (WOODWARD CLYDE, 1998)
- B B' — CROSS SECTION LINE

N

0 10 20 30 40
(metres)

CLIENT
Greenway and Banks

PROJECT
ENVIRONMENTAL ASSESSMENT
LOT 2, MANCHESTER RD
AUBURN, NSW

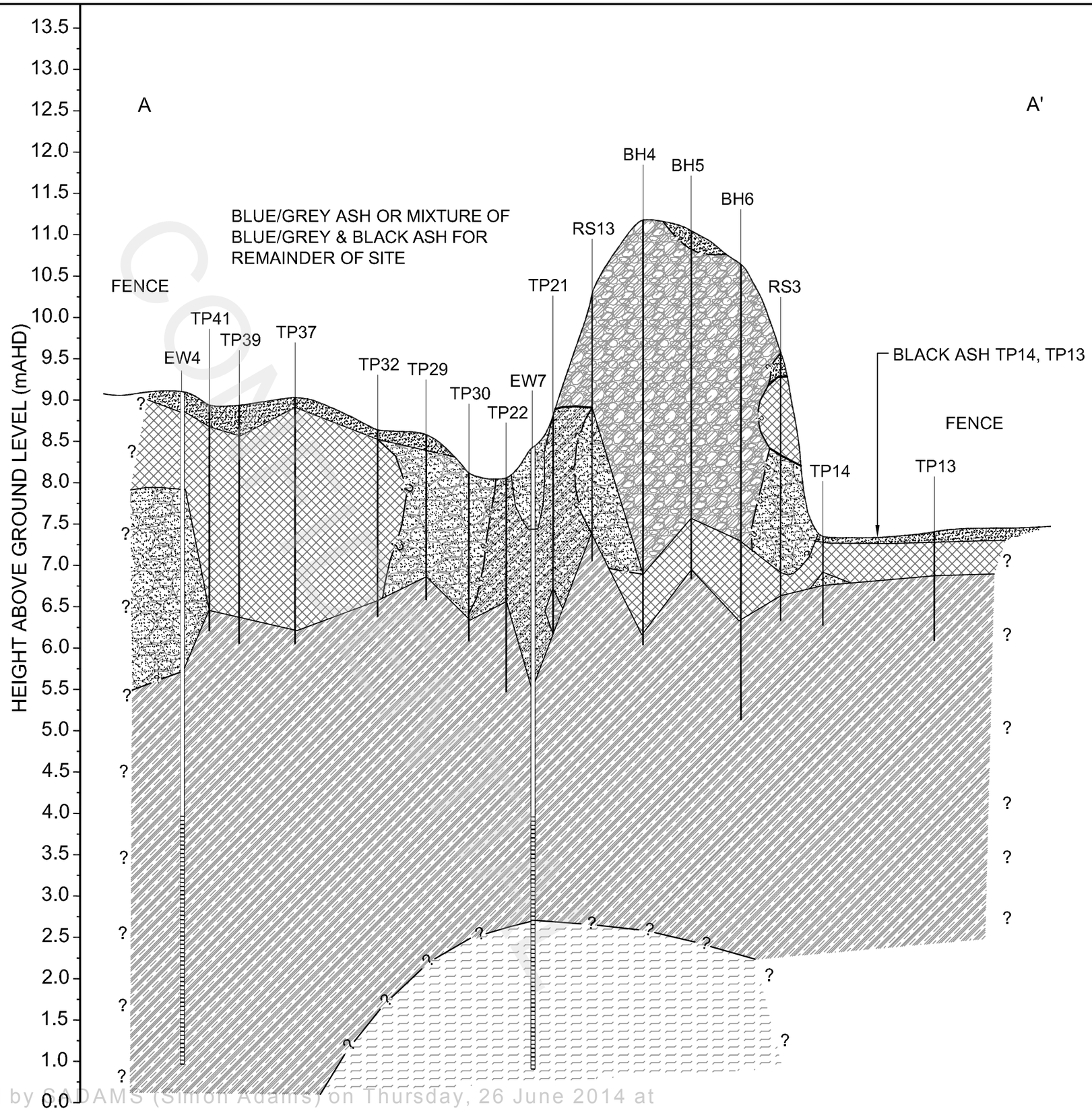
TITLE
SITE LAYOUT AND SAMPLING LOCATION PLAN

FIGURE
2

E3 consult

Printed By: ReynoldsR Plot Date: 09/11/10 - 20:30 Cad File: E:\personal_CAD 02\E3Consult_PROJECTS\Auburn\FIGURES\S10233-01-F005.dwg

A3



PROJECT-FILE NAME S10233-01-F009
DATE 4/11/2010
DRAWN RR
APPROVED RO

LEGEND

- TOPSOIL LOAM
- GRAVEL CLAY FILL
- ASH FILL
- SANDY GRAVELLY FILL
- SANDY CLAY FILL
- CLAY FILL
- CLAY (NATURAL)
- SHALE

VERTICAL EXAGGERATION = 24

0 10 20 30 40
HORIZONTAL SCALE (metres)

CLIENT
Greenway and Banks

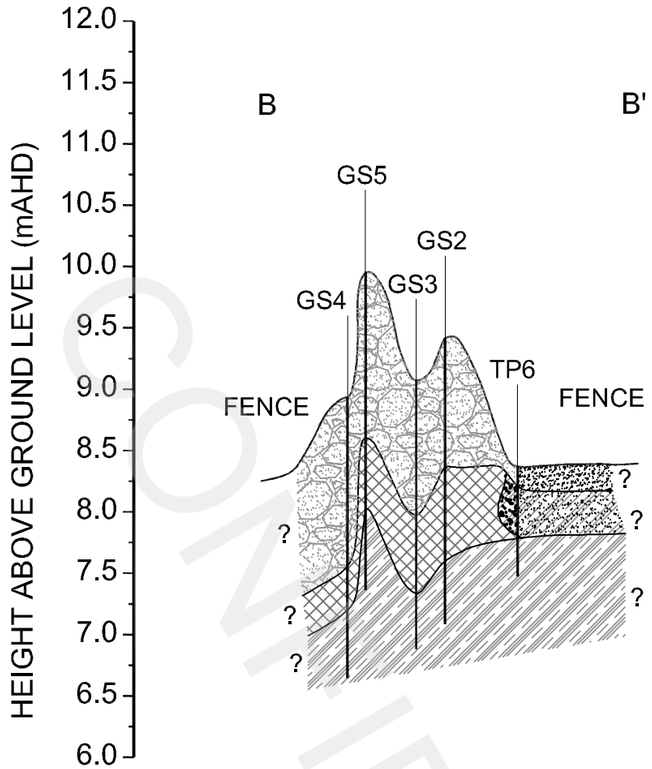
PROJECT
ENVIRONMENTAL ASSESSMENT
LOT 2, MANCHESTER RD
AUBURN, NSW

TITLE
CROSS SECTION A - A'

FIGURE
3

E3 consult

Plotted By: ReynoldsR Plot Date: 09/11/10 - 20:40 Cad File: E:\personal_CAD R2\E3Consult_PROJECTS\Auburn\FIGURES\S10233-01-F009.dwg



PROJECT-FILE NAME S10233-01-F008
DATE 4/11/2010
DRAWN RR
APPROVED RO

LEGEND

- TOPSOIL
- SANDY GRAVELLY FILL
- ASH FILL
- SANDY CLAY FILL
- CLAY (NATURAL)

VERTICAL EXAGGERATION = 24

0 10 20 30 40
HORIZONTAL SCALE (metres)

CLIENT
Greenway and Banks

PROJECT
ENVIRONMENTAL ASSESSMENT
LOT 2, MANCHESTER RD
AUBURN, NSW

TITLE
CROSS SECTION B - B'

FIGURE
4

A3

LOCATION	TP39 (dup)
DEPTH (m)	2 - 2.1
TPH	8630

LOCATION	TP25
DEPTH (m)	0.5 - 0.6
Pb	2200
Cu	7800

LOCATION	TP18
DEPTH (m)	0.4 - 0.5
Cu	7300

LOCATION	TP26
DEPTH (m)	0.9 - 1.0
Pb	13000
Cu	30000

LOCATION	TP22 (dup)
DEPTH (m)	1.1 - 1.2
Pb	2400
TPH	1390

LOCATION	EW 7	EW 7 (dup)
DEPTH (m)	0 - 0.2	0 - 0.2
Pb	2400	2500

LOCATION	RS14
DEPTH (m)	3.1 - 3.2
Pb	1500

LOCATION	BH 2
DEPTH (m)	3.4 - 3.5
Pb	7000

LOCATION	RS19
DEPTH (m)	2.0 - 2.1
B(a)P	5.6

LOCATION	RS7
DEPTH (m)	1.2 - 1.3
Pb	3800

LOCATION	GS2	GS2
DEPTH (m)	1.0 - 1.1	1.0 - 1.1 (dup)
TPH	1930	4830

LOCATION	RS16
DEPTH (m)	0.4 - 0.5
TPH	1520

LOCATION	BH 6
DEPTH (m)	3.4 - 3.5
TPH	2730

LOCATION	TP14
DEPTH (m)	0.2 - 0.3
Pb	1800

LOCATION	RS4
DEPTH (m)	1.9 - 2.0
TPH	1030

LOCATION	TP10	TP10 (dup)
DEPTH (m)	0.4 - 0.5	0.4 - 0.5
Pb	3300	2000

REMNANT STOCKPILE

NORTHERN PART OF SITE

RELOCATED STOCKPILE

SOUTHERN PART OF SITE

GRAVEL STOCKPILE

ASBESTOS - CONTAINING STOCKPILE

4 D.P. 1007656

1 D.P. 833989

6 D.P. 1007656

SEC. B D.P. 2797

2

FENCE

MANCHESTER ROAD

CHISHOLM RD

300 EWP

100UPVC

TP1 TP2 TP3 TP3B TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP23 TP24 TP25 TP26 TP27 TP28 TP29 TP30 TP31 TP32 TP33 TP34 TP35 TP36 TP37 TP38 TP39 TP40 TP41 TP42

GS1 GS2 GS3 GS4 GS5 GS6

RS1 RS2 RS3 RS4 RS5 RS6 RS7 RS8 RS9 RS10 RS11 RS12 RS13 RS14 RS15 RS16 RS17 RS18 RS19 RS20

AS1 AS2 AS3 AS4 AS5 AS6 AS7 AS8

BH1 BH2 BH3 BH4 BH5 BH6 BH7 BH8 BH9

EW3 EW4 EW5 EW6 EW7 EW8 EW9

MW1 MW2

PROJECT-FILE NAME	S10233-01-F006
DATE	03/11/2010
DRAWN	RR
APPROVED	RO

LEGEND

- TP1 — E3 TEST PIT LOCATION
- BH5 — E3 BOREHOLE LOCATION
- EW3 — E3 MONITORING WELL LOCATION
- MW2 — MONITORING WELL LOCATION (WOODWARD CLYDE, 1998)

TPH = SUM OF TOTAL (C_{10}- C_{36}) PETROLEUM HYDROCARBONS

Pb = LEAD

Cu = COPPER

B(a)P = BENZO(a)PYRENE

dup = INTRALABORATORY DUPLICATE

CONCENTRATIONS IN mg/kg

N

0 10 20 30 40
(metres)

CLIENT
Greenway and Banks

PROJECT
ENVIRONMENTAL ASSESSMENT
LOT 2, MANCHESTER RD
AUBURN, NSW

TITLE
SOIL ANALYTICAL RESULTS - GREATER THAN COMMERCIAL/ INDUSTRIAL CRITERIA

FIGURE
5

E3 consult

Cad File: E:\personal_CAD R2\E3Consult_PROJECTS\Auburn\FIGURES\S10233-01-F006.dwg
Plot Date: 28/03/11 - 20:15
Plotted By: ReynoldsR

A3

REMNANT STOCKPILE

NORTHERN PART OF SITE

RELOCATED STOCKPILE

SOUTHERN PART OF SITE

GRAVEL STOCKPILE

ASBESTOS - CONTAINING STOCKPILE

4 D.P. 1007656

1 D.P. 833989

6 D.P. 1007656

SEC B D.P. 2797

FENCE

MANCHESTER ROAD

CHISHOLM RD

TP1 TP2 TP3 TP3B TP4 TP5 TP6 TP7 TP8 1.077 TP9 TP10 0.004 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 0.007 0.003 TP21 0.021/0.006 0.246 TP22 0.021/ 0.002 TP23 TP24 TP25 0.050 0.033 0.011 TP26 TP27 TP28 TP29 0.030 TP30 0.027 TP31 0.010 TP32 TP33 TP34 TP35 TP36 0.007 TP37 TP38 TP39 0.012 TP40 TP41 0.011 TP42

EW1 EW2 EW3 EW4 EW5 EW6 EW7 0.035 EW8 EW9 0.005

MW1 MW2

BH1 BH2 BH3 BH4 BH5 BH6 BH7 BH8 BH9 0.482

AS1 0.874 AS2 1.143 AS3 0.002 AS4 0.162 AS5 AS6 AS7 AS8

RS1 RS2 RS3 RS4 RS5 0.006 RS6 RS7 RS8 RS9 RS10 0.038 RS11 RS12 RS13 RS14 RS15 RS16 0.003 RS17 0.005 RS18 0.022 RS19 RS20 0.012

GS1 GS2 GS3 GS4 GS5 0.544 GS6

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

300 EWP 150RCP 100UPVC SEAL

PROJECT-FILE NAME S10233-01-F007
DATE 03/11/2010
DRAWN RR
APPROVED RO

LEGEND

- TP1 — E3 TEST PIT LOCATION
- BH5 — E3 BOREHOLE LOCATION
- EW3 — E3 MONITORING WELL LOCATION
- MW2 — MONITORING WELL LOCATION (WOODWARD CLYDE, 1998)
- NO ASBESTOS DETECTED
- ASBESTOS DETECTED BUT NOT GREATER THAN SITE CRITERIA
- FIBROUS ASBESTOS GREATER THAN SITE CRITERIA
- ACM GREATER THAN SITE CRITERIA

N

0 10 20 30 40
(metres)

CLIENT
Greenway and Banks

PROJECT
ENVIRONMENTAL ASSESSMENT
LOT 2, MANCHESTER RD
AUBURN, NSW

TITLE
SOIL ANALYTICAL RESULTS - ASBESTOS

FIGURE
6

E3 consult

Cad File: E:\personal_CAD R2\E3Consult_PROJECTS\Auburn\FIGURES\S10233-01-F007.dwg Plot Date: 09/11/10 - 20:59 Printed By: ReynoldsR

A3

REMNANT STOCKPILE

NORTHERN PART OF SITE

SOUTHERN PART OF SITE

RELOCATED STOCKPILE

GRAVEL STOCKPILE

ASBESTOS - CONTAINING STOCKPILE

4 D.P. 1007656

1 D.P. 833989

2

6 D.P. 1007656

SEC. B D.P. 2797

MANCHESTER ROAD

CHISHOLM RD

FENCE

300 EWP

100UPVC

EW4 5.86

EW8 DRY

EW5 5.81

EW6 4.74

BW9 7.29

MW2 6.42

MW1 9.06

EW7

BH1 BH2 BH3 BH4 BH5 BH6 BH7 BH8 BH9

TP1 TP2 TP3 TP3B TP4 TP5 TP6 TP7 TP8 TP9 TP10 TP11 TP12 TP13 TP14 TP15 TP16 TP17 TP18 TP19 TP20 TP21 TP22 TP23 TP24 TP25 TP26 TP27 TP28 TP29 TP30 TP31 TP32 TP33 TP34 TP35 TP36 TP37 TP38 TP39 TP40 TP41 TP42

GS1 GS2 GS3 GS4 GS5 GS6

RS1 RS2 RS3 RS4 RS5 RS6 RS7 RS8 RS9 RS10 RS11 RS12 RS13 RS14 RS15 RS16 RS17 RS18 RS19 RS20

AS1 AS2 AS3 AS4 AS5 AS6 AS7 AS8

6.0 7.0 8.0 9.0 5.0

PROJECT-FILE NAME	S10233-01-F010
DATE	03/11/2010
DRAWN	RR
APPROVED	RO

LEGEND

- TP1 — E3 TEST PIT LOCATION
- BH5 — E3 BOREHOLE LOCATION
- EW8 — E3 MONITORING WELL LOCATION
- MW2 — MONITORING WELL LOCATION (WOODWARD CLYDE, 1998)
- 9.06 — STANDING WATER LEVEL (mAHD) GROUNDWATER IN NATURAL CLAYS
- 9.0 — INFERRED GROUNDWATER CONTOUR (mAHD)
- 7.29 — STANDING WATER LEVEL (mAHD) GROUNDWATER IN FILL MATERIALS
- INFERRED GROUNDWATER FLOW DIRECTION

N

0 10 20 30 40 (metres)

CLIENT
Greenway and Banks

PROJECT
ENVIRONMENTAL ASSESSMENT
LOT 2, MANCHESTER RD
AUBURN, NSW

TITLE
INFERRED GROUNDWATER CONTOURS

FIGURE
7

E3 consult

Cad File: E:\personal_CAD R2\E3Consult_PROJECTS\Auburn\FIGURES\S10233-01-F010.dwg Plot Date: 09/11/10 - 20:44 Plotted By: ReynoldsR

Appendix C – Tables from E3 Report

TABLES

Table T1: Soil Analytical Results - Relocated Stockpile - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Table T2: Soil Analytical Results - Relocated Stockpile - Asbestos

Table T3: Soil Analytical Results - Asbestos-containing Stockpile - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Table T4: Soil Analytical Results - Asbestos-containing Stockpile Asbestos

Table T5: Soil Analytical Results - Gravel Stockpile - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Table T6: Soil Analytical Results - Gravel Stockpile - Asbestos

Table T7: Soil Analytical Results - Southern part of Site, Site-wide Fill Materials - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Table T8: Soil Analytical Results - Southern part of Site, Site-wide Fill Materials - Asbestos

Table T9: Soil Analytical Results - Northern part of Site, Site-wide Fill Materials - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Table T10: Soil Analytical Results - Northern part of Site, Site-wide Fill Materials - Asbestos

Table T11: Groundwater Field Quality Parameters

Table T12: Groundwater Standing Water Levels

Table T13: Groundwater Analytical Results - TPH, BTEX, PAHs, Metals, VOCs

Table T14: Leachate Analytical Results - PAHs, Metals

Table T15: Soil RPD Results

Table T16: Groundwater RPD Results

Table T1 - Relocated Stockpile Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						RS1			RS2			RS3		RS4			RS5	RS6	RS7			RS8
Sample ID						RS1C	QC209 (Intra Dup RS1C 0.9-1)	RS1E	RS2A	QC212 (Intra Dup RS2A 0.5-0.6)	QC312 (inter Dup RS2A 0.5-0.6)	RS3B	RS3E	RS4B	RS4C	QC211 (Intra Dup RS4C 1.9-2)	RS5A	RS6B	RS7A	RS7B	RS7C	RS8B
Depth (mBGS)						0.9-1		2.5-2.6	0.5-0.6			1.3-1.4	3.1-3.2	1-1.1	1.9-2		0.4-0.5	1.1-1.2	0.4-0.5	1.2-1.3	2-2.1	1-1.1
PID						0.6		0.9	1.4			0.7	1	1.1	0.8		0.9	0.7	0.9	1.1	0.5	1
Date Sampled						10/08/2010		10/08/2010	11/08/2010			11/08/2010	11/08/2010	11/08/2010	11/08/2010		11/08/2010	11/08/2010	12/08/2010	12/08/2010	11/08/2010	12/08/2010
Compounds	EQL	EPA 1994 Terrestial Organisms	NEPM 1999 PILs	NEPM 1999 HIL A	NEPM 1999 HIL F																	
TPHs																						
TPH C6 - C9	10	65	-	-	-	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	<100	320	<100	150	<100	100	<100	<100	<100	390	<100	<100	<100	160	<100	<100	120
TPH C29-C36	100	-	-	-	-	120	400	<100	230	110	150	<100	<100	<100	640	<100	130	<100	170	150	<100	180
TPH+C10 - C36 (Sum of total)		1000	-	-	-	120	720	NC	380	110	250	NC	NC	NC	1030	NC	130	NC	330	150	NC	300
BTEX																						
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	1	-	-	-	-	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																						
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	0.05	-	-	1	5	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	0.2	-	-	-	-	<1	<1	<1	<1	<1	0.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.1	-	-	-	-	<0.5	0.7	<0.5	<0.5	<0.5	0.3	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.4	0.6	<0.5	<0.5	1	0.7	<0.5	0.6	0.7	<0.5	<0.5	0.7
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.3	<0.5	<0.5	<0.5	0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	0.5
Pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.4	0.6	<0.5	<0.5	1	0.7	<0.5	0.5	0.7	<0.5	<0.5	0.7
PAHs (Sum of total)		20	-	20	100	NC	0.7	NC	NC	NC	2.4	1.2	NC	NC	3.9	2.1	NC	1.1	1.4	NC	NC	1.9
Metals																						
Arsenic	1	-	20	100	500	14	29	51	18	22	34	17	6.5	14	4.9	23	73	21	51	290	8.7	29
Cadmium	0.1	-	3	20	100	<2	6	3	2.5	2.6	1.3	<2	<2	<2	<2	<2	4.9	2.7	5.7	4.5	<2	2.4
Chromium (III+VI)	1	-	-	-	-	16	3300	27	16	14	24	11	20	7.3	6.6	20	28	21	25	24	14	15
Copper	1	-	100	1000	5000	120	210	47	430	300	440	64	14	140	24	94	1300	680	850	230	3.9	430
Mercury	0.05	-	1	15	75	0.03	0.04	0.02	0.04	0.06	0.2	0.08	<0.01	0.07	0.01	0.1	0.11	0.07	0.09	0.05	<0.01	0.08
Lead	1	300	600	300	1500	170	350	61	200	290	390	120	16	150	42	120	780	440	780	3800	29	900
Nickel	1	-	60	600	3000	9.2	100	31	13	16	26	14	<2	9.7	6.1	24	38	20	33	48	<2	23
Zinc	1	-	200	7000	35000	510	1900	160	330	560	620	140	13	250	54	200	990	450	1300	1700	8.7	740
Organochlorine Pesticides																						
4,4-DDE	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
a-BHC	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Aldrin	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Aldrin + Dieldrin		-	-	10	50	NC	NC	NA	NA	NA	NA	NA	NA	NA	NC	NC	NA	NA	NC	NA	NC	NA
b-BHC	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Chlordane (cis)	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Chlordane (trans)	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
d-BHC	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
DDD	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
DDT	0.1	-	-	-	-	<0.2	<0.2	NA	NA	NA	NA	NA	NA	NA	<0.2	<0.2	NA	NA	<0.2	NA	<0.2	NA
DDT+DDE+DDD		-	-	200	1000	NC	NC	NA	NA	NA	NA	NA	NA	NA	NC	NC	NA	NA	<0.3	NA	NC	NA
Dieldrin	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Endosulfan I	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Endosulfan II	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Endosulfan sulphate	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Endrin	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Endrin aldehyde	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
g-BHC (Lindane)	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Heptachlor	0.05	-	-	10	50	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Heptachlor epoxide	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Methoxychlor	0.1	-	-	-	-	<0.2	<0.2	NA	NA	NA	NA	NA	NA	NA	<0.2	<0.2	NA	NA	<0.2	NA	<0.2	NA
Hexachlorobenzene	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	NA	<0.05	NA
Polychlorinated Biphenyls																						
Arochlor 1016	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	NA	<0.5	NA
Arochlor 1221	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arochlor 1232	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	NA	<0.5	NA
Arochlor 1242	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	NA	<0.5	NA
Arochlor 1248	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	NA	<0.5	NA
Arochlor 1254	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	NA	<0.5	NA
Arochlor 1260	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	NA	<0.5	NA
PCBs (Sum of total)		-	-	10	50	NC	NC	NA	NA	NA	NA	NA	NA	NA	NC	NC	NA	NA	NC	NA	NC	NA

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investigation Levels for Residential with gardens and accessible soil - NEHF A (NEPC, 1999; DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T1 - Relocated Stockpile Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						RS9		RS10	RS11				RS12	RS13		RS14		RS15	RS16			RS17	RS18		RS19		
Sample ID						RS9A	RS9C	RS10A	RS11B	RS11C	QC216 (Intra Dup RS11C 2.2-2.3)	QC316 (Inter Dup RS11C 2.2-2.3)	RS12A	RS13C	RS13D	RS14A	RS14D	RS15C	RS16A	RS16C	QC213 (Intra Dup RS16C 2.1-2.2)	RS17A	RS18A	RS18C	RS19C	QC226 (Intra Dup RS19C 2-2.1)	QC326 (Inter Dup RS19C 2-2.1)
Depth (mBGS)						0.5-0.6	2.2-2.3	0.4-0.5	1.2-1.3	2.2-2.3			0.5-0.6	2-2.1	2.9-3	0.5-0.6	3.1-3.2	2.5-2.6	0.4-0.5	2.1-2.2		0.3-0.4	0.4-0.5	1.8-1.9	2-2.1		
PID						0.8	1.4	0.5	0.7	1.1			0.3	0.5	2	0.5	1	0.8	1.2	1.5		0.5	0.5	0.7	1.2		
Date Sampled						12/08/2010	12/08/2010	11/08/2010	11/08/2010	11/08/2010			11/08/2010	11/08/2010	11/08/2010	11/08/2010	11/08/2010	11/08/2010	11/08/2010	11/08/2010		11/08/2010	16/08/2010	16/08/2010	16/08/2010		
Compounds	EQL	EPA 1994 Terrestial Organisms	NEPM 1999 PILs	NEPM 1999 HIL A	NEPM 1999 HIL F																						
TPHs																											
TPH C6 - C9	10	65	-	-	-	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<25
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	130	240	<100	<100	<100	<100	<100	<100	100	<100	<100	130	<100	840	100	<100	<100	<100	230	<100	<100	<100
TPH C29-C36	100	-	-	-	-	210	670	<100	<100	<100	<100	<100	100	160	<100	<100	240	120	680	130	<100	100	<100	190	<100	<100	<100
TPH+C10 - C36 (Sum of total)		1000	-	-	-	340	910	NC	NC	NC	NC	NC	100	260	NC	NC	370	120	1520	230	NC	100	NC	420	NC	NC	NC
BTEX																											
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	1	-	-	-	-	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																											
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1
Anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	<0.1
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4.2	<0.5	0.3
Benzo(a) pyrene	0.05	-	-	1	5	<0.5	<0.5	<0.5	0.6	0.6	<0.5	0.06	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	5.6	<0.5	0.3
Benzo(b)&(k)fluoranthene	0.2	-	-	-	-	<1	<1	<1	<1	1	<1	<0.2	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	9	<1	0.6
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	4	<0.5	0.3
Chrysene	0.1	-	-	-	-	<0.5	<0.5	<0.5	0.6	0.7	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	0.5	<0.5	3.9	<0.5	0.4
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1
Fluoranthene	0.1	-	-	-	-	0.5	0.6	<0.5	1.2	1.3	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	1.1	0.8	0.7	0.9	<0.5	11.4	0.7	0.6
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	3.2	<0.5	0.3
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1
Phenanthrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	1.1	0.7	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	0.5	0.6	<0.5	<0.5	3	<0.5	0.3
Pyrene	0.1	-	-	-	-	0.5	0.6	<0.5	1.2	1.4	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	1.1	0.7	0.6	0.8	<0.5	10.7	0.7	0.6
PAHs (Sum of total)		20	-	20	100	1	1.2	NC	4.7	5.7	NC	0.26	NC	NC	NC	NC	1	NC	NC	4.8	2	1.9	2.2	NC	55.9	1.4	3.7
Metals																											
Arsenic	1	-	20	100	500	34	39	16	41	18	9.2	8	19	39	2.1	34	47	15	17	31	29	47	33	20	25	17	27
Cadmium	0.1	-	3	20	100	4.4	83	<2	<2	<2	<2	<0.5	3.2	7.3	<2	<2	14	<2	3.3	<2	<2	2.2	4	<2	<2	<2	0.5
Chromium (III+VI)	1	-	-	-	-	24	40	10	14	55	12	12	20	28	7.7	21	28	5.5	17	18	27	30	14	17	22	23	23
Copper	1	-	100	1000	5000	340	230	200	84	53	52	20	3300	1500	9.9	130	1100	83	53	140	150	230	87	150	780	330	3000
Mercury	0.05	-	1	15	75	0.12	0.06	0.12	0.05	0.06	0.08	<0.1	0.07	0.15	0.01	0.05	0.1	0.04	0.01	0.12	0.09	0.07	0.07	0.09	0.04	0.06	0.3
Lead	1	300	600	300	1500	740	770	340	150	100	110	31	880	700	29	180	1500	150	110	190	280	390	110	160	330	370	720
Nickel	1	-	60	600	3000	26	26	14	17	16	18	5	40	34	<2	13	28	9.5	5.3	31	36	21	23	25	31	28	34
Zinc	1	-	200	7000	35000	650	1300	280	640	140	170	30	550	560	19	330	2200	270	570	240	350	560	170	260	310	370	350
Organochlorine Pesticides																											
4,4-DDE	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
a-BHC	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Aldrin	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Aldrin + Dieldrin		-	-	10	50	NA	NA	NA	NC	NC	NC	NC	NA	NA	NA	NC	NA	NA	NA	NC	NC	NA	NC	NA	NC	NC	NC
b-BHC	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Chlordane (cis)	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Chlordane (trans)	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
d-BHC	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
DDD	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
DDT	0.1	-	-	-	-	NA	NA	NA	<0.2	<0.2	<0.2	<0.1	NA	NA	NA	<0.2	NA	NA	NA	<0.2	<0.2	NA	<0.2	NA	<0.2	<0.2	<0.1
DDT+DDE+DDD		-	-	200	1000	NA	NA	NA	NC	NC	NC	NC	NA	NA	NA	NC	NA	NA	NA	NC	NC	NA	NC	NA	NC	NC	NC
Dieldrin	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Endosulfan I	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Endosulfan II	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Endosulfan sulphate	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Endrin	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Endrin aldehyde	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1
g-BHC (Lindane)	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Heptachlor	0.05	-	-	10	50	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Heptachlor epoxide	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Methoxychlor	0.1	-	-	-	-	NA	NA	NA	<0.2	<0.2	<0.2	<0.1	NA	NA	NA	<0.2	NA	NA	NA	<0.2	<0.2	NA	<0.2	NA	<0.2	<0.2	<0.1
Hexachlorobenzene	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	NA	NA	<0.05	<0.05	NA	<0.05	NA	<0.05	<0.05	<0.1
Polychlorinated Biphenyls																											
Arochlor 1016	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	NA	NA	<0.5	<0.5	NA	<0.5	NA	<0.5	<0.5	<0.1
Arochlor 1221	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1
Arochlor 1232	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	NA	NA	<0.5	<0.5	NA	<0.5	NA	<0.5	<0.5	<0.1
Arochlor 1242	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	NA	NA	<0.5	<0.5	NA	<0.5	NA	<0.5	<0.5	<0.1
Arochlor 1248	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	NA	NA	<0.5	<0.5	NA	<0.5	NA	<0.5	<0.5	<0.1
Arochlor 1254	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	NA	NA	<0.5	<0.5	NA	<0.5	NA	<0.5	<0.5	<0.1
Arochlor 1260	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	NA	NA	<0.5	<0.5	NA	<0.5	NA	<0.5	<0.5	<0.1
PCBs (Sum of total)		-	-	10	50	NA	NA	NA	NC	NC	NC	NC	NA	NA	NA	NC	NA	NA	NA	NC	NC	NA	NC	NA	NC	NC	NC

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investigation Levels for Residential with gardens and accessible soil - NEHF A (NEPC, 1999; DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T1 - Relocated Stockpile Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						RS20		BH1	BH2		BH3	BH4	BH5			BH6				BH7	BH8				BH9	EW9		
Sample ID						RS20A	RS20B	BH1	BH2	BH2	BH3	BH4	BH5	BH5	BH5	BH6	BH6	QC417 (Intra Dup BH6 2-2.1)	BH6	BH7	BH8	QC418 (intra Dup BH8 2-2.1)	QC518 (Inter Dup BH8 2-2.1)	BH8	BH9	EW9	QC415 (intra Dup EW9 2.1-2.2)	EW9
Depth (mBGS)						0.4-0.5	1-1.1	1-1.1	3.4-3.5	4-4.1	0.4-0.5	1-1.1	3-3.1	4.1-4.2	4-4.1	0.4-0.5	2-2.1		3.4-3.5	1-1.1	2-2.1			5-5.1	1-1.1	2.1-2.2		4.5-4.6
PID						0.6	0.7	0.4	0.7	0.7	0.2	0.2	0.9	0.8	0.3	1	1		0.6	0.5	0.8			1.1	0.7	0.9		0.9
Date Sampled						16/08/2010	16/08/2010	17/08/2010	17/08/2010	17/08/2010	17/08/2010	17/08/2010	17/08/2010	17/08/2010	17/08/2010	17/08/2010	17/08/2010		17/08/2010	17/08/2010	17/08/2010			17/08/2010	17/08/2010	17/08/2010		17/08/2010
Compounds	**EQL**	**EPA 1994 Terrestial Organisms**	**NEPM 1999 PILs**	**NEPM 1999 HIL A**	**NEPM 1999 HIL F**																							
TPHs																												
TPH C6 - C9	10	65	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<10
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	130	170	120	<100	<100	100	150	<100	<100	350	<100	300	210	1180	<100	220	<100	100	<100	290	120	<100	<100
TPH C29-C36	100	-	-	-	-	140	170	110	<100	<100	<100	110	120	<100	570	130	340	240	1550	<100	200	110	<100	<100	280	140	110	<100
TPH+C10 - C36 (Sum of total)		1000	-	-	-	270	340	230	NC	NC	100	260	120	NC	920	130	640	450	2730	NC	420	110	100	NC	570	260	110	NC
BTEX																												
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	1	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																												
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	1.1	<0.5	<0.5	0.6	1.9	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.3	<0.5	<0.5	0.6	<0.5	<0.5
Benzo(a) pyrene	0.05	-	-	1	5	<0.5	<0.5	1	<0.5	<0.5	<0.5	1.3	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.3	<0.5	<0.5	0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	0.2	-	-	-	-	<1	<1	2	<1	<1	<1	2	<1	<1	2	<1	<1	<1	<1	<1	<1	<1	0.5	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.1	-	-	-	-	<0.5	<0.5	1.2	<0.5	<0.5	0.5	1.4	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.3	<0.5	<0.5	0.6	<0.5	<0.5
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.1	-	-	-	-	<0.5	<0.5	2.1	<0.5	<0.5	0.8	4	0.6	<0.5	1.3	0.5	<0.5	<0.5	<0.5	0.7	0.7	0.5	0.6	<0.5	<0.5	1.2	0.5	<0.5
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.1	-	-	-	-	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.1	-	-	-	-	<0.5	<0.5	1.3	<0.5	<0.5	<0.5	4.8	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.4	<0.5	<0.5	0.8	<0.5	<0.5
Pyrene	0.1	-	-	-	-	<0.5	<0.5	1.9	<0.5	<0.5	0.8	3.7	0.6	<0.5	1.4	0.5	<0.5	0.5	<0.5	0.7	0.7	0.5	0.6	<0.5	<0.5	1.2	0.5	<0.5
PAHs (Sum of total)		20	-	20	100	NC	NC	11.6	NC	NC	2.7	22.9	1.2	NC	8.6	1	NC	0.5	NC	1.4	1.4	1	3.2	NC	NC	4.9	0.5	NC
Metals																												
Arsenic	1	-	20	100	500	54	11	37	42	8	27	20	23	4	171	68	28	64	7	24	24	44	13	6	15	38	38	7
Cadmium	0.1	-	3	20	100	3	<2	1.1	3	0.2	1.2	0.9	1	0.2	2.6	1.4	2	5.2	1.2	0.9	1.8	4	0.6	0.5	1.8	2.6	2	0.7
Chromium (III+VI)	1	-	-	-	-	34	9.9	36	53	18	16	18	18	15	16	34	21	26	10	17	16	19	14	14	19	30	26	9
Copper	1	-	100	1000	5000	540	130	619	556	14	130	224	110	7	192	361	181	474	117	56	203	411	140	12	996	463	416	6
Mercury	0.05	-	1	15	75	0.07	<0.01	0.49	0.5	0.07	0.3	0.41	0.28	0.08	0.49	0.35	0.18	0.27	0.13	0.21	0.2	0.23	0.1	0.09	0.38	0.91	0.33	<0.05
Lead	1	300	600	300	1500	610	100	811	7000	73	232	219	154	44	1430	630	266	783	157	113	235	481	140	21	806	478	408	14
Nickel	1	-	60	600	3000	20	7.5	27	37	3	30	19	29	3	39	28	13	35	11	22	18	25	12	2	18	60	34	4
Zinc	1	-	200	7000	35000	1000	290	517	1970	22	333	340	213	9	985	642	693	1770	280	223	481	1040	240	8	1040	638	631	8
Organochlorine Pesticides																												
4,4-DDE	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
a-BHC	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Aldrin	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Aldrin + Dieldrin		-	-	10	50	NA	NA	NA	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	NA	NA	NA	NC
b-BHC	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Chlordane (cis)	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Chlordane (trans)	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
d-BHC	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
DDD	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
DDT	0.1	-	-	-	-	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	<0.2	<0.1	NA	NA	NA	NA	<0.2
DDT+DDE+DDD		-	-	200	1000	NA	NA	NA	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	NA	NA	NA	NC
Dieldrin	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Endosulfan I	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Endosulfan II	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Endosulfan sulphate	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Endrin	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Endrin aldehyde	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA
g-BHC (Lindane)	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Heptachlor	0.05	-	-	10	50	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Heptachlor epoxide	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Methoxychlor	0.1	-	-	-	-	NA	NA	NA	<0.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.2	<0.2	<0.1	NA	NA	NA	NA	<0.2
Hexachlorobenzene	0.05	-	-	-	-	NA	NA	NA	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05	<0.1	NA	NA	NA	NA	<0.05
Polychlorinated Biphenyls																												
Arochlor 1016	0.1	-	-	-	-	NA	NA	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	<0.1	NA	NA	NA	NA	<0.5
Arochlor 1221	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA
Arochlor 1232	0.1	-	-	-	-	NA	NA	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	<0.1	NA	NA	NA	NA	<0.5
Arochlor 1242	0.1	-	-	-	-	NA	NA	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	<0.1	NA	NA	NA	NA	<0.5
Arochlor 1248	0.1	-	-	-	-	NA	NA	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	<0.1	NA	NA	NA	NA	<0.5
Arochlor 1254	0.1	-	-	-	-	NA	NA	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	<0.1	NA	NA	NA	NA	<0.5
Arochlor 1260	0.1	-	-	-	-	NA	NA	NA	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.5	<0.5	<0.1	NA	NA	NA	NA	<0.5
PCBs (Sum of total)		-	-	10	50	NA	NA	NA	NC	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NC	NC	NC	NA	NA	NA	NA	NC

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investigation Levels for Residential with gardens and accessible soil - NEHF A (NEPC, 1999; DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T2 - Relocated Stockpile Asbestos Results

Borehole/Test Pit ID			RS2	RS3	RS4	RS5	RS7			RS8	RS9		RS10	RS11	RS12	RS13	RS14		RS15
Sample ID			RS2A	RS3 (1)	RS4 (1)	RS5 (1)	RS7 (1)	RS7 (2)	RS7 (3)	RS8 (2)	RS9 (1)	RS9 (3)	RS10 (1)	RS11 (2)	RS12 (1)	RS13 (2)	RS14 (1)	RS14 (2)	RS15 (2)
Depth (mBGS)			0.5-0.6	1.3-1.4	1.9-2.0	0.4-0.5	0.4-0.5	1.2-1.3	2.0-2.1	1-1.1	0.5-0.6	2.2-2.3	0.4-0.5	1.2-1.3	0.5-0.6	2-2.1	0.5-0.6	3.1-3.2	2.5-2.6
Date Sampled			11/08/10	11/08/10	11/08/10	11/08/10	12/08/10			12/08/10	12/08/10		11/08/10	11/08/10	11/08/10	11/08/10	11/08/10		11/08/10
Components	WA Guidelines for ACM Comm/Ind	WA Guidelines for AF/FA																	
Sample Description			Soil, stones, plant matter, fragments of plaster, glass and debris	Clayish soil, stones, plant matter, fragments of cement, corroded metal, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, glass and debris	Clayish soil, plant matter, fibres, fragments of cement, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones and plant matter	Clayish soil, stones, plant matter, fragments of plaster, corroded metal, glass and debris	Clayish soil, stones, plant matter, fibres, fragments of plaster, corroded metal, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones, plant matter, fibres, fragments of plaster, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, glass and debris	Clayish soil, stones, plant matter, fragments of plaster and debris	Clayish soil, stones, plant matter, fragments of plaster, bitumen, corroded metal and debris	Clayish soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones, plant matter, fragments of plaster, corroded metal and debris
a) Chrysotile Asbestos in ACM (g)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b) Chrysotile Asbestos Fibres (g)	NA	NA	-	-	-	-	-	-	-	-	0.004	-	0.109	-	-	-	-	-	-
c) Amosite Asbestos in ACM (g)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d) Amosite Asbestos Fibres (g)	NA	NA	-	-	-	0.018	-	-	-	-	-	-	-	-	-	-	-	-	-
e) Crocidolite Asbestos in ACM (g)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
f) Crocidolite Asbestos Fibres (g)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
g) Total asbestos fibres (g)	NA	NA	-	-	-	0.018	-	-	-	-	0.004	-	0.109	-	-	-	-	-	-
h) Soil mass (g)	NA	NA	-	-	-	315	-	-	-	-	310	-	286	-	-	-	-	-	-
i) FA w/w Analysis (%)	NA	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	0.006%	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	0.001%	No Asbestos Detected	0.038%	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
j) ACM w/w Analysis (%)	0.05	NA				NC					NC		NC						

Notes:
a) Chrysotile in ACM fragments (g)
b) Free Chrysotile fibres (g)
c) Amosite in ACM fragments (g)
d) Free Amosite fibres (g)
e) Crocidolite in ACM fragments (g)
f) Free Crocidolite fibres (g)
g) Total asbestos fibres (g)
h) Mass of soil sub-sample (g)
i) Weight/Weight fibres in soil sub-sample (%)
j) Weight/Weight ACM in soil sub-sample (%)
NA indicates that no criteria exist
-' indicates that this type of asbestos was not identified
NC = non calculable

Table T2 - Relocated Stockpile Asbestos Results

Borehole/Test Pit ID			RS16	RS17	RS18		RS20		BH1	BH4	BH5	BH6	BH7	BH8		BH9	EW9	
Sample ID			RS16 (1)	RS17 (1)	RS18 (1)	RS18 (2)	RS20 (1)	RS20 (2)	BH1 (1)	BH4 (1)	BH5 (2)	BH6 (1)	BH7 (1)	BH8 2.0-2.1	BH8 (2)	BH9 (1)	EW9 (1)	EW9 (3)
Depth (mBGS)			0.4-0.5	0.3-0.4	0.4-0.5	1.8-1.9	0.4-0.5	1.0-1.1	1-1.1	1-1.1	4-4.1	0.4-0.5	1-1.1	2-2.1	5-5.1	1-1.1	2.1-2.2	4.5-4.6
Date Sampled			11/08/10	11/08/10	16/08/10		16/08/10		17/08/10	178/10	17/08/10	17/08/10	17/08/10	17/08/10		178/10	17/08/10	
Components	WA Guidelines for ACM Comm/Ind	WA Guidelines for AF/FA																
Sample Description			Clayish soil, stones, plant matter, fibres, fragments of plaster, glass and debris	Clayish soil, stones, plant matter, fibres, fragments of plaster, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, cement and debris	Clayish soil, stones, plant matter, fibres, fragments of plaster, glass and debris	Clayish soils, stones, plant matter, fibres, fragments of plaster, cement, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, corroded metal and debris	Clayish soil, stones, plant matter, fragments of plaster, glass, corroded metal, coal like material and debris	Clayish soil, stones, plant matter, fragments of plaster, glass, corroded metal, coal like material and debris	Clayish soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones, plant matter, fragments of plaster, corroded metal and debris	Clayish soil, stones, plant matter, fragments of plaster, glass and debris	Soil, stones, plant matter, fragments of plaster, brick, glass and bitumen like material	Clayish soil, stones and plant matter	Clayish soil, stones, plant matter, fibres, fragments of plaster, glass, corroded metal and debris	Soil, stones, plant matter, fibres, fragments of fibre cement, plaster, glass, corroded metal, bitumen and debris	Clayish soil and stones
a) Chrysotile Asbestos in ACM (g)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.008	-
b) Chrysotile Asbestos Fibres (g)	NA	NA	0.010	0.010	-	0.069	0.032	-	-	-	-	-	-	-	-	1.360	-	-
c) Amosite Asbestos in ACM (g)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d) Amosite Asbestos Fibres (g)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.012	-
e) Crocidolite Asbestos in ACM (g)	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.005	-
f) Crocidolite Asbestos Fibres (g)	NA	NA	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-
g) Total asbestos fibres (g)	NA	NA	0.010	0.014	-	0.069	0.032	-	-	-	-	-	-	-	-	1.360	0.012	-
h) Soil mass (g)	NA	NA	296	272	-	308	278	-	-	-	-	-	-	-	-	282	238	-
i) FA w/w Analysis (%)	NA	0.001	0.003%	0.005%	No Asbestos	0.022%	0.012%	No Asbestos	No Asbestos	No Asbestos	No Asbestos	No Asbestos	No Asbestos	No Asbestos	No Asbestos	0.482%	0.005%	No Asbestos
j) ACM w/w Analysis (%)	0.05	NA	NC	NC	Detected	NC	NC	Detected	Detected	Detected	Detected	Detected	Detected	Detected	Detected	NC	0.005%	Detected

Notes:
a) Chrysotile in ACM fragments (g)
b) Free Chrysotile fibres (g)
c) Amosite in ACM fragments (g)
d) Free Amosite fibres (g)
e) Crocidolite in ACM fragments (g)
f) Free Crocidolite fibres (g)
g) Total asbestos fibres (g)
h) Mass of soil sub-sample (g)
i) Weight/Weight fibres in soil sub-sample (%)
j) Weight/Weight ACM in soil sub-sample (%)
NA indicates that no criteria exist
-' indicates that this type of asbestos was not identified
NC = non calculable

Table T3 - Asbestos-containing Stockpile Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						AS1	AS2		AS3		AS4	AS5		AS6	AS7			AS8	
Sample ID						AS1B	AS2A	AS2B	AS3B	AS3C	AS4A	AS5B	QC225 (Intra Dup AS5B 0.9-1)	AS6A	AS7A	AS7C	AS7D	AS8A	AS8B
Depth (mBGS)						0.7-0.8	0.4-0.5	0.9-1	1.1-1.2	1.4-1.5	0.5-0.6	0.9-1		0.4-0.5	0.5-0.6	1.7-1.8	2-2.1	0.4-0.5	1.1-1.2
PID						0.9	0.4	1	0.2	0.7	0.2	1.4		0.6	0.9	0.9	0.7	0.8	1.1
Date Sampled						10/08/2010	10/08/2010	10/08/2010	16/08/2010	16/08/2010	16/08/2010	16/08/2010		16/08/2010	16/08/2010	16/08/2010	16/08/2010	16/08/2010	16/08/2010
Compounds	**EQL**	**EPA 1994 Terrestial Organisms**	**NEPM 1999 PILs**	**NEPM 1999 HIL A**	**NEPM 1999 HIL F**														
TPHs																			
TPH C6 - C9	10	65	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	<100	<100	<100	<100	<100	130	<100	<100	<100	<100	<100	<100	<100	220
TPH C29-C36	100	-	-	-	-	100	<100	<100	<100	<100	210	100	<100	150	130	<100	<100	130	190
TPH+C10 - C36 (Sum of total)		1000	-	-	-	100	NC	NC	NC	NC	340	100	NC	150	130	NC	NC	130	410
BTEX																			
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	1	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																			
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	0.8	2.6
Benzo(a) pyrene	0.05	-	-	1	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	0.7	1.9
Benzo(b)&(k)fluoranthene	0.2	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	3
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
Chrysene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	0.7	2.1
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.1	-	-	-	-	0.8	0.6	<0.5	<0.5	<0.5	0.5	0.6	1.2	0.7	0.8	<0.5	<0.5	1.7	4.4
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	0.5	0.5	<0.5	<0.5	1.2	3
Pyrene	0.1	-	-	-	-	0.7	0.6	<0.5	<0.5	<0.5	0.5	0.5	1	0.7	0.8	<0.5	<0.5	1.5	3.7
PAHs (Sum of total)		20	-	20	100	1.5	1.2	NC	NC	NC	1	1.1	4.5	1.9	2.6	NC	NC	7.6	22.8
Metals																			
Arsenic	1	-	20	100	500	38	28	25	23	4.8	39	47	41	35	45	26	13	33	26
Cadmium	0.1	-	3	20	100	2.2	<2	<2	<2	<2	2.6	4.3	2.6	3.5	2.9	<2	<2	2.1	<2
Chromium (III+VI)	1	-	-	-	-	24	20	16	8.3	17	26	31	30	23	29	15	26	31	18
Copper	1	-	100	1000	5000	330	200	180	31	8.5	290	520	350	270	280	130	16	260	170
Mercury	0.05	-	1	15	75	0.09	0.05	0.06	<0.01	<0.01	0.06	0.06	0.04	0.04	0.04	0.02	<0.01	0.04	0.04
Lead	1	300	600	300	1500	410	380	360	57	15	1000	1300	860	640	410	220	13	1100	430
Nickel	1	-	60	600	3000	24	20	16	13	2.6	36	37	43	20	25	14	5.6	30	26
Zinc	1	-	200	7000	35000	630	500	490	140	22	1200	1600	3800	1300	630	310	13	1100	570
Organochlorine Pesticides																			
4,4-DDE	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
a-BHC	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Aldrin	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Aldrin + Dieldrin		-	-	10	50	NA	NA	NA	NA	NC	NA	NC	NC	NA	NA	NA	NA	NA	NA
b-BHC	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Chlordane (cis)	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Chlordane (trans)	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
d-BHC	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
DDD	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
DDT	0.1	-	-	-	-	NA	NA	NA	NA	<0.2	NA	<0.2	<0.2	NA	NA	NA	NA	NA	NA
DDT+DDE+DDD		-	-	200	1000	NA	NA	NA	NA	NC	NA	NC	NC	NA	NA	NA	NA	NA	NA
Dieldrin	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Endosulfan I	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Endosulfan II	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Endosulfan sulphate	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Endrin	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
g-BHC (Lindane)	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Heptachlor	0.05	-	-	-	50	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Heptachlor epoxide	0.05	-	-	10	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Methoxychlor	0.1	-	-	-	-	NA	NA	NA	NA	<0.2	NA	<0.2	<0.2	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.05	-	-	-	-	NA	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls																			
Arochlor 1016	0.1	-	-	-	-	NA	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA
Arochlor 1232	0.1	-	-	-	-	NA	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA
Arochlor 1242	0.1	-	-	-	-	NA	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA
Arochlor 1248	0.1	-	-	-	-	NA	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA
Arochlor 1254	0.1	-	-	-	-	NA	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA
Arochlor 1260	0.1	-	-	-	-	NA	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA
PCBs (Sum of total)		-	-	10	50	NA	NA	NA	NA	NC	NA	NC	NC	NA	NA	NA	NA	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investigation Levels for Residential with gardens and accessible soil - NEHF A (NEPC, 1999; DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T4 - Asbestos-containing Stockpile Asbestos Results

Borehole/Test Pit ID			AS1	AS2		AS3			AS4	AS5	AS6	AS7			AS8	
Sample ID			AS1 (1)	AS2 (1)	AS2B	AS3 (1)	AS3 (2)	AS3 (3)	AS4 (1)	AS5 (1)	AS6 (1)	AS7 (1)	AS7 (2)	AS7 (3)	AS8 (1)	AS8 (2)
Depth (mBGS)			0.6-0.7	0.5-0.6	0.9-1.0	0.4-0.5	1.1-1.2	1.4-1.5	0.5-0.6	0.4-0.5	0.4-0.5	0.5-0.6	1.7-1.8	2.0-2.1	0.4-0.5	1.1-1.2
Date Sampled			10/08/10	10/08/10		16/08/10			16/08/10	16/08/10	16/08/10	16/08/10			16/08/10	
Components	WA Guidelines for ACM Comm/Ind	WA Guidelines for AF/FA														
Sample Description			Clayish soil, stones, plant matter, fibres, fragments of fibre cement, cement, bitumen and debris	Clayish soil, stones, plant matter, fragments of fibre cement, plaster, cement, glass and bitumen	Clayish soil, stones and plant matter	Clayish soil, stones, plant matter, fibres, fragments of plaster, cement, bitumen, corroded metal, glass and debris	Soil, stones, plant matter, synthetic mineral fibres, fragments of cement, glass and debris	Clayish soil, stones and plant matter	Clayish soil, stones, plant matter, synthetic mineral fibres, fragments of fibre cement, glass, bitumen and debris	Clayish soil, stones, plant matter, fragments of fibre cement, plaster, glass and debris	Clayish soil, stones, plant matter, fragments of bitumen, glass and debris	Clayish soil, stones, plant matter, fragments of fibre cement, plaster, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, glass and debris	Clayish soil, stones and plat matter	Clayish soil, stones, plant matter, synthetic mineral fibres, fibres, fragments of plaster, plaster, glass and debris	Soil, stones, plant matter, synthetic mineral fibres, fragments of cement, bitumen, glass and debris
a) Chrysotile Asbestos in ACM (g)	-	-	5.700	3.700	-	-	-	-	0.530	0.002	-	0.017	-	-	-	-
b) Chrysotile Asbestos Fibres (g)	-	-	0.006	-	-	0.006	-	-	-	-	-	-	-	-	0.004	-
c) Amosite Asbestos in ACM (g)	-	-	-	1.170	-	-	-	-	-	0.000	-	0.004	-	-	-	-
d) Amosite Asbestos Fibres (g)	-	-	0.003	-	-	-	-	-	-	-	-	-	-	-	-	-
e) Crocidolite Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
f) Crocidolite Asbestos Fibres (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
g) Total asbestos fibres (g)	-	-	0.009	NC	-	0.006	-	-	NC	NC	-	NC	-	-	0.004	-
h) Soil mass (g)	-	-	652	426	-	337	-	-	327	218	-	468	-	-	278	-
i) FA w/w Analysis (%)	-	0.001	0.001%	NC	No Asbestos Detected	0.002%	No Asbestos Detected	No Asbestos Detected	NC	NC	No Asbestos Detected	NC	No Asbestos Detected	No Asbestos Detected	0.001%	No Asbestos Detected
j) ACM w/w Analysis (%)	0.05	-	0.874%	1.143%		NC			0.162%	0.001%		0.004%			NC	

Notes:
a) Chrysotile in ACM fragments (g)
b) Free Chrysotile fibres (g)
c) Amosite in ACM fragments (g)
d) Free Amosite fibres (g)
e) Crocidolite in ACM fragments (g)
f) Free Crocidolite fibres (g)
g) Total asbestos fibres (g)
h) Mass of soil sub-sample (g)
i) Weight/Weight fibres in soil sub-sample (%)
j) Weight/Weight ACM in soil sub-sample (%)
NA indicates that no criteria exist
'-' indicates that this type of asbestos was not identified
NC = non calculable

Table T5 - Gravel Stockpile Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						GS1		GS2			GS3	GS4				GS5				GS6	
Sample ID						GS1C	GS1D	GS2A	GS2B	QC205 (Intra laboratory GS2B 1-1.1)	GS3B	GS4B	QC207 (Intra Dup GS4B 1.1-1.2)	GS4C	GS4D	GS5B	GS5C	QC206 (Intra Dup GS5C 1.5-1.6)	QC306 (Inter Dup GS5C 1.5-1.6)	GS6A	GS6D
Depth (mBGS)						1.6-1.7	2.2-2.3	0.5-0.6	1-1.1		1.1-1.2	1.1-1.2		1.6-1.7	1.9-2	0.9-1	1.5-1.6			0.4-0.5	2-2.1
PID						0.3	1.2	0.3	0.3		1	1.2		0.9	0.7	1	1.4			0.9	0.9
Date Sampled						9/08/2010	9/08/2010	10/08/2010	10/08/2010		10/08/2010	10/08/2010		10/08/2010	10/08/2010	10/08/2010	10/08/2010			9/08/2010	9/08/2010
Compounds	**EQL**	**EPA 1994 Terrestial Organisms**	**NEPM 1999 PILs**	**NEPM 1999 HIL A**	**NEPM 1999 HIL F**																
TPHs																					
TPH C6 - C9	10	65	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	<100	<100	<100	850	2310	<100	<100	160	130	<100	<100	<100	<100	<100	<100	<100
TPH C29-C36	100	-	-	-	-	100	<100	<100	1080	2520	<100	<100	260	170	<100	190	130	150	<100	<100	<100
TPH+C10 - C36 (Sum of total)		1000	-	-	-	100	NC	NC	1930	4830	NC	NC	420	300	NC	190	130	150	NC	NC	NC
BTEX																					
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	1	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																					
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Benzo(a) pyrene	0.05	-	-	1	5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5
Benzo(b)&(k)fluoranthene	0.2	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<1	<1
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Chrysene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Fluoranthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Phenanthrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
Pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5
PAHs (Sum of total)		20	-	20	100	NC	NC	NC	NC	NC	1	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Metals																					
Arsenic	1	-	20	100	500	110	4	6.3	110	75	39	150	170	150	5.5	4.7	11	37	27	5.5	19
Cadmium	0.1	-	3	20	100	2.6	<2	<2	2.7	2.4	<2	<2	<2	<2	<2	<2	<2	<2	0.6	<2	<2
Chromium (III+VI)	1	-	-	-	-	12	17	21	9.2	11	2.2	28	26	10	15	17	2.2	12	15	20	34
Copper	1	-	100	1000	5000	210	9.8	32	230	230	27	120	110	120	2.6	33	43	110	60	26	6.1
Mercury	0.05	-	1	15	75	0.09	<0.01	0.17	0.05	0.05	<0.01	<0.01	<0.01	0.02	<0.01	0.31	<0.01	0.01	<0.1	0.29	<0.01
Lead	1	300	600	300	1500	1100	12	65	440	360	31	48	66	520	10	61	25	140	48	55	27
Nickel	1	-	60	600	3000	27	3.2	14	15	12	4.6	89	82	13	<2	21	4.8	19	25	17	3
Zinc	1	-	200	7000	35000	1200	78	170	310	240	140	130	160	650	6.4	110	70	210	210	160	14
Organochlorine Pesticides																					
4,4-DDE	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
a-BHC	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Aldrin	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Aldrin + Dieldrin		-	-	10	50	NA	NA	NA	NC	NC	NA	NA	NC	NC	NA	NA	NA	NA	NA	NA	NA
b-BHC	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Chlordane (cis)	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Chlordane (trans)	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
d-BHC	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
DDD	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
DDT	0.1	-	-	-	-	NA	NA	NA	<0.2	0.6	NA	NA	<0.2	<0.2	NA	NA	NA	NA	NA	NA	NA
DDT+DDE+DDD		-	-	200	1000	NA	NA	NA	NC	0.6	NA	NA	NC	NC	NA	NA	NA	NA	NA	NA	NA
Dieldrin	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Endosulfan I	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Endosulfan II	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Endosulfan sulohate	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Endrin	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
g-BHC (Lindane)	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Heotachlor	0.05	-	-	-	50	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Heotachlor epoxide	0.05	-	-	10	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	0.1	-	-	-	-	NA	NA	NA	<0.2	<0.2	NA	NA	<0.2	<0.2	NA	NA	NA	NA	NA	NA	NA
Hexachlorobenzene	0.05	-	-	-	-	NA	NA	NA	<0.05	<0.05	NA	NA	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA
Polychlorinated Biphenyls																					
Arochlor 1016	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA
Arochlor 1232	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA
Arochlor 1242	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA
Arochlor 1248	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA
Arochlor 1254	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA
Arochlor 1260	0.1	-	-	-	-	NA	NA	NA	<0.5	<0.5	NA	NA	<0.5	<0.5	NA	NA	NA	NA	NA	NA	NA
PCBs (Sum of total)		-	-	10	50	NA	NA	NA	NC	NC	NA	NA	NC	NC	NA	NA	NA	NA	NA	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investigation Levels for Residential with gardens and accessible soil - NEHF A (NEPC, 1999; DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T6 - Gravel Stockpile Asbestos Results

Borehole/Test Pit ID			GS2	GS5
Sample ID			GS2B	GS5 (1)
Depth (mBGS)			1-1.1	0.9-1.0
Date Sampled			10/08/10	10/08/10
Components	WA Guidelines for ACM Comm/Ind	WA Guidelines for AF/FA		
Sample Description			Soil, stones, plant matter, fragments of plaster, corroded metal, glass and debris	Soil, stones, plant matter, fragments of fibre cement, cement, bitumen and debris
a) Chrysotile Asbestos in ACM (g)	-	-	-	1.980
b) Chrysotile Asbestos Fibres (g)	-	-	-	-
c) Amosite Asbestos in ACM (g)	-	-	-	0.540
d) Amosite Asbestos Fibres (g)	-	-	-	-
e) Crocidolite Asbestos in ACM (g)	-	-	-	-
f) Crocidolite Asbestos Fibres (g)	-	-	-	-
g) Total asbestos fibres (g)	-	-	-	NC
h) Soil mass (g)	-	-	-	463
i) FA w/w Analysis (%)	-	0.001	No Asbestos Detected	NC
j) ACM w/w Analysis (%)	0.05	-		**0.544%**

Notes:
a) Chrysotile in ACM fragments (g)
b) Free Chrysotile fibres (g)
c) Amosite in ACM fragments (g)
d) Free Amosite fibres (g)
e) Crocidolite in ACM fragments (g)
f) Free Crocidolite fibres (g)
g) Total asbestos fibres (g)
h) Mass of soil sub-sample (g)
i) Weight/Weight fibres in soil sub-sample (%)
j) Weight/Weight ACM in soil sub-sample (%)
NA indicates that no criteria exist
-' indicates that this type of asbestos was not identified
NC = non calculable

Table T7 - Southern part of Site, Site-wide Fill Materials Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						TP1		TP2	TP3	TP4		TP5	TP6			TP7	TP8		TP9	TP10		TP11	TP12
Sample ID						TP1A	TP1B	TP2A	TP3A	TP4A	QC201 (Intra Dup TP4A 0.2-0.3)	TP4C	TP5A	TP6A	QC202 (Intra Dup TP6A 0.2-0.3)	QC302 (Inter Dup TP6A 0.2-0.3)	TP7A	TP8A	TP8B	TP9A	TP10A	QC203 (Intra Dup TP10A 0.4-0.5)	TP11A	TP12A
Depth (mBGS)						0.4-0.5	0.9-1	0.5-0.6	0.9-1	0.2-0.3		0.9-1	0.3-0.4	0.2-0.3			0.3-0.4	0.5-0.6	0.9-1	0.3-0.4	0.4-0.5		0.5-0.6	0.4-0.5
PID						1.1	0.3	0.2	1.6	0.5		1.7	0.8	0.8			0.7	1	1.1	1.3	1.3		0.8	0.5
Date Sampled						9/08/2010	9/08/2010	9/08/2010	9/08/2010	9/08/2010		9/08/2010	9/08/2010	9/08/2010			9/08/2010	9/08/2010	9/08/2010	9/08/2010	9/08/2010		9/08/2010	9/08/2010
Compounds	**EQL**	**EPA 1994 Terrestial Organisms**	**NEPM 1999 PILs**	**NEPM 1999 HIL A**	**NEPM 1999 HIL F**																		
TPHs																							
TPH C6 - C9	10	65	-	-	-	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	160	<100	230	<100
TPH C29-C36	100	-	-	-	-	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	120	100	290	<100
TPH+C10 - C36 (Sum of total)		1000	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	280	100	520	NC
BTEX																							
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	1	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																							
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5
Benzo(a) pyrene	0.05	-	-	1	5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	0.2	-	-	-	-	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	1	<1	<1	<1	2	<1	<1	<1
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5
Chrysene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	0.6	<0.5	<0.5	<0.5	1.4	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.1	1.3	0.6	<0.5	<0.5	3.2	<0.5	0.6	<0.5
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.1	0.7	<0.5	<0.5	<0.5	3.1	<0.5	<0.5	<0.5
Pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.1	1.2	0.6	<0.5	<0.5	3.1	<0.5	0.6	<0.5
PAHs (Sum of total)		20	-	20	100	NC	NC	NC	2.1	NC	NC	NC	2.1	NC	NC	NC	5.8	1.2	NC	NC	16.3	NC	1.2	NC
Metals																							
Arsenic	1	-	20	100	500	8.7	12	13	35	13	28	18	7.8	29	13	6	100	59	11	120	90	57	140	18
Cadmium	0.1	-	3	20	100	<2	<2	<2	3.5	<2	<2	<2	<2	7.5	<2	0.7	<2	4.1	<2	<2	7.5	6.8	<2	<2
Chromium (III+VI)	1	-	-	-	-	27	17	15	12	2.9	4.5	4.6	5	19	6.7	3	5.1	23	12	5.8	49	47	19	12
Copper	1	-	100	1000	5000	14	15	55	590	100	89	22	93	450	110	90	38	1200	9.7	1100	900	570	190	180
Mercury	0.05	-	1	15	75	0.02	<0.01	0.02	0.39	<0.01	0.02	<0.01	<0.01	0.33	0.01	<0.1	0.02	0.08	0.01	0.26	0.03	0.05	0.06	0.01
Lead	1	300	600	300	1500	18	13	23	780	40	84	21	160	510	220	91	48	990	35	460	3300	2000	1000	350
Nickel	1	-	60	600	3000	11	<2	6.6	20	5.2	8.1	2.5	9.7	16	11	9	12	34	<2	13	75	75	37	25
Zinc	1	-	200	7000	35000	39	22	49	580	42	66	35	290	530	500	300	210	1100	11	270	1300	1200	530	260
Organochlorine Pesticides																							
4,4-DDE	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
a-BHC	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Aldrin	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Aldrin + Dieldrin		-	-	10	50	NC	NC	-	-	NC	NC	NC	-	NC	NC	NC	NC	-	NC	NA	NC	NC	NA	NA
b-BHC	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Chlordane (cis)	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Chlordane (trans)	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
d-BHC	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
DDD	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
DDT	0.1	-	-	-	-	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	NA	<0.2	<0.2	NA	NA
DDT+DDE+DDD		-	-	200	1000	NC	NC	-	-	NC	NC	NC	-	NC	NC	NC	NC	-	NC	NA	NC	NC	NA	NA
Dieldrin	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Endosulfan I	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Endosulfan II	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Endosulfan sulphate	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Endrin	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Endrin aldehyde	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	NA	NA	NA	NA	NA	NA
g-BHC (Lindane)	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Heptachlor	0.05	-	-	10	50	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Heptachlor epoxide	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Methoxychlor	0.1	-	-	-	-	<0.2	<0.2	-	-	<0.2	<0.2	<0.2	-	<0.2	<0.2	<0.1	<0.2	-	<0.2	NA	<0.2	<0.2	NA	NA
Hexachlorobenzene	0.05	-	-	-	-	<0.05	<0.05	-	-	<0.05	<0.05	<0.05	-	<0.05	<0.05	<0.1	<0.05	-	<0.05	NA	<0.05	<0.05	NA	NA
Polychlorinated Biphenyls																							
Arochlor 1016	0.1	-	-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.1	<0.5	-	<0.5	NA	<0.5	<0.5	NA	NA
Arochlor 1221	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-	-	NA	NA	NA	NA	NA	NA
Arochlor 1232	0.1	-	-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.1	<0.5	-	<0.5	NA	<0.5	<0.5	NA	NA
Arochlor 1242	0.1	-	-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.1	<0.5	-	<0.5	NA	<0.5	<0.5	NA	NA
Arochlor 1248	0.1	-	-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.1	<0.5	-	<0.5	NA	<0.5	<0.5	NA	NA
Arochlor 1254	0.1	-	-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.1	<0.5	-	<0.5	NA	<0.5	<0.5	NA	NA
Arochlor 1260	0.1	-	-	-	-	<0.5	<0.5	-	-	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.1	<0.5	-	<0.5	NA	<0.5	<0.5	NA	NA
PCBs (Sum of total)		-	-	10	50	NC	NC	-	-	NC	NC	NC	-	NC	NC	NC	NC	-	NC	NA	NC	NC	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investigation Levels for Residential with gardens and accessible soil - NEHF A (NEPC, 1999; DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T7 - Southern part of Site, Site-wide Fill Materials Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						TP13				TP14	TP15	TP16	TP17	TP18			TP19			TP20		EW6	
Sample ID						TP13A	QC204 (Intra Dup TP13A 0.5-0.6)	QC304 (Inter Dup TP13A 0.5-0.6)	TP13B	TP14A	TP15A	TP16A	TP17B	TP18A	TP18B	TP18C	TP19A	TP19C	QC219 (Intra Dup TP19C 1.5-1.6)	TP20A	TP20B	EW 6	EW 6
Depth (mBGS)						0.5-0.6			0.7-0.8	0.2-0.3	0.2-0.3	0.4-0.5	0.4-0.5	0.4-0.5	1.2-1.3	2-2.1	0.3-0.4	1.5-1.6		0.4-0.5	1-1.1	2.9-3	5.9-6
PID						1.4			1.4	1.1	0.9	1.2	0.4	0.4	0.6	1.5	1.5	1.4		0.7	0.7	0	0.1
Date Sampled						9/08/2010			9/08/2010	10/08/2010	10/08/2010	10/08/2010	10/08/2010	12/08/2010	12/08/2010	12/08/2010	12/08/2010	12/08/2010		12/08/2010	12/08/2010	16/08/2010	16/08/2010
Compounds	**EQL**	**EPA 1994 Terrestial Organisms**	**NEPM 1999 PILs**	**NEPM 1999 HIL A**	**NEPM 1999 HIL F**																		
TPHs																							
TPH C6 - C9	10	65	-	-	-	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	180	120	140	<100	<100	<100	<100	<100	<100	260	<100	140	<100	<100	120	<100	<100	<100
TPH C29-C36	100	-	-	-	-	180	120	<100	<100	<100	<100	<100	<100	<100	370	<100	230	<100	<100	190	<100	<100	<100
TPH+C10 - C36 (Sum of total)		1000	-	-	-	360	240	140	NC	NC	NC	NC	NC	NC	630	NC	370	NC	NC	310	NC	NC	NC
BTEX																							
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	1	-	-	-	-	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																							
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.1	-	-	-	-	<0.5	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5
Benzo(a) pyrene	0.05	-	-	1	5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	0.2	-	-	-	-	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.1	-	-	-	-	<0.5	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.1	-	-	-	-	0.5	0.5	1	<0.5	1	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	0.7	<0.5	<0.5	1.3	<0.5	<0.5	<0.5
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.1	-	-	-	-	<0.5	<0.5	0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.1	-	-	-	-	<0.5	<0.5	1	<0.5	0.7	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	<0.5	<0.5
Pyrene	0.1	-	-	-	-	0.5	<0.5	1	<0.5	1	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	0.7	<0.5	<0.5	1.4	<0.5	<0.5	<0.5
PAHs (Sum of total)		20	-	20	100	1	0.5	6.6	NC	2.7	NC	NC	NC	NC	2.4	NC	2.9	NC	NC	6.2	NC	NC	NC
Metals																							
Arsenic	1	-	20	100	500	180	140	160	7.9	25	39	10	2.1	54	140	7.6	51	4.9	3.2	79	44	<2	14
Cadmium	0.1	-	3	20	100	2.2	<2	1.8	<2	3.1	<2	<2	<2	2.3	4.9	<2	2.5	<2	<2	4.2	<2	<2	<2
Chromium (III+VI)	1	-	-	-	-	10	16	16	16	6.5	6.7	3.7	19	56	18	15	15	17	35	19	5.5	12	
Copper	1	-	100	1000	5000	400	240	260	19	730	1400	190	140	7300	1200	14	460	12	12	490	120	4.9	19
Mercury	0.05	-	1	15	75	0.29	0.18	1	<0.01	0.06	0.22	0.01	<0.01	0.09	0.16	<0.01	0.48	<0.01	<0.01	0.09	0.05	<0.01	0.02
Lead	1	300	600	300	1500	1000	740	610	16	1800	130	330	200	300	1400	21	590	14	17	790	250	4.4	15
Nickel	1	-	60	600	3000	30	17	24	<2	22	15	18	8.6	39	49	3.1	39	4.1	4.7	38	16	<2	11
Zinc	1	-	200	7000	35000	1000	570	620	12	2100	380	360	370	630	1500	22	730	100	82	1500	460	28	44
Organochlorine Pesticides																							
4,4-DDE	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
a-BHC	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Aldrin	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Aldrin + Dieldrin		-	-	10	50	NC	NA	NC	NA	NA	NA	NA	NA	NA	NC	NC	NA	NC	NC	NC	NA	NA	NA
b-BHC	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Chlordane (cis)	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Chlordane (trans)	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
d-BHC	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
DDD	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
DDT	0.1	-	-	-	-	<0.2	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.2	<0.2	NA	<0.2	<0.2	<0.2	NA	NA	NA
DDT+DDE+DDD		-	-	200	1000	NC	NA	NC	NA	NA	NA	NA	NA	NA	NC	NC	NA	NC	NC	NC	NA	NA	NA
Dieldrin	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Endosulfan I	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Endosulfan II	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Endosulfan sulphate	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Endrin	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Endrin aldehyde	0.1	-	-	-	-	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
g-BHC (Lindane)	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Heptachlor	0.05	-	-	10	50	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Heptachlor epoxide	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Methoxychlor	0.1	-	-	-	-	<0.2	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.2	<0.2	NA	<0.2	<0.2	<0.2	NA	NA	NA
Hexachlorobenzene	0.05	-	-	-	-	<0.05	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.05	<0.05	NA	<0.05	<0.05	<0.05	NA	NA	NA
Polychlorinated Biphenyls																							
Arochlor 1016	0.1	-	-	-	-	<0.5	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	<0.5	<0.5	<0.5	NA	NA	NA
Arochlor 1221	0.1	-	-	-	-	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arochlor 1232	0.1	-	-	-	-	<0.5	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	<0.5	<0.5	<0.5	NA	NA	NA
Arochlor 1242	0.1	-	-	-	-	<0.5	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	<0.5	<0.5	<0.5	NA	NA	NA
Arochlor 1248	0.1	-	-	-	-	<0.5	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	<0.5	<0.5	<0.5	NA	NA	NA
Arochlor 1254	0.1	-	-	-	-	<0.5	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	<0.5	<0.5	<0.5	NA	NA	NA
Arochlor 1260	0.1	-	-	-	-	<0.5	NA	<0.1	NA	NA	NA	NA	NA	NA	<0.5	<0.5	NA	<0.5	<0.5	<0.5	NA	NA	NA
PCBs (Sum of total)		-	-	10	50	NC	NA	NC	NA	NA	NA	NA	NA	NA	NC	NC	NA	NC	NC	NC	NA	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investigation Levels for Residential with gardens and accessible soil - NEHF A (NEPC, 1999; DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T8 - Southern part of Site, Site-wide Fill Materials Asbestos Results

Borehole/Test Pit ID			TP1		TP4	TP6	TP8	TP10	TP15	TP17	TP18			TP19		TP20		EW6	
Sample ID			TP1A	TP1B	TP4A	TP6A	TP8 (1)	TP10A	TP15A	TP17B	TP18 (1)	TP18 (2)	TP18 (3)	TP19 (1)	TP19 (2)	TP20A	TP20 (1)	EW6 3.9-4.0	EW6 5.9-6.0
Depth (mBGS)			0.4-0.5	0.9-1.0	0.2-0.3	0.2-0.3	0.5-0.6	0.4-0.5	0.2-0.3	0.4-0.5	0.4-0.5	1.2-1.3	2-2.1	0.3-0.4	1.5-1.6	0.4-0.5	1-1.1	3.9-4	4.9-6
Date Sampled			9/08/10		9/08/10	9/08/10	9/08/10	9/08/10	10/08/10	10/08/10	12/08/10			12/08/10		12/08/10		16/08/10	
Components	WA Guidelines for ACM Comm/Ind	WA Guidelines for AF/FA																	
Sample Description			Clayish soil, stones and plant matter	Clayish soil, stones and plant matter	Clayish soil, stones, plant matter and fragments of glass	Soil, stones, plant matter, fragments of plaster, glass and debris	Clayish soil, stones, plant matter, fibres, fragments of plaster, corroded metal, glass and debris	Soil, stones, plant matter, fibres, fragments of plaster, corroded metal, glass and debris	Soil, stones, plant matter, fragments of plaster, corroded metal, glass and debris	Soil, stones, plant matter, fragments of plaster, corroded metal, glass and debris	Clayish soil, stone, plant matter, fragments of plaster, glass and debris	Clayish soil, stones, plant matter, fragments of plaster, corroded metal and debris	Clayish soil, stones and plant matter	Soil, stones, plant matter, fragments of plaster, corroded metal, glass and debris	Clayish soil, stones and plant matter	Clayish soil, stones, fibres, fragments of plaster and glass	Clayish soil, stones, plant matter, fibres, fragments of plaster, corroded metal, glass and debris	Clayish soil, stones and plant matter	Clayish soil, stones and plant matter
a) Chrysotile Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b) Chrysotile Asbestos Fibres (g)	-	-	-	-	-	-	3.900	-	-	-	-	-	-	-	-	0.002	0.010	-	-
c) Amosite Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d) Amosite Asbestos Fibres (g)	-	-	-	-	-	-	-	0.001	-	-	-	-	-	-	-	-	-	-	-
e) Crocidolite Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
f) Crocidolite Asbestos Fibres (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
g) Total asbestos fibres (g)	-	-	-	-	-	-	3.900	0.001	-	-	-	-	-	-	-	0.002	0.010	-	-
h) Soil mass (g)	-	-	-	-	-	-	362	19	-	-	-	-	-	-	-	32	298	-	-
i) FA w/w Analysis (%)	-	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	1.077%	0.004%	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	0.007%	0.003%	No Asbestos Detected	No Asbestos Detected
j) ACM w/w Analysis (%)	0.05	-					NC	NC								NC	NC		

Notes:
a) Chrysotile in ACM fragments (g)
b) Free Chrysotile fibres (g)
c) Amosite in ACM fragments (g)
d) Free Amosite fibres (g)
e) Crocidolite in ACM fragments (g)
f) Free Crocidolite fibres (g)
g) Total asbestos fibres (g)
h) Mass of soil sub-sample (g)
i) Weight/Weight fibres in soil sub-sample (%)
j) Weight/Weight ACM in soil sub-sample (%)
NA indicates that no criteria exist
-' indicates that this type of asbestos was not identified
NC = non calculable

Table T9 - Northern part of Site, Site-wide Fill Materials Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						TP21		TP22				TP23	TP24						TP25	TP26		TP27			TP28	TP29	
Sample ID						TP21A	TP21C	TP22A	TP22B	QC220 (Intra Dup TP22B 1.1-1.2)	QC320 (Inter Dup TP22B 1.1-1.2)	TP23A	TP24A	TP24B	TP24C	QC218 (Intra Dup TP24C 2-2.1)	QC318 (Intra Dup TP24C 2-2.1)	TP24D	TP25A	TP26B	TP26C	TP27B	QC221 (Intra Dup TP27B 1.1-1.2)	TP27E	TP28B	TP29A	TP29B
Depth (mBGS)						0.5-0.6	2.1-2.2	0.5-0.6	1.1-1.2			0.5-0.6	0.5-0.6	1.1-1.2	2-2.1			2.2-2.3	0.5-0.6	0.9-1	1.9-2	1.1-1.2		3.2-3.3	0.7-0.8	0.3-0.4	0.9-1
PID						1.3	1.3	0.6	1.2			0.5	0.3	0.8	0.5			1	0.3	0.6	0.7	0.5		0.4	0.6	0.6	0.5
Date Sampled						12/08/2010	12/08/2010	12/08/2010	12/08/2010			12/08/2010	12/08/2010	12/08/2010	12/08/2010			12/08/2010	12/08/2010	12/08/2010	12/08/2010	12/08/2010		12/08/2010	10/08/2010	12/08/2010	12/08/2010
Compounds	**EQL**	**EPA 1994 Terrestial Organisms**	**NEPM 1999 PILs**	**NEPM 1999 HIL A**	**NEPM 1999 HIL F**																						
TPHs																											
TPH C6 - C9	10	65	-	-	-	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	<50	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	280	120	<100	360	600	110	<100	<100	320	<100	<100	<100	<100	140	430	<100	<100	<100	<100	130	<100	140
TPH C29-C36	100	-	-	-	-	450	200	140	570	740	170	<100	140	260	<100	<100	<100	<100	150	520	<100	<100	<100	<100	110	<100	140
TPH+C10 - C36 (Sum of total)		1000	-	-	-	730	320	140	930	1390	280	NC	140	580	NC	NC	NC	NC	290	950	NC	NC	NC	NC	240	NC	280
BTEX																											
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & o)	1	-	-	-	-	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																											
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	0.8	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	2.3	0.3	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	0.05	-	-	1	5	<0.5	<0.5	<0.5	<0.5	2.4	0.3	<0.5	<0.5	0.5	<0.5	<0.5	0.4	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b&k)fluoranthene	0.2	-	-	-	-	<1	<1	<1	<1	4	0.5	<1	<1	<1	<1	<1	0.5	<1	<1	1	<1	<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	1.2	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	2.6	0.3	<0.5	<0.5	0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.1	-	-	-	-	<0.5	<0.5	0.6	0.5	3.2	0.4	<0.5	<0.5	0.8	<0.5	<0.5	0.2	<0.5	<0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3-c,d)pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	0.9	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	2.4	0.2	<0.5	<0.5	0.6	<0.5	<0.5	<0.1	<0.5	<0.5	0.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	0.1	-	-	-	-	<0.5	<0.5	0.6	0.5	4.1	0.4	<0.5	<0.5	0.7	<0.5	<0.5	0.3	<0.5	<0.5	1.4	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)		20	-	20	100	NC	NC	1.2	1	23.9	2.8	NC	NC	3.1	NC	NC	2.2	NC	NC	5.3	NC	NC	NC	NC	NC	NC	NC
Metals																											
Arsenic	1	-	20	100	500	49	22	33	89	310	38	88	68	36	24	29	31	7.8	110	210	12	33	26	9	45	17	92
Cadmium	0.1	-	3	20	100	2.8	2.6	2.1	8.6	25	0.9	4.5	5.1	3.4	<2	<2	<0.5	<2	13	89	<2	3.2	2.8	<2	2.3	<2	4.6
Chromium (III+VI)	1	-	-	-	-	22	15	15	23	85	19	42	26	30	15	13	14	14	32	120	6.3	35	26	13	16	11	180
Copper	1	-	100	1000	5000	1300	560	270	1500	3400	1000	940	620	1600	440	880	1100	17	7800	30.000	66	530	600	38	920	210	760
Mercury	0.05	-	1	15	75	0.08	0.06	0.08	0.09	0.52	0.3	0.06	0.14	0.43	0.02	0.03	0.1	<0.01	0.14	0.13	0.04	0.2	0.1	<0.01	0.08	0.04	0.08
Lead	1	300	600	300	1500	540	460	310	1300	2400	570	1100	520	700	260	160	240	14	2200	13.000	50	630	350	21	700	200	350
Nickel	1	-	60	600	3000	21	14	17	45	170	36	64	36	32	25	32	38	<2	53	230	5.2	48	38	2	51	20	700
Zinc	1	-	200	7000	35000	750	560	410	1000	3000	490	1200	880	910	460	300	340	18	2300	7700	150	910	850	34	700	410	3800
Organochlorine Pesticides																											
4,4-DDE	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
a-BHC	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Aldrin	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Aldrin + Dieldrin		-	-	10	50	NC	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NC	NA	NA	NA	NC	NA	NC	NC	NA	NA	NA
b-BHC	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Chlordane (cis)	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Chlordane (trans)	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
d-BHC	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
DDD	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
DDT	0.1	-	-	-	-	<0.2	NA	NA	<0.2	<0.2	<0.1	NA	<0.2	NA	<0.2	<0.2	<0.1	NA	NA	NA	<0.2	NA	<0.2	<0.2	NA	NA	NA
DDT+DDE+DDD		-	-	200	1000	NC	NA	NA	NC	NC	NC	NA	NC	NA	NC	NC	NC	NA	NA	NA	NC	NA	NC	NC	NA	NA	NA
Dieldrin	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Endosulfan I	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Endosulfan II	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Endosulfan sulohate	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Endrin	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Endrin aldehyde	0.1	-	-	-	-	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
g-BHC (Lindane)	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Heotachlor	0.05	-	-	10	50	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Heotachlor epoxide	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Methoxychlor	0.1	-	-	-	-	<0.2	NA	NA	<0.2	<0.2	<0.1	NA	<0.2	NA	<0.2	<0.2	<0.1	NA	NA	NA	<0.2	NA	<0.2	<0.2	NA	NA	NA
Hexachlorobenzene	0.05	-	-	-	-	<0.05	NA	NA	<0.05	<0.05	<0.1	NA	<0.05	NA	<0.05	<0.05	<0.1	NA	NA	NA	<0.05	NA	<0.05	<0.05	NA	NA	NA
Polychlorinated Biphenyls																											
Arochlor 1016	0.1	-	-	-	-	<0.5	NA	NA	<0.5	<0.5	<0.1	NA	<0.5	NA	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA
Arochlor 1221	0.1	-	-	-	-	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	<0.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arochlor 1232	0.1	-	-	-	-	<0.5	NA	NA	<0.5	<0.5	<0.1	NA	<0.5	NA	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA
Arochlor 1242	0.1	-	-	-	-	<0.5	NA	NA	<0.5	<0.5	<0.1	NA	<0.5	NA	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA
Arochlor 1248	0.1	-	-	-	-	<0.5	NA	NA	<0.5	<0.5	<0.1	NA	<0.5	NA	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA
Arochlor 1254	0.1	-	-	-	-	<0.5	NA	NA	<0.5	<0.5	<0.1	NA	<0.5	NA	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA
Arochlor 1260	0.1	-	-	-	-	<0.5	NA	NA	<0.5	<0.5	<0.1	NA	<0.5	NA	<0.5	<0.5	<0.1	NA	NA	NA	<0.5	NA	<0.5	<0.5	NA	NA	NA
PCBs (Sum of total)		-	-	10	50	NC	NA	NA	NC	NC	NC	NA	NC	NA	NC	NC	NC	NA	NA	NA	NC	NA	NC	NC	NA	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investiciation Levels for Residential with gardens and accessible soil - NEHF A (NEPC, 1999: DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T9 - Northern part of Site, Site-wide Fill Materials Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						TP30		TP31			TP32		TP33		TP34		TP35	TP36		TP37			TP38		
Sample ID						TP30A	TP30C	TP31C	QC210 (Intra Dup TP31C 2.9-3)	QC310 (Inter Dup TP31C 2.9-3)	TP32A	TP32C	TP33B	TP33D	TP34A	TP34B	TP35A	TP36A	TP36D	TP37B	QC222 (Intra Dup TP37B 1-1.1)	QC322 (Inter Dup TP37B 1-1.1)	TP38A	TP38D	TP38E
Depth (mBGS)						0.5-0.6	2-2.1	2.9-3			0.4-0.5	2.1-2.2	1-1.1	2.6-2.7	0.4-0.5	0.9-1	0.3-0.4	0.3-0.4	2-2.1	1-1.1			0.4-0.5	1.9-2	2.8-2.9
PID						1.4	1.2	1.2			0.3	1.6	0.7	0.4	0.2	0.3	0.3	0.4	0.4	0.3			0.5	1.1	1.3
Date Sampled						12/08/2010	12/08/2010	10/08/2010			12/08/2010	12/08/2010	12/08/2010	12/08/2010	16/08/2010	16/08/2010	12/08/2010	12/08/2010	12/08/2010	12/08/2010			16/08/2010	16/08/2010	16/08/2010
Compounds	EQL	EPA 1994 Terrestial Organisms	NEPM 1999 PILs	NEPM 1999 HIL A	NEPM 1999 HIL F																				
TPHs																									
TPH C6 - C9	10	65	-	-	-	<10	<10	<10	<10	<25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<25	<10	<10	<10
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	210	<100	100	140	<100	320	<100	<100	<100	<100	<100	<100	130	<100	<100	<100	<100	340	<100	<100
TPH C29-C36	100	-	-	-	-	300	<100	<100	140	<100	330	<100	<100	<100	<100	<100	<100	120	<100	<100	<100	<100	170	<100	<100
TPH+C10 - C36 (Sum of total)		1000	-	-	-	510	NC	100	280	NC	650	NC	NC	NC	NC	NC	NC	250	NC	NC	NC	NC	510	NC	NC
BTEX																									
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	1	-	-	-	-	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	<1	<1
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																									
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Benzo(a) pyrene	0.05	-	1	5	-	<0.5	<0.5	<0.5	<0.5	0.07	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	0.2	-	-	-	-	<1	<1	<1	<1	<0.2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<1	<1	<1
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Chrysene	0.1	-	-	-	-	0.5	<0.5	<0.5	<0.5	0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Fluoranthene	0.1	-	-	-	-	0.6	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
Phenanthrene	0.1	-	-	-	-	0.5	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	0.7	<0.5	<0.5
Pyrene	0.1	-	-	-	-	0.6	<0.5	<0.5	<0.5	0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5
PAHs (Sum of total)		20	-	20	100	2.2	NC	NC	NC	0.77	NC	NC	NC	NC	NC	NC	1	NC	NC	NC	NC	NC	0.7	NC	NC
Metals																									
Arsenic	1	-	20	100	500	83	3.5	58	80	22	39	5.5	<2	6.5	10	6.3	23	33	59	20	21	10	18	6.4	3.7
Cadmium	0.1	-	3	20	100	9.6	<2	5.7	5.7	2.1	9	<2	<2	<2	<2	<2	<2	4.6	5.7	2.1	<2	<0.5	8.2	<2	<2
Chromium (III+VI)	1	-	-	-	-	35	14	16	28	24	14	19	<2	3	4.2	9	21	19	8.1	14	11	6	14	3.8	13
Copper	1	-	100	1000	5000	1400	13	260	650	800	3500	17	9.8	12	28	25	220	280	97	340	150	790	130	36	7.2
Mercury	0.05	-	1	15	75	0.08	0.02	0.13	0.12	0.3	0.17	<0.01	<0.01	0.03	0.01	<0.01	0.08	0.18	<0.01	0.91	0.19	0.6	0.29	0.01	<0.01
Lead	1	300	600	300	1500	1400	20	490	510	460	700	14	10	15	29	75	210	510	110	160	110	310	420	46	12
Nickel	1	-	60	600	3000	36	2.5	34	46	100	40	4.4	<2	3.2	5.2	4.6	20	32	19	23	12	39	9.9	10	2.3
Zinc	1	-	200	7000	35000	1200	15	1700	1400	700	1700	21	28	27	230	97	490	1200	1700	800	250	320	1500	150	12
Organochlorine Pesticides																									
4,4-DDE	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
a-BHC	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Aldrin	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Aldrin + Dieldrin		-	-	10	50	<0.05	NA	NA	NA	NA	NA	NA	NC	NA	NC	NA	NC	NA	NA	NC	NC	NC	NC	NA	NA
b-BHC	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Chlordane (cis)	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Chlordane (trans)	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
d-BHC	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
DDD	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
DDT	0.1	-	-	-	-	<0.2	NA	NA	NA	NA	NA	NA	<0.2	NA	<0.2	NA	<0.2	NA	NA	<0.2	<0.2	<0.1	<0.2	NA	NA
DDT+DDE+DDD		-	-	200	1000	NC	NA	NA	NA	NA	NA	NA	NC	NA	NC	NA	NC	NA	NA	NC	NC	NC	NC	NA	NA
Dieldrin	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Endosulfan I	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Endosulfan II	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Endosulfan sulphate	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Endrin	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Endrin aldehyde	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA
g-BHC (Lindane)	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Heotachlor	0.05	-	-	10	50	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Heotachlor epoxide	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Methoxychlor	0.1	-	-	-	-	<0.2	NA	NA	NA	NA	NA	NA	<0.2	NA	<0.2	NA	<0.2	NA	NA	<0.2	<0.2	<0.1	<0.2	NA	NA
Hexachlorobenzene	0.05	-	-	-	-	<0.05	NA	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	<0.05	NA	NA	<0.05	<0.05	<0.1	<0.05	NA	NA
Polychlorinated Biphenyls																									
Arochlor 1016	0.1	-	-	-	-	<0.5	NA	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	<0.5	NA	NA	<0.5	<0.5	<0.1	<0.5	NA	NA
Arochlor 1221	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.1	NA	NA	NA
Arochlor 1232	0.1	-	-	-	-	<0.5	NA	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	<0.5	NA	NA	<0.5	<0.5	<0.1	<0.5	NA	NA
Arochlor 1242	0.1	-	-	-	-	<0.5	NA	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	<0.5	NA	NA	<0.5	<0.5	<0.1	<0.5	NA	NA
Arochlor 1248	0.1	-	-	-	-	<0.5	NA	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	<0.5	NA	NA	<0.5	<0.5	<0.1	<0.5	NA	NA
Arochlor 1254	0.1	-	-	-	-	<0.5	NA	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	<0.5	NA	NA	<0.5	<0.5	<0.1	<0.5	NA	NA
Arochlor 1260	0.1	-	-	-	-	<0.5	NA	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	<0.5	NA	NA	<0.5	<0.5	<0.1	<0.5	NA	NA
PCBs (Sum of total)		-	-	10	50	NC	NA	NA	NA	NA	NA	NA	NC	NA	NC	NA	NC	NA	NA	NC	NC	NC	NC	NA	NA

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investigation Levels for Residential with gardens and accessible soil - NEHF A (NEPC, 1999: DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T9 - Northern part of Site, Site-wide Fill Materials Analytical Results - TPH, BTEX, PAHs, Metals, OCPs, PCBs

Borehole/Test Pit ID						TP39						TP40				TP41			TP42	EW4		EW5		EW7			EW8	
Sample ID						TP39A	TP39C	TP39D	QC224 (Intra Dup TP39D 2-2.1)	QC324 (Inter Dup TP39D 2-2.1)	TP39E	TP40A	TP40B	TP40C	QC223 (Intra Dup TP40C 2.9-3)	TP41A	TP41B	TP41D	TP42A	EW 4	EW 4	EW 5	EW 5	EW 7	QC401 (Intra Dup EW7 0-0.2)	EW 7	EW8	EW8
Depth (mBGS)						0.2-0.3	1.3-1.4	2-2.1			2.7-2.8	0.5-0.6	1.5-1.6	2.9-3		0.1-0.2	0.9-1	2.6-2.7	0.4-0.5	1.9-2	5.9-6	3.9-4	5.9-6	0 - 0.2		4.9-5	1.7-1.8	2.9-3
PID						0.8	0.4	1.2			1.2	0.5	0.5	0.6		0.2	0.3	0.6	0.4	0.6	0	0.4	0.3	0.5		0.4	0.7	0.7
Date Sampled						16/08/2010	16/08/2010	16/08/2010			16/08/2010	16/08/2010	16/08/2010	16/08/2010		16/08/2010	16/08/2010	16/08/2010	16/08/2010	16/08/2010	16/08/2010	16/08/2010	16/08/2010	16/08/2010		16/08/2010	17/08/2010	17/08/2010
Compounds	EQL	EPA 1994 Terrestial Organisms	NEPM 1999 PILs	NEPM 1999 HIL A	NEPM 1999 HIL F																							
TPHs																												
TPH C6 - C9	10	65	-	-	-	<10	<10	<10	20	<25	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH C10 - C14	50	-	-	-	-	<50	<50	<50	100	<100	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	100	-	-	-	-	<100	110	320	4620	<200	<100	<100	200	<100	<100	560	140	<100	<100	<100	<100	<100	<100	110	110	<100	<100	<100
TPH C29-C36	100	-	-	-	-	<100	<100	210	3910	220	<100	130	<100	<100	<100	120	<100	<100	<100	<100	<100	<100	<100	190	210	<100	<100	<100
TPH+C10 - C36 (Sum of total)		1000	-	-	-	NC	110	530	8630	220	NC	130	200	NC	NC	680	140	NC	NC	NC	NC	NC	NC	300	320	NC	NC	NC
BTEX																												
Benzene	0.2	1	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Ethylbenzene	0.5	3.1	-	-	-	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	0.5	1.4	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene (m & p)	1	-	-	-	-	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Xylene (o)	0.5	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Xylene Total		14	-	-	-	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
PAHs																												
Acenaphthene	0.1	-	-	-	-	<0.5	<0.5	<0.5	0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	0.7	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	4.1	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a) pyrene	0.05	-	1	5		<0.5	<0.5	<0.5	2.2	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b&j)(k)fluoranthene	0.2	-	-	-	-	<1	<1	<1	5	<0.4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene	0.1	-	-	-	-	<0.5	<0.5	<0.5	0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.1	-	-	-	-	<0.5	<0.5	<0.5	2.9	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.1	-	-	-	-	0.5	0.7	<0.5	4.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	0.1	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)ovrene	0.1	-	-	-	-	<0.5	<0.5	<0.5	0.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	0.1	-	-	-	-	<0.5	<0.5	<0.5	2.6	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.1	-	-	-	-	<0.5	0.6	<0.5	2	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	0.1	-	-	-	-	0.5	0.8	<0.5	5.4	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
PAHs (Sum of total)		20	-	20	100	1	2.1	NC	31.2	NC	NC	NC	NC	NC	NC	1.1	NC	NC	1.1	NC	NC	NC	NC	0.5	NC	NC	NC	NC
Metals																												
Arsenic	1	-	20	100	500	23	15	19	18	74	4.5	8	11	8.2	12	29	22	<2	9.4	21	<2	3.4	3	110	73	7.1	6	29
Cadmium	0.1	-	3	20	100	<2	5.3	3.6	3.4	1	<2	<2	<2	<2	<2	2.2	2.7	<2	4.7	<2	<2	<2	<2	12	4.2	<2	4.3	2.3
Chromium (III+VI)	1	-	-	-	-	22	23	9.4	23	17	19	17	24	4.9	6.1	29	8.1	5.1	5	12	6.3	9.5	6.2	49	44	20	7	5
Copper	1	-	100	1000	5000	270	1700	770	400	1700	14	42	970	42	38	840	190	2.4	8.7	76	12	21	17	2100	1100	33	6	77
Mercury	0.05	-	1	15	75	0.04	0.02	<0.01	0.06	0.2	<0.01	<0.01	<0.01	<0.01	<0.01	0.12	0.04	<0.01	0.01	0.04	0.01	0.03	<0.01	0.23	0.25	0.01	0.13	0.09
Lead	1	300	600	300	1500	220	300	130	420	210	13	51	160	9.8	15	690	110	7.4	14	12	11	90	6.2	2400	2500	37	10	148
Nickel	1	-	60	600	3000	25	50	13	13	21	4.2	4.6	48	3.5	6.1	32	17	<2	5.6	37	<2	29	2.7	34	35	7.7	4	13
Zinc	1	-	200	7000	35000	290	680	250	340	410	12	100	290	97	150	520	730	6.1	910	210	9.9	1600	15	1600	2600	51	410	730
Organochlorine Pesticides																												
4,4-DDE	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
a-BHC	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Aldrin	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Aldrin + Dieldrin		-	-	10	50	NC	NC	NA	NA	NA	NA	NA	NC	NA	NC	NA	NA	NA	NA	NA	NC	NA	NA	NC	NC	NA	NC	NA
b-BHC	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Chlordane (cis)	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Chlordane (trans)	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
d-BHC	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
DDD	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
DDT	0.1	-	-	-	-	<0.2	<0.2	NA	NA	NA	NA	NA	<0.2	NA	<0.2	NA	NA	NA	NA	NA	<0.2	NA	NA	<0.2	<0.2	NA	<0.2	NA
DDT+DDE+DDD		-	-	200	1000	NC	NC	NA	NA	NA	NA	NA	NC	NA	NC	NA	NA	NA	NA	NA	NC	NA	NA	NC	NC	NA	NC	NA
Dieldrin	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Endosulfan I	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Endosulfan II	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Endosulfan sulohate	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Endrin	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Endrin aldehyde	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
g-BHC (Lindane)	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Heotachlor	0.05	-	-	10	50	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Heptachlor epoxide	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Methoxychlor	0.1	-	-	-	-	<0.2	<0.2	NA	NA	NA	NA	NA	<0.2	NA	<0.2	NA	NA	NA	NA	NA	<0.2	NA	NA	<0.2	<0.2	NA	<0.2	NA
Hexachlorobenzene	0.05	-	-	-	-	<0.05	<0.05	NA	NA	NA	NA	NA	<0.05	NA	<0.05	NA	NA	NA	NA	NA	<0.05	NA	NA	<0.05	<0.05	NA	<0.05	NA
Polychlorinated Biphenyls																												
Arochlor 1016	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	NA	NA	NA	NA	<0.5	NA	NA	<0.5	<0.5	NA	<0.5	NA
Arochlor 1221	0.1	-	-	-	-	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Arochlor 1232	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	NA	NA	NA	NA	<0.5	NA	NA	<0.5	<0.5	NA	<0.5	NA
Arochlor 1242	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	NA	NA	NA	NA	<0.5	NA	NA	<0.5	<0.5	NA	<0.5	NA
Arochlor 1248	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	NA	NA	NA	NA	<0.5	NA	NA	<0.5	<0.5	NA	<0.5	NA
Arochlor 1254	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	NA	NA	NA	NA	<0.5	NA	NA	<0.5	<0.5	NA	<0.5	NA
Arochlor 1260	0.1	-	-	-	-	<0.5	<0.5	NA	NA	NA	NA	NA	<0.5	NA	<0.5	NA	NA	NA	NA	NA	<0.5	NA	NA	<0.5	<0.5	NA	<0.5	NA
PCBs (Sum of total)		-	-	10	50	NC	NC	NA	NA	NA	NA	NA	NC	NA	NC	NA	NA	NA	NA	NA	NC	NA	NA	NC	NC	NA	NC	NA

NOTES:
All concentrations are in mg/kg
1 - Threshold concentrations of senstive landuse - Guidelines for the Assessment of Service Station Sites (NSW EPA, 1994)
2 - PIL Column 5 - Provisional Phytotoxicity-based Investigation Levels (NSW DEC, 2006)
3 - HIL Column 1 - Health Based Investigation Levels for Residential with gardens and accessible soil - NEHF A /NEPC, 1999: DEC 2006)
4 - HIL Column 4 - Health Based Investigation Levels for Commercial or industrial - NEHF F (NEPC, 1999; NSW DEC, 2006)
EQL - laboratory Estimated Quantitation Limit
"-" indicates that the criteria is not applicable for these analytes
< Value = Concentration less than laboratory EQL
465 Concentrations greater than adopted criteria
NC - Non Calculable
NA - Not Analysed
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T10 - Northern part of Site, Site-wide Fill Materials Asbestos Results

Borehole/Test Pit ID			TP21			TP22		TP23	TP24				TP25	TP26		TP27		TP28	TP29	TP30		TP31		TP32	
Sample ID			TP21 (1)	TP21 (2)	TP21A	TP22 (1)	TP22A 0.5-0.6	TP23 (1)	TP24 (1)	TP24 (2)	TP24 (3)	TP24 (4)	TP25 (1)	TP26 (1)	TP26 (2)	TP27 (2)	TP27 (3)	TP28 (1)	TP29 (1)	TP30 (1)	TP30 (2)	TP31 (1)	TP31C	TP32 (1)	TP32 (2)
Depth (mBGS)			0.5-0.6	2.1-2.2	0.5-0.6	0.5-0.6	0.5-0.6	0.5-0.6	0.5-0.6	1.1-1.2	2-2.1	2.2-2.3	0.5-0.6	0.9-1	1.9-2	1.9-2	3.2-3.3	0.7-0.8	0.9-1	0.5-0.6	2-2.1	0.9-1	2.9-3	0.4-0.5	2.1-2.2
Date Sampled			12/08/10			12/08/10		12/08/10	12/08/10				12/08/10	12/08/10		12/08/10		10/08/10	12/08/10	12/08/10		10/08/10		12/08/10	
Components	WA Guidelines for ACM Comming	WA Guidelines for AFFA																							
Sample Description			Clayish soil, stones, plant matter, synthetic mineral fibres, fibres, fragments of plaster, cement, corroded metal, glass and debris	Clayish soil, stones, plant matter, fibres, fragments of plaster, glass, corroded metal and debris	Soil, stones, plant matter, fibres, fragments of plaster, corroded metal, glass and debris	Clayish soil, stones, plant matter, synthetic mineral fibres, fibres, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones, plant matter, fibres, fragments of glass and debris	Clayish soil, stones, plant matterm synthetic mineral fibres, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones, plant matter, fibres, fragments of plaster, glass, brick, corroded metal and debris	Clayish soil, stones, plant matter, fibres, fragments of plaster, glass, brick, corroded metal and debris	Clayish soil, stones, plant matter and fragments of plaster	Soil, stones, plant matter, fibres, fragments of plaster, cement, glass, brick, corroded metal and debris	Soil, stones, plant matter, fragments of plaster, cement, glass, corroded metal and debris	Clayish soil, stones and plant matter	Soil, stones, plant matter, fragmetns of plaster, glass, coal like material, corroded metal and debris	Clayish soil, stones, plant matter	Soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Soil, stones, plant matter, fibres, fragments of plaster, glass, corroded metal and debris	Soil, stones, plant matter, fibres, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones and plant matter	Soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Soil, stones, plant matter, fibres, fragments of glass and debris	Soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones and plant matter
a) Chrysotile Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b) Chrysotile Asbestos Fibres (g)	-	-	0.068	0.700	0.001	0.043	-	-	-	0.137	0.106	-	0.021	-	-	-	-	-	0.091	0.084	-	-	-	-	-
c) Amosite Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d) Amosite Asbestos Fibres (g)	-	-	-	-	0.0003	0.021	0.0004	-	-	-	-	-	0.013	-	-	-	-	-	-	-	-	-	0.002	-	-
e) Crocidolite Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
f) Crocidolite Asbestos Fibres (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
g) Total asbestos fibres (g)	-	-	0.068	0.700	0.002	0.064	0.000	-	-	0.137	0.106	-	0.034	-	-	-	-	-	0.091	0.084	-	-	0.002	-	-
h) Soil mass (g)	-	-	329	284	26	298	24	-	-	276	318	-	302	-	-	-	-	-	304	306	-	16	-	-	-
i) FA w/w Analysis (%)	-	0.001	0.021%	0.246%	0.006%	0.021%	0.002%	No Asbestos Detected	No Asbestos Detected	0.050%	0.033%	No Asbestos Detected	0.011%	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	0.030%	0.027%	No Asbestos Detected	No Asbestos Detected	0.010%	No Asbestos Detected	No Asbestos Detected
j) ACM w/w Analysis (%)	0.05	-	NC	NC	NC	NC	NC			NC	NC		NC						NC	NC			NC		

Notes:
a) Chrysotile in ACM fragments (g)
b) Free Chrysotile fibres (g)
c) Amosite in ACM fragments (g)
d) Free Amosite fibres (g)
e) Crocidolite in ACM fragments (g)
f) Free Crocidolite fibres (g)
g) Total asbestos fibres (g)
h) Mass of soil sub-sample (g)
i) Weight/Weight fibres in soil sub-sample (%)
j) Weight/Weight ACM in soil sub-sample (%)
NA indicates that no criteria exist
'-' indicates that this type of asbestos was not identified
NC = non calculable

Table T10 - Northern part of Site, Site-wide Fill Materials Asbestos Results

Borehole/Test Pit ID			TP33		TP34	TP35	TP36		TP37	TP38			TP39					TP40	TP41		TP42	EW4		EW7		EW8	
Sample ID			TP33 (2)	TP33 (4)	TP34 (1)	TP35 (1)	TP36 (1)	TP36 (3)	TP37 (1)	TP38 (1)	TP38 (4)	TP38 (5)	TP39 (1)	TP39 (2)	TP39 (3)	TP39 (4)	TP39 (5)	TP40 (2)	TP41 (1)	TP41 (3)	TP42 (1)	EW4 1.9-2.0	EW4 5.9-6.0	EW7 0.5-0.6	EW7 4.9-5.0	EW8 (2)	EW8 (3)
Depth (mBGS)			1-1.1	2.8-2.9	0.4-0.5	0.3-0.4	0.3-0.4	2.8-2.9	1-1.1	0.4-0.5	1.9-2	2.8-2.9	0.2-0.3	0.7-0.8	1.3-1.4	2-2.1	2.7-2.8	2.9-3	0.9-1	2.6-2.7	0.4-0.5	1.9-2	5.9-6	0.5-0.6	4.9-5	1.7-1.8	2.9-3
Date Sampled			12/08/10		16/08/10	12/08/10	12/08/10		12/08/10	16/08/10			16/08/10					16/08/10	16/08/10		16/08/10	16/08/10		16/08/10		17/08/10	
Components	WA Guidelines for ACM Comming	WA Guidelines for AFFA																									
Sample Description			Soil, stones, plant matter, fragments of glass, corroded metal and debris	Clayish soil, stones and plant matter	Soil, stones, plant matter, fragments of gass and debris	Soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Soil, stones, plant matter, fibres, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones and plant matter	Soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Soil stones, plant matter, fragments of glass, shale like material and debris	Soil, stones, plant matter, fragments of plaster, glass, corroded metal, coal like material and debris	Clayish soil, stones and plant matter	Soil stones, plant matter, fibres, fragments of plaster, glass, corroded metal and debris	Soil, stones and plant matter	Soil, stones, plant matter, fragments of plaster, coal like material, corroded metal and debris	Soil, stones, plant matter, fragments of glass, corroded metal and debris	Clayish soil, stones, plant matter and fragments of glass	Soil, stones, plant matter, fragments of glass and debris	Clayish soil, stones, plant matter, fibres, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones and plant matter	Clayish soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris	Clayish soil, stones, and plant matter	Soil, stones, plant matter, fibres, fragments of plaster, glass, corroded metal, bitumen and debris	Clayish soil, stones and plant matter	Soil and stones	Soil, stones, plant matter, fragments of plaster, glass, corroded metal and debris
a) Chrysotile Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
b) Chrysotile Asbestos Fibres (g)	-	-	-	-	-	-	-	-	-	-	-	-	0.036	-	-	-	-	-	-	-	-	-	-	0.012	-	-	-
c) Amosite Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
d) Amosite Asbestos Fibres (g)	-	-	-	-	-	-	0.019	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
e) Crocidolite Asbestos in ACM (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
f) Crocidolite Asbestos Fibres (g)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.029	-	-	-	-	-	-	-	-
g) Total asbestos fibres (g)	-	-	-	-	-	-	0.019	-	-	-	-	-	0.036	-	-	-	-	-	0.029	-	-	-	-	0.012	-	-	-
h) Soil mass (g)	-	-	-	-	-	-	289	-	-	-	-	-	310	-	-	-	-	-	256	-	-	-	-	245	-	-	-
i) FA w/w Analysis (%)	-	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	0.007%	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	0.012%	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	0.011%	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	0.005%	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
j) ACM w/w Analysis (%)	0.05	-					NC						NC						NC					NC			

Notes:
a) Chrysotile in ACM fragments (g)
b) Free Chrysotile fibres (g)
c) Amosite in ACM fragments (g)
d) Free Amosite fibres (g)
e) Crocidolite in ACM fragments (g)
f) Free Crocidolite fibres (g)
g) Total asbestos fibres (g)
h) Mass of soil sub-sample (g)
i) Weight/Weight fibres in soil sub-sample (%)
j) Weight/Weight ACM in soil sub-sample (%)
NA indicates that no criteria exist
'-' indicates that this type of asbestos was not identified
NC = non calculable

Table T11 - Groundwater Field Qaulity Parameters

Sample ID	Date Sampled	Volume Purged (L)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	pH	Redox (mV)	Temp (Degrees Celcius)	Observations
Shallow Groundwater Monitoring Wells								
MW1	26/08/2010	20	2.89	9210	6.65	81	18.3	Turbid, brown. No odour or sheen.
		40	1.52	9220	6.83	97	18.8	**Cloudy after 5L with no odour or sheen.**
		55	*1.97*	*9290*	*6.87*	*100*	*18.7*	
		After Sampling	**1.43**	**9222**	**6.83**	**85**	**18.7**	
MW2	26/08/2010	15	6.74	801	6.46	128	19.7	Turbid, brown. No odour or sheen.
		17	*7.52*	*203*	*6.86*	*124*	*20.2*	**Cloudy after 4L, went dry at 15L. Waited to recharge to sample. No odour or sheen.**
		After Sampling	**6.27**	**216**	**6.42**	**166**	**19.0**	
EW4	26/08/2010	20	4.58	1283	5.53	97.0	20.6	Brown, turbid. No odour or sheen.
		40	3.61	1327	5.52	102.0	21.8	**Cloudy after 25-30L no odour or sheen.**
		60	3.35	1330	5.55	108.0	21.7	
		75	*3.32*	*1349*	*5.52*	*117.0*	*21.8*	
		After Sampling	**5.24**	**2340**	**5.74**	**113.0**	**21.1**	
EW5	26/08/2010	20	6.89	1018	5.73	162.0	18.2	Cloudy and turbid with sediment, brown becoming clear. No odour or
		40	5.07	1105	5.68	141.0	19.4	**Clear to cloudy. No odour or sheen.**
		60	4.34	1159	5.68	132.0	19.9	
		75	*4.72*	*1176*	*5.70*	*127.0*	*20.2*	
		After Sampling	**4.61**	**376**	**5.70**	**129**	**20.3**	
EW6	26/08/2010	15	7.92	3710	6.78	45.0	19.4	Brown, turbid. No odour or sheen. Went dry after 15L.
		WELL WENT DRY						
EW7	26/08/2010	20	6.54	1667	6.26	82	21	Brown, turbid. No odour or sheen.
		40	5.17	2570	6.19	109	20.5	**Cloudy after 30L, went dry at 50L. Waited to recharge to sample. No odour or sheen.**
		50	*5.37*	*1636*	*6.17*	*111*	*20.2*	
		After Sampling	**5.23**	**1633**	**6.17**	**114**	**20.0**	
Perched Groundwater Monitoring Wells								
EW8	26/08/2010	**WELL DRY**						
EW9	26/08/2010	5	2.45	2550	6.80	-124	18.7	Black with some sediment. Slight odour but no sheen.
		10	1.32	3330	6.85	-124	18.2	**Clear to cloudy after 6L, no sheen. Slight odour.**
		15	*1.35*	*3260*	*6.86*	*-122*	*17.9*	
		After Sampling	**1.37**	**3240**	**6.86**	**-121**	**18.0**	

NOTES:
L = Litre
mg/L = milligrams per litre
µS/cm = microSiemens per centimetre
pH = potential hydrogen
mV = milli volts
Field parameter measurements were taken during purging. *Final measurements prior to sampling are in italics.*

Table T12 - Groundwater Standing Water Levels

Well ID	Easting	Northing	RL - Ground Level (m AHD)	RL - Top of Casing (TOC) (m AHD)	Date Gauged	Gauged Well Depth (m BTOC)	Gauged SWL (m BTOC)	LNAPL Present	Corrected SWL (m AHD)
Shallow Groundwater Monitoring Wells									
MW1	317146.97	6253239.18	12.67	13.35	9/08/2010	8.780	4.397	No	8.95
					26/08/2010	8.792	4.294	No	9.06
MW2	316745.90	6253238.28	7.28	8.29	9/08/2010	6.430	1.764	No	6.53
					26/08/2010	6.431	1.871	No	6.42
EW4	316764.44	6253520.65	8.53	9.13	26/08/2010	9.072	3.267	No	5.86
EW5	316717.18	6253409.69	8.50	9.21	26/08/2010	9.419	3.396	No	5.81
EW6	316723.18	6253358.04	6.95	7.60	26/08/2010	6.702	2.859	No	4.74
EW7	316823.03	6253391.58	8.49	9.10	26/08/2010	9.073	3.762	No	5.34
Perched Groundwater Monitoring Wells									
EW8	316726.44	6253409.94	9.25	9.95	26/08/2010	4.168	DRY	No	NA
EW9	316782.49	6253302.64	10.55	11.30	26/08/2010	4.749	4.012	No	7.29

NOTES:
m BTOC = metres Below Top of Casing
m AHD = metres Australian Height Datum
LNAPL = Light Non Aqueous Phase Lighquid
SWL = Standing Water Level/Static Water Level
RL = Real Level
NA - calculation not applicable because the well is dry

Table T13 - Groundwater Results for TPHs, BTEX, PAHs, VOCs and Metals

Well Type			Shallow Groundwater Monitoring Wells						Perched Groundwater Monitoring Well	
Well ID			MW01	MW02	EW4	EW5	EW6	EW7	EW9	QC201 (Intra Dup EW9)
Date Sampled			26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010	
Compounds	EQL	ANZECC & ARMCANZ (2000) MW Trigger Levels								
BTEX										
Benzene	5	**700**	<5	<5	<5	<5	<5	<5	<5	<5
Ethylbenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Xylene (m & p)	10	**NA**	<10	<10	<10	<10	<10	<10	<10	<10
Xylene (o)	5	**350**	<5	<5	<5	<5	<5	<5	<5	<5
Xylene Total		NA	NC	NC	NC	NC	NC	NC	NC	NC
TPH C6-C36										
TPH C6 - C9	50	**NA**	<50	<50	<50	<50	<50	<50	<50	<50
TPH C10 - C14	50	**NA**	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15 - C28	200	**NA**	<200	<200	<200	<200	<200	<200	<200	<200
TPH C29-C36	50	**NA**	<50	<50	<50	<50	<50	<50	<50	<50
TPH+C10 - C36 (Sum of total)		**NA**	NC	NC	NC	NC	NC	NC	NC	NC
PAHs										
Acenaphthene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
Acenaphthylene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
Anthracene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
Benz(a)anthracene	1	NA	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(a) pyrene	1	NA	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(b)&(k)fluoranthene	2	**NA**	<2	<2	<2	<2	<2	<2	<2	<2
Benzo(g,h,i)perylene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
Chrysene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
Dibenz(a,h)anthracene	1	NA	<1	<1	<1	<1	<1	<1	<1	<1
Fluoranthene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
Fluorene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
Indeno(1,2,3-c,d)pyrene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
Naphthalene	1	**70**	<1	<1	<1	<1	<1	<1	<1	<1
Phenanthrene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
Pyrene	1	**NA**	<1	<1	<1	<1	<1	<1	<1	<1
PAHs (Sum of total)		**NA**	NC	NC	NC	NC	NC	NC	NC	NC
Metals										
Arsenic (Filtered)	5	**NA**	<5	<5	<5	5	<5	<5	210	190
Cadmium (Filtered)	0.2	**0.7**	<0.2	0.2	<0.2	0.2	0.2	**2.3**	<0.2	<0.2
Chromium (III+VI) (Filtered)	5	**NA**	<5	<5	<5	<5	<5	<5	12	<5
Copper (Filtered)	1	**1.3**	**2**	1	**4**	**8**	1	**14**	1	**2**
Mercury (Filtered)	0.1	**0.4**	<0.2	0.1	<0.2	<0.3	<0.2	<0.3	0.1	0.1
Lead (Filtered)	1	**4.4**	<1	<1	1	2	<1	2	<1	<1
Nickel (Filtered)	5	**7**	<5	<5	**57**	**21**	**8**	**8**	**26**	**27**
Zinc (Filtered)	5	**15**	6	**17**	**280**	**58**	**82**	**37**	**60**	**38**
VOCs										
1,1,1,2-tetrachloroethane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,1,1-trichloroethane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,1,2,2-tetrachloroethane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,1,2-trichloroethane	5	**1900**	<5	<5	<5	<5	<5	<5	<5	<5
1,1-dichloroethane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,1-dichloroethene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,1-dichloropropene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,2,3-trichlorobenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,2,3-trichloropropane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,2,4-trichlorobenzene	5	**80**	<5	<5	<5	<5	<5	<5	<5	<5
1,2,4-trimethylbenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,2-dibromo-3-chloropropane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,2-dibromoethane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,2-dichlorobenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,2-dichloroethane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,2-dichloropropane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,3,5-trimethylbenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,3-dichlorobenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,3-dichloropropane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
1,4-dichlorobenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Methyl Ethyl Ketone	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
2-chlorotoluene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
2-hexanone (MBK)	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
2-pentanone	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
4-chlorotoluene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
4-Methyl-2-pentanone	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Bromobenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Bromodichloromethane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Bromoform	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Bromomethane	50	**NA**	<50	<50	<50	<50	<50	<50	<50	<50
Carbon disulfide	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Carbon tetrachloride	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Chlorobenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Chlorodibromomethane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Chloroethane	50	**NA**	<50	<50	<50	<50	<50	<50	<50	<50
Chloroform	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Chloromethane	50	**NA**	<50	<50	<50	<50	<50	<50	<50	<50
cis-1,2-dichloroethene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
cis-1,3-dichloropropene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Dibromomethane	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Dichlorodifluoromethane	50	**NA**	<50	<50	<50	<50	<50	<50	<50	<50
Ethyl acetate	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Hexachlorobutadiene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Isopropylbenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
n-butylbenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
n-propylbenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
p-isopropyltoluene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
sec-butylbenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Styrene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Trichloroethene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
tert-butylbenzene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Tetrachloroethene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
trans-1,2-dichloroethene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
trans-1,3-dichloropropene	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Trichlorofluoromethane	50	**NA**	<50	<50	<50	<50	<50	<50	<50	<50
Vinyl acetate	5	**NA**	<5	<5	<5	<5	<5	<5	<5	<5
Vinyl chloride	50	**NA**	<50	<50	<50	<50	<50	<50	<50	<50

NOTES:
ANZECC & ARMCANZ (2000) 95% or 99% level of protection for Marine Aquatic ecosystems
465 Concentrations greater than adopted criteria
All concentrations are in µg/L
EQL - laboratory Estimated Quantitation Limit
< Value = Concentration less than laboratory EQL
Intra Dup - Intra-laboratory duplicate sample
NC - Non Calculable
NA indicates that the criteria is not applicable for these analytes
"-" indicates that the sample was not analysed for these analytes

Table T14 - Leachate Analytical Results - PAHS and Metals

Method			TCLP	ASLP	TCLP	ASLP	TCLP	ASLP
Borehole/Test Pit ID			TP18		TP38			
Sample ID			TP18B		TP38A		TP38D	
Depth (mBGS)			1.2-1.3		0.4-0.5		1.9-2	
Date Sampled			12/08/2010		16/08/2010		16/08/2010	
Compounds	EQL	ANZECC & ARMCANZ (2000) MW Trigger Levels						
Inorganics								
pH (Final)	-		5.1	7.1	4.9	6.8	4.9	6.4
pH (Initial)	-		7	7	7.4	7.4	6.7	6.8
Metals								
Arsenic	5	NA	<5	7	<5	<5	<5	<5
Cadmium	5	0.7	11	<5	9	<5	<5	<5
Chromium (III+VI)	5	NA	11	<5	18	<5	20	<5
Copper	5	1.3	870	38	0.5	9	<5	<5
Mercury	0.2	0.4	0.2	<1	<1	<0.1	<1	<0.1
Lead	5	4.4	660	42	71	6	<5	<5
Nickel	5	7	90	<5	12	<5	9	<5
Zinc	5	15	6300	98	1900	180	520	120
PAHs								
Acenaphthene	1	NA	<1	-	<1	-	<1	-
Acenaphthylene	1	NA	<1	-	<1	-	<1	-
Anthracene	1	NA	<1	-	<1	-	<1	-
Benz(a)anthracene	1	NA	<1	-	<1	-	<1	-
Benzo(a) pyrene	1	NA	<1	-	<1	-	<1	-
Benzo(b)&(k)fluoranthene	2	NA	<2	-	<2	-	<2	-
Benzo(g,h,i)perylene	1	NA	<1	-	<1	-	<1	-
Chrysene	1	NA	<1	-	<1	-	<1	-
Dibenz(a,h)anthracene	1	NA	<1	-	<1	-	<1	-
Fluoranthene	1	NA	<1	-	<1	-	<1	-
Fluorene	1	NA	<1	-	<1	-	<1	-
Indeno(1,2,3-c,d)pyrene	1	NA	<1	-	<1	-	<1	-
Naphthalene	1	70	<1	-	<1	-	<1	-
Phenanthrene	1	NA	<1	-	<1	-	<1	-
Pyrene	1	NA	<1	-	<1	-	<1	-
PAHs (Sum of total)		NA	NC	-	NC	-	NC	-

NOTES:
All concentrations are in µg/L
ANZECC & ARMCANZ (2000) 95% or 99% level of protection for Marine Aquatic ecosystems
465 Concentrations greater than adopted criteria
EQL - laboratory Estimated Quantitation Limit
< Value = Concentration less than laboratory EQL
"-" indicates that the sample was not analysed for these analytes

Table T15 - Soil RPD Values

Borehole/Test Pit ID		TP4			TP6						TP10			TP13			TP13			GS2			GS5						GS4			RS1			TP31					
Sample ID		TP4A	QC201 (Intra Dup of TP4A)	RPD	TP6A	QC202 (Intra Dup of TP6A)	RPD	TP6A	QC302 (Inter Dup of TP6A)	RPD	TP10A	QC203 (Intra Dup of TP10A)	RPD	TP13A	QC204 (Intra Dup of TP13A)	RPD	TP13A	QC304 (Inter Dup of TP13A)	RPD	GS2B	QC205 (Intra Dup of GS2B)	RPD	GS5C	QC206 (Intra Dup of GS5C)	RPD	GS5C	QC306 (Inter Dup of GS5C)	RPD	GS4B	QC207 (Intra Dup of GS4B)	RPD	RS1C	QC209 (Intra Dup of RS1C)	RPD	TP31C	QC210 (Intra Dup of TP31C)	RPD	TP31C	QC310 (Inter Dup of TP31C)	RPD
Depth (mBGS)		0.2-0.3			0.2-0.3			0.2-0.3			0.4-0.5			0.5-0.6			0.5-0.6			1-1.1			1.5-1.6			1.5-1.6			1.1-1.2			0.9-1.0			2.9-3			2.9-3		
Date Sampled		9/08/2010			9/08/2010			9/08/2010			9/08/2010			9/08/2010			9/08/2010			10/08/2010			10/08/2010			10/08/2010			10/08/2010			10/08/2010			10/08/2010			10/08/2010		
Compounds	**EQL/PQL**																																							
BTEX																																								
Benzene	0.2/0.5	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA
Ethylbenzene	0.5/1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA
Toluene	0.5	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA
Xylene (m & p)	1/2	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA
Xylene (o)	0.5/1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA
TPHs																																								
TPH C6 - C9	10/25	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA
TPH C10 - C14	50	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA
TPH C15 - C28	100	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	160.0	<100.0	46	180.0	120.0	40	180.0	140.0	25	**850.0**	**2310.0**	92	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	160.0	46	<100.0	320.0	105	100.0	140.0	33	100.0	<100.0	NA
TPH C29-C36	100	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	120.0	100.0	18	180.0	120.0	40	180.0	<100.0	57	**1080.0**	**2520.0**	80	130.0	150.0	14	130.0	<100.0	26	<100.0	260.0	89	120.0	400.0	108	<100.0	140.0	33	<100.0	<100.0	NA
PAHs																																								
Acenaphthene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Acenaphthylene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Anthracene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Benz(a)anthracene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	1.1	<0.5	75	<0.5	<0.5	NA	<0.5	0.6	18	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Benzo(a) pyrene	0.5/0.05	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.05	NA	1.2	<0.5	82	<0.5	<0.5	NA	<0.5	0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.05	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.07	NA
Benzo(b)&(k)fluoranthene	1/0.2	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<0.2	NA	2.0	<1.0	67	<1.0	<1.0	NA	<1.0	1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<0.2	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<0.2	NA
Benzo(g,h,i)perylene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	0.7	<0.5	33	<0.5	<0.5	NA	<0.5	0.3	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Chrysene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	1.4	<0.5	95	<0.5	<0.5	NA	<0.5	0.7	33	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	0.7	33	<0.5	<0.5	NA	<0.5	0.1	NA
Dibenz(a,h)anthracene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Fluoranthene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	3.2	<0.5	146	0.5	0.5	NA	0.5	1.0	67	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.2	NA
Fluorene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.3	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Naphthalene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Phenanthrene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	3.1	<0.5	144	<0.5	<0.5	NA	<0.5	1.0	67	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.2	NA
Pyrene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	3.1	<0.5	144	0.5	<0.5	NA	0.5	1.0	67	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.2	NA
Metals																																								
Arsenic	1	**13.0**	**28.0**	**73**	**29.0**	**13.0**	**76**	**29.0**	**6.0**	**131**	90.0	57.0	45	180.0	140.0	25	180.0	160.0	12	110.0	75.0	38	**11.0**	**37.0**	**108**	**11.0**	**27.0**	**84**	150.0	170.0	13	**14.0**	**29.0**	**70**	58.0	80.0	32	**58.0**	**22.0**	**90**
Cadmium	0.1	<2.0	<2.0	NA	7.5	<2.0	116	**7.5**	**0.7**	**166**	7.5	6.8	10	2.2	<2.0	10	2.2	1.8	20	2.7	2.4	12	<2.0	<2.0	NA	<2.0	0.6	NA	<2.0	<2.0	NA	<2.0	6.0	100	5.7	5.7	NA	**5.7**	**2.1**	**92**
Chromium (III+VI)	1	2.9	4.5	43	**19.0**	**6.7**	**96**	19.0	3.0	145	49.0	47.0	4	16.0	10.0	46	16.0	16.0	NA	9.2	11.0	18	2.2	12.0	138	2.2	15.0	149	28.0	26.0	7	**16.0**	**3300.0**	**198**	**16.0**	**28.0**	**55**	16.0	24.0	40
Copper	1	100.0	89.0	12	**450.0**	**110.0**	**121**	**450.0**	**90.0**	**133**	900.0	570.0	45	400.0	240.0	50	400.0	260.0	42	230.0	230.0	NA	**43.0**	**110.0**	**88**	43.0	60.0	33	120.0	110.0	9	**120.0**	**210.0**	**55**	**260.0**	**650.0**	**86**	**260.0**	**800.0**	**102**
Mercury	0.05	<0.01	0.02	67	0.33	0.01	188	0.33	<0.1	107	0.03	0.05	50	0.29	0.18	47	**0.29**	**1.0**	**110**	0.05	0.05	NA	<0.01	0.01	NA	<0.01	<0.1	NA	<0.01	<0.01	NA	0.03	0.04	29	0.13	0.12	8	0.13	0.3	79
Lead	1	**40.0**	**84.0**	**71**	**510.0**	**220.0**	**79**	**510.0**	**91.0**	**139**	3300.0	2000.0	49	1000.0	740.0	30	1000.0	610.0	48	440.0	360.0	20	**25.0**	**140.0**	**139**	**25.0**	**48.0**	**63**	48.0	66.0	32	**170.0**	**350.0**	**69**	490.0	510.0	4	490.0	460.0	6
Nickel	1	5.2	8.1	44	16.0	11.0	37	**16.0**	**9.0**	**56**	75.0	75.0	NA	**30.0**	**17.0**	**55**	30.0	24.0	22	15.0	12.0	22	4.8	19.0	119	4.8	25.0	136	89.0	82.0	8	**9.2**	**100.0**	**166**	34.0	46.0	30	**34.0**	**100.0**	**99**
Zinc	1	42.0	66.0	44	530.0	500.0	6	**530.0**	**300.0**	**55**	1300.0	1200.0	8	**1000.0**	**570.0**	**55**	1000.0	620.0	47	310.0	240.0	25	**70.0**	**210.0**	**100**	**70.0**	**210.0**	**100**	130.0	160.0	21	**510.0**	**1900.0**	**115**	1700.0	1400.0	19	**1700.0**	**700.0**	**83**
OCPs																																								
4,4-DDE	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
a-BHC	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Aldrin	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
b-BHC	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Chlordane (cis)	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Chlordane (trans)	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
d-BHC	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
DDD	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
DDT	0.2/0.1	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	<0.2	<0.2	NA	-	-	-	<0.2	<0.1	NA	<0.2	0.6	100	-	-	-	-	-	-	-	-	-	<0.2	<0.2	NA	-	-	-	-	-	-
Dieldrin	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Endosulfan I	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Endosulfan II	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Endosulfan sulphate	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Endrin	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
g-BHC (Lindane)	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Heptachlor	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Heptachlor epoxide	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
Methoxychlor	0.2/0.1	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	<0.2	<0.2	NA	-	-	-	<0.2	<0.1	NA	<0.2	<0.2	NA	-	-	-	-	-	-	-	-	-	<0.2	<0.2	NA	-	-	-	-	-	-
Hexachlorobenzene	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	-	-	-	-	-	-
PCBs																																								
Arochlor 1016	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	-	-	-	-	-	-
Arochlor 1232	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	-	-	-	-	-	-
Arochlor 1242	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	-	-	-	-	-	-
Arochlor 1248	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	-	-	-	-	-	-
Arochlor 1254	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	-	-	-	-	-	-
Arochlor 1260	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	-	-	-	-	-	-

NOTES:
All concentrations are in mg/kg
RPDs have only been considered where a concentration is greater than 5 times the EQL.

$$\text{RPD Calculation Method} = \frac{|D1-D2|}{(D1+D2)/2} \times 100$$

RPD result exceeding acceptance criteria for organics - 50%; inorganics - 30%
RPD results exceeding the acceptance criteria but were disregarded if primary or duplicate sample results were <5 x EQL
Reference: Australian Standard, Guide to the Investigation and Sampling of Potentially Contaminated Soil (AS4482.1-2005 and AS4482.2-1999)
#/# - Primary lab EOL/Secondary lab EOL
"-" indicates that these samples were not analysed
NA - Calculation not applicable or RPD=0
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T15 - Soil RPD Values

Borehole/Test Pit ID		RS4			RS2			RS2			RS16			RS11			RS11			TP24			TP24			TP19			TP22			TP22			TP22			TP27		
Sample ID		RS4C	QC211 (Intra Dup of RS4C)	RPD	RS2A	QC212 (Intra Dup of RS2A)	RPD	RS2A	QC312 (Inter Dup of RS2A)	RPD	RS16C	QC213 (Intra Dup of RS16C)	RPD	RS11C	QC216 (Intra Dup of RS11C)	RPD	RS11C	QC316 (Inter Dup of RS11C)	RPD	TP24C	QC218 (Intra Dup of TP24C)	RPD	TP24C	QC318 (Inter Dup of TP24C)	RPD	TP19C	QC219 (Intra Dup of TP19C)	RPD	TP22B	QC220 (Intra Dup of TP22B)	RPD	TP22B	QC320 (Inter Dup of TP22B)	RPD	TP27B	QC221 (Intra Dup of TP27B)	RPD
Depth (mBGS)		1.9-2			0.5-0.6			0.5-0.6			2.1-2.2			2.2-2.3			2.2-2.3			2-2.1			2-2.1			1.5-1.6			1.1-1.2			1.1-1.2			1.1-1.2		
Date Sampled		11/08/2010			11/08/2010			11/08/2010			11/08/2010			11/08/2010			11/08/2010			12/08/2010			12/08/2010			12/08/2010			12/08/2010			12/08/2010			12/08/2010		
Compounds	EQL/PQL																																						
BTEX																																							
Benzene	0.2/0.5	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA
Ethylbenzene	0.5/1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA
Toluene	0.5	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA
Xylene (m & p)	1/2	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA
Xylene (o)	0.5/1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA
TPHs																																							
TPH C6 - C9	10/25	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA	<10.0	<10.0	NA
TPH C10 - C14	50	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA
TPH C15 - C28	100	390.0	<100.0	118	150.0	<100.0	40	150.0	100.0	40	100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	360.0	600.0	50	360.0	110.0	106	<100.0	<100.0	NA
TPH C29-C36	100	640.0	<100.0	146	230.0	110.0	71	230.0	150.0	42	130.0	<100.0	26	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	570.0	740.0	26	570.0	170.0	108	<100.0	<100.0	NA
PAHs																																							
Acenaphthene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA
Acenaphthylene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA
Anthracene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	0.8	46	<0.5	<0.1	NA	<0.5	<0.5	NA
Benz(a)anthracene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.2	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	0.2	NA	<0.5	<0.5	NA	<0.5	2.3	129	<0.5	0.3	NA	<0.5	<0.5	NA
Benzo(a) pyrene	0.5/0.05	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.2	NA	0.5	<0.5	NA	0.6	<0.5	18	0.6	0.06	164	<0.5	<0.5	NA	<0.5	0.4	NA	<0.5	<0.5	NA	<0.5	2.4	131	<0.5	0.3	NA	<0.5	<0.5	NA
Benzo(b)&(k)fluoranthene	1/0.2	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	0.4	NA	1.0	<1.0	NA	1.0	<1.0	NA	1.0	<0.2	133	<1.0	<1.0	NA	<1.0	0.5	NA	<1.0	<1.0	NA	<1.0	4.0	120	<1.0	0.5	NA	<1.0	<1.0	NA
Benzo(g,h,i)perylene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	0.2	NA	<0.5	<0.5	NA	<0.5	1.2	82	<0.5	0.2	NA	<0.5	<0.5	NA
Chrysene	0.5/0.1	1.4	<0.5	95	<0.5	<0.5	NA	<0.5	0.3	NA	0.6	<0.5	18	0.7	<0.5	33	0.7	<0.1	150	<0.5	<0.5	NA	<0.5	0.2	NA	<0.5	<0.5	NA	<0.5	2.6	135	<0.5	0.3	NA	<0.5	<0.5	NA
Dibenz(a,h)anthracene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA
Fluoranthene	0.5/0.1	1.0	0.7	35	<0.5	<0.5	NA	<0.5	0.4	NA	1.1	0.8	32	1.3	<0.5	89	1.3	0.1	171	<0.5	<0.5	NA	<0.5	0.2	NA	<0.5	<0.5	NA	0.5	3.2	146	0.5	0.4	22	<0.5	<0.5	NA
Fluorene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA
Indeno(1,2,3-c,d)pyrene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	0.2	NA	<0.5	<0.5	NA	<0.5	0.9	57	<0.5	0.2	NA	<0.5	<0.5	NA
Naphthalene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA
Phenanthrene	0.5/0.1	0.5	0.7	33	<0.5	<0.5	NA	<0.5	0.3	NA	0.5	0.5	NA	0.7	<0.5	33	0.7	<0.1	150	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	2.4	131	<0.5	0.2	NA	<0.5	<0.5	NA
Pyrene	0.5/0.1	1.0	0.7	35	<0.5	<0.5	NA	<0.5	0.4	NA	1.1	0.7	44	1.4	<0.5	95	1.4	0.1	173	<0.5	<0.5	NA	<0.5	0.3	NA	<0.5	<0.5	NA	0.5	4.1	157	0.5	0.4	22	<0.5	<0.5	NA
Metals																																							
Arsenic	1	4.9	23.0	130	18.0	22.0	20	**18.0**	**34.0**	**62**	31.0	29.0	7	**18.0**	**9.2**	**65**	**18.0**	**8.0**	**77**	24.0	29.0	19	24.0	31.0	25	4.9	3.2	42	**89.0**	**310.0**	**111**	**89.0**	**38.0**	**80**	33.0	26.0	24
Cadmium	0.1	<2.0	<2.0	NA	2.5	2.6	4	**2.5**	**1.3**	**63**	<2.0	<2.0	NA	<2.0	<2.0	NA	<2.0	<0.5	NA	<2.0	<2.0	NA	<2.0	<0.5	NA	<2.0	<2.0	NA	**8.6**	**25.0**	**98**	**8.6**	**0.9**	**162**	3.2	2.8	13
Chromium (III+VI)	1	**6.6**	**20.0**	**101**	16.0	14.0	13	16.0	24.0	40	18.0	27.0	40	**55.0**	**12.0**	**128**	**55.0**	**12.0**	**128**	15.0	13.0	14	15.0	14.0	7	15.0	17.0	13	**23.0**	**85.0**	**115**	23.0	19.0	19	35.0	26.0	30
Copper	1	**24.0**	**94.0**	**119**	430.0	300.0	36	430.0	440.0	2	140.0	150.0	7	53.0	52.0	2	**53.0**	**20.0**	**90**	**440.0**	**880.0**	**67**	**440.0**	**1100.0**	**86**	12.0	12.0	NA	**1500.0**	**3400.0**	**78**	1500.0	1000.0	40	530.0	600.0	12
Mercury	0.05	0.01	0.1	164	0.04	0.06	40	0.04	0.2	133	0.12	0.09	29	0.06	0.08	29	0.06	<0.1	NA	0.02	0.03	40	0.02	0.1	133	<0.01	<0.01	NA	0.09	0.52	141	0.09	0.3	108	0.2	0.1	67
Lead	1	**42.0**	**120.0**	**96**	200.0	290.0	37	**200.0**	**390.0**	**64**	190.0	280.0	38	100.0	110.0	10	**100.0**	**31.0**	**105**	260.0	160.0	48	260.0	240.0	8	14.0	17.0	19	**1300.0**	**2400.0**	**59**	**1300.0**	**570.0**	**78**	**630.0**	**350.0**	**57**
Nickel	1	**6.1**	**24.0**	**119**	13.0	16.0	21	**13.0**	**26.0**	**67**	31.0	36.0	15	16.0	18.0	12	16.0	5.0	105	25.0	32.0	25	25.0	38.0	41	4.1	4.7	14	**45.0**	**170.0**	**116**	45.0	36.0	22	48.0	38.0	23
Zinc	1	**54.0**	**200.0**	**115**	330.0	**560.0**	**52**	**330.0**	**620.0**	**61**	240.0	350.0	37	140.0	170.0	19	**140.0**	**30.0**	**129**	460.0	300.0	42	460.0	340.0	30	100.0	82.0	20	**1000.0**	**3000.0**	**100**	**1000.0**	**490.0**	**68**	910.0	850.0	7
OCPs																																						
4,4-DDE	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
a-BHC	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Aldrin	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
b-BHC	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Chlordane (cis)	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Chlordane (trans)	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
d-BHC	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
DDD	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
DDT	0.2/0.1	<0.2	<0.2	NA	-	-	-	-	-	-	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	-	-	-
Dieldrin	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Endosulfan I	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Endosulfan II	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Endosulfan sulphate	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Endrin	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
g-BHC (Lindane)	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Heptachlor	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Heptachlor epoxide	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
Methoxychlor	0.2/0.1	<0.2	<0.2	NA	-	-	-	-	-	-	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	-	-	-
Hexachlorobenzene	0.05/0.1	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-
PCBs																																						
Arochlor 1016	0.5/0.1	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-
Arochlor 1232	0.5/0.1	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-
Arochlor 1242	0.5/0.1	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-
Arochlor 1248	0.5/0.1	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-
Arochlor 1254	0.5/0.1	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-
Arochlor 1260	0.5/0.1	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-

NOTES:
All concentrations are in mg/kg
RPDs have only been considered where a concentration is greater than 5 times the EQL.

$$\text{RPD Calculation Method} = \frac{|D1-D2|}{(D1+D2)/2} \times 100$$

RPD result exceeding acceptance criteria for organics - 50%; inorganics - 30%
RPD results exceeding the acceptance criteria but were disregarded if primary or duplicate sample results were <5 x EQL
Reference: Australian Standard, Guide to the Investigation and Sampling of Potentially Contaminated Soil (AS4482.1-2005 and AS4482.2-1999)
- Primary lab EOL/Secondary lab EOL
"-" indicates that these samples were not analysed
NA - Calculation not applicable or RPD=0
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T15 - Soil RPD Values

Borehole/Test Pit ID		TP37						TP40			TP39						AS5			RS19						EW7			EW9			BH6			BH8			BH8		
Sample ID		TP37B	QC222 (Intra Dup of TP37B)	RPD	TP37B	QC322 (Inter Dup of TP37B)	RPD	TP40C	QC223 (Intra Dup of TP40C)	RPD	TP39D	QC224 (Intra Dup of TP39D)	RPD	TP39D	QC324 (Inter Dup of TP39D)	RPD	AS5B	QC225 (Intra Dup of AS5B)	RPD	RS19C	QC226 (Intra Dup of RS19C)	RPD	RS19C	QC326 (Inter Dup of RS19C)	RPD	EW7	QC401 (Intra Dup of EW7)	RPD	EW9	QC415 (Intra Dup of EW9)	RPD	BH6	QC417 (Intra Dup of BH6)	RPD	BH8	QC418 (Intra Dup of BH8)	RPD	BH8	QC518 (Inter Dup of BH8)	RPD
Depth (mBGS)		1-1.1			1-1.1			2-9.3			2-2.1			2-2.1			0.9-1			2-2.1			2-2.1			0 - 0.2			2.1-2.2			2-2.1			2-2.1			2-2.1		
Date Sampled		12/08/2010			12/08/2010			16/08/2010			16/08/2010			16/08/2010			16/08/2010			16/08/2010			16/08/2010			16/08/2010			17/08/2010			17/08/2010			17/08/2010			17/08/2010		
Compounds	EQL/PQL																																							
BTEX																																								
Benzene	0.2/0.5	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.5	NA			
Ethylbenzene	0.5/1	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA			
Toluene	0.5	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA			
Xylene (m & p)	1/2	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<2.0	NA			
Xylene (o)	0.5/1	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<1.0	NA			
TPHs																																								
TPH C6 - C9	10/25	<10.0	<10.0	NA	<10.0	<25.0	NA	<10.0	<10.0	NA	<10.0	20.0	67	<10.0	<25.0	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<10.0	NA	<10.0	<25.0	NA			
TPH C10 - C14	50	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	100.0	67	<50.0	<100.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA	<50.0	<50.0	NA			
TPH C15 - C28	100	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	320.0	4620.0	174	320.0	<200.0	46	<100.0	<100.0	NA	230.0	<100.0	79	230.0	<100.0	79	110.00	110.0	NA	120.0	<100.0	18	300.0	210.0	35	220.0	<100.0	75	220.0	100.0	75
TPH C29-C36	100	<100.0	<100.0	NA	<100.0	<100.0	NA	<100.0	<100.0	NA	210.0	3910.0	180	210.0	220.0	5	100.0	<100.0	NA	190.0	<100.0	62	190.0	<100.0	62	190.0	210.0	10	140.0	110.0	24	340.0	240.0	34	200.0	110.0	58	200.0	<100.0	67
PAHs																																								
Acenaphthene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	0.5	NA	<0.5	<0.2	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA			
Acenaphthylene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.2	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA			
Anthracene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	0.7	33	<0.5	<0.2	NA	<0.5	<0.5	NA	0.9	<0.5	57	0.9	<0.1	160	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA			
Benz(a)anthracene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	4.1	157	<0.5	<0.2	NA	<0.5	0.5	NA	4.2	<0.5	157	4.2	0.3	173	<0.5	<0.5	NA	0.6	<0.5	18	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.3	NA
Benzo(a) pyrene	0.5/0.05	<0.5	<0.5	NA	<0.5	<0.05	NA	<0.5	<0.5	NA	<0.5	2.2	126	<0.5	<0.1	NA	<0.5	0.5	NA	5.6	<0.5	167	5.6	0.3	180	<0.5	<0.5	NA	0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.3	NA
Benzo(b)&(k)fluoranthene	1/0.2	<1.0	<1.0	NA	<1.0	<0.2	NA	<1.0	<1.0	NA	<1.0	5.0	133	<1.0	<0.4	NA	<1.0	<1.0	NA	9.0	<1.0	160	9.0	0.6	175	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	<1.0	NA	<1.0	0.5	NA
Benzo(g,h,i)perylene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	0.6	18	<0.5	<0.2	NA	<0.5	<0.5	NA	4.0	<0.5	156	4.0	0.3	172	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.1	NA
Chrysene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	2.9	141	<0.5	<0.2	NA	<0.5	0.5	NA	3.9	<0.5	155	3.9	0.4	163	<0.5	<0.5	NA	0.6	<0.5	18	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.3	NA
Dibenz(a,h)anthracene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.2	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Fluoranthene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	4.6	161	<0.5	<0.2	NA	0.6	1.2	67	11.4	0.7	177	**11.4**	**0.6**	**180**	0.5	<0.5	NA	1.2	0.5	82	<0.5	<0.5	NA	0.7	0.5	33	0.7	0.6	15
Fluorene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.2	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Indeno(1,2,3-c,d)pyrene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	0.6	18	<0.5	<0.2	NA	<0.5	<0.5	NA	3.2	<0.5	146	3.2	0.3	166	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.1	NA
Naphthalene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	2.6	135	<0.5	<0.2	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA
Phenanthrene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	2.0	120	<0.5	<0.2	NA	<0.5	0.8	46	3.0	<0.5	143	3.0	0.3	164	<0.5	<0.5	NA	0.8	<0.5	46	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	0.4	NA
Pyrene	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	<0.5	5.4	166	<0.5	<0.2	NA	0.5	1.0	67	10.7	0.7	175	**10.7**	**0.6**	**179**	<0.5	<0.5	NA	1.2	<0.5	82	<0.5	0.5	NA	0.7	0.5	33	0.7	0.6	15
Metals																																								
Arsenic	1	20.0	21.0	5	**20.0**	**10.0**	**67**	8.2	12.0	38	19.0	18.0	5	**19.0**	**74.0**	**118**	47.0	41.0	14	25.0	17.0	38	25.0	27.0	8	110.0	73.0	40	38.0	38.0	NA	**28.0**	**64.0**	**78**	**24.0**	**44.0**	**59**	**24.0**	**13.0**	**59**
Cadmium	0.1	2.1	<2.0	5	2.1	<0.5	123	<2.0	<2.0	NA	3.6	3.4	6	**3.6**	**1.0**	**113**	4.3	2.6	49	<2.0	<2.0	NA	<2.0	0.5	NA	**12.0**	**4.2**	**96**	2.6	2.0	26	**2.0**	**5.2**	**89**	**1.8**	**4.0**	**76**	**1.8**	**0.6**	**100**
Chromium (III+VI)	1	14.0	11.0	24	**14.0**	**6.0**	**80**	4.9	6.1	22	**9.4**	**23.0**	**84**	**9.4**	**17.0**	**58**	31.0	30.0	3	22.0	23.0	4	22.0	23.0	4	49.0	44.0	11	30.0	26.0	14	21.0	26.0	21	16.0	19.0	17	16.0	14.0	13
Copper	1	**340.0**	**150.0**	**78**	**340.0**	**790.0**	**80**	42.0	38.0	10	**770.0**	**400.0**	**63**	**770.0**	**1700.0**	**75**	520.0	350.0	39	**780.0**	**330.0**	**81**	**780.0**	**3000.0**	**117**	**2100.0**	**1100.0**	**63**	463.0	416.0	11	**181.0**	**474.0**	**89**	**203.0**	**411.0**	**68**	203.0	140.0	37
Mercury	0.05	0.91	0.19	131	0.91	0.6	41	<0.01	<0.01	NA	<0.01	0.06	143	<0.01	0.2	181	0.06	0.04	40	0.04	0.06	40	0.04	0.3	153	0.23	0.25	8	**0.91**	**0.33**	**94**	0.18	0.27	40	0.2	0.23	14	0.2	0.1	67
Lead	1	160.0	110.0	37	**160.0**	310.0	**64**	9.8	15.0	42	**130.0**	**420.0**	**105**	130.0	210.0	47	1300.0	860.0	41	330.0	370.0	11	**330.0**	**720.0**	**74**	2400.0	2500.0	4	478.0	408.0	16	**266.0**	**783.0**	**99**	**235.0**	**481.0**	**69**	**235.0**	**140.0**	**51**
Nickel	1	**23.0**	**12.0**	**63**	**23.0**	**39.0**	**52**	3.5	6.1	54	13.0	13.0	NA	13.0	21.0	47	37.0	43.0	15	31.0	28.0	10	31.0	34.0	9	34.0	35.0	3	**60.0**	**34.0**	**55**	**13.0**	**35.0**	**92**	18.0	25.0	33	18.0	12.0	40
Zinc	1	**800.0**	**250.0**	**105**	800.0	**320.0**	86	97.0	150.0	43	250.0	340.0	31	250.0	410.0	48	**1600.0**	**3800.0**	**81**	310.0	370.0	18	310.0	350.0	12	1600.0	2600.0	48	638.0	631.0	1	**693.0**	**1770.0**	**87**	**481.0**	**1040.0**	**74**	**481.0**	**240.0**	**67**
OCPs																																								
4,4-DDE	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
a-BHC	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Aldrin	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
b-BHC	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Chlordane (cis)	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Chlordane (trans)	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
d-BHC	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
DDD	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
DDT	0.2/0.1	<0.2	<0.2	NA	<0.2	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	<0.2	<0.2	NA	-	-	-	-	-	-	<0.2	<0.2	NA	<0.2	<0.1	NA
Dieldrin	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Endosulfan I	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Endosulfan II	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Endosulfan sulphate	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Endrin	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
g-BHC (Lindane)	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Heptachlor	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Heptachlor epoxide	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
Methoxychlor	0.2/0.1	<0.2	<0.2	NA	<0.2	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.2	<0.2	NA	<0.2	<0.2	NA	<0.2	<0.1	NA	<0.2	<0.2	NA	-	-	-	-	-	-	<0.2	<0.2	NA	<0.2	<0.1	NA
Hexachlorobenzene	0.05/0.1	<0.05	<0.05	NA	<0.05	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.05	NA	<0.05	<0.1	NA	<0.05	<0.05	NA	-	-	-	-	-	-	<0.05	<0.05	NA	<0.05	<0.1	NA
PCBs																																								
Arochlor 1016	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.1	NA
Arochlor 1232	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.1	NA
Arochlor 1242	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.1	NA
Arochlor 1248	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.1	NA
Arochlor 1254	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.1	NA
Arochlor 1260	0.5/0.1	<0.5	<0.5	NA	<0.5	<0.1	NA	-	-	-	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.5	NA	<0.5	<0.1	NA	<0.5	<0.5	NA	-	-	-	-	-	-	<0.5	<0.5	NA	<0.5	<0.1	NA

NOTES:
All concentrations are in mg/kg
RPDs have only been considered where a concentration is greater than 5 times the EQL.

$$\text{RPD Calculation Method} = \frac{|D1-D2|}{(D1+D2)/2} \times 100$$

RPD result exceeding acceptance criteria for organics - 50%; inorganics - 30%
RPD results exceeding the acceptance criteria but were disregarded if primary or duplicate sample results were <5x EQL
Reference: Australian Standard, Guide to the Investigation and Sampling of Potentially Contaminated Soil (AS4482.1-2005 and AS4482.2-1999)
##/# - Primary lab EOL/Secondary lab EOL
"-" indicates that these samples were not analysed
NA - Calculation not applicable or RPD=0
Intra Dup - Intra-laboratory duplicate sample
Inter Dup - Inter-laboratory duplicate sample

Table T16 - Groundwater RPD Values

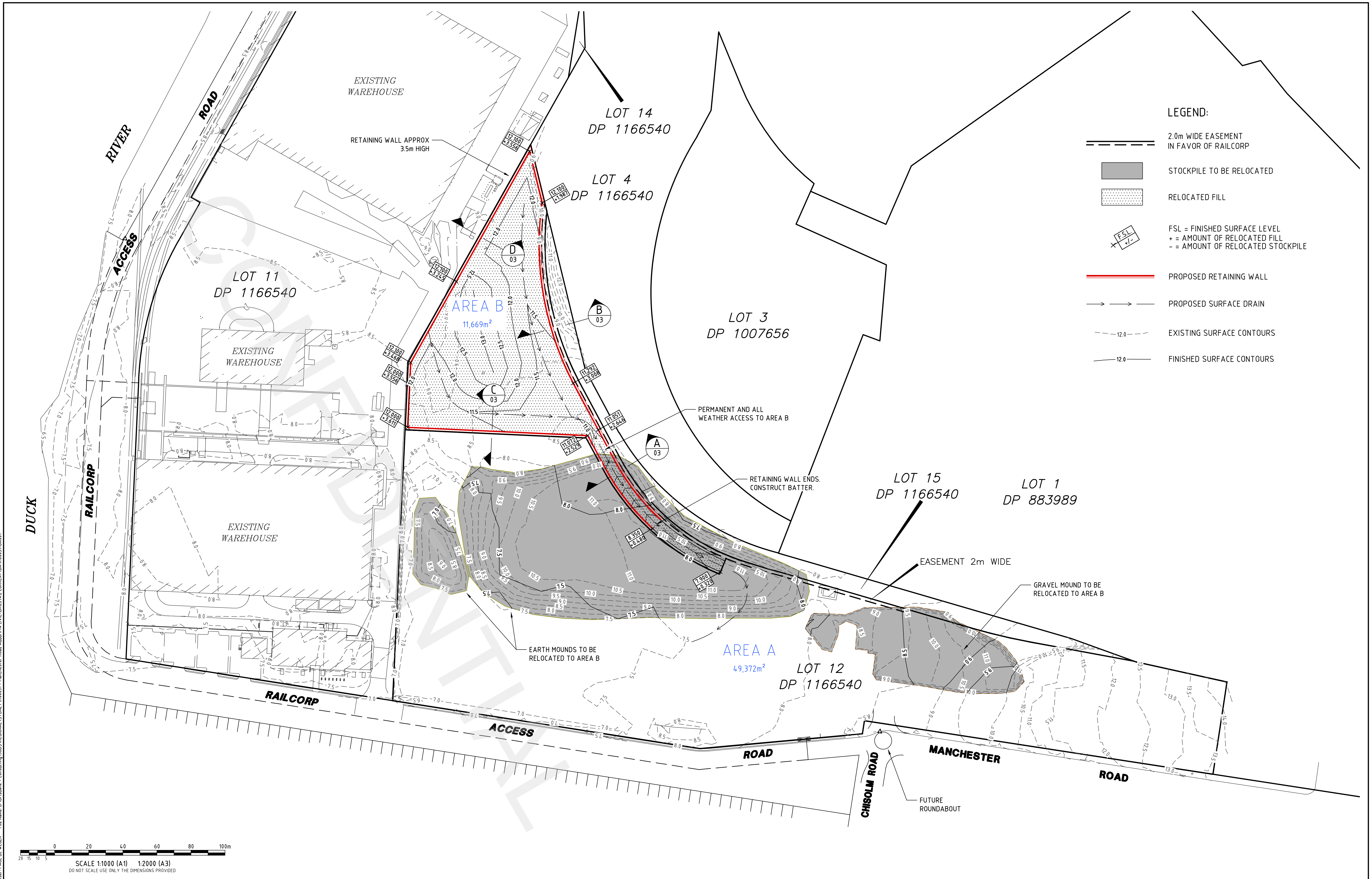
Well ID		EW9		
Sample ID		EW9	QC102 (Intralab Dup EW9)	RPD
Date Sampled		13/08/2010		
Compounds	**EQL**			
BTEX				
Benzene	5	<5	<5	NA
Ethylbenzene	5	<5	<5	NA
Toluene	5	<5	<5	NA
Xylene (m & p)	10	<10	<10	NA
Xylene (o)	5	<5	<5	NA
TPH C6-C36				
TPH C6 - C9	50	<50	<50	NA
TPH C10 - C14	50	<50	<50	NA
TPH C15 - C28	200	<200	<200	NA
TPH C29-C36	50	<50	<50	NA
PAHs				
Acenaphthene	1	<1	<1	NA
Acenaphthylene	1	<1	<1	NA
Anthracene	1	<1	<1	NA
Benz(a)anthracene	1	<1	<1	NA
Benzo(a) pyrene	1	<1	<1	NA
Benzo(b)&(k)fluoranthene	2	<2	<2	NA
Benzo(g,h,i)perylene	1	<1	<1	NA
Chrysene	1	<1	<1	NA
Dibenz(a,h)anthracene	1	<1	<1	NA
Fluoranthene	1	<1	<1	NA
Fluorene	1	<1	<1	NA
Indeno(1,2,3-c,d)pyrene	1	<1	<1	NA
Naphthalene	1	<1	<1	NA
Phenanthrene	1	<1	<1	NA
Pyrene	1	<1	<1	NA
Metals				
Arsenic (Filtered)	5	210	190	10
Cadmium (Filtered)	0.2	<0.2	<0.2	NA
Chromium (III+VI) (Filtered)	5	12	<5	82
Copper (Filtered)	1	1	2	67
Mercury (Filtered)	0.1	0.1	0.1	NA
Lead (Filtered)	1	<1	<1	NA
Nickel (Filtered)	5	26	27	4
Zinc (Filtered)	5	60	38	45
VOCs				
1,1,1,2-tetrachloroethane	5	<5	<5	NA
1,1,1-trichloroethane	5	<5	<5	NA
1,1,2,2-tetrachloroethane	5	<5	<5	NA
1,1,2-trichloroethane	5	<5	<5	NA
1,1-dichloroethane	5	<5	<5	NA
1,1-dichloroethene	5	<5	<5	NA
1,1-dichloropropene	5	<5	<5	NA
1,2,3-trichlorobenzene	5	<5	<5	NA
1,2,3-trichloropropane	5	<5	<5	NA
1,2,4-trichlorobenzene	5	<5	<5	NA
1,2,4-trimethylbenzene	5	<5	<5	NA
1,2-dibromo-3-chloropropane	5	<5	<5	NA
1,2-dibromoethane	5	<5	<5	NA
1,2-dichlorobenzene	5	<5	<5	NA
1,2-dichloroethane	5	<5	<5	NA
1,2-dichloropropane	5	<5	<5	NA
1,3,5-trimethylbenzene	5	<5	<5	NA
1,3-dichlorobenzene	5	<5	<5	NA
1,3-dichloropropane	5	<5	<5	NA
1,4-dichlorobenzene	5	<5	<5	NA
Methyl Ethyl Ketone	5	<5	<5	NA
2-chlorotoluene	5	<5	<5	NA
2-hexanone (MBK)	5	<5	<5	NA
2-pentanone	5	<5	<5	NA
4-chlorotoluene	5	<5	<5	NA
4-Methyl-2-pentanone	5	<5	<5	NA
Bromobenzene	5	<5	<5	NA
Bromodichloromethane	5	<5	<5	NA
Bromoform	5	<5	<5	NA
Bromomethane	50	<50	<50	NA
Carbon disulfide	5	<5	<5	NA
Carbon tetrachloride	5	<5	<5	NA
Chlorobenzene	5	<5	<5	NA
Chlorodibromomethane	5	<5	<5	NA
Chloroethane	50	<50	<50	NA
Chloroform	5	<5	<5	NA
Chloromethane	50	<50	<50	NA
cis-1,2-dichloroethene	5	<5	<5	NA
cis-1,3-dichloropropene	5	<5	<5	NA
Dibromomethane	5	<5	<5	NA
Dichlorodifluoromethane	50	<50	<50	NA
Ethyl acetate	5	<5	<5	NA
Hexachlorobutadiene	5	<5	<5	NA
Isopropylbenzene	5	<5	<5	NA
n-butylbenzene	5	<5	<5	NA
n-propylbenzene	5	<5	<5	NA
p-isopropyltoluene	5	<5	<5	NA
sec-butylbenzene	5	<5	<5	NA
Styrene	5	<5	<5	NA
Trichloroethene	5	<5	<5	NA
tert-butylbenzene	5	<5	<5	NA
Tetrachloroethene	5	<5	<5	NA
trans-1,2-dichloroethene	5	<5	<5	NA
trans-1,3-dichloropropene	5	<5	<5	NA
Trichlorofluoromethane	50	<50	<50	NA
Vinyl acetate	5	<5	<5	NA
Vinyl chloride	50	<50	<50	NA

NOTES:
All concentrations are in µg/L
RPDs have only been considered where a concentration is greater than 5 times the EQL.

RPD Calculation Method = $\frac{|D1-D2|}{(D1+D2)/2} \times 100$

RPD result exceeding acceptance criteria for organics - 50%; inorganics - 30%
RPD results exceeding the acceptance criteria but were disregarded if primary or duplicate sample results were <5 x EQL
EQL - laboratory Estimated Quantitation Limit
#/# - Primary lab EQL/Different Primary lab EQL
"-" indicates that these samples were not analysed
NA - Calculation not applicable or RPD=0
Reference: Australian Standard, Guide to the Investigation and Sampling of Potentially Contaminated Soil (AS4482.1-2005 and AS4482.2-1999)
Intra Dup - Intra-laboratory duplicate sample

Appendix D – Detailed Drawings for Relocation of Materials and Design for Containment Area on Area B



No.	Amendments	Drawn	Design	Appd	Certified	Reg No.	Date
D	RE-ISSUED FOR APPROVAL	PDW	PDW	PH			19/06/12
C	NOTES ADDED TO PLAN	CR	PDW	PH			07/06/12
B	ISSUED FOR DEVELOPMENT APPROVAL	PDW	PDW	PH			13.04.12
A	ISSUED FOR APPROVAL	PDW	PDW	PH			04.04.12

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brisbane • cairns • canberra • gladstone • gold coast • mackay • sydney • townsville

Client: JANYON PTY. LTD.

Project: MANCHESTER ROAD, AUBURN

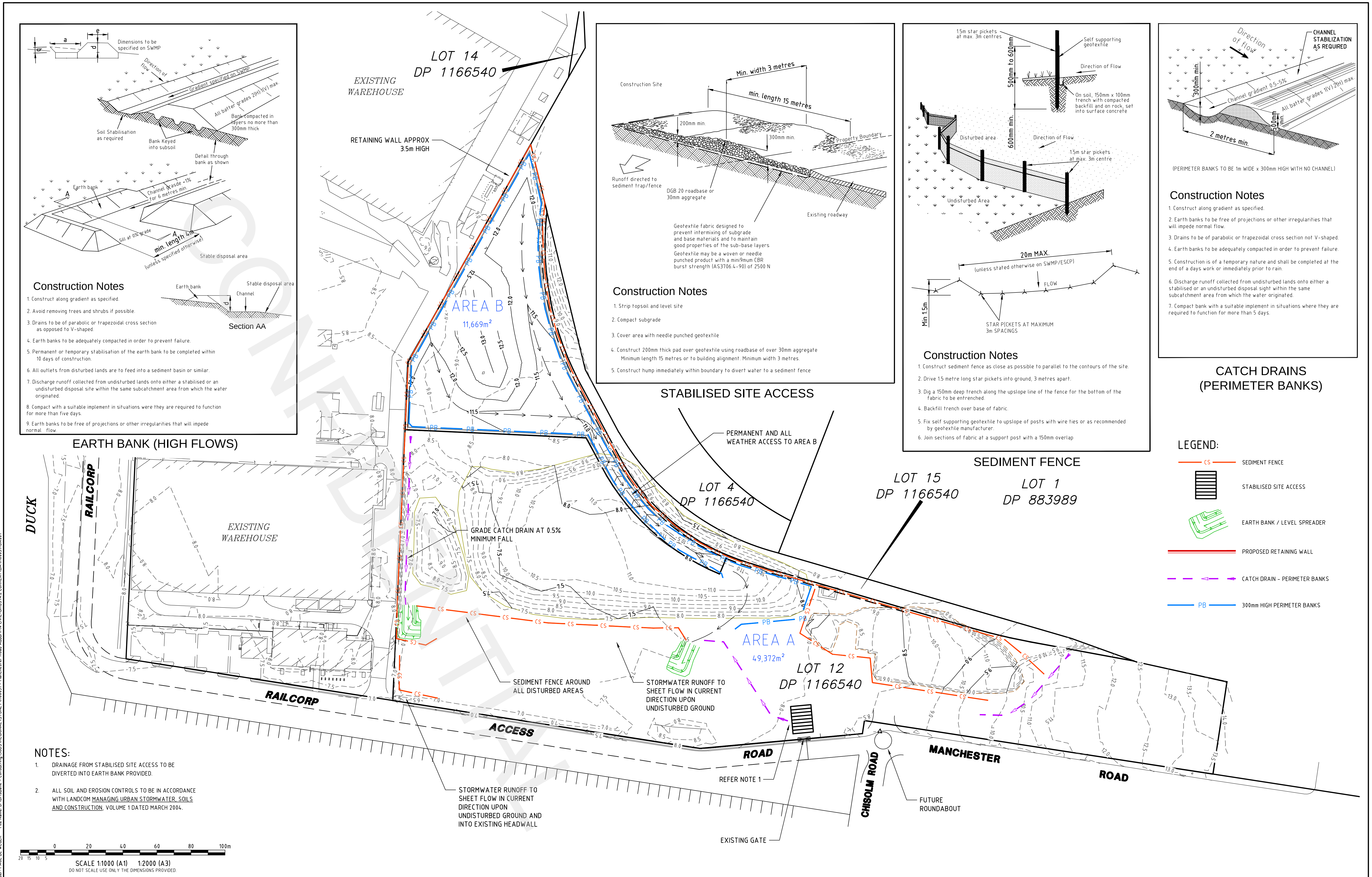
Title: RELOCATION OF EXISTING FILL MOUNDS WITHIN LOT 12 DP 1166540

Datum: AHD, SSM 91938, RL 8.668, MGA

N

NOT FOR CONSTRUCTION

Project No. / Drawing No.: H00031-DA001 — Rev: D



EARTH BANK (HIGH FLOWS)
Construction Notes
1. Construct along gradient as specified.
2. Avoid removing trees and shrubs if possible.
3. Drains to be of parabolic or trapezoidal cross section as opposed to V-shaped.
4. Earth banks to be adequately compacted in order to prevent failure.
5. Permanent or temporary stabilisation of the earth bank to be completed within 10 days of construction.
6. All outlets from disturbed lands are to feed into a sediment basin or similar.
7. Discharge runoff collected from undisturbed lands onto either a stabilised or an undisturbed disposal site within the same subcatchment area from which the water originated.
8. Compact with a suitable implement in situations where they are required to function for more than five days.
9. Earth banks to be free of projections or other irregularities that will impede normal flow.
Section AA
STABILISED SITE ACCESS
Construction Notes
1. Strip topsoil and level site
2. Compact subgrade
3. Cover area with needle punched geotextile
4. Construct 200mm thick pad over geotextile using roadbase of over 30mm aggregate Minimum length 15 metres or to building alignment. Minimum width 3 metres.
5. Construct hump immediately within boundary to divert water to a sediment fence
SEDIMENT FENCE
Construction Notes
1. Construct sediment fence as close as possible to parallel to the contours of the site.
2. Drive 1.5 metre long star pickets into ground, 3 metres apart.
3. Dig a 150mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
4. Backfill trench over base of fabric.
5. Fix self supporting geotextile to upslope of posts with wire ties or as recommended by geotextile manufacturer.
6. Join sections of fabric at a support post with a 150mm overlap
CATCH DRAINS (PERIMETER BANKS)
(PERIMETER BANKS TO BE 1m WIDE x 300mm HIGH WITH NO CHANNEL)
Construction Notes
1. Construct along gradient as specified.
2. Earth banks to be free of projections or other irregularities that will impede normal flow.
3. Drains to be of parabolic or trapezoidal cross section not V-shaped.
4. Earth banks to be adequately compacted in order to prevent failure.
5. Construction is of a temporary nature and shall be completed at the end of a days work or immediately prior to rain.
6. Discharge runoff collected from undisturbed lands onto either a stabilised or an undisturbed disposal sight within the same subcatchment area from which the water originated.
7. Compact bank with a suitable implement in situations where they are required to function for more than 5 days.
LEGEND:
SEDIMENT FENCE
STABILISED SITE ACCESS
EARTH BANK / LEVEL SPREADER
PROPOSED RETAINING WALL
CATCH DRAIN - PERIMETER BANKS
300mm HIGH PERIMETER BANKS
LOT 14 DP 1166540
EXISTING WAREHOUSE
RETAINING WALL APPROX 3.5m HIGH
AREA B 11,669m²
AREA A 49,372m²
LOT 4 DP 1166540
LOT 15 DP 1166540
LOT 1 DP 883989
LOT 12 DP 1166540
PERMANENT AND ALL WEATHER ACCESS TO AREA B
GRADE CATCH DRAIN AT 0.5% MINIMUM FALL
SEDIMENT FENCE AROUND ALL DISTURBED AREAS
STORMWATER RUNOFF TO SHEET FLOW IN CURRENT DIRECTION UPON UNDISTURBED GROUND
STORMWATER RUNOFF TO SHEET FLOW IN CURRENT DIRECTION UPON UNDISTURBED GROUND AND INTO EXISTING HEADWALL
DUCK
RAILCORP
RAILCORP
ACCESS
ROAD
MANCHESTER
ROAD
CHISOLM ROAD
REFER NOTE 1
EXISTING GATE
FUTURE ROUNDABOUT
NOTES:
1. DRAINAGE FROM STABILISED SITE ACCESS TO BE DIVERTED INTO EARTH BANK PROVIDED.
2. ALL SOIL AND EROSION CONTROLS TO BE IN ACCORDANCE WITH LANDCOM MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION, VOLUME 1 DATED MARCH 2004.
SCALE 1:1000 (A1) 1:2000 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.
CONFIDENTIAL

No.	Amendments	Drawn	Design	Appd	Certified	Reg No.	Date
D	RE-ISSUED FOR APPROVAL	PDW	PDW	PH			19/06/12
C	NOTES ADDED TO PLAN	CR	PDW	PH			07/06/12
B	ISSUED FOR DEVELOPMENT APPROVAL	PDW	PDW	PH			13.04.12
A	ISSUED FOR APPROVAL	PDW	PDW	PH			04.04.12

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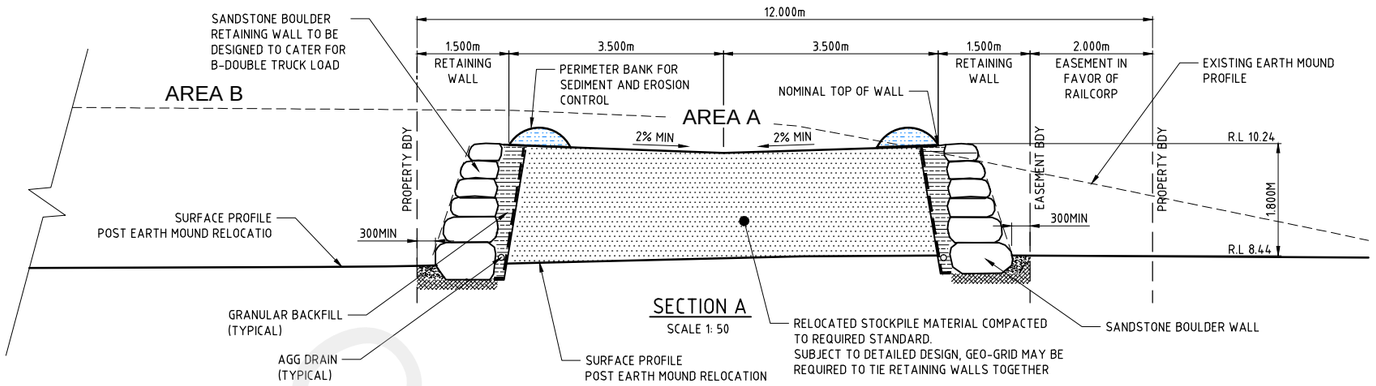
Client: JANYON PTY. LTD.
Project: MANCHESTER ROAD, AUBURN
Title: RELOCATION OF EXISTING FILL MOUNDS WITHIN LOT 12 DP 1166540 SEDIMENT AND EROSION CONTROL PLAN

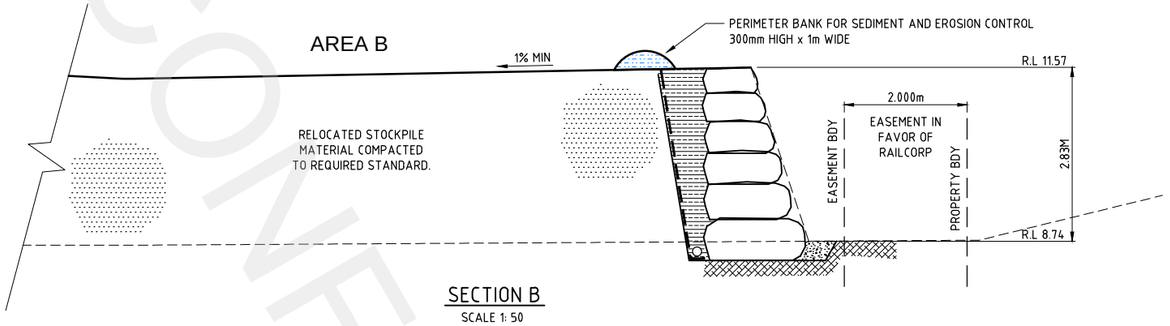
Datum: AHD
SSM 91938
RL 8.668
MGA

NOT FOR CONSTRUCTION

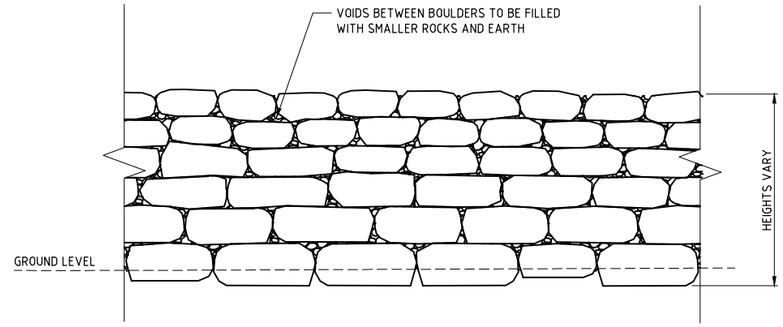
Project No. / Drawing No.: H00031-DA002
Rev: D



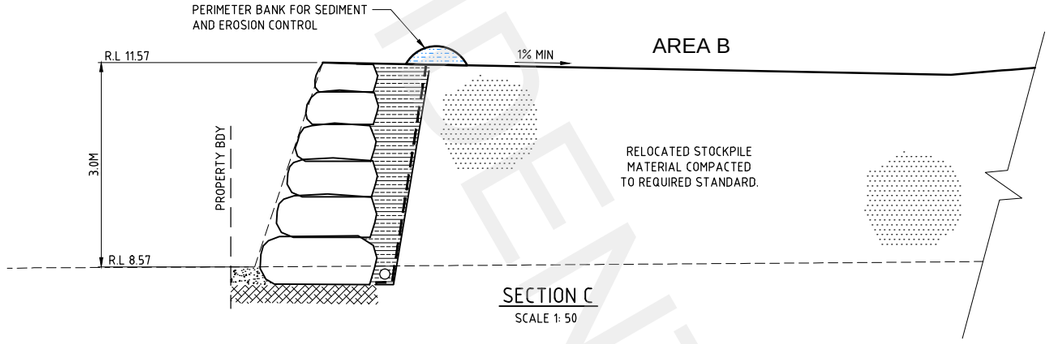
SECTION A
SCALE 1: 50



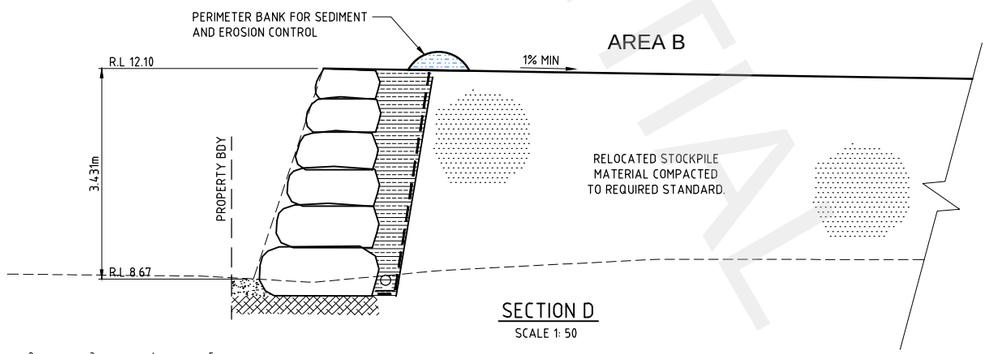
SECTION B
SCALE 1: 50



TYPICAL BOULDER WALL ELEVATION
SCALE 1: 50



SECTION C
SCALE 1: 50



SECTION D
SCALE 1: 50

0 1 2 3 4 5m
1.00 0.75 0.50 0.25
SCALE 1:50 (A1) 1:100 (A3)
DO NOT SCALE USE ONLY THE DIMENSIONS PROVIDED.

No.	Amendments	Drawn	Design	Appd	Certified	Reg No.	Date
C	RE-ISSUED FOR APPROVAL	PDW	PDW	PH			19/06/12
B	NOTES AND RLS ADDED TO SECTIONS	CR	PDW	PH			07/06/12
A	ISSUED FOR DEVELOPMENT APPROVAL	PDW	PDW	PH			13.04.12

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Client: JANYON PTY. LTD.
Project: MANCHESTER ROAD, AUBURN
Title: RELOCATION OF EXISTING FILL MOUNDS WITHIN LOT 12 DP 1166540 TYPICAL SECTIONS

Datum: AHD
SSM 91938
RL 8.668
MGA

NOT FOR CONSTRUCTION

Project No.: H00031-DA003
Drawing No.:
Rev: C

APPENDIX E – BORELOGS

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH01**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay.	D-M			
	1							
	1.5					1.5		
	2							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH02**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay.	D-M			
	1							
	1.5							
	2							
	2.5							
	3					3.0		

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH03**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5							
	1					1.0		
	1.5							
	2			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay.	D-M			
	2.5							
	3							
	3.5							
	4					4.0		

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH04**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D		No visible asbestos fragments	
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay.	D-M			
	1							
	1.5							
	2					2.0		
	2.5							
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH05**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D		No visible asbestos fragments	
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay and trace large cobbles.	D-M			
	1							
	1.5					1.5		
	2							
	2.5							
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH06**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1					1.0		
	1.5							
	2							
	2.5							
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH07**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1							
	1.5					1.5		
				Refusal at 1.5m due to Ballast				
	2							
	2.5							
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH08**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M	1.0		
	1							
	1.5							
	2					2.0		
	2.5			Refusal at 2 m due to Ballast				
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH09**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1					1.0		
	1.5			Refusal at 1.1m due to concrete boulder				
	2							
	2.5							
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH10**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
				FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	0.5					1.0		
				Refusal at 0.5 m due to concrete boulder				
	1							
	1.5							
	2							
	2.5							
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH11**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1							
	1.5							
	2							
	2.5							
	3					3.0		
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH12**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1							
	1.5							
	2							
	2.5							
	3					3.0		
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH13**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1							
	1.5							
	2					2.0		
	2.5							
	3							
	3.5							
	4							

DLA Environmental Services
A Pacific Environment company

Soil Profile Log

Location **BH14**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1							
	1.5					1.5	Visible asbestos fragment.	
	2							
	2.5							
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH15**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5							
	1							
	1.5					1.5		
	2			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	2.5							
	3							
	3.5							
	4					4.0		

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH16**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1							
	1.5							
	2					2.0		
	2.5							
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH17**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown.				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1							
	1.5							
	2							
	2.5							
	3					3.0	Three visible asbestos fragments	
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH18**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1							
	1.5							
	2							
	2.5					2.5	no visible asbestos fragments	
	3							
	3.5							
	4							

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location **BH19**

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M			
	1							
	1.5							
	2							
	2.5							
	3							
	3.5							
	4					4.0		

Soil Profile Log

DLA Environmental Services
A Pacific Environment company

Location BH20

Client:	Payce	Job Type:	Landuse Suitability Assessment
Project No:	DL3393	Address:	Lot 12 Manchestor Road Auburn
Date:	18/03/2015	Logged By:	KH
Contractor:	Groundtech	Method:	Drill Rig
Hole Size	200 mm	Co-ordinates:	

Method	Depth (m)	Graphic Log	USCS Classification	Material Description	Moisture	Sampling	Field Records/Comments	Monitoring well Details
	0.03			Bituminous Hardstand	D			
	0.15			FILL: Silty CLAY: Low to medium plasticity, brown				
	0.5			FILL: Gravelly SAND: Brown sand, fine to coarse gravel angular with pockets of brown clay with trace large cobbles	D-M	1.0		
	1							
	1.5							
	2							
	2.5							
	3							
	3.5							
	4					4.0		