Douglas Partners
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Integrated Practical Solutions

Report on
Contamination Investigation

Carpark P6D (Site 2)
Cnr Australia Ave and Parkview Drive
Sydney Olympic Park

Prepared for
Ecove Group Pty Ltd

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Report on Contamination Investigation
Carpark P6D (Site 2)
Cnr Australia Ave and Parkview Drive, Sydney Olympic Park

1. Introduction

This report presents the results of a contamination investigation undertaken by Douglas Partners Pty Ltd (DP) for a proposed mixed use development at Car Park P6D, Sydney Olympic Park Parkview Precinct (the site), as shown on Drawing 1, Appendix B. The investigation was commissioned by Mr Greg Hynd of Ecove Group Pty Ltd (the client) and was undertaken in accordance with Douglas Partners' proposal SYD180435 dated 7 August 2018.

It is understood that the proposed development of the site will include the construction of two 30-storey mixed use towers with a four or five level common basement carpark. It is further understood that the proposed basement will extend to the existing property boundaries, except for the north-west and south-west corners of the site where a large tree is to remain and the T7 Olympic Park Line railway tunnels run beneath.

The objectives of this contamination investigation were to assess the suitability of the site for the proposed development and to provide recommendations for detailed assessment, if required.

This report was undertaken in conjunction with a geotechnical investigation with results reported separately in DP *Geotechnical Investigation Carpark P6D (Site 2) Cnr Australia Ave and Parkview Dr Sydney Olympic Park* Reference 86411.00.R.002.Rev0, dated October 2018 (DP, 2018).

2. Scope of Works

The scope of works for the contamination investigation comprised the following:

- Site walkover by a DP engineer;
- Review of previous reports undertaken on the site;
- Collection of soil samples from each of the six boreholes drilled for geotechnical purposes, at regular intervals and where signs of contamination were observed (BH1 to BH6);
- Dispatch of selected soil samples (plus QA/QC samples) for quantitative analysis by a NATA accredited laboratory for a selection of the following contaminants of concern and parameters:
    - Metals (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Zinc)
    - Total recoverable hydrocarbons (TRH, screening for petroleum hydrocarbons - TPH);
    - Monocyclic aromatic hydrocarbons (benzene, toluene, ethylbenzene and xylene – BTEX);
    - Polycyclic aromatic hydrocarbons (PAH);
    - Phenols;
    - Organochlorine pesticides (OCP);
    - Organophosphorus pesticides (OPP);

- Polychlorinated biphenyls (PCB);
- Volatile organic compounds (VOC);
- Perfluorinated alkyl sulfonate (PFAS) chemicals, including perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexanosulfonic acid (PFHxS) ;
- Asbestos;
- pH;
- CEC;
- TCLP;
- Collection/ preparation and analysis of an intra-laboratory replicate soil samples for QA/QC purposes (metals TRH, BTEX and PAH); and
- Analysis of a trip spike and trip blank for QA/QC purposes (TRH and BTEX).

- Collection of groundwater samples from the three onsite groundwater wells installed during this investigation;
- Dispatch of the groundwater samples (plus QA/QC sample) for quantitative analysis by a NATA accredited laboratory for a selection of the following contaminants of concern and parameters:
  - Metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)
  - TRH;
  - BTEX;
  - PAH;
  - Phenols:
  - OCP;
  - OPP;
  - PCB;
  - PFAS;
  - Collection/ preparation and analysis of an intra-laboratory replicate groundwater samples for QA/QC purposes (metals, TRH and BTEX); and
  - Analysis of a trip spike and trip blank for QA/QC purposes (TRH and BTEX).

- Preparation of this contamination investigation report, detailing the methodology and results, providing comment on the suitability of the site for the proposed development, and recommendations for further investigations, remediation and management (as required).

3. Site Information

The approximately 7,000 m^2 rectangular site is currently occupied by a single level asphaltic concrete carpark. The site encapsulates Site 2 at the Sydney Olympic Park Parkview Precinct and is bound to the north by Murray Rose Avenue, to the south by Parkview Drive, to the west by Australia Avenue and to the east by a commercial lot. The site slopes down gently from the south-west to the north-east.

The south-west corner of the site is constrained by a rail easement from the T7 Olympic Park Line railway tunnels which pass beneath the south-west corner of the site, see Figure 1 and Drawing 1. The tunnels are understood to have been constructed using cut and cover methods, with the width of the tunnels increasing as it approaches the Olympic Park Station to the west. The tunnels crown and invert are understood to be at approximately RL 8 m and RL 15.5 m relative to Australian Height Datum (AHD).

4. Regional Geology

Reference to the Sydney 1:100,000 Geological Series Sheet indicates that the site is underlain by Ashfield Shale of the Triassic aged Wianamatta Group, which typically comprises black to dark grey shale and laminite. The Ashfield Shale is typically closely bedded and contains an orthogonal pair of steeply dipping (70^{o} to 90^{o}) joint sets typically striking NNE and ESE and spaced at 0.5 m to 5 m. Randomly oriented, 30° to 45° dipping slickensided joints are also ubiquitous.

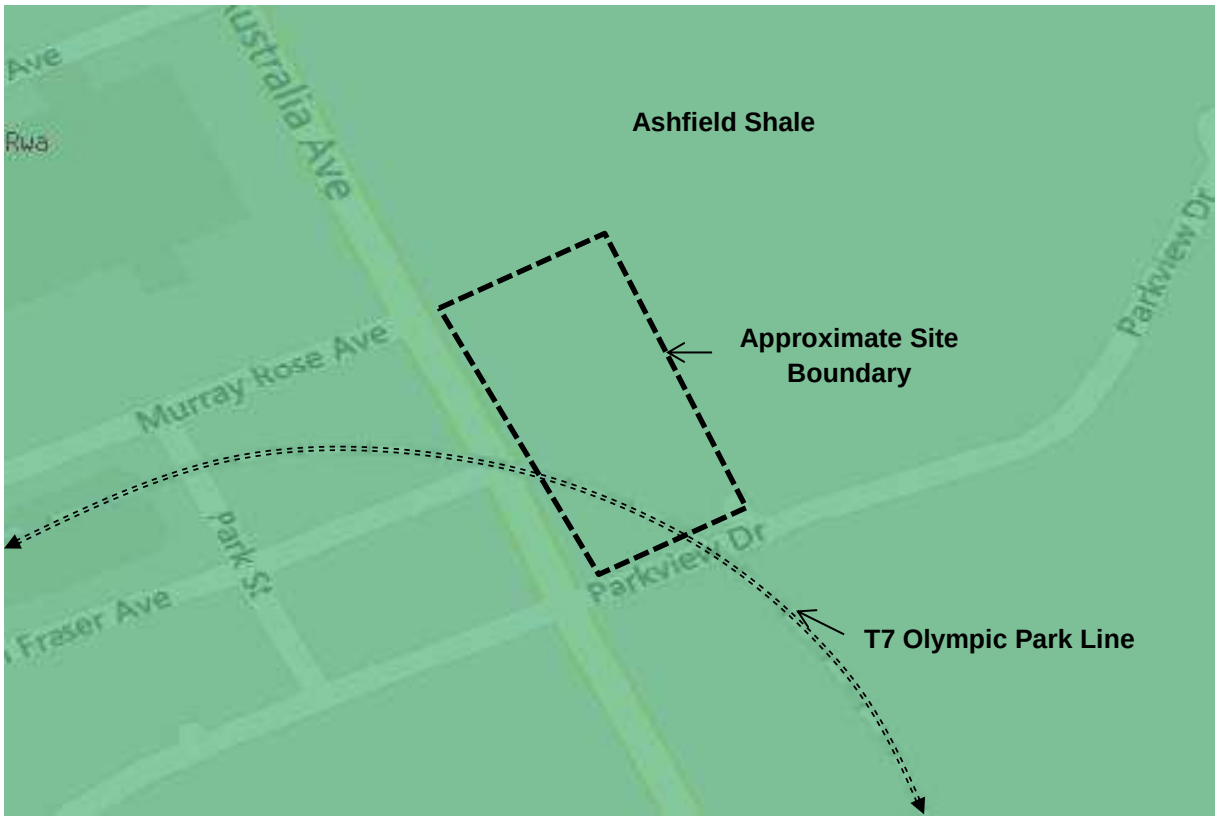


Figure 1: Extract from Geological Series Sheet

5. Previous Reports

The following existing reports which relate to the site were provided by the client. The findings of the reports are summarised in the following sections.

- HLA – Enviroscienes Pty Limited (HLA) *Site Contamination Assessment Sites 2 and 8 Sydney Olympic Park Town Centre Homebush, NSW,* reference J1938 dated 18 December 2002 (HLA, 2002); and
- Sanko Excavation Environmental and Civil Services P/L (Sanko) *Stage 1 / 2 Environmental Site Assessment, Proposed Motel Development Part lot71, DP1134933, Carpark P6D, Sydney Olympic Park,* reference E14 104-BR1 dated 14 June 2016 (Sanko, 2016).

5.1 HLA, (2002)

This report detailed the findings of a site contamination assessment undertaken by HLA (Appendix C) on the site (Site 2) and a nearby site (Site 8) for the purpose of evaluating the subsurface conditions prior to the possible divestment of the site for future development. The report included the following information:

- Site Description - Site location and setting, topography, surrounding land uses and site inspection;
- Site History –Review of historical aerial photographs and previous site investigations;
- Geology and Hydrogeology – Regional geology, review of previous reports, hydrogeology and review of receiving water bodies;
- Contamination Investigation – Potential areas and contaminants of concern, sampling and analysis plan, quality assurance and control, soil assessment criteria, onsite screening results, laboratory analytical results; and
- Discussion and conclusions.

HLA conducted a site inspection of the site. HLA concluded that approximately 50% of the site was occupied by an on grade asphalt car park, approximately 40% was covered with a gravel surface with the rest of the site being covered with grass, with a large established fig tree present within the north western corner of the site. HLA identified that the site had two distinct surface levels with the asphalt car park in the southern area of the site being the upper level and the predominantly gravel and grass area to the north being approximately 1.5m lower. HLA did not identify any buildings on the site, however, they did identify evidence of a historical building in the northern portion of the site.

Surrounding land use was observed by HLA to be predominantly commercial in nature with a commercial building to the east of the site, a railway station to the west of the site and car parking and development sites to the north and south of the site.

HLA conducted a review of previous reports undertaken on the site which included a soil and groundwater contamination investigation undertaken by Coffey Partners International Pty Ltd (Coffey) in 1991 (Coffey, 1991) and a dioxin review report for the Homebush bay Olympic site undertaken by CH2MHILL Australia Pty Ltd (CH2MHILL) in 1997 (CH2MHILL, 1997). Coffey (1991) did not contain any specific information regarding the site, except that it was not located in any area identified as landfill areas. CH2MHILL (1997) did not contain any specific information in regards to the site.

HLA reviewed historical photographs from 1930 to 2002, which indicated that the site had been predominantly undeveloped between 1930 and 1995, after which time the site was developed for use as a car park and numerous small buildings were constructed on the site.

HLA determined that there was no visual evidence of potential contamination with the exception of filling, which was thought to be greatest in the southern portion of the site. The regional geology was identified as consisting of Ashfield Shale overlying Hawkesbury Sandstone at depth. HLA did not search for registered groundwater bores in the vicinity of the site, however, previous groundwater studies in the vicinity of the site had identified two distinct, non-connected groundwater systems, a shallow perched aquifer within fill material and a deeper aquifer within the fractures of the shale. HLA concluded that groundwater flow is greatly influenced by a nearby brick pit to the north of the site which acts as a receiving sink/basin.

HLA concluded that contamination associated with imported fill was the highest potential source of contamination material on the site.

HLA's intrusive contamination investigation included the drilling of 19 soil bores on the site to a maximum depth of 4.5 m below ground level (bgl) using a combination of solid flight augers and direct push tube. Samples were collected form the surface, every 1 m or at targeted depths depending on lithology changes and areas of suspected contamination. HLA despatched 33 soil samples for laboratory analysis. No fibre cement or brick type building rubble was identified within fill during this investigation.

In the southern section of the site, HLA recorded filling material consisting of sand, crushed sandstone and gravel filling to depths between 0.1 -2.3 m bgl, overlying silty clay filling to depths of between 0.6 m to 2.5 m bgl, overlying weathered shale and shale bedrock. HLA noted that the filling was deepest in the vicinity of the railway tunnels. Saturated soils, associated with groundwater, were encountered by HLA in one location during the investigation at a depth of 1.8 m bgl within the filling, above the natural stiff silty clay layer. Groundwater under aquifer conditions was not encountered by HLA during their investigation.

Concentrations of chemicals of concern were below the adopted site assessment criteria for the site (which were current in 2002) with the exception of nickel from a surface sample which was above the provisional Phytotoxicity-Based Investigation Level, however, due to the nature of the site it was not considered to present a significant risk and HLA determined it did not warrant further site specific testing. It is noted that samples were not analysed for asbestos.

HLA concluded that the subsurface soil conditions at the site were suitable for either residential land use (with minimal soil access) and /or commercial/industrial land use.

A summary of the results of the laboratory analysis undertaken in the HLA 2002 investigation is presented in Table F1 in Appendix F

5.2 Sanko (2016)

This report detailed the findings of a stage 1 / 2 environmental site assessment undertaken by Sanko (Appendix C) on the northern portion of the site for the purpose of obtaining information about possible contamination levels and distribution for development as a commercial site. The report included the following information:

- Site Information – Site identification, site location and setting, topography, site inspection and surrounding land use;
- Geology and Hydrogeology – Sub-surface soil and groundwater conditions observed during the investigations;

- Site History –Review of historical aerial photographs, historical land title records, SafeWork NSW records and NSW EPA records;
- Soil Assessment;
- Groundwater Assessment;
- Conceptual Site Model; and
- Recommendations.

Sanko conducted a site walkover which concluded that the site was approximately 3,000m^2 and consisted predominantly of an on grade asphalt car park, with a large protected fig tree present in the north western corner of the site and some smaller vegetated areas on the site. Sanko did not identify any development on the site with the exception of the car park. Sanko identified that the site sloped from the south down to the north east corner of the site. Surrounding land use was observed by Sanko to be predominantly commercial in nature, with sporting facilities and car parking areas also observed. Sanko did not obtain a section 149 planning certificate as part of their investigation.

Sanko reviewed historical information such as aerial photographs from an unknown date in the 1950s to 2014, historical land title deeds, SafeWork NSW records and NSW EPA records. Based on this review Sanko indicated that the site had potentially been part of an industrial style development at some stage prior to 2002 when the site was vacant and then a car park from 2007 until the present. Sanko did identify a stockpile present in the western portion of the site, to the south of the fig tree in the 2005 aerial photograph, which had been removed by 2009. No dangerous goods licences were identified at the site and were not included on the NSW EPA records pertaining to contaminated land and contaminating activity. No potential significantly contaminating activities are recorded to have been present on site.

Sanko concluded that contamination associated with imported fill was the highest potential source of contamination material on the site.

Sanko's intrusive soil contamination investigation included the drilling of six boreholes to a maximum depth of 7.0 m bgl using solid flight augers. Sanko recorded pavement material to approximately 0.4 - 0.5 m bgl, overlying filling to approximately 0.6 m bgl, overlying residual clays to between 1.5 m and 2.5 m bgl, overlying weathered rock. Soil samples were taken at changes of geology and other factors such as odour and colour. Sanko despatched a total of 18 soil samples for laboratory analysis. Sanko did not analyse for the presence of asbestos in the investigation as there was no indication of the presence of anthropogenic materials within the fill. Sanko reported that all soil results were below laboratory practical quantitation limits PQLs or adopted site assessment criteria.

As part of a groundwater investigation Sanko installed a groundwater monitoring well in their borehole BH2 located in the north eastern corner of the site. One sample was taken from this well and sent for laboratory analysis. Sanko concluded that the results of this analysis indicated that all chemicals of concern were below laboratory PQLs or SAC with the exception of copper which was four times above the adopted SAC (freshwater GIL), however, due to the nature of the site it was not considered to present a significant risk.

Sanko concluded that the site is suitable for the proposed commercial development with no further requirements. Further to this Sanko recommended that a waste classification should be undertaken of the pavement material prior to offsite removal, and that due to elevated copper the groundwater should be classified accordingly as per the Liquid Waste Guidelines.

It should be noted that the laboratory certificate provided in the Sanko report indicated that the groundwater metal results were provided in mg/L, whilst the adopted guidelines are in µg/L, which would indicate that all of the metals tested are significantly above the adopted SAC. However, it is noted that the date of the groundwater sample is the same as the date of drilling provided on the logs and that it is not stated whether the samples were filtered in the field; which indicate that the water sampled and analysed form this well may not be representative of groundwater as a whole across the site.

It should be noted that the fieldwork for this investigation was undertaken in 2014 and the report was not prepared until 2016. Further to this the laboratory certificates present in the appendices of the Sanko report indicate that the groundwater sample had to be diluted ten fold due to the highly turbid nature of the sample. The results of this investigation are not considered to be particularly reliable due to the reasons noted above, and therefore the results of the Sanko investigation will be discounted from this investigation.

6. Site Walkover

A site walkover was undertaken on 23 August 2018. The site walkover was undertaken to check and identify (where possible) the likely presence, or otherwise, of potential sources of contamination with reference to the site history review, and to identify and comment on additional potential sources of contamination which were encountered/observed. Drawing 1 (Appendix B) shows the layout of the site.

The site walkover confirmed that the site is currently occupied by an on-grade asphalt car park with a large, established fig tree located within a fenced area in the north western corner of the site. Small amounts of landscaping and garden beds were observed along the south, east and western boundaries of the site and a small garden bed in the middle of the site. The site can be accessed from Murray Rose Avenue to the north and Parkview Drive to the south.

The site is bounded by Murray Rose Avenue to the north, Parkview Drive to the south, Australia Avenue to the west and commercial properties (offices) to the east. The surrounding land uses are predominantly commercial to the east and south and predominantly recreational to the north and west. No significant potential sources of contamination were identified during the inspection.

7. Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e. it enables an assessment of the potential source – pathway – receptor linkages, as listed in Table 2. The CSM is used to inform the scope of investigations and remediation (if required).

7.1 Potential Contamination Sources

Based on the current and previous site uses and DP site observations, the potential contamination sources (or areas of environmental concern) are summarised in Table 1 below.

Table 1: Areas of Environmental Concern (AEC)

Potential AEC	Location	Description of Potential Contaminating Activity	Contaminants of Concern
S1 – Current site use	The entire site	Current site use, leaks and spills of automotive fluids.	Heavy metals, TRH, BTEX, PAH, PCB andVOC.
S2- Imported fill from unknown sources and demolition rubble	The entire site	Fill, associated with levelling, site formation, and demolition of previous buildings on site, is present, and the source of site fill is not known.	Heavy metals, TRH, BTEX, PAH, phenols, PCB, OCP, OPP, VOC, PFAS and asbestos
S3- Potentially contaminated groundwater flowing onto the site from up gradient properties	The entire site	Previous historical site use of the surrounding land, including industrial activity in the surrounding region.	Heavy metals, TRH, BTEX, PAH, phenols, PCB, OCP, OPP and PFAS.

It should be noted that whilst there are no specific point sources of groundwater contamination up gradient of the site. However, due to the highly disturbed nature and the history of potentially significantly contaminating activities undertaken in the surrounding region, it is considered prudent to include up gradient properties at this stage.

7.2 Potential Receptors

Human Health Receptors

R1 – Current and future site users (office workers – commercial land use);

R2 – Construction and maintenance workers; and

R3 – Land users in adjacent areas (commercial/residential).

Environmental Receptors

R4 – Groundwater;

R5 – Terrestrial ecology; and

R6 – Surface water (Homebush Bay).

Note, the nearest surface water body, Homebush Bay, is located approximately 1.4 km from the site and is considered to be too far from the site to be considered a significant environmental receptor from overland flow. However, consideration of impact on this potential receptor has been given for impact by surface water flow through the stormwater system.

Building and Structures Receptors

R7 – Buildings, foundations and other underground infrastructure.

7.3 Potential Pathways

Potential pathways for contamination to impact on receptors include the following:

P1 – Ingestion and dermal contact;

P2 – Inhalation of dust and/or vapours;

P3 – Leaching of contaminants and vertical mitigation into groundwater;

P4 – Lateral migration of groundwater;

P5 – Surface water via the stormwater system;

P6 – Direct contact with terrestrial ecology; and

P6 – Contact with buildings and structures.

7.4 Summary of Potential Complete Pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human, water or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (complete pathways). The possible pathways between the above sources (S1 and S2) and receptors (R1 to R7) are provided in Table 2 below.

Table 2: Summary of Potential Complete Pathways

Source	Transport Pathway	Receptor
S1: Current Site Use Heavy Metals, TRH, BTEX, PAH, PCB and VOC **S2: Imported Fill** Heavy metals, TRH, BTEX, PAH, phenols, PCB, OCP, OPP, VOC, PFAS and asbestos	**P1**: Ingestion and dermal contact **P2**: Inhalation of dust and/or vapours	**R1:** Current and future site users **R2:** Construction and maintenance workers.
	P2: Inhalation of dust and/or vapours	**R3**: Land users in adjacent areas
	P3: Leaching of contaminants and vertical mitigation into groundwater	**R4**: Groundwater
	P4: Lateral migration of groundwater **P5**: Surface water via the stormwater system	**R5:** Surface water
	P6: Direct contact with terrestrial ecology	**R6:** Terrestrial ecology
	P7: Contact with buildings and structures	**R7:** Buildings, foundations and other underground infrastructure
S3: Onsite Groundwater Migration Heavy metals, TRH, BTEX, PAH, phenols, PCB, OCP, OPP and PFAS	**P2**: Inhalation of dust and/or vapours	**R1:** Current and future site users
	P1: Ingestion and dermal contact **P2**: Inhalation of dust and/or vapours	**R2:** Construction and maintenance workers.
	P7: Contact with buildings and structures	**R7:** Buildings, foundations and other underground infrastructure

Based on the findings of the conceptual site model, DP has conducted a soil and groundwater investigation to assess the potential for broad scale and gross contamination at the site in relation to the historical and current land use.

8. Fieldwork and Sampling Methodology

The field work for the investigation included six cored boreholes (BH1 to BH6, inclusive). The boreholes were all drilled using a truck-mounted drilling rig.

The boreholes were initially drilled to depths of between 2.5 m and 5.5 m using spiral flight augers and rotary drilling techniques within the soil and extremely low to very low strength rock. Standard penetration tests (SPTs) were carried out at regular intervals to sample the soil and weathered rock and to assess the *in situ* strength of the materials. The boreholes were then cased and continued into the underlying rock using diamond core drilling techniques to obtain continuous core samples of the bedrock down to a maximum depth of 20.85 m.

Monitoring wells were installed at BH2, BH3 and BH6 to facilitate measurement of groundwater levels in the longer term, water sampling for laboratory testing and permeability testing.

The borehole locations are shown on Drawing 1 in Appendix B and borehole logs are provided in Appendix E. Borehole coordinates and ground surface levels were surveyed and provided by LTS Lockley.

8.1 Soil Sampling Procedure

Soil samples for contamination testing purposes were collected from the boreholes using the following procedure:

- Collection of soil samples directly from the SPT tube and auger using disposable sampling equipment (note: sampling for contamination purposes was not undertaken during wash boring or coring). Care was taken whilst collecting the samples to remove any extraneous material;
- Collection of 10% replicate samples for QA/QC purposes;
- Transfer of samples into laboratory-prepared glass jars, filled to the top to minimise the headspace within the sample jar and capping immediately to minimise loss of volatiles. Replicate samples were placed into snap lock plastic bags for asbestos analysis;
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth;
- Placement of the glass jars, with non-Teflon lined lids, into an ice cooled, insulated and sealed container for transport to the laboratory; and
- Chain of custody documentation was maintained at all times and countersigned by the receiving laboratory on transfer of samples.

Samples for environmental purposes were generally collected from the near surface, and at regular depth intervals or changes in strata within each borehole.

Envirolab Services Pty Ltd (NATA accreditation number: 2901) was used for the analysis of soil samples. The laboratory is required to carry out routine in-house QC procedures and one inter-laboratory duplicate was sent to Eurofins Environment Testing Australia Pty Ltd (NATA accreditation number 1261). The C-O-C documentation (Laboratory) is included in Appendix D.

8.2 Well Installation and Sampling Details

Groundwater monitoring wells were installed in three boreholes as shown on Drawing 1, Appendix B. The wells were installed primarily to facilitate measurement of groundwater levels in the longer term, water sampling for laboratory testing and permeability testing. Field observations did not record the presence of possible free groundwater at the time of installation.

The monitoring wells were constructed of 50 mm diameter acid washed class 18 PVC casing and machine slotted well screen intervals. The screen was installed from the base of the well and extended to above the ground water level, where groundwater was observed.

Joints were screw threaded, thereby avoiding the use of glues and solvents which may contaminate the wells. Wells were backfilled with sand to at least 0.5 m above the top of the screen. A 0.3 m to 0.5 m thick bentonite plug was installed above the sand in each well and drilling spoil back filled to the surface. The well construction details and the ground surface levels are recorded on the logs in Appendix E.

Following installation, the wells were developed by removing a minimum five well volumes of groundwater, or until pumped dry, using a submersible pump. The wells were allowed to recharge and groundwater levels re-measured including the measurement of phase separated hydrocarbons (PSH). No PSH were detected.

The wells were micro-purged on 19 September 2018 using a low flow pump approved for PFAS sampling (Geosub) until field parameters (pH, temperature, dissolved oxygen (DO), conductivity, total dissolved solids (TDS) and redox) readings stabilised. Once field parameters had stabilised, a sample was collected using the low flow pump. The sample was placed with a minimum of aeration into appropriately preserved bottles. For analysis of metals the relevant sample fraction was filtered using an in-line disposable 0.45 µ filter.

Details of the groundwater sampling are also provided on the groundwater field sheets provided in Appendix E.

9. Site Assessment Criteria

Two 30-storey mixed use towers with a four or five level common basement carpark are proposed for the site. It is understood that tower 2A, on the northern portion of the site, will consist of a double level foyer, two levels of conference space, six levels of commercial and office space, one level of childcare, one plant level, 17 levels of hotel accommodation and two levels of rooftop amenities. The proposed childcare centre is located on Level 9 and has a dedicated outdoor play area also located on this level, therefore it is not expected that there will be access to site soils.

It is understood that tower 2B, on the southern portion of the site will consist of a double level foyer, five levels of commercial office space, one level of plant, 23 levels of serviced apartments and a rooftop plant room. The proposed serviced apartments are located from Level 8, and therefore it is not expected that there will be significant access to site soils.

It is understood that the proposed basement will extend to the existing property boundaries, except for the north-west and south-west corners of the site where a large tree is to remain and the T7 Olympic Park Line railway tunnels run beneath.

The Site Assessment Criteria (SAC) applied in the current assessment are informed by the CSM (refer to Section 7*)* which identified human and environmental receptors to potential contamination on the site. Analytical results were assessed (as a Tier 1 assessment) against the SAC comprising the investigation and screening levels of Schedule B1, *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013 (NEPC, 2013). NEPC (NEPC (2013) is endorsed by the ACT EPA under the *Environment Protection Act* 1997.

PFAS SAC have been derived from the *PFAS National Environmental Management Plan (NEMP) 2018* (PFAS NEMP).

The investigation and screening levels are applicable to generic land use settings and include consideration of, where relevant, the soil type and the depth of contamination. The investigation and screening levels are not intended to be used as clean up levels. Rather, they establish concentrations above which further appropriate investigation (e.g. Tier 2 assessment) should be undertaken. They are intentionally conservative and are based on a reasonable worst-case scenario.

9.1 Soil

9.1.1 Health Investigation and Screening Levels

The Health Investigation Levels (HIL) and Health Screening Levels (HSL) are scientifically-based, generic assessment criteria designed to be used in the first stage (Tier 1) of an assessment of potential human health risk from chronic exposure to contaminants.

HILs are applicable to assessing health risk arising via all relevant pathways of exposure for a range of metals and organic substances. The HIL are generic to all soil types and apply generally to a depth of 3 m below the surface for residential use. Site-specific conditions may determine the depth to which HILs apply for other land uses.

HSLs are applicable to selected petroleum compounds and fractions to assess the risk to human health via inhalation and direct contact pathways. HSL have been developed for different land uses, soil types and depths to contamination.

Whilst it is noted that a childcare centre is proposed for the site, due to the proposed location Level 9 and the childcare centre having its own outdoor play area located on Level 9, it is not considered necessary to assess the site using the most conservative residential HILs as there is minimal likelihood of children coming into contact with site soils..

Due to the proposed landscaping of the land above the railway tunnels and the proposed inclusion of power and usb plugin points it is anticipated that there is potential for future site users to access site soils that have not been removed during excavation and construction.

The generic HIL and HSL are considered to be appropriate for the assessment of contamination at the site. Given the proposed land use as a mixed use development, discussed above, the adopted HIL and HSL are:

- **HIL-B** – Residential with minimal opportunities to access soil.
- **HIL-D** – Commercial/Industrial; and
- **HSL-D** – Commercial/ industrial (for vapour intrusion).

The HSL adopted are predicated on the inputs summarised in Table 3.

Table 3: Inputs to the Derivation of HSLs

Variable	Input	Rationale
Potential exposure pathway	Soil vapour intrusion (inhalation) / Direct Contact *	Potential exposure pathways include vapour intrusion through concrete slabs from potentially contaminated filling against the basement walls. There is also the risk of soil vapours during any excavation of potentially contaminated filling. Direct contact with site soils in landscaped areas above the railway tunnels.
Soil Type	Sand	A mixture of soil types including sand, silt and clay were encountered (Section 10). Sand has been adopted as the initial conservative screen.
Depth to contamination	0 m to <1 m	A conservative approach has been adopted for this assessment.

* Developed by CRC CARE (2011)

The adopted soil HIL and HSL for the potential contaminants of concern are presented in Table 4.

Table 4: Health Investigation and Screening Levels (HIL and HSL) in mg/kg unless otherwise indicated

Contaminants		HIL-B	HIL-D	HSL-D Vapour Intrusion
Metals	Arsenic	500	3 000	-
	Cadmium	150	900	-
	Chromium (VI)	500	3 600	-
	Copper	30 000	240 000	-
	Lead	1 200	1 500	-
	Mercury (inorganic)	120	730	-
	Nickel	1 200	6 000	-
	Zinc	60 000	400 000	-
PAH	Benzo(a)pyrene TEQ[1]	4	40	-
	Naphthalene	NC	NC	NL [3]
	Total PAH	400	4 000	-
TRH	C6 – C10 (less BTEX) [F1]	-	-	260
	>C10-C16 (less Naphthalene) [F2]	-	-	NL [3]
	>C16-C34 [F3]	-	-	-
	>C34-C40 [F4]	-	-	-
BTEX	Benzene	-	-	3
	Toluene	-	-	NL [3]
	Ethylbenzene	-	-	NL [3]
	Xylenes	-	-	230
Phenol	Pentachlorophenol (used as an initial screen)	130	660	-
OCP	Aldrin + Dieldrin	10	45	-
	Chlordane	90	530	-
	DDT+DDE+DDD	600	3 600	-
	Endosulfan	400	2 000	-
	Endrin	20	100	-
	Heptachlor	10	50	-
	HCB	15	80	-
	Methoxychlor	500	2 500	-

Contaminants		HIL-B	HIL-D	HSL-D Vapour Intrusion
OPP	Chlorpyrifos	340	2 000	-
PCB [2]		1	7	-
PFAS [4]	PFHxS	2	20	-
	PFOS	2	20	-
	PFOA	20	50	-
VOC			PQL as initial screening concentration. Reference to national or international standards above the PQL.	

Notes:

1 Sum of carcinogenic PAH
2 Non dioxin-like PCBs only.
3 NL – not limiting
4 PFAS guidelines derived from *PFAS NEMP 2018* and are presented as interim guidelines

9.1.2 Ecological Investigation Levels

Ecological Investigation Levels (EIL) have been derived for selected metals and organic compounds and are applicable for assessing risk to terrestrial ecosystems (NEPC, 2013). EIL depend on specific soil physiochemical properties and land use scenarios and generally apply to the top 2 m of soil, which corresponds to the root zone and habitation zone of many species. The EIL is determined for a contaminant based on the sum of the ambient background concentration (ABC) and an added contaminant limit (ACL). The ABC of a contaminant is the soil concentration in a specific locality that is the sum of naturally occurring background levels and the contaminants levels that have been introduced from diffuse or non-point sources (e.g. motor vehicle emissions). The ACL is the added concentration (above the ABC) of a contaminant above which further appropriate investigation and evaluation of the impact on ecological values is required.

The EIL is calculated using the following formula:

EIL = ABC + ACL,

The ABC is determined through direct measurement at an appropriate reference site or through the use of methods defined by Olszowy et al *Trace element concentrations in soils from rural and urban areas of Australia*, Contaminated Sites monograph no. 4, South Australian Health Commission, Adelaide, Australia 1995 (Olszowy, 1995) or Hamon et al, *Geochemical indices allow estimation of heavy metal background concentrations in soils*, Global Biogeochemical Cycles, vol. 18, GB1014, (Hamon, 2004). ACL is based on the soil characteristics of pH, CEC and clay content.

EIL (and ACLs where appropriate) have been derived in NEPC (2013) for only a short list of contaminants comprising As, Cu, Cr (III), DDT, naphthalene, Ni, Pb and Zn. An *Interactive (Excel) Calculation Spreadsheet* may be used for calculating site-specific EIL for these contaminants, and has been provided in the ASC NEPM Toolbox available on the SCEW (Standing Council on Environment and Water) website (http://www.scew.gov.au/node/941).

The adopted EIL, derived from the *Interactive (Excel) Calculation Spreadsheet* are shown in the following Table 5. The following site specific data and assumptions have been used to determine the EILs:

- A protection level of 80% for urban residential and public open space land has been adopted;
- The EILs will apply to the top 2m of the soil profile;
- Given the likely source of soil contaminants (i.e. historical filling) the contamination is considered as "aged" (>2 years);
- ABCs have been derived using the *Interactive (Excel) Calculation Spreadsheet* using input parameters of NSW for the State in which the site is located, and for high traffic volumes. No background concentration is assumed for lead (conservative);
- EILs were calculated based on average pH, CEC and clay content values for soils collected across the site, the values used were: pH = 5.5, CEC = 5.4 $cmol_c/kg$ and clay content= 25%.

Table 5: Ecological Investigation Levels (EIL) in mg/kg

Analyte		EIL	Comments
Metals	**Arsenic**	100	*Adopted pH of 5.5, CEC of 5.4 $cmol_c/kg$; and clay content of 25%.
	Copper	130	
	Nickel	45	
	Chromium III	550	
	Lead	1100	
	Zinc	310	
PAH	**Naphthalene**	170	
OCP	**DDT**	180	
PFAS [1]	**PFOS**	1	
	PFOA	10	

Note:

1 PFAS guidelines derived from *PFAS NEMP 2018* and are presented as interim guidelines

9.1.3 Ecological Screening Levels – Petroleum Hydrocarbons

Ecological Screening Levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. ESL apply to the top 2 m of the soil profile as for EIL.

ESL have been derived in NEPC (2013) for petroleum fractions F1 to F4 as well as BTEX and Benzo(a)pyrene. Site specific data and assumptions as summarised in Table 6 have been used to determine the ESL. The adopted ESL, from Table 1B(6), Schedule B1 of NEPC (2013) are shown in Table 7.

Table 6: Inputs to the derivation of ESL

Variable	Input	Rationale
Depth of ESL application	Top 2 m of the soil profile	The top 2 m depth below ground level corresponds to the root zone and habitation zone of many species.
Land use	Urban residential and public open space	Most sensitive land use.
Soil Texture	Coarse	A mixture of soil types including sand, silt and clay were encountered (Section 10), therefore sand (coarse) has been adopted as the initial conservative screen.

Table 7: Ecological Screening Levels (ESL) in mg/kg

Analyte		ESL	Comments
TRH	**C6 – C10 (less BTEX) [F1]**	180*	*All ESLs are low reliability apart from those marked with * which are moderate reliability
	>C10-C16 (less Naphthalene) [F2]	120*	
	>C16-C34 [F3]	300	
	>C34-C40 [F4]	2800	
BTEX	**Benzene**	50	
	Toluene	85	
	Ethylbenzene	70	
	Xylenes	105	
PAH	**Benzo(a)pyrene**	0.7	

9.1.4 Management Limits – Petroleum Hydrocarbons

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards;
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

Management Limits to avoid or minimise these potential effects have been adopted in NEPC (2013) as interim Tier 1 guidance. Management Limits have been derived in NEPC (2013) for the same four petroleum fractions as the HSL (F1 to F4). The adopted Management Limits, from Table 1B(7), Schedule B1 of NEPC (2013) are shown in the following Table 8. The following site specific data and assumptions have been used to determine the Management Limits:

- The Management Limits will apply to any depth within the soil profile;
- The Management Limits for residential, parkland and public open space as the most sensitive land use;
- A mixture of soil types including sand, silt and clay were encountered (Section 10), therefore sand (coarse) has been adopted as the initial conservative screen.

Table 8: Management Limits in mg/kg

Analyte		Management Limit
TRH	**$C_6 - C_{10}$ (F1) #**	700
	$>C_{10}$-C_{16} (F2) #	1000
	$>C_{16}$-C_{34} (F3)	2500
	$>C_{34}$-C_{40} (F4)	10000

Separate management limits for BTEX and naphthalene are not available hence these have not been subtracted from the relevant fractions to obtain F1 and F2

9.1.5 Asbestos in Soil

Bonded asbestos-containing material (ACM) is the most common form of asbestos contamination across Australia, generally arising from:

- Inadequate removal and disposal practices during demolition of buildings containing asbestos products;
- Widespread dumping of asbestos products and asbestos containing filling on vacant land and development sites; and
- Commonly occurring in historical filling containing unsorted demolition materials.

Mining, manufacturing or distribution of asbestos products may result in sites being contaminated by friable asbestos including free fibres. Severe weathering or damage to bonded ACM may also result in the formation of friable asbestos comprising fibrous asbestos (FA) and/or asbestos fines (AF).

Asbestos only poses a risk to human health when asbestos fibres are made airborne and inhaled. If asbestos is bound in a matrix such as cement or resin, it is not readily made airborne except through substantial physical damage. Bonded ACM in sound condition represents a low human health risk, whilst both FA and AF materials have the potential to generate, or be associated with, free asbestos fibres. Consequently, FA and AF must be carefully managed to prevent the release of asbestos fibres into the air.

For samples taken from jars for general analysis of chemicals the presence or absence of asbestos at a limit of reporting of 0.1 g/kg as well as a visual assessment for the presence or absence of ACM has been adopted as the SAC.

NEPC (2013) defines the various asbestos types referred to above as follows:

Bonded ACM: Asbestos containing material which is in sound condition, bound in a matrix of cement or resin, and cannot pass a 7 mm x 7 mm sieve;

FA: Fibrous asbestos material including severely weathered cement sheet, insulation products and woven asbestos material. This material is typically unbonded or was previously bonded and is now significantly degraded and crumbling; and

AF: Asbestos fines including free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.

For 500 mL bag samples the adopted SAC for AF / FA will be 0.001% w/w and for ACM 0.04 % w/w (applicable to any fill soils retained on site) will be adopted consistent with the residential B threshold.

9.2 Groundwater

The potential receptors of impacted groundwater from the site include:

- Future occupiers of the site (construction and maintenance workers, workers, visitors and residents);
- Workers conducting excavations, construction or maintenance works within the site or nearby the site;
- Localised groundwater; and
- Open water bodies (Homebush Bay).

Given there are no registered domestic groundwater bores on site, and that the site is in a heavily urbanised area with water supplies, ingestion via drinking water is excluded as a pathway to human receptors.

9.2.1 Groundwater Investigation Levels

The Groundwater Investigation Levels (GILs) adopted in NEPC (2013) are based on:

- *Australian Drinking Water Guidelines* 2011 (ADWG);
- *Guidelines for Managing Risk in Recreational Waters* 2008 (GMRRW);
- *National water quality management strategy. Australian and New Zealand guidelines for fresh and marine water quality* 2000 (ANZECC & ARMCANZ).
- *PFAS National Environmental Management Plan (NEMP) 2018* (PFAS NEMP).

ANZECC & ARMCANZ has since been replaced by Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018). Therefore the GIL have been adjusted where necessary to comply with ANZG (2018).

On the basis of the identified potential human and ecological receptors, the adopted GILs are as follows:

- The fresh water GIL from NEPC (2013) for a highly disturbed fresh water system, at a general protection level of protection of 80% of species.

The adopted GIL for the analytes included in the assessment (where applicable), and the corresponding source documents, are shown in Table 9.

Table 9: Groundwater Investigation Levels (in µg/L unless otherwise stated)

Analyte		NEPC (2013) Fresh [1]	Comments
Metals	Arsenic (V)	13	[#] Corrected for hardness (*hard*) in accordance with ANZG (2018)
	Cadmium	0.8[#]	
	Chromium (VI)	4.4	
	Copper	1.4	
	Lead	9.4[#]	
	Mercury (total)	0.6	
	Nickel	17.0[#]	
	Zinc	31.0[#]	
PAH	Naphthalene	85	
	Benzo(a)pyrene	NC	
BTEX	Benzene	2000	
	Toluene	-	
	Ethylbenzene	-	
	Xylene (o)	640	
	Xylene (p)	340	
	Xylenes (Total)	-	
OCP	Chlordane	0.27	
	DDT	0.04	
	Endosulfan	1.8	
	Endrin	0.06	
	Heptachlor	0.7	
	Aldrin + Dieldrin	-	
	Heptachlor Expoxide	-	
	Lindane	1	
OPP	Chlorpyrifos	1.2	
	Diazinon	0.08	
	Dimethoate	0.3	
	Fenitrothion	0.4	
	Ethion	-	
	Malathion	1.1	
	Parathion	0.04	
PCB	Aroclor 1242	1.7	
	Aroclor 1254	0.2	
PFAS [2]	PFHxS	-	
	PFOS	31	
	PFOA	1824	

Notes:
1 *Investigation levels apply to typically highly disturbed systems*
2 PFAS guidelines derived from *PFAS NEMP 2018* and are presented as interim guidelines

9.2.2 Health Screening Levels – Petroleum Hydrocarbons

Health Screening Levels (HSLs) are used to assess selected petroleum compounds and fractions to assess the risk to human health via inhalation and direct contact with affected soils and groundwater. Depths to groundwater were recorded between 10.5 m and 10.6 m bgl. The proposed development includes a four to five level basement therefore parts of the basement will be below the recorded groundwater table. The generic HSL are not applicable were the depth to groundwater is less than 2 m. Therefore the laboratory practical quantitation limits (PQL) have been adopted as an initial screen

10. Field Work Results

10.1 Boreholes

Details of the subsurface conditions encountered are given in the borehole logs included in Appendix E, with notes defining classification methods and descriptive terms.

The general sequence of materials encountered in the boreholes is summarised below:

Pavements:	Typically asphalt to between 0.01 m and 0.05 m bgl.
Filling:	Roadbase – grey, fine to medium grained angular roadbase gravel to depths of between 0.2 m and 0.25 m bgl in boreholes BH1 to BH4.
	Silty Clay – brown and grey silty clay filling with trace of sand, gravel and ripped sandstone to depths of between 0.5 m and 1.1 m bgl in boreholes BH1 to BH4.
	Ripped Shale - grey and brown sand, sandy clay and ripped shale gravel filling to depths of 6.5 m and 5.5 m bgl respectively in BH5 and BH6, with fill directly onto bedrock.
Residual Soil:	Clay, grey-brown, with occasional ironstone bands to depths of between 1.5. and 2.3 m bgl in boreholes BH1 to BH4.
Weathered Bedrock:	Extremely low to low strength grey laminite and shale, with some ironstone bands to depths of between 5.1 and 9.1 m bgl.
Bedrock:	Medium and high strength, grey laminite and shale to a maximum depth of 20.85 m bgl

No free groundwater or seepage was encountered in the boreholes during augering. The use of water as a drilling fluid precluded any observations of groundwater while coring the underlying rock.

Deeper filling overlying weathered bedrock was encountered in BH5 and BH6 in the southern portion of the site near the cut and cover rail tunnels.

There were no visual or olfactory indicators (i.e. staining or odours) to suggest the presence of contamination within the bores.

10.2 Groundwater Readings

Monitoring wells were installed in boreholes BH2, BH3 and BH6 to allow measurement of groundwater levels. The water level readings taken from each monitoring well are shown in Table 10.

Table 10: Groundwater Level Readings

Date	Borehole BH2		Borehole BH3		Borehole BH6	
	Depth (m)	RL (m, AHD)	Depth (m)	RL (m, AHD)	Depth (m)	RL (m, AHD)
*11 Sept 2018	10.58	2.92	4.83	9.77	10.45	4.45
19 Sept 2018	10.64	2.86	10.48	4.12	10.50	4.40

* measured prior to purging (removing drilling water)

11. Analytical Results

11.1 Laboratory Quality Assurance and Quality Control (QA/QC)

This investigation has been devised in general accordance with the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of NEPC (2013). The DQO process is outlined as follows:

- State the problem;
- Identify the decision;
- Identify inputs into the decision;
- Define the boundary of the assessment;
- Develop a decision rule;
- Specify acceptable limits on decision errors; and
- Optimise the design for obtaining data.

Referenced sections for the respective DQOs listed above are provided in Appendix G.

11.2 Data Quality Indicators

The performance of the assessment in achieving the DQO was assessed through the application of data quality indicators (DQI) as defined by:

Precision: A quantitative measure of the variability (reproducibility) of data;

Accuracy: A quantitative measure of the closeness of reported data to the “true” value;

Representativeness: The confidence (expressed qualitatively) that data are representative of each media present on the site;

Completeness: A measure of the useable data from a data collection activity; and

Comparability: The confidence (expressed qualitatively) that data can be considered equivalent for each sampling and analytical event.

Further comments on the DQIs are presented in Appendix G.

11.3 Soils

A summary of the results of the laboratory analysis undertaken on the soil samples and from the HLA 2002 investigation is presented in Table F1 in Appendix F.

The results of the HLA 2002 investigation have been assessed under the adopted SAC for this investigation. The reported soil chemical analysis results were all within the adopted SAC with the exception of nickel at BH37/0.02 (163 mg/kg), which exceeds the EIL for urban residential and public open space use. BH37 was located in the middle of the northern site boundary and appears to have undergone redevelopment since 2002.

The reported soil chemical analysis results for this investigation were all within the adopted SAC. Concentrations of TRH, BTEX, OCP, OPP, PCB, phenols, VOC and asbestos were all at or below the laboratory PQL, whilst metals, PAH and PFAS results were below the SAC, with the exception of nickel at BD1/20180904 (53 mg/kg) which is a duplicate sample of BH6/1.0, which exceeds the EIL for urban residential and public open space use. Whilst this sample exceeds the SAC, it is considered that a statistical analysis of the results would indicate that the single nickel exceedance does not indicate a wider risk to the site. .

11.4 Groundwater

A summary of the results of the laboratory analysis undertaken on the groundwater samples is presented in Table F2 in Appendix F.

The reported concentrations for BH2 were at or below the laboratory PQL for OCP, OPP, PAH, PCB, PFAS and phenols. Metals and TRH were below the adopted SAC with the exception of copper (0.004 mg/L) and nickel (0.027 mg/L) which both exceed the GIL for fresh water, and toluene (0.002 mg/L), m&p-xylene (0.002 mg/L), o-xylene (0.001 mg/L) and TRH F1 fraction (0.033 mg/L) which are above the initial HSL vapour screening level (PQL).

The reported concentrations for BH3 were at or below the laboratory PQL for OCP, OPP, PCB, phenols and PFAS. PAH was below the adopted SAC. Metals, BTEX and TRH were below the adopted SAC with the exception of copper (0.008 mg/L) which exceeds the GIL for fresh water, and ethylbenzene (0.002 mg/L), o-xylene (0.001 mg/L) and TRH F1 fraction (0.018 mg/L) which are above the initial HSL vapour screening level (PQL).

The reported groundwater chemical analysis results for BH6 were below the laboratory PQL with the exception of arsenic, nickel and zinc which were below the adopted SAC.

It is noted that the site is located within a highly disturbed system so the GIL exceedances of copper and zinc in BH2 and BH3 are considered likely to be reflective of background concentrations within the surrounding region. The exceedances in BH2 and BH3 of ethylbenzene, toluene, xylene and TRH F1 fraction are exceedances of the PQL as it is not appropriate to use the HSL.

12. Conclusions and Recommendations

Based on the findings of this investigation, which included only limited sampling and testing, the potential for significant contamination to be present within the site is considered to be low. It is considered that the site can be made suitable for the proposed commercial development subject to the following:

1. Undertake a further round of groundwater sampling and analysis for the presence of TRH, BTEX and full VOC suite to assess the vapour risk of petroleum hydrocarbons in groundwater;
2. Preparation of a waste classification / VENM assessment prior to or during bulk excavation; and
3. Preparation of an unexpected finds protocol (UFP) prior to bulk excavation of the site.

13. Limitations

Douglas Partners (DP) has prepared this report for this project at Carpark P6D, Cnr Australia Ave and Parkview Dr, Sydney Olympic Park in accordance with DP's proposal SYD180435 dated 7 August 2018 and acceptance received from Greg Hynd of Ecove Group Pty Ltd. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Ecove Group Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Asbestos has not been detected by observation or by laboratory analysis, either on the surface of the site, or in filling materials at the test locations sampled and analysed, however it is possible that some

may be present on site associated with building demolition materials, such as concrete, tile, glass, foam and plastic. If encountered during excavation these are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints, or to parts of the site being inaccessible and not available for inspection/sampling. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the (geotechnical / environmental / groundwater) components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

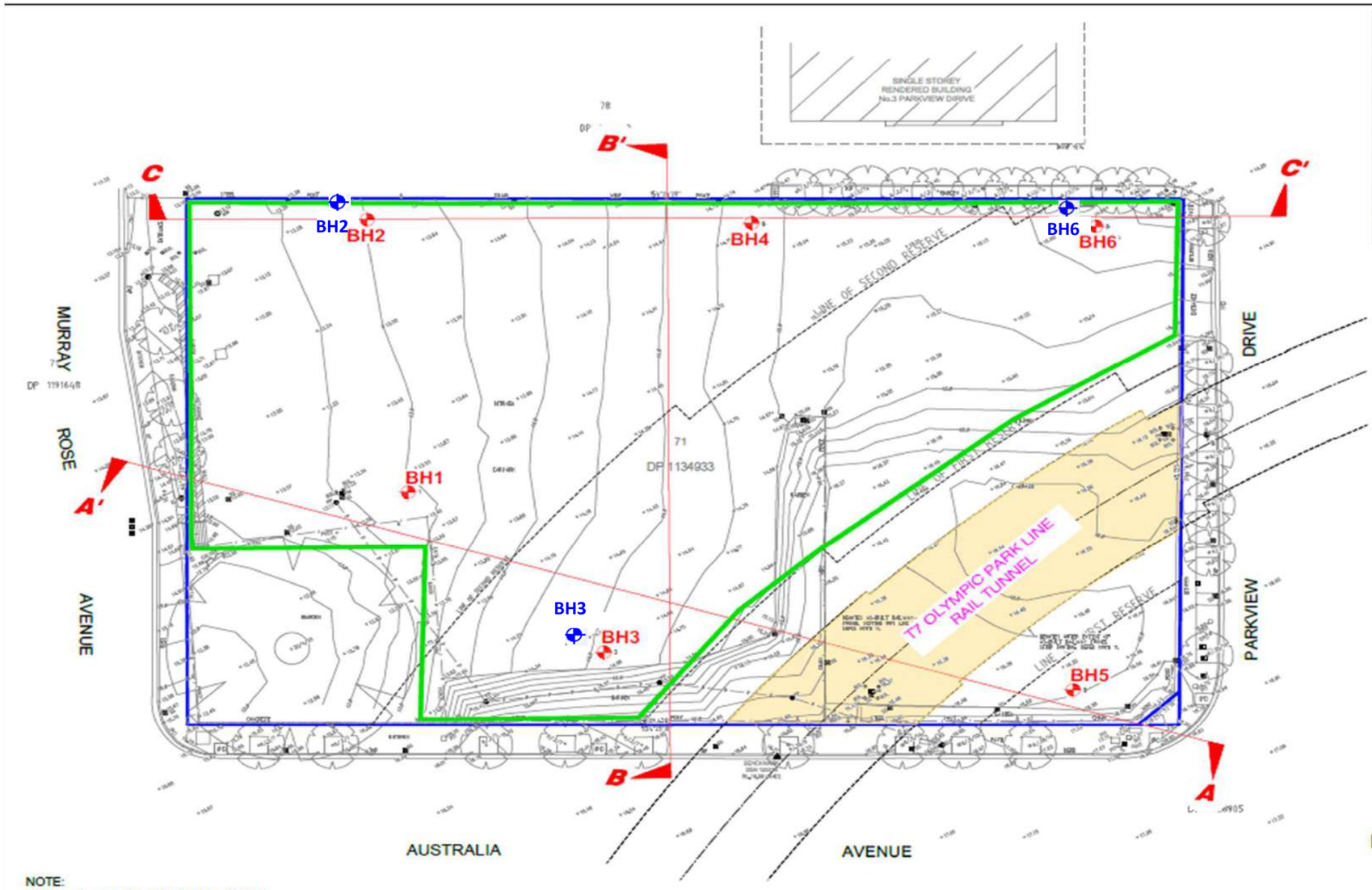
The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Appendix B

Drawing 1 – Borehole Locations



Locality Plan



NOTE:
1: Base drawing from LTS Lockley Pty Ltd (Ref 50357 002DT, dated 14.6.2018)
2: Test locations are approximate only and are shown with reference to existing features.

0 5 10 15 20 30 40 50m
1:500 @ A3

LEGEND
- Borehole location
- Groundwater monitoring well location
- Geotechnical Cross Section A-A'
- Approx, extent of proposed basement

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Ecove Pty Ltd		TITLE: Test Location Plan Carpark P6D (Site 2) Olympic Park, SYDNEY	PROJECT No: 86411.00
OFFICE: Sydney	DRAWN BY: PSCH		DRAWING No: 1
SCALE: 1:500 @ A3	DATE: 17.9.2018		REVISION: 0

Appendix C

Previous Reports



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STAGE 1/2 ENVIRONMENTAL SITE ASSESSMENT

PROPOSED MOTEL DEVELOPMENT

PART LOT 71, DP 1134933
CARPARK P6D
SYDNEY OLYMPIC PARK

14/06/2016



E14 104-BR1

E14 104 - BR1

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14/06/2016

Document - E14 104-BR1_SydneyOlympicPark SIS2 ESA.Rpt

STAGE 1 & 2 ENVIRONMENTAL SITE ASSESSMENT

PROPOSED MOTEL DEVELOPMENT
PART LOT 71, DP 1134933
CARPARK P6D
SYDNEY OLYMPIC PARK

We are pleased to provide this Stage 1 & 2 Environmental Site Assessment (ESA) at the above mentioned site.

The objective of this investigation is to assess the possible extent of contamination of the site and to provide guidance during the Development Application process to validate the site for the proposed commercial use OR to identify the remediation required the render the site suitable for the proposed commercial use.

In summary, historical information was obtained and soil and groundwater samples were collected and tested for identified contaminants of concern. Historical information suggested that there was some potential for contamination, so further assessment of the site was conducted including the chemical testing.

It can be concluded that the data obtained in this assessment indicates that the site will be suitable for the proposed commercial use with no further requirements.

1 INTRODUCTION

The purpose of this S1/2 ESA investigation is to obtain past and current information about possible contamination levels and distribution on the site for development as a commercial site and to review all data on the site, including historical uses and any previous investigations.

As mentioned above, the objective of this investigation is to assess the possible extent of contamination of the site and to provide guidance during the Development Application process to validate the site for the proposed commercial use OR to identify the remediation required the render the site suitable for the proposed commercial use, namely a multi storey motel development.

1.1 Existing and Proposed Development Details

The site is denoted as Part Lot 71, DP 1134933 with site boundaries shown on the attached Figure 1 and site location shown on the attached Figure 2. Currently the site comprises an existing asphaltic concrete sealed car park.

New development will involve the construction of a new multi storey motel complex and associated infrastructure. Detailed designs were not available at the time of assessment.

2 SITE DETAILS

The site is located to the east of Australia Avenue and to the north of Parkview Drive, within the Sydney Olympic Park precinct, NSW and is approximately 3,000 m^2 in area in total. The site is bound by existing roads to the north and west and existing car parking areas to the south and east, with the surrounding development comprising sporting facilities, accommodation and commercial buildings and is summarised below in Table 1.

TABLE 1 – SUMMARY OF SITE DETAILS

SITE ADDRESS:	Carpark P6D, Sydney Olympic Park. Cnr Australia Avenue and Parkview Drive
APPROXIMATE SITE AREA:	Total site area is approximately 3,000m^2.
SITE IDENTIFICATION	Part Lot 71 DP 1134933. The site is situated in the Local Government Area of Auburn
CURRENT AND PREVIOUS LANDUSE:	Existing Asphaltic Sealed Car Park. Information suggests that the area was Crown Land prior to 1950's. The area was then used for industrial purposes, that were ceased prior to the 2000 Olympics. The vacant area was then used as the existing car park since 2002.
PROPOSED LANDUSE:	The proposed new land use is for the creation of a commercial development, namely a new multi storey motel development.
ADJOINING SITE USES:	The site is surrounded by other commercial developments, sporting facilities and car parking areas.

Reference should be made to the proposed development plans (including plan and section views) contained in all construction drawings prepared.

The attached Photographs 1 to 4 detail onsite features noted during a site walkover prior to and during the drilling of boreholes and underground service clearance.

The topography of the site consists of slightly sloping area, sloping from the south down to the north on the eastern edge of a residual deposit adjacent to of alluvial floodplains west of the site. Drainage on the site comprised surface water run off into the existing piped stormwater system. Vegetation on the site comprised of a large protected fig tree in the north western corner of the site, with some smaller landscaping trees on the eastern and western boundary of the site.

The following observations were made during the site walkover;

- The site is rectangular in shape with an area of approximately 3000 m^2.
- Site access is via the existing carpark to the south of the site at the Park View Drive end. Access is also via Murray Rose Avenue in the northern corner of the site.
- At the time of the inspection the majority of the site was sealed with surface material consisting of asphaltic concrete.
- The site was partially fenced at the time of assessment.
- Some trees were located on the boundary of the site with a large protected fig tree in the western corner of the site. This tree is protected by a local planning policy.
- No existing development was located on the lots at the time of assessment apart from the carpark pavement.
- Stormwater collection systems observed on site on the day of investigation consisted of gutters, pits and pipes.

The following observations were made regarding the current on-site infrastructure:

- A Stored Chemicals Information Register (SCIR) search has been completed and there are no entries on the register for the site. The search letter is contained in this report as Attachment 10.
- A concrete stormwater system, comprising pits and piping removes surface run off from the site;
- Fill associated with pavement construction was found on the site as per usual light flexible pavement design and specifications, overlying natural material;
- A metal pole lighting system was installed for the carpark and a landscaped garden was located on the western and south western boundary.

3 SITE GEOLOGY AND HYDROLOGY

The site appears to be characterised by pavement material approximately 0.4m to 0.5m in depth overlying some limited shallow fill overlying residual clays overlying weathered rock. Fill material was mainly detected in the drilling process in the pavement material above about 0.6m depth. Rock material was encountered at depths ranging from 1.5m to 2.5m as shown on the attached Engineering Logs.

Hydrological data for the site suggests that groundwater was located at a depth of 1.5 – 2.5m below existing surface levels, suggesting that this material is seepage in the residual tracking across the underling rock material. A groundwater monitoring well was installed at the lowest point of the site (BH2) to obtain a baseline groundwater sample.

4 HISTORICAL SEARCH

4.0 Desktop Study

A Desktop Study has been undertaken to identify potentially contaminating activities that are currently being performed on the site and that may have been performed on the site in the past, and to identify potential Areas of Environmental Concern (AECs) and Chemicals of Concern (CoCs).

4.1 Land Title Search

A land title search and history of title transactions has been carried out with the NSW department of Land and Property Information and is attached to this report as Appendix 9.

Results are summarised below in Table 2:

TABLE 2 – SUMMARY OF HISTORY OF TITLE SEARCH

Lot 71 DP 1134933	
Date	**Title – 71/1134933**
03/07/2009	Edition 1 – Lot 71 in DP 1134933 at Homebush, Local Government Area Auburn, Parish of Concord, County of Cumberland. First Schedule – Sydney Olympic Park Second Schedule – 2 Notifications 1. Reservations and Conditions in the Crown Grant(s) 2. L827059 – Right of Way 20.115m wide appurtenant to the part of the land shown so benefited from the title diagram being the residue of Vol. 6129 Fol. 216 at 28/04/1970 affecting Lot 100 in DP 1042833 and Lots 10 & 15 in DP 778665

Lot 71 DP 1134933	
Date	**Title – 71/1134933**
03/07/2009	DP 1134933 – Deposited Plan – Folio Created Ed. 1
06/07/2009	AE812898 - Departmental Dealing
18/08/2010	DP1114423 – Withdrawn – Pre-examination Plan
16/05/2012	AG988855 – Departmental Dealing

Lot 14 DP 1110035	
Date	**Title – 14/1110035**
25/06/2007	DP 1110035 – Deposited Plan – Folio Created Ed. 1
26/06/2007	AD217596 – Departmental Dealing
02/06/2009	AE720968 – Departmental Dealing
09/06/2009	AE735159 – Departmental Dealing
03/07/2009	DP1114933 – Deposited Plan – Folio Cancelled

Lot 74 DP 818981	
Date	**Title – 74/818981**
03/08/1992	DP 818981 - Deposited Plan
01/10/1992	E799640/799641 – Withdrawal of Caveat
22/09/1993	I378527 / I356058 / I378525 – Request / Application Ed. 2
18/05/1995	O470143 – Departmental Dealing
08/12/1995	O738097 - Request
25/08/1997	3350416 – Departmental Dealing
28/01/1998	3755286 – Departmental Dealing
03/03/1998	DP85562 – Deposited Plan – Folio Cancelled

Lot 5 DP 774130	
Date	**Title – 5/774130**
23/6/1988	DP774130 - Deposited Plan , Folio Created ED. 1
10/4/1989	Y27673 - Request Transfer Granting Easement – Ed 2.
3/7/1990	Z98397 – Departmental Dealing - Z80438 – Request Transfer of Lease - Z80440 - Transfer of Lease Ed 3.
3/3/1992	E295488 – Caveat
8/4/1992	E377182 - Caveat
3/8/1992	E617299 – Application - DP818981 – Deposited Plan – Folio Cancelled – Residue Remains
17/10/2002	DP1045522 - Deposited Plan
22/11/2002	9148874 - Departmental Dealing – Folio Restored
22/11/2002	8971451 - Request – Folio Cancelled – Residue Remains
6/2/2008	DP1122970 - Deposited Plan

26/8/2008	AE170873 - Departmental Dealing
28/10/2008	AE136428 Request – Folio Cancelled - AE292555 Departmental Dealing - AE292760 - Departmental Dealing – Folio Cancelled – Residue Remains
12/3/2014	AI435678 - Departmental Dealing
20/5/2014	AI590976 - Departmental Dealing – Folio Restored
20/05/2014	Ai591058 - Departmental Dealing – Folio Cancelled – Residue Remains

Lot 14 DP 1110035	
Date	**Title – 14/1110035**
25/06/2007	DP 1110035 – Deposited Plan – Folio Created Ed. 1
26/06/2007	AD217596 – Departmental Dealing
02/06/2009	AE720968 – Departmental Dealing
09/06/2009	AE735159 – Departmental Dealing
03/07/2009	DP1114933 – Deposited Plan – Folio Cancelled

4.2 Contamination Notices

A search of the NSW EPA Office of Environment and Heritage indicates that the site is **not** a contaminated site notified to the EPA as of 10 June 2016. It is recommended that the council registered site owner obtain a Section 149 Certificate to identify if there are any further environmental issues or constraints for the site.

A plan provided by the Sydney Olympic Park Authority (attached) indicates that the site is outside of the reclaimed or contaminated areas within the Olympic Park Precinct, designated as Section 28 Notice and Section 35 Notice and VRA areas as shown on the attached plan.

4.3 Areas of Environmental Concern (AECs) and Contaminants of Concern (CoCs)

TABLE 3 – AREAS OF CHEMICAL CONCERN

Area of Concern	Possible Mode of Contamination	Contaminants of Concern
Existing Pavement Material	- Spilt oil / fuel / grease; - Contaminated Pavement Materials; - Existing asphalt.	- TRH; - PAH; - BTEX; - Heavy Metals;
Imported Fill	- Imported from contaminated sites	- TRH; - PAH; - BTEX; - Heavy Metals; - Asbestos

NOTES:
** = It is important to note that this is not an assessment of the financial risk associated with the AEC in the event contamination is detected, but a qualitative assessment of the probability of contamination being detected at the potential AEC.*

Metals - Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc; TRH - Total Recoverable Hydrocarbons; PAH - Polycyclic Aromatic Hydrocarbons; OCP - Organochlorine Pesticides; OPP – Organophosphorus Pesticides

4.4 Aerial Photograph Summary

The following summarises the results of aerial photography searches and are attached to this report, in Attachment 5;

- Black and White (Unknown Date) – Area is located on the edge of the existing industrial estate;

- 2002 – Area is vacant land with an access track intersecting the site north-west to south-east and an existing carpark upslope to the south;

- 2005 – Site remains vacant land with a soil stockpile located in the western portion of the site, south of the protected tree;

- 2007 – Northern portion of the site has been developed into a carpark, with discrete soil stockpiles located in the southern portion of the site;

- 2009 – The remaining southern portion of the site has been developed into a carpark with northern access in the centre of the boundary.

- 2011 – Northern boundary access has been moved to the northern corner of the carpark. The site is now in its current format.

- 2016 – The site is in its current format.

Historical information as contained in Table 2 above and anecdotal evidence suggests that the land has had the following uses:

TABLE 4 – CHRONOLOGICAL LIST OF SITE USES

Time Period	Land Use
Prior to 1950's	Vacant Crown Land
1950's – Prior 2000	Industrial Land
2000 – Present	Existing Car Park

5 ASSESSMENT OF PAST INVESTIGATIONS

Previous reports have not been reviewed as part of this investigation.

6 SOIL ASSESSMENT

6.1 Data Quality Objectives

An intrusive soil investigation was designed in accordance with the adopted assessment framework described below and based upon the site data obtained above in

The objective of this investigation is to determine the extent of possible onsite contamination and the process of re-development of the site. Further soil and groundwater assessment may be required during construction if unexpected contamination is found during construction.

A conceptual Site Model has been detailed in Section 8 below.

Site boundaries are indicated on the attached Figure 1. Proposed excavation depths indicate that bulk excavation is required for adequate foundation construction.

Decisions to be made and the criteria to be used is listed as follows;

- Assessment of the contamination type and distribution on the site has been made using the requirements of the National Environmental Protection Measures NEPM (2013);

- Assessment of the groundwater contamination using criteria described in the NEPM (2013);

- Assessment of laboratory results against the NEMP (2013) – Schedule B1 and the CRC Contamination Assessment and Remediation of the Environment – Technical Report 10 – HSL's for Petroleum Hydrocarbons in Soil and Groundwater 2011.

To minimise the potential of decisions errors all data will be assessed against the NSW EPA Guidelines for the NSW Site Auditor Scheme – Appendix V – Quality Assurance and Quality Control.

It is assumed that some errors may be contained within the assembled data and information. If it is found during contaminated material excavation that conditions encountered onsite differ significantly from those suggested by the collected data, the referenced RAP – Contingency plan should be referred to and the environmental consultant should be contacted and made aware of the situation.

Table A of the *NSW EPA Sampling Design Guidelines 2011* specifies that the minimum number of recommended sampling points for a site this size (approximately 3,000m^2 equating to 0.3 hectares) is 9. Eighteen (18) primary samples and two (2) duplicate samples were selected and forwarded to ALS Environmental Laboratories to achieve an adequate spread of the site.

The material profile present on the site consisted of the following;

- Pavement material approximately 0.4m to 0.5m in depth overlying;
- Limited shallow fill to a depth of 0.6m associated with pavement construction overlying;
- Residual clays to a depth of 1.5m to 2.5m overlying;
- Weathered rock.
-

Reference should be made to the attached engineering logs, namely Attachment 6.

6.2 Soil Sampling Methodology

Asbestos was not tested for because the only fill material detected onsite was associated with the existing pavement layer including underlying gravels. It was observed that the pavement gravels were free from anthropogenic material. Due to the highly controlled nature and recent placement of this pavement material it can be assumed that there is negligible likelihood of asbestos contamination in the pavement fill.

Borehole locations were selected prior to commencement of drilling based on drilling rig access requirements and ensuring an appropriate spread of the site was sampled including up gradient and down gradient areas. All borehole and groundwater well locations are shown on the attached Figure 1.

The locations were then cleared by a professional service locator to ensure that all boreholes were clear of underground utilities and services. All boreholes were drilled using a trailer mounted drilling rig equipped with solid flight augurs to TC Bit refusal depth.

Soil samples were taken from various depths in BH1 to BH6. The depth at which the soil samples were taken and tested was dictated by changes in soil characteristics and other such factors as odour and colour.

Eighteen (18) primary samples and two (2) duplicate samples and one (1) groundwater sample was tested for the following CoC's;

- TRH
- PAH's
- BTEXN
- PC's
- Metals

All sampling was undertaken in accordance with all relevant Australian Standards, including *AS 1726 – 1993 – Geotechnical Site Investigations*, with reference to the CLM Act and associated guidelines as mentioned above. All laboratories used were NATA Certified.

6.2 QA/QC

A field duplicate sample was taken at a rate of 1 per 10 samples, meaning that two duplicate samples were required. Duplicates indicated QA/QC was maintained.

New latex gloves were worn during sampling and replaced prior to collection of each sample. All collected samples were placed in laboratory supplied glass with Teflon coated lids. Decontamination of sampling equipment was carried out with Decon 90 and clean water. Samples were then placed on ice and transported to a fridge at our premises prior to dispatch to the laboratory.

A Chain of Custody form was prepared and accompanied samples to the laboratory. Laboratory QA/QC procedures are detailed in the attached laboratory testing results.

All QA/QC documentation supplied by the laboratory is contained in ALS document referenced in this report.

6.3 Soil Laboratory Testing

The following tables, Table 5a and Table 5b detail the laboratory testing results of the collected soil samples tabulated against **the relevant NEPM Health Based Investigation Levels (HBIL's) for Commercial / Industrial specifications.**

TABLE 5a – ENVIRONMENTAL TESTING OF SOIL SAMPLES (CHEMICALS)

	C_6-C_{10}	C_{10}-C_{16}	C_{16}-C_{34}	C_{34}-C_{40}	Benzene	Toluene	Ethyl Benzene	Xylene	Total PAH's
Threshold[1]	***26000***	***20000***	***27000***	***38000***	***430***	***99000***	***27000***	***81000***	***4000***
BH1 0.1m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH1 0.6m	ND	ND	ND	ND	ND	ND	ND	ND	1.7
BH1 3.5M	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH2 0.2m	ND	ND	430	330	ND	ND	ND	ND	8.9
BH2 2.0m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH2 2.5m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH3 0.4m	ND	ND	290	160	ND	ND	ND	ND	2.1
BH3 1.0m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH3 3.0m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH4 0.6m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH4 1.0m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH4 4.5m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH5 0.5m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH5 2.5m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH5 4.0M	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH6 0.2m	ND	ND	420	960	ND	ND	ND	ND	ND
BH6 1.1m	ND	ND	ND	ND	ND	ND	ND	ND	ND
BH6 3.0m	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dup 1 BH1 0.6m	ND	ND	ND	ND	ND	ND	ND	ND	2.6
Dup 2 BH 3 1.0m	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

1 Threshold values for **Total PAH's** based upon *National Environmental Protection Council (NEPC) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) – Schedule B1, Table 1A(1), Column B – Residential* **and values for the remaining CoC's based upon** *The CRC Contamination Assessment and Remediation of the Environment – Technical Report 10 – HSL's for Petroleum Hydrocarbons in Soil and Groundwater 2011* in the absence of NEPM threshold data.

2 All values reported in mg/kg of dry soil weight.

3 **Bold** values denote those exceeding the threshold concentrations.

4 ND denotes Non Detect.

TABLE 5b – ENVIRONMENTAL TESTING OF SOIL SAMPLES (METALS)

	Arsenic	Cadmium	Chromium	Copper	Lead	Zink	Nickel	Mercury
Threshold[1]	***3000***	***900***	***3600***	***240000***	***1500***	***730***	***6000***	***730***
BH1 0.1m	*ND*	*1*	*8*	*108*	*6*	*34*	*84*	*ND*
BH1 0.6m	*6*	*ND*	*10*	*14*	*13*	*ND*	*8*	*ND*
BH1 3.5M	*ND*	*ND*	*7*	*28*	*18*	*5*	*43*	*ND*
BH2 0.2m	*ND*	*ND*	*26*	*63*	*70*	*17*	*146*	*ND*
BH2 2.0m	*9*	*ND*	*23*	*18*	*22*	*ND*	*6*	*ND*
BH2 2.5m	*ND*	*ND*	*10*	*57*	*27*	*35*	*160*	*ND*
BH3 0.4m	*5*	*ND*	*28*	*38*	*73*	*19*	*155*	*ND*
BH3 1.0m	*10*	*ND*	*28*	*30*	*26*	*3*	*19*	*ND*
BH3 3.0m	*ND*	*ND*	*8*	*40*	*15*	*ND*	*17*	*ND*
BH4 0.6m	*12*	*ND*	*33*	*19*	*44*	*8*	*37*	*ND*
BH4 1.0m	*10*	*ND*	*26*	*20*	*22*	*ND*	*6*	*ND*
BH4 4.5m	*5*	*ND*	*11*	*76*	*20*	*34*	*160*	*ND*
BH5 0.5m	*14*	*ND*	*42*	*14*	*42*	*7*	*42*	*ND*
BH5 2.5m	*ND*	*ND*	*6*	*31*	*13*	*ND*	*18*	*ND*
BH5 4.0M	*ND*	*ND*	*8*	*18*	*10*	*2*	*12*	*ND*
BH6 0.2m	*ND*	*ND*	*17*	*121*	*10*	*9*	*61*	*ND*
BH6 1.1m	*8*	*ND*	*25*	*17*	*17*	*3*	*10*	*ND*
BH6 3.0m	*ND*	*ND*	*8*	*24*	*16*	*ND*	*10*	*ND*
Dup 1 BH1 0.6m	*13*	*ND*	*10*	*28*	*6*	*ND*	*34*	*ND*
Dup 2 BH 3 1.0m	*6*	*ND*	*10*	*28*	*18*	*6*	*44*	*ND*

Notes:

1 Threshold based upon *National Environmental Protection Council (NEPC) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM 2013) – Schedule B1, Table 1A(1), Column D – Commercial / Industrial.*

5 All values reported in mg/kg of dry soil weight.

6 ND denotes Non Detect or below Limit of Reading

In summary, laboratory testing results for soil samples tested indicate that **TRH, BTEX, Phenolic Compounds, PAH's and metals levels detected are below** laboratory detection limits or relevant guideline threshold concentrations in all locations.

7 WATER ASSESSMENT

Groundwater seepage was noted in all boreholes with the exception of BH1 at depths ranging from 4.0m to 6.5m. A sampling well was installed in BH2 to obtain a groundwater sample.

7.1 Water Sampling Methodology

The groundwater well was constructed as per NEPM (2013) Schedule B2 – Section 8.2.3 – Well Construction.

The groundwater bore was constructed using the following methods in the location as shown on the attached Figure 1;

- Solid flight auguring of borehole to termination depth;
- Installation of a factory slotted PVC piezometer, with 1.5m of screen at the base the remainder of blank at the top;
- Backfilling of the void with graded well sand to a depth of 0.5m below surface;
- Plugging of the remaining 0.5m with bentonite clay and installation of a flush gattic cover to allow traficability.

All sampling was undertaken in accordance with all relevant Australian Standards, including *AS 1726 – 1993 – Geotechnical Site Investigations*, with reference to the CLM Act and associated guidelines. All laboratories used were NATA Certified

7.2 QA/QC

All groundwater wells were purged prior to sampling using a disposable plastic bailer. New neoprene gloves were worn during sampling and replaced prior to collection of each sample. All collected samples were placed in laboratory supplied vials. Decontamination of sampling equipment was carried out with Decon 90 and clean water. Samples were then placed on ice and transported to a fridge at our premises prior to dispatch to the laboratory. A Chain of Custody form was prepared and accompanied samples to the laboratory. Laboratory QA/QC procedures are detailed in the attached laboratory testing results. All QA/QC documentation supplied by the laboratory is contained in ALS document referenced in this report.

7.3 Groundwater Laboratory Testing

The following tables, Table 6a and Table 6b detail the laboratory testing results of the collected water sample compared to **the relevant NEPM Health Based Investigation Levels (HBIL's) for Commercial / Industrial specifications.**

TABLE 6a – ENVIRONMENTAL TESTING OF WATER SAMPLES FOR CHEMICALS
(With Appropriate Threshold Values)

Location and depth to GW below existing surface	C_{10}-C_{40}	Benzene	Toluene	Ethyl Benzene	Xylene	Total PAH's	Naphthalene
Threshold[1]	***600***	**300**	**300**	**140**	**380**	**3**	**16**
BH2	440	BDL	BDL	BDL	BDL	2.0	BDL

TABLE 6b – ENVIRONMENTAL TESTING OF WATER SAMPLES FOR METALS
(With Appropriate Threshold Values)

Location and Depth	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zink
Threshold[1]	**13**	**0.2**	**1**	**1.4**	**3.4**	**0.06**	**11**	**8**
BH2	0.227	0.0178	0.392	**4.32**	1.96	0.0043	0.659	4.96

Notes: [1] Threshold values in ***italics*** based upon *ANZEEC (2000) National Water Quality Management Strategy – Australian Guidelines for Water Quality Monitoring and Reporting (Dutch Intervention Limits)* and threshold values in **bold** form NEPM (2013) Table 1(C) – Groundwater investigation Levels (GIL's) or the *NSW EPA Contaminated Sites – Guidelines for Assessing Service Station Sites, Table 4 "Threshold concentrations – Waters"* where insufficient Data is present or non-existent in ANZECC / NEPM Guidelines and have also been assessed against *The CRC Contamination Assessment and Remediation of the Environment – Technical Report 10 – HSL's for Petroleum Hydrocarbons in Soil and Groundwater 2011* . All values reported in µg/L with the exception of Lead reported in mg/L.

7 ***Bold*** denotes value exceeds threshold.

3 BDL denotes Below Detection Limits

Groundwater analytical testing results are compared to set criteria as described in the above Table 6a and 6b. Certificates of analysis are referenced and should be read in conjunction with this report this report.

In summary laboratory testing results for groundwater samples tested indicate that **all TRH, BTEX, Phenolic Compounds or PAH's levels are not detected or are below** the relevant threshold concentrations.

Laboratory testing results for groundwater samples tested indicate that **all heavy metal concentration levels detected are below** the relevant threshold concentrations with the exception of Copper (4.32 mg/L with threshold level at 1.4).

8 CONCEPTUAL SITE MODEL

This Conceptual Site Model (CSM) is specific to this site and is based on a review of all available information, including site inspections / investigations and historical searches.

The following sensitive receptors have been identified on the site;

- Nearby residents and businesses in both the short and long term;
- Site personnel working on the demolition, remediation and construction of the site;
- Long term businesses after construction of the development;
- Any nearby waterways;
- Groundwater.

All potential contamination sources are noted in Section 8 – Contamination Sources.

At the time of assessment, the surface water existed the site by way of limited infiltration, with the majority being surface run off that drained to the onsite pits and piping that drained to the existing stormwater system.

In summary, soil material encountered comprised of pavement asphalt and gravels overlying residual clays underlain by shallow weathered rock.

Groundwater seepage was detected on the site at a depth of approximately 4.0m to 6.5m below existing surface levels at BH2 to BH6. It is presumed that groundwater collected groundwater is probably flowing through the semi permeable residual material above the weathered rock material.

It is assessed that the following potential contamination migration pathways are present on the site;

- Groundwater migrating offsite;
- Contaminated material being removed offsite during bulk excavations;

The nature and extent of contamination considered likely to be found on the site is negligible as shown by the historical information, site walkover, borehole excavations and laboratory testing of both soil and groundwater samples collected.

Due to the past use of the site the following sources of isolated possible contaminated areas and possible contamination were identified;

Possible Onsite Contaminated Areas

- The imported pavement gravels.

Possible Onsite Contamination

- **Uncontrolled Fill** imported during adjacent construction phases over time. This material was not detected during the onsite drilling;

Possible Offsite Contamination Sources

- Possible contaminated groundwater flowing on the site from adjoining properties;

8.1 Contaminants of Concern (CoC's)

The following contaminants of concern were tested for in soil and water samples:

- TRH (Total Recoverable Hydrocarbons)
- Total PAH's (Polycyclic Aromatic Hydrocarbons)
- BTEX (Benzene, Toluene, Ethyl Benzene and Xylene)
- Lead and select heavy metals including cadmium, chromium, zinc, copper, mercury, arsenic and nickel;
- Phenolic Compounds

Other contaminants of concern that could be present on the site, and considered during further investigations, site validation and remediation, as indicated by the *UPSS Technical Note : Site Validation Reporting*, include the following:

- VOC's (Volatile Organic Compounds)
- Chlorinated Solvents (degreasers);
- pH of the medium;

9 RECOMMENDATIONS

Based on the information contained in Section 1 – 7 above It is recommended that the site is suitable for the proposed commercial development with no further requirements.

Waste Classification assessment should be carried out on the pavement material prior to offsite removal for appropriate disposal or recycling. Hydrocarbons were detected in the pavement material at BH2, BH3 and BH6. This may be explained by cross contamination during construction or asphalt placement. It may prove more cost effective to strip the asphalt and pavement gravels separately, for separate offsite disposal. Elevated copper was detected in the groundwater sample, indicating that any groundwater generated during construction should be classified accordingly as per the Liquid Waste Classification Guidelines, referenced in this report.

If unexpected contamination is encountered during construction, work should be stopped and the environmental consultant should be advised.

10 LIMITATIONS

It is the nature of contaminated site investigations that the degree of variability in site conditions cannot be known completely and no sampling and analysis program can eliminate all uncertainty concerning the condition of the site. Professional judgement must be exercised in the collection and interpretation of the data.

In preparing this assessment, current guidelines for assessment and management of contaminated land were followed. This work has been conducted in good faith in accordance with Sanko's understanding of the client's brief and general accepted practice for environmental consulting.

This assessment was prepared with the objective of providing guidance on the remediation and validation activities to be undertaken. No warranty, expressed or implied, is made as to the information and professional advice included in this report. Anyone using this document does so at their own risk and should satisfy themselves concerning the applicability of its application and where necessary should seek expert advice in relation to the particular situation.

If you have any further questions about this report, please contact the undersigned.

For and on behalf of
Sanko Excavation Environmental and Civil Services P/L



Damien Sankowsky *BE(Env)*
Principal Environmental Engineer
Sanko Excavation Environmental and Civil Services P/L

Attachments:

- *1. Report Limitations*
- *2. Figure 1 – Site Location*
- *3. Figure 2 –Test Locations*
- *4. Site Photographs 1 – 4*
- *5. Historical Photographs*
- *6. Log Explanation Sheets*
- *7. Engineering Borehole Logs*
- *8. Laboratory Testing Results for Soil and Water and QA/QC*
- *9. Historical Information*
- *10. SafeWork NSW Stored Chemical Information Register Search Letter*
- *11. Sydney Olympic Park Precinct Contamination Areas*

References:

- *NEPC National Environmental Protection Measures NEMP (2013)*
- *The CRC Contamination Assessment and Remediation of the Environment – Technical Report 10 – HSL's for Petroleum Hydrocarbons in Soil and Groundwater 2011*
- *Guidelines for Consultants Reporting on Contaminated Sites (OEH 2011)*
- *NSW EPA Sampling Design Guidelines (2011)*
- *NSW EPA Waste Classification Guideline, Part 1: Classifying Waste*
- *NSW EPA Guidelines for the NSW Site Auditor Scheme (2nd edition)*
- *Protection of the Environment Operations (Waste) Regulation 2005 – General Exemption Under Part 6, Clause 51 and 51A - The excavated natural material exemption 2012*
- *Guidelines for the Assessment and Management of Groundwater Contamination (DECC 2007)*
- *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (DECC 2009)*
- *Site Validation Reporting (DECCW 2010b)*
- *The Requirements of the Guidelines for the NSW Site Auditor Scheme (DEC 2006)*
- *AS4629;2004 "Method for the Qualitative Identification of Asbestos in Bulk Samples"*

Sanko

Excavation Environmental & Civil Services P/L • Environmental and Geotechnical Engineering

REPORT LIMITATIONS

Sanko Excavation Environmental and Civil Service Pty Ltd have undertaken a site assessment in accordance with current industry and professional standards. The scope of works were limited to that as set out in the proposal as refered to in this investigation. This report is based upon limited site investigation and subsurface sampling and laboratory testing of samples as set out in the forementioned proposal. Report findings are based upon site conditions at the time of investigation and as such can not be relied upon for unqualified warranties or assume liablity for site conditions not observed and/or accessable during or at the time of investigation. The works are restricted to the site detailed in the report with no offsite investigations conducted. Despite all resaonable care and dilligance taken ground conditions encountered and contaminant concentrations may not represent conditions between sample locations. Site characteristics may also change subsequent to this investigation due to natural processes, chemical reactions, spilling or leaking of contaminants, change in water levels or dumping of fill. All observations and interpretation is made from a limited number of observation points assuming geological and chemical conditions are representative across the site. No other warranties are made or intended. Third parties should seek their own independent advice regarding report contents. This report has been prepared exclusively for the client as detailed on the report and remains the property of this company and the client and can not be reproduced without the written consent of the client as detailed on the report and can then only be reproduced in its entirety.



E14 104-BR1 - PHOTOGRAPH 1



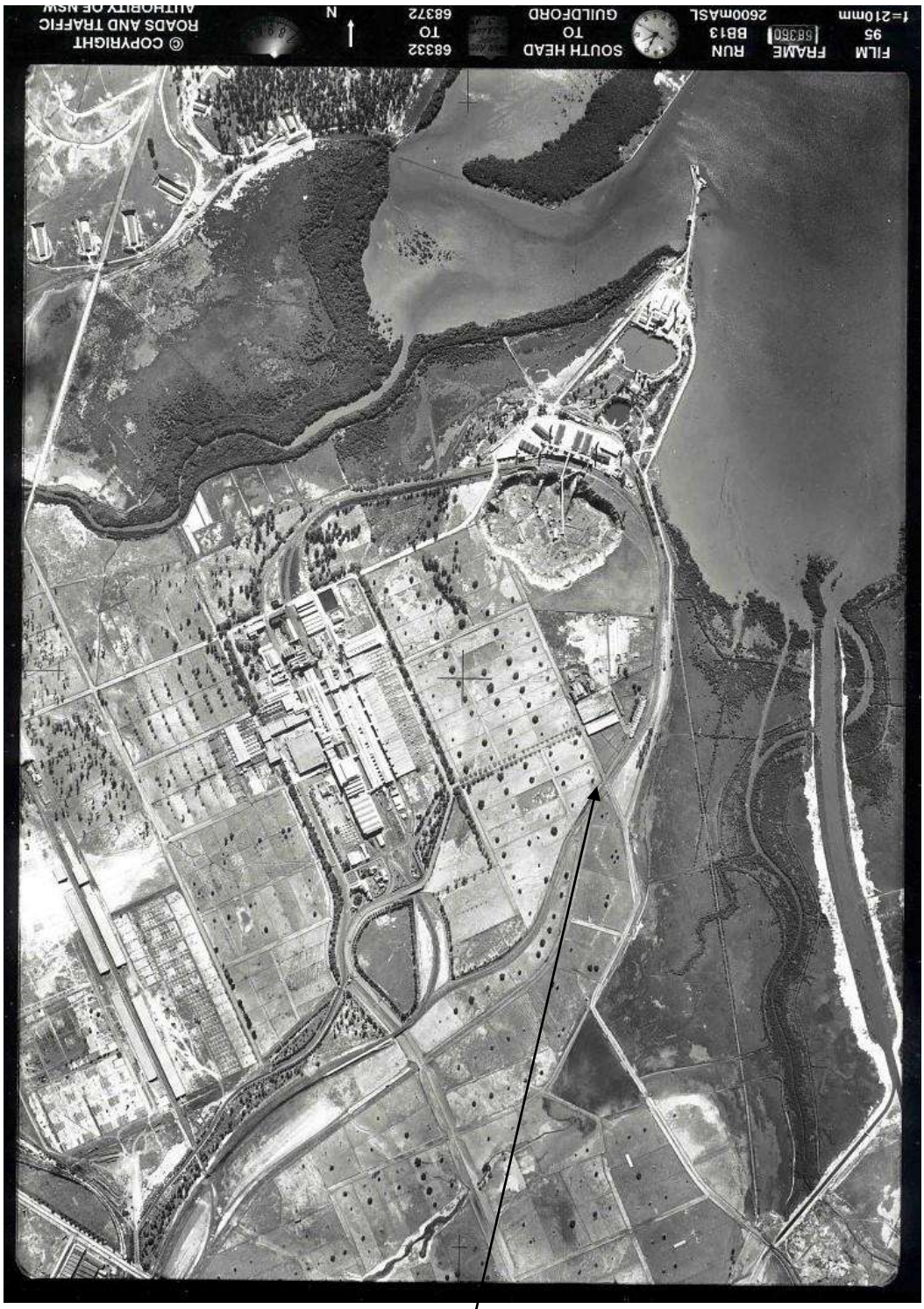
E14 104-BR1 - PHOTOGRAPH 2



E14 104-BR1 - PHOTOGRAPH 3



E14 104-BR1 - PHOTOGRAPH 4



Approximate Site Location

Unknown Date

E14 104-BR1 Historical Photographs



2002



2005

E14 104-BR1 Historical Photographs



2009



2014

E14 104-BR1 Historical Photographs

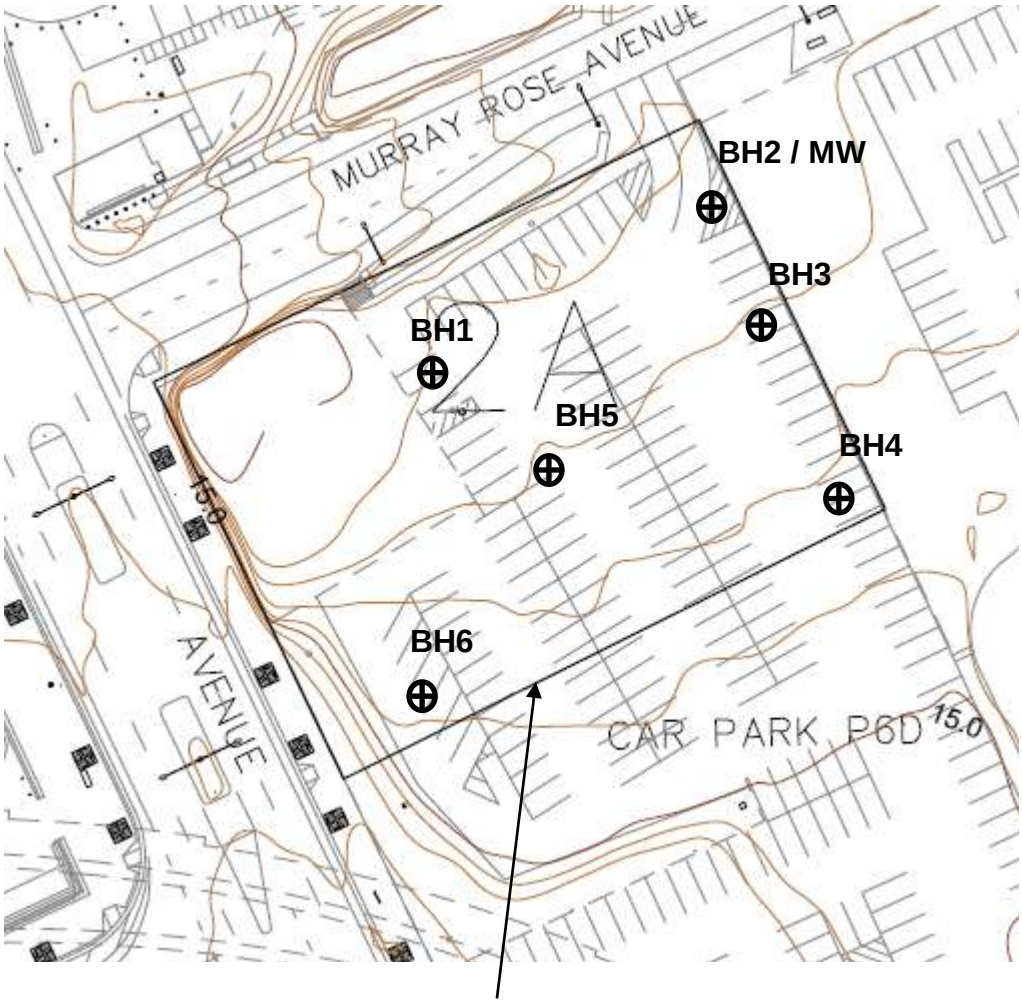
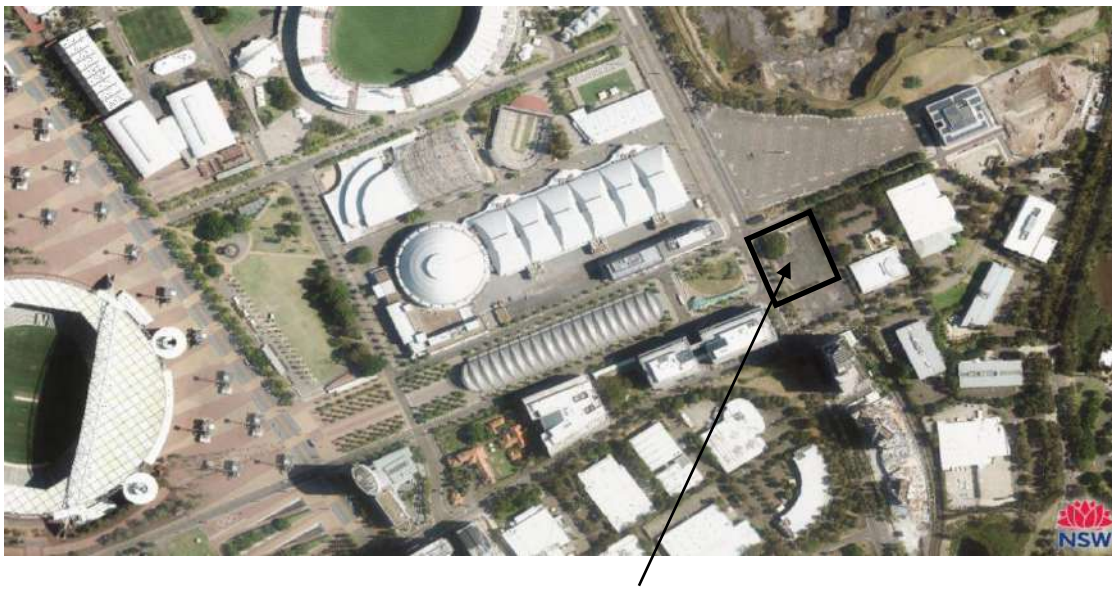


FIGURE 1

CARPARK 6D
SYDNEY OLYMPIC PARK

BOREHOLE LOCATION

E14 104-BR1 June 2016



Site Location

FIGURE 2

CARPARK 6D
SYDNEY OLYMPIC PARK

SITE LOCATION

E14 104-BR1 June 2016

DEFINITION:

In engineering terms soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

CLASSIFICATION SYMBOL & SOIL NAME

Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 µm to 2.36 mm
	medium	200 µm to 600 µm
	fine	75 µm to 200 µm

MOISTURE CONDITION

Dry Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.

Moist Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere.

Wet As for moist but with free water forming on hands when handled.

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH s_u (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort.
Soft	12 - 25	A finger can be pushed into the soil to about 25mm depth.
Firm	25 - 50	The soil can be indented about 5mm with the thumb, but not penetrated.
Stiff	50 - 100	The surface of the soil can be indented with the thumb, but not penetrated.
Very Stiff	100 - 200	The surface of the soil can be marked, but not indented with thumb pressure.
Hard	>200	The surface of the soil can be marked only with the thumbnail.
Friable	–	Crumbles or powders when scraped by thumbnail.

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very loose	Less than 15
Loose	15 - 35
Medium Dense	35 - 65
Dense	65 - 85
Very Dense	Greater than 85

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT IN:
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

ZONING		CEMENTING	
Layers	Continuous across exposure or sample.	Weakly cemented	Easily broken up by hand in air or water.
Lenses	Discontinuous layers of lenticular shape.	Moderately cemented	Effort is required to break up the soil by hand in air or water.
Pockets	Irregular inclusions of different material.		

GEOLOGICAL ORIGIN

WEATHERED IN PLACE SOILS

Extremely weathered material — Structure and fabric of parent rock visible.

Residual soil — Structure and fabric of parent rock not visible.

TRANSPORTED SOILS

Aeolian soil — Deposited by wind.

Alluvial soil — Deposited by streams and rivers.

Colluvial soil — Deposited on slopes (transported downslope by gravity).

Fill — Man made deposit. Fill may be significantly more variable between tested locations than naturally occurring soils.

Lacustrine soil — Deposited by lakes.

Marine soil — Deposited in ocean basins, bays, beaches and estuaries.

SOIL DESCRIPTION EXPLANATION SHEET 1/2

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 60 mm and basing fractions on estimated mass)							USC	PRIMARY NAME
COARSE GRAINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm	(About the smallest particle visible to the naked eye)	GRAVELS More than half of coarse fraction is larger than 2.0 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.			GW	GRAVEL
				Predominantly one size or a range of sizes with more intermediate sizes missing.			GP	GRAVEL
			GRAVELS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below)			GM	SILTY GRAVEL
				Plastic fines (for identification procedures see CL below)			GC	CLAYEY GRAVEL
		SANDS More than half of coarse fraction is smaller than 2.0 mm	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes missing			SW	SAND
				Predominantly one size or a range of sizes with some intermediate sizes missing.			SP	SAND
			SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).			SM	SILTY SAND
				Plastic fines (for identification procedures see CL below).			SC	CLAYEY SAND
FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm	(A 0.075 mm particle is about the smallest particle visible to the naked eye)		IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm.					
				DRY STRENGTH	DILATANCY	TOUGHNESS		
		SILTS & CLAYS Liquid limit less than 50		None to Low	Quick to slow	None	ML	SILT
				Medium to High	None	Medium	CL	CLAY
				Low to medium	Slow to very slow	Low	OL	ORGANIC SILT
		SILTS & CLAYS Liquid limit greater than 50		Low to medium	Slow to very slow	Low to medium	MH	SILT
				High	None	High	CH	CLAY
				Medium to High	None	Low to medium	OH	ORGANIC CLAY
HIGHLY ORGANIC SOILS		Readily identified by colour, odour, spongy feel and frequently by fibrous texture.					Pt	PEAT

• Low plasticity – Liquid Limit W_L less than 35%. • Modium plasticity – W_L between 35% and 50%.

COMMON DEFECTS IN SOIL

TERM	DEFINITION	DIAGRAM
PARTING	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (eg bedding). May be open or closed.	
JOINT	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.	
SHEARED ZONE	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.	
SHEARED SURFACE	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.	

TERM	DEFINITION	DIAGRAM
SOFTENED ZONE	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.	
TUBE	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter	
TUBE CAST	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases the soil which makes up the tube cast is cemented.	
INFILLED SEAM	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries which cuts through a soil mass. Formed by infilling of open joints.	

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SOIL DESCRIPTION EXPLANATION SHEET 2/2

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Client:	**GWH Build Pty Ltd**	Report Number:	**P642 - 1/1**
Job Number:	**P642**	Report Date:	**9/12/2014**
Project:		Order Number:	
Location	,	Test Method :	
Lab No:	**S14-3649**	**Sample Location**	
Date Sampled:	**7/12/2014**	Proposed Mecure Hotel	
Date Tested:	**AS**	VC Ref: Q2014_94	
Sampled By:	**Lonnie Broekman**	BH:1	
Sample Method:	**AS1289.1.2.1**	Depth;	
Material Source:	**-**		
For Use As:	**existing pavement**		
Remarks:	**-**		

Horizon (m)	Description	Sample Details	Comments
0-.030	ASPHALTIC CONCRETE,		Pavement Condition - Good, no defects
.030-.200	(GW) Sandy GRAVEL,Grey,Dense		some moisture, Fill
.200-.800	(CL) Sandy Gravelly CLAY,Orange Brown,Firm	, PP= 150 kPa	some moisture
.800-2.5m	(CH) CLAY,Medium to High Plasticity,Orange Grey,Firm to Stiff	, PP= 250 kPa	some moisture Moist, Natural
2.5m-5.5m	Siltstone,Grey,Stiff to Very Stiff		Borehole Refusal with T/C Bit at 5.5m below existing pavement surface

DCP Results

Lab No: S14-3649

Date Tested: 7/12/2014

Test Method: AS1289.6.3.2

Condition: existing pavement

Depth	Blows
0.00 - 0.10	-
0.10 - 0.20	-
0.20 - 0.30	3
0.30 - 0.40	4
0.40 - 0.50	4
0.50 - 0.60	3
0.60 - 0.70	3
0.70 - 0.80	2
0.80 - 0.90	3
0.90 - 1.00	3
1.00 - 1.10	2
1.10 - 1.20	7
1.20 - 1.30	3
1.30 - 1.40	3
1.40 - 1.50	4
1.50 - 1.60	4
1.60 - 1.70	5
1.70 - 1.80	5
1.80 - 1.90	5
1.90 - 2.00	5
2.00 - 2.10	15
2.10 - 2.20	20
2.20 - 2.30	25
2.30 - 2.40	Dcp-Term

ABN: 50 103 355 531
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Client:	**GWH Build Pty Ltd**	Report Number:	**P642 - 2/1**
Job Number:	**P642**	Report Date:	**9/12/2014**
Project:		Order Number:	
Location	,	Test Method :	
Lab No:	**S14-3634**	**Sample Location**	
Date Sampled:	**7/12/2014**	Proposed Mecure Hotel	
Date Tested:	**AS**	VC Ref: Q2014_94	
Sampled By:	**Lonnie Broekman**	BH:2	
Sample Method:	**AS1289.1.2.1**	Depth; 0.5/-1.5m	
Material Source:	**-**		
For Use As:	**Subgrade**		
Remarks:	**-**		

Horizon (m)	Description	Sample Details	Comments
0-.050	ASPHALTIC CONCRETE,		Pavement Condition - Good, no defects
.050-.500	(GW) Sandy GRAVEL,Dark Grey,Dense		dry, Fill
.500-1.8m	(CH) Sandy CLAY,some gravel Grey,Firm to Stiff	, PP= 250 kPa	some moisture
1.8m-2.2m	(CH) Sandy CLAY,Grey Brown,mottled Stiff	, PP= 300 kPa	some moisture Moist, Natural
2.2m-7.0m	Siltstone,Grey,Stiff to Very Stiff		Borehole Refusal at 7m water inflow at 4m below existing pavement surface

DCP Results

Depth	Blows
0.00-0.10	-
0.10-0.20	-
0.20-0.30	-
0.30-0.40	-
0.40-0.50	Start of Dcp
0.50-0.60	1
0.60-0.70	1
0.70-0.80	1
0.80-0.90	1
0.90-1.0	7
1.0-1.1	7
1.1-1.2	8
1.2-1.3	9
1.3-1.4	10
1.4-1.5	10
1.5-1.6	15
1.6-1.7	Dcp-Ref

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Client:	**GWH Build Pty Ltd**	Report Number:	**P642 - 3/1**
Job Number:	**P642**	Report Date:	**9/12/2014**
Project:		Order Number:	
Location	,	Test Method :	

Lab No:	**S14-3636**	**Sample Location**
Date Sampled:	**7/12/2014**	Proposed Mecure Hotel
Date Tested:	**AS**	VC Ref: Q2014_94
Sampled By:	**Lonnie Broekman**	BH:3
Sample Method:	**AS1289.1.2.1**	Depth; 0.5/-1.2m
Material Source:	**-**	
For Use As:	**Subgrade**	
Remarks:	**-**	

Horizon (m)	Description	Sample Details	Comments
0-.050	ASPHALTIC CONCRETE,		Pavement Condition - Good, no defects
.050-.500	(GW) Sandy GRAVEL,Dark Grey,Dense		some moisture, Fill
.500-2.2m	(CH) CLAY,Medium to High Plasticity,Grey Brown,Firm	, PP= 350 kPa	Moist, Natural
2.2m-6.5m	Siltstone,Grey,Stiff to Very Stiff		Borehole Refusal with T/C Bit at 6.5m below existing pavement surface

DCP Results

Lab No: S14-3636
Date Tested: 7/12/2014
Test Method: AS1289.6.3.2
Condition: existing pavement

Depth	Blows
0.00 - 0.10	-
0.10 - 0.20	-
0.20 - 0.30	-
0.30 - 0.40	-
0.40 - 0.50	Start of Dcp
0.50 - 0.60	1
0.60 - 0.70	1
0.70 - 0.80	1
0.80 - 0.90	3
0.90 - 1.00	8
1.00 - 1.10	10
1.10 - 1.20	18
1.20 - 1.30	23
1.30 - 1.40	25
1.40 - 1.50	Dcp-Term

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Client:	**GWH Build Pty Ltd**	Report Number:	**P642 - 4/1**
Job Number:	**P642**	Report Date:	**9/12/2014**
Project:		Order Number:	
Location	,	Test Method :	
Lab No:	**S14-3631**	**Sample Location**	
Date Sampled:	**7/12/2014**	Proposed Mecure Hotel	
Date Tested:	**AS**	VC Ref: Q2014_94	
Sampled By:	**Lonnie Broekman**	BH:4	
Sample Method:	**AS1289.1.3.1**	U50 Tube Sample	
Material Source:	-		
For Use As:	-		
Remarks:	-		

Horizon (m)	Description	Sample Details	Comments	DCP Results
0-.050	ASPHALTIC CONCRETE,		Pavement Condition - Good, no defects	Lab No: S14-3631 Date Tested: 7/12/2014 Test Method: AS1289.6.3.2 Condition: existing pavement
.050-.500	(GW) Sandy GRAVEL,Dense		, Fill	
.500-.700	(CL) Sandy Gravelly CLAY,Dark Grey Soft		some moisture	
.700-1.5m	(CH) CLAY,Medium to High Plasticity,Red Grey,brownFirm		Moist, Natural	
1.5m-5.0m	Siltstone,Grey,Stiff to Very Stiff		Borehole Refusal with T/C Bit at 5m below existing pavement	

Depth	Blows
0.00 - 0.10	-
0.10 - 0.20	-
0.20 - 0.30	-
0.30 - 0.40	-
0.40 - 0.50	Start of Dcp
0.50 - 0.60	1
0.60 - 0.70	1
0.70 - 0.80	1
0.80 - 0.90	7
0.90 - 1.00	7
1.00 - 1.10	8
1.10 - 1.20	9
1.20 - 1.30	12
1.30 - 1.40	20
1.40 - 1.50	23
1.50 - 1.60	25
1.60 - 1.70	Dcp-Term

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Client:	**GWH Build Pty Ltd**	Report Number:	**P642 - 4/1**
Job Number:	**P642**	Report Date:	**9/12/2014**
Project:		Order Number:	
Location	,	Test Method :	

Lab No:	**S14-3632**	**Sample Location**
Date Sampled:	**7/12/2014**	Proposed Mecure Hotel
Date Tested:	**AS**	VC Ref: Q2014_94
Sampled By:	**Lonnie Broekman**	BH:5
Sample Method:	**AS1289.1.3.1**	U50 Tube Sample
Material Source:	-	
For Use As:	-	
Remarks:	-	

Horizon (m)	Description	Sample Details	Comments
0-.030	ASPHALTIC CONCRETE,		Pavement Condition - Good, no defects
.030-.300	(GW) Sandy GRAVEL,Dark Grey,Dense		some moisture, Fill
.300-.600	(CL-CH) sandy CLAY,Dark Brown,Soft		Moist,
.600-2.0m	(CH) CLAY,Medium to High Plasticity,Firm	, PP= 300 kPa	Moist, Natural
2.0m-4.8m	Siltstone,Grey,Stiff to Very Stiff		Borehole Refusal with T/C Bit at 4.8m below existing pavement surface

DCP Results

Lab No: S14-3632
Date Tested: 7/12/2014
Test Method: AS1289.6.3.2
Condition: existing pavement

Depth	Blows
0.00 - 0.10	-
0.10 - 0.20	-
0.20 - 0.30	-
0.30 - 0.40	-
0.40 - 0.50	Start of Dcp
0.50 - 0.60	1
0.60 - 0.70	1
0.70 - 0.80	1
0.80 - 0.90	6
0.90 - 1.00	8
1.00 - 1.10	8
1.10 - 1.20	7
1.20 - 1.30	8
1.30 - 1.40	7
1.40 - 1.50	10
1.50 - 1.60	12
1.60 - 1.70	20
1.70 - 1.80	23
1.80 - 1.90	25
1.90 - 2.00	Dcp-Term

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Client:	**GWH Build Pty Ltd**	Report Number:	**P642 - 4/1**
Job Number:	**P642**	Report Date:	**9/12/2014**
Project:		Order Number:	
Location	,	Test Method :	
Lab No:	**S14-3633**	**Sample Location**	
Date Sampled:	**7/12/2014**	Proposed Mecure Hotel	
Date Tested:	**AS**	VC Ref: Q2014_94	
Sampled By:	**Lonnie Broekman**	BH:6	
Sample Method:	**AS1289.1.3.1**	U50 Tube Sample	
Material Source:	**-**		
For Use As:	**-**		
Remarks:	**-**		

Horizon (m)	Description	Sample Details	Comments
0-.030	ASPHALTIC CONCRETE,		Pavement Condition - Good, no defects
.030-.300	(GW) Sandy GRAVEL,Grey,Dense		dry some moisture, Fill
.300-.800	(CL-CH) sandy CLAY,Dark Grey,Firm	, PP= 150 kPa	Moist,
.800-2.5m	(CH) CLAY,Medium to High Plasticity,Orange Brown,Firm to Stiff	, PP= 250 kPa	some moisture Moist, Natural
2.5m-5.8m	Siltstone,Grey,Stiff to Very Stiff		Borehole Refusal with T/C Bit at 5.8m below existing pavement surface

DCP Results

Lab No: S14-3633
Date Tested: 7/12/2014
Test Method: AS1289.6.3.2
Condition: existing pavement

Depth	Blows
0.00 - 0.10	-
0.10 - 0.20	-
0.20 - 0.30	-
0.30 - 0.40	-
0.40 - 0.50	Start of Dcp
0.50 - 0.60	1
0.60 - 0.70	1
0.70 - 0.80	1
0.80 - 0.90	4
0.90 - 1.00	5
1.00 - 1.10	5
1.10 - 1.20	6
1.20 - 1.30	6
1.30 - 1.40	8
1.40 - 1.50	8
1.50 - 1.60	9
1.60 - 1.70	8
1.70 - 1.80	10
1.80 - 1.90	10
1.90 - 2.00	12
2.00 - 2.10	23
2.10 - 2.20	25
2.20 - 2.30	Dcp-Term

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1426959**	Page	: 1 of 15
Client	: **VALLEY CIVILAB**	Laboratory	: Environmental Division Sydney
Contact	: MR KARL DAWES	Contact	: Client Services
Address	: PO BOX 284 THORNTON NSW, AUSTRALIA 2322	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: karl.dawes@valleycivilab.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 49661844	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49661855	Facsimile	: +61-2-8784 8500
Project	: SOP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: VC00628		
C-O-C number	: 226501-2	Date Samples Received	: 08-DEC-2014
Sampler	: DS	Issue Date	: 11-DEC-2014
Site	: ----		
		No. of samples received	: 21
Quote number	: SY/864/14	No. of samples analysed	: 20

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA WORLD RECOGNISED ACCREDITATION

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.**
- **Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.**
- **EP075(SIM): Poor surrogate recovery due to sample matrix interfernces.**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	BH1 0.1M	BH1 0.6M	BH1 3.5M	BH2 0.2M	BH2 2.0M
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
					ES1426959-001	ES1426959-002	ES1426959-003	ES1426959-004	ES1426959-005
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		**8.8**	**16.4**	**14.2**	**14.2**	**22.5**
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	**6**	<5	<5	**9**
Cadmium	7440-43-9	1	mg/kg		**1**	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		**8**	**10**	**7**	**26**	**23**
Copper	7440-50-8	5	mg/kg		**108**	**14**	**28**	**63**	**18**
Lead	7439-92-1	5	mg/kg		**6**	**13**	**18**	**70**	**22**
Nickel	7440-02-0	2	mg/kg		**34**	<2	**5**	**17**	<2
Zinc	7440-66-6	5	mg/kg		**84**	**8**	**43**	**146**	**6**
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	**1.2**	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	**0.8**	<0.5	**2.3**	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	**0.9**	<0.5	**2.3**	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1 0.1M	BH1 0.6M	BH1 3.5M	BH2 0.2M	BH2 2.0M
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
Compound	CAS Number	LOR	Unit		ES1426959-001	ES1426959-002	ES1426959-003	ES1426959-004	ES1426959-005
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	**0.8**	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	**0.7**	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	**0.8**	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	**0.8**	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	**1.7**	<0.5	**8.9**	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	**1.0**	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**1.3**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.6**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	**210**	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	**330**	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	**540**	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	**430**	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	**330**	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	**760**	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH1 0.1M	BH1 0.6M	BH1 3.5M	BH2 0.2M	BH2 2.0M
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
Compound	CAS Number	LOR	Unit		ES1426959-001	ES1426959-002	ES1426959-003	ES1426959-004	ES1426959-005
EP080: BTEXN - Continued									
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**79.7**	**76.3**	**80.2**	**74.6**	**79.7**
2-Chlorophenol-D4	93951-73-6	0.1	%		**83.4**	**81.8**	**85.4**	**71.3**	**84.0**
2.4.6-Tribromophenol	118-79-6	0.1	%		**69.0**	**75.3**	**69.5**	**31.5**	**67.0**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**95.8**	**97.8**	**96.8**	**127**	**100**
Anthracene-d10	1719-06-8	0.1	%		**110**	**112**	**111**	**99.5**	**115**
4-Terphenyl-d14	1718-51-0	0.1	%		**97.0**	**98.7**	**98.9**	**128**	**102**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**104**	**94.4**	**93.8**	**102**	**97.8**
Toluene-D8	2037-26-5	0.1	%		**106**	**99.2**	**103**	**114**	**104**
4-Bromofluorobenzene	460-00-4	0.1	%		**107**	**101**	**104**	**106**	**107**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	BH2 5.5M	BH3 0.4M	BH3 1.0M	BH3 3.0M	BH4 0.6M
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
					ES1426959-006	ES1426959-007	ES1426959-008	ES1426959-009	ES1426959-010
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		**13.7**	**14.8**	**27.7**	**15.6**	**18.7**
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	**5**	**10**	<5	**12**
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		**10**	**28**	**28**	**8**	**33**
Copper	7440-50-8	5	mg/kg		**57**	**38**	**30**	**40**	**19**
Lead	7439-92-1	5	mg/kg		**27**	**73**	**25**	**15**	**44**
Nickel	7440-02-0	2	mg/kg		**35**	**19**	**3**	<2	**8**
Zinc	7440-66-6	5	mg/kg		**160**	**155**	**19**	**17**	**37**
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	**0.6**	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	**0.7**	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	**0.8**	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH2 5.5M	BH3 0.4M	BH3 1.0M	BH3 3.0M	BH4 0.6M
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
Compound	CAS Number	LOR	Unit		ES1426959-006	ES1426959-007	ES1426959-008	ES1426959-009	ES1426959-010
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	**2.1**	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	**220**	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	**140**	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	**360**	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	**290**	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	**160**	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	**450**	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	BH2 5.5M	BH3 0.4M	BH3 1.0M	BH3 3.0M	BH4 0.6M
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
					ES1426959-006	ES1426959-007	ES1426959-008	ES1426959-009	ES1426959-010
EP080: BTEXN - Continued									
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**73.9**	**72.0**	**67.3**	**75.1**	**77.3**
2-Chlorophenol-D4	93951-73-6	0.1	%		**77.5**	**65.0**	**78.3**	**79.9**	**82.9**
2.4.6-Tribromophenol	118-79-6	0.1	%		**52.2**	**29.0**	**56.5**	**59.3**	**58.4**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**92.3**	**94.9**	**95.9**	**94.8**	**98.1**
Anthracene-d10	1719-06-8	0.1	%		**106**	**109**	**110**	**108**	**112**
4-Terphenyl-d14	1718-51-0	0.1	%		**94.4**	**98.1**	**98.4**	**96.9**	**101**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**113**	**104**	**91.4**	**98.3**	**98.3**
Toluene-D8	2037-26-5	0.1	%		**121**	**112**	**96.1**	**107**	**104**
4-Bromofluorobenzene	460-00-4	0.1	%		**119**	**106**	**100**	**106**	**105**

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	BH4 1.0M	BH4 4.5M	BH5 0.5M	BH5 2.5M	BH5 4.0M
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
					ES1426959-011	ES1426959-012	ES1426959-013	ES1426959-014	ES1426959-015
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		**25.4**	**14.9**	**22.7**	**12.6**	**12.6**
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**10**	**5**	**14**	<5	<5
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		**26**	**11**	**42**	**6**	**8**
Copper	7440-50-8	5	mg/kg		**20**	**78**	**14**	**31**	**18**
Lead	7439-92-1	5	mg/kg		**22**	**20**	**42**	**13**	**10**
Nickel	7440-02-0	2	mg/kg		<2	**34**	**7**	<2	**2**
Zinc	7440-66-6	5	mg/kg		**6**	**160**	**42**	**18**	**12**
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH4 1.0M	BH4 4.5M	BH5 0.5M	BH5 2.5M	BH5 4.0M
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
Compound	CAS Number	LOR	Unit		ES1426959-011	ES1426959-012	ES1426959-013	ES1426959-014	ES1426959-015
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH4 1.0M	BH4 4.5M	BH5 0.5M	BH5 2.5M	BH5 4.0M
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
Compound	CAS Number	LOR	Unit		ES1426959-011	ES1426959-012	ES1426959-013	ES1426959-014	ES1426959-015
EP080: BTEXN - Continued									
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ Total Xylenes	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		80.4	78.7	76.7	81.0	79.0
2-Chlorophenol-D4	93951-73-6	0.1	%		84.5	83.9	82.4	85.0	82.5
2.4.6-Tribromophenol	118-79-6	0.1	%		53.6	53.4	68.7	58.2	64.5
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		99.4	100	99.4	100	97.4
Anthracene-d10	1719-06-8	0.1	%		114	117	114	114	113
4-Terphenyl-d14	1718-51-0	0.1	%		102	104	102	104	101
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		96.6	96.8	96.3	111	101
Toluene-D8	2037-26-5	0.1	%		99.6	96.0	94.4	108	100
4-Bromofluorobenzene	460-00-4	0.1	%		102	99.7	96.5	109	104

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	BH6 0.2M	BH6 1.1M	BH6 3.0M	DUP1	DUP2
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
					ES1426959-016	ES1426959-017	ES1426959-018	ES1426959-019	ES1426959-020
EA055: Moisture Content									
Moisture Content (dried @ 103°C)	----	1.0	%		**12.4**	**29.2**	**15.4**	**21.3**	**11.5**
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	**8**	<5	**13**	**6**
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		**17**	**25**	**8**	**25**	**10**
Copper	7440-50-8	5	mg/kg		**121**	**17**	**24**	**20**	**28**
Lead	7439-92-1	5	mg/kg		**10**	**17**	**15**	**28**	**18**
Nickel	7440-02-0	2	mg/kg		**9**	**3**	<2	**6**	**6**
Zinc	7440-66-6	5	mg/kg		**61**	**10**	**10**	**34**	**44**
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Chlorophenol	95-57-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylphenol	95-48-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
3- & 4-Methylphenol	1319-77-3	1	mg/kg		<1	<1	<1	<1	<1
2-Nitrophenol	88-75-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dimethylphenol	105-67-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4-Dichlorophenol	120-83-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.6-Dichlorophenol	87-65-0	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	87-86-5	2	mg/kg		<2	<2	<2	<2	<2
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	86-73-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	120-12-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	<0.5	<0.5	**1.0**	<0.5
Pyrene	129-00-0	0.5	mg/kg		<0.5	<0.5	<0.5	**1.0**	<0.5

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	BH6 0.2M	BH6 1.1M	BH6 3.0M	DUP1	DUP2
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
Compound	CAS Number	LOR	Unit		ES1426959-016	ES1426959-017	ES1426959-018	ES1426959-019	ES1426959-020
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	218-01-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	<0.5	<0.5	**0.6**	<0.5
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	<0.5	<0.5	**2.6**	<0.5
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	<0.5	<0.5	**0.6**	<0.5
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	**0.6**	**0.6**	**1.0**	**0.6**
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	**1.2**	**1.2**	**1.3**	**1.2**
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	<10	<10	<10	<10
C10 - C14 Fraction	----	50	mg/kg		<50	<50	<50	<50	<50
C15 - C28 Fraction	----	100	mg/kg		**140**	<100	<100	<100	<100
C29 - C36 Fraction	----	100	mg/kg		**480**	<100	<100	<100	<100
^ C10 - C36 Fraction (sum)	----	50	mg/kg		**620**	<50	<50	<50	<50
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	<10	<10	<10
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	<10	<10	<10
>C10 - C16 Fraction	>C10_C16	50	mg/kg		<50	<50	<50	<50	<50
>C16 - C34 Fraction	----	100	mg/kg		**420**	<100	<100	<100	<100
>C34 - C40 Fraction	----	100	mg/kg		**960**	<100	<100	<100	<100
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		**1380**	<50	<50	<50	<50
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	<50	<50	<50
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Client sample ID	BH6 0.2M	BH6 1.1M	BH6 3.0M	DUP1	DUP2
				Client sampling date / time	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00	07-DEC-2014 15:00
					ES1426959-016	ES1426959-017	ES1426959-018	ES1426959-019	ES1426959-020
EP080: BTEXN - Continued									
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	<0.2	<0.2	<0.2	<0.2
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	91-20-3	1	mg/kg		<1	<1	<1	<1	<1
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.1	%		**78.8**	**76.8**	**73.2**	**74.9**	**78.2**
2-Chlorophenol-D4	93951-73-6	0.1	%		**86.6**	**78.8**	**75.7**	**79.3**	**81.2**
2.4.6-Tribromophenol	118-79-6	0.1	%		**41.8**	**42.0**	**41.5**	**54.3**	**42.0**
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		**101**	**90.1**	**90.6**	**94.3**	**95.9**
Anthracene-d10	1719-06-8	0.1	%		**117**	**104**	**105**	**109**	**111**
4-Terphenyl-d14	1718-51-0	0.1	%		**129**	**106**	**106**	**109**	**110**
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		**104**	**100**	**100**	**105**	**102**
Toluene-D8	2037-26-5	0.1	%		**94.8**	**96.7**	**95.2**	**101**	**98.6**
4-Bromofluorobenzene	460-00-4	0.1	%		**95.8**	**99.9**	**96.2**	**102**	**102**

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

QUALITY CONTROL REPORT

Work Order	: **ES1426959**	Page	: 1 of 11
Client	: **VALLEY CIVILAB**	Laboratory	: Environmental Division Sydney
Contact	: MR KARL DAWES	Contact	: Client Services
Address	: PO BOX 284 THORNTON NSW, AUSTRALIA 2322	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: karl.dawes@valleycivilab.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 49661844	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49661855	Facsimile	: +61-2-8784 8500
Project	: SOP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 226501-2	Date Samples Received	: 08-DEC-2014
Sampler	: DS	Issue Date	: 11-DEC-2014
Order number	: VC00628		
		No. of samples received	: 21
Quote number	: SY/864/14	No. of samples analysed	: 20

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Pabi Subba	Senior Organic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 3748519)									
ES1426947-001	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	27.1	28.6	5.4	0% - 20%
ES1426959-006	BH2 5.5M	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	13.7	14.3	4.0	0% - 50%
EA055: Moisture Content (QC Lot: 3748520)									
ES1426959-015	BH5 4.0M	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	12.6	12.2	3.5	0% - 50%
ES1426980-006	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1.0	%	9.4	9.7	3.1	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 3748301)									
ES1426829-011	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	22	0.0	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	6	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	6	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	16	15	9.1	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	164	168	2.6	0% - 20%
ES1426829-022	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	13	9	32.9	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	9	6	37.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	17	14	22.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	20	16.1	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 3748305)									
ES1426959-002	BH1 0.6M	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	8	22.8	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	7	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	13	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	12	14.5	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	8	10	19.9	No Limit
ES1426959-012	BH4 4.5M	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	11	11	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	34	34	0.0	0% - 50%
		EG005T: Arsenic	7440-38-2	5	mg/kg	5	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	78	75	3.6	0% - 50%
		EG005T: Lead	7439-92-1	5	mg/kg	20	18	7.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	160	155	3.4	0% - 20%

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3748302)									
ES1426829-011	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1426829-022	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3748306)									
ES1426959-002	BH1 0.6M	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES1426959-012	BH4 4.5M	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)A: Phenolic Compounds (QC Lot: 3747497)									
ES1426959-001	BH1 0.1M	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
ES1426959-011	BH4 1.0M	EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1	mg/kg	<1	<1	0.0	No Limit
		EP075(SIM): Pentachlorophenol	87-86-5	2	mg/kg	<2	<2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3747497)									
ES1426959-001	BH1 0.1M	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 3747497) - continued									
ES1426959-001	BH1 0.1M	EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
ES1426959-011	BH4 1.0M	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3747493)									
ES1426959-001	BH1 0.1M	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES1426959-011	BH4 1.0M	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3747496)									
ES1426959-001	BH1 0.1M	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
ES1426959-011	BH4 1.0M	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3747496) - continued									
ES1426959-011	BH4 1.0M	EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3747493)									
ES1426959-001	BH1 0.1M	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES1426959-011	BH4 1.0M	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3747496)									
ES1426959-001	BH1 0.1M	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
ES1426959-011	BH4 1.0M	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	<50	0.0	No Limit
EP080: BTEXN (QC Lot: 3747493)									
ES1426959-001	BH1 0.1M	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES1426959-011	BH4 1.0M	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3748301)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	100	92	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	96.0	87	121
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	99.0	80	136
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	102	93	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	98.7	86	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	104	93	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	103	81	133
EG005T: Total Metals by ICP-AES (QCLot: 3748305)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	109	92	130
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	102	87	121
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	105	80	136
EG005T: Copper	7440-50-8	5	mg/kg	<5	32.0 mg/kg	115	93	127
EG005T: Lead	7439-92-1	5	mg/kg	<5	40.0 mg/kg	100	86	124
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55.0 mg/kg	110	93	131
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	106	81	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3748302)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	93.7	70	105
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3748306)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	93.6	70	105
EP075(SIM)A: Phenolic Compounds (QCLot: 3747497)								
EP075(SIM): Phenol	108-95-2	0.5	mg/kg	<0.5	4 mg/kg	101	74	116
EP075(SIM): 2-Chlorophenol	95-57-8	0.5	mg/kg	<0.5	4 mg/kg	102	74	116
EP075(SIM): 2-Methylphenol	95-48-7	0.5	mg/kg	<0.5	4 mg/kg	104	72	116
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	1.0	mg/kg	<1	8 mg/kg	105	69	123
EP075(SIM): 2-Nitrophenol	88-75-5	0.5	mg/kg	<0.5	4 mg/kg	73.2	60.3	117
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.5	mg/kg	<0.5	4 mg/kg	106	69	117
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.5	mg/kg	<0.5	4 mg/kg	98.6	68	112
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.5	mg/kg	<0.5	4 mg/kg	105	73	117
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.5	mg/kg	<0.5	4 mg/kg	99.8	76.4	114
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.5	mg/kg	<0.5	4 mg/kg	89.5	57	111
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.5	mg/kg	<0.5	4 mg/kg	90.7	68.9	112
EP075(SIM): Pentachlorophenol	87-86-5	1.0	mg/kg	<1	8 mg/kg	16.6	10	57
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3747497)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	4 mg/kg	110	80	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3747497) - continued								
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	4 mg/kg	113	77	123
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	4 mg/kg	105	79	123
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	4 mg/kg	112	77	123
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	4 mg/kg	111	79	123
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	4 mg/kg	112	79	123
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	4 mg/kg	115	79	123
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	4 mg/kg	114	79	125
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	4 mg/kg	115	73	121
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	4 mg/kg	111	81	123
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	4 mg/kg	113	70	118
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	4 mg/kg	114	77	123
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	4 mg/kg	110	76	122
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	4 mg/kg	86.2	71	113
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	4 mg/kg	90.0	71.7	113
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	4 mg/kg	76.6	72.4	114
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3747493)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	98.3	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3747496)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	102	71	131
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	116	74	138
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	87.9	64	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3747493)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	101	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3747496)								
EP071: >C10 - C16 Fraction	>C10_C16	50	mg/kg	<50	250 mg/kg	118	70	130
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	107	74	138
EP071: >C34 - C40 Fraction	----	50	mg/kg	<100	150 mg/kg	69.3	63	131
EP080: BTEXN (QCLot: 3747493)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	88.4	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	90.4	62	128
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	90.4	58	118
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	92.1	60	120
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	93.7	60	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	78.6	62	138

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 3748301)							
ES1426829-011	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.7	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	99.2	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	101	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	108	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	99.4	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	101	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	95.8	70	130
EG005T: Total Metals by ICP-AES (QCLot: 3748305)							
ES1426959-002	BH1 0.6M	EG005T: Arsenic	7440-38-2	50 mg/kg	104	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	109	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	110	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	102	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	109	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	105	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3748302)							
ES1426829-011	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	102	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3748306)							
ES1426959-002	BH1 0.6M	EG035T: Mercury	7439-97-6	5 mg/kg	92.5	70	130
EP075(SIM)A: Phenolic Compounds (QCLot: 3747497)							
ES1426959-001	BH1 0.1M	EP075(SIM): Phenol	108-95-2	10 mg/kg	115	70	130
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	119	70	130
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	106	60	130
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	119	70	130
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	64.2	20	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3747497)							
ES1426959-001	BH1 0.1M	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	116	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	104	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3747493)							
ES1426959-001	BH1 0.1M	EP080: C6 - C9 Fraction	----	32.5 mg/kg	114	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3747496)							
ES1426959-001	BH1 0.1M	EP071: C10 - C14 Fraction	----	560 mg/kg	101	73	137
		EP071: C15 - C28 Fraction	----	2370 mg/kg	93.9	53	131
		EP071: C29 - C36 Fraction	----	1695 mg/kg	111	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3747493)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3747493) - continued							
ES1426959-001	BH1 0.1M	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	114	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3747496)							
ES1426959-001	BH1 0.1M	EP071: >C10 - C16 Fraction	>C10_C16	902 mg/kg	119	73	137
		EP071: >C16 - C34 Fraction	----	3190 mg/kg	108	53	131
		EP071: >C34 - C40 Fraction	----	1087 mg/kg	110	52	132
EP080: BTEXN (QCLot: 3747493)							
ES1426959-001	BH1 0.1M	EP080: Benzene	71-43-2	2.5 mg/kg	91.8	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	93.0	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	93.3	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	94.0	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.4	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	84.3	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

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

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3747493)										
ES1426959-001	BH1 0.1M	EP080: C6 - C9 Fraction	----	32.5 mg/kg	114	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3747493)										
ES1426959-001	BH1 0.1M	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	114	----	70	130	----	----
EP080: BTEXN (QCLot: 3747493)										
ES1426959-001	BH1 0.1M	EP080: Benzene	71-43-2	2.5 mg/kg	91.8	----	70	130	----	----
		EP080: Toluene	108-88-3	2.5 mg/kg	93.0	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	93.3	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	94.0	----	70	130	----	----
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	95.4	----	70	130	----	----
		EP080: Naphthalene	91-20-3	2.5 mg/kg	84.3	----	70	130	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3747496)										
ES1426959-001	BH1 0.1M	EP071: C10 - C14 Fraction	----	560 mg/kg	101	----	73	137	----	----
		EP071: C15 - C28 Fraction	----	2370 mg/kg	93.9	----	53	131	----	----
		EP071: C29 - C36 Fraction	----	1695 mg/kg	111	----	52	132	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3747496)										

Sub-Matrix: **SOIL**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3747496) - continued										
ES1426959-001	BH1 0.1M	EP071: >C10 - C16 Fraction	>C10_C16	902 mg/kg	119	----	73	137	----	----
		EP071: >C16 - C34 Fraction	----	3190 mg/kg	108	----	53	131	----	----
		EP071: >C34 - C40 Fraction	----	1087 mg/kg	110	----	52	132	----	----
EP075(SIM)A: Phenolic Compounds (QCLot: 3747497)										
ES1426959-001	BH1 0.1M	EP075(SIM): Phenol	108-95-2	10 mg/kg	115	----	70	130	----	----
		EP075(SIM): 2-Chlorophenol	95-57-8	10 mg/kg	119	----	70	130	----	----
		EP075(SIM): 2-Nitrophenol	88-75-5	10 mg/kg	106	----	60	130	----	----
		EP075(SIM): 4-Chloro-3-methylphenol	59-50-7	10 mg/kg	119	----	70	130	----	----
		EP075(SIM): Pentachlorophenol	87-86-5	10 mg/kg	64.2	----	20	130	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3747497)										
ES1426959-001	BH1 0.1M	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	116	----	70	130	----	----
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	104	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3748301)										
ES1426829-011	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.7	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	99.2	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	101	----	70	130	----	----
		EG005T: Copper	7440-50-8	250 mg/kg	108	----	70	130	----	----
		EG005T: Lead	7439-92-1	250 mg/kg	99.4	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	101	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	95.8	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3748302)										
ES1426829-011	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	102	----	70	130	----	----
EG005T: Total Metals by ICP-AES (QCLot: 3748305)										
ES1426959-002	BH1 0.6M	EG005T: Arsenic	7440-38-2	50 mg/kg	104	----	70	130	----	----
		EG005T: Cadmium	7440-43-9	50 mg/kg	104	----	70	130	----	----
		EG005T: Chromium	7440-47-3	50 mg/kg	109	----	70	130	----	----
		EG005T: Copper	7440-50-8	250 mg/kg	110	----	70	130	----	----
		EG005T: Lead	7439-92-1	250 mg/kg	102	----	70	130	----	----
		EG005T: Nickel	7440-02-0	50 mg/kg	109	----	70	130	----	----
		EG005T: Zinc	7440-66-6	250 mg/kg	105	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3748306)										
ES1426959-002	BH1 0.6M	EG035T: Mercury	7439-97-6	5 mg/kg	92.5	----	70	130	----	----

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1426959**	Page	: 1 of 7
Client	: VALLEY CIVILAB	Laboratory	: Environmental Division Sydney
Contact	: MR KARL DAWES	Contact	: Client Services
Address	: PO BOX 284 THORNTON NSW, AUSTRALIA 2322	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: karl.dawes@valleycivilab.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 49661844	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49661855	Facsimile	: +61-2-8784 8500
Project	: SOP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 226501-2	Date Samples Received	: 08-DEC-2014
Sampler	: DS	Issue Date	: 11-DEC-2014
Order number	: VC00628		
		No. of samples received	: 21
Quote number	: SY/864/14	No. of samples analysed	: 20

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
BH1 0.1M, BH1 0.6M, BH1 3.5M, BH2 0.2M, BH2 2.0M, BH2 5.5M, BH3 0.4M, BH3 1.0M, BH3 3.0M, BH4 0.6M, BH4 1.0M, BH4 4.5M, BH5 0.5M, BH5 2.5M, BH5 4.0M, BH6 0.2M, BH6 1.1M, BH6 3.0M, DUP1, DUP2	**07-DEC-2014**	**----**	----	----	**09-DEC-2014**	21-DEC-2014	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
BH1 0.1M, BH1 0.6M, BH1 3.5M, BH2 0.2M, BH2 2.0M, BH2 5.5M, BH3 0.4M, BH3 1.0M, BH3 3.0M, BH4 0.6M, BH4 1.0M, BH4 4.5M, BH5 0.5M, BH5 2.5M, BH5 4.0M, BH6 0.2M, BH6 1.1M, BH6 3.0M, DUP1, DUP2	**07-DEC-2014**	**09-DEC-2014**	05-JUN-2015	✓	**10-DEC-2014**	05-JUN-2015	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
BH1 0.1M, BH1 0.6M, BH1 3.5M, BH2 0.2M, BH2 2.0M, BH2 5.5M, BH3 0.4M, BH3 1.0M, BH3 3.0M, BH4 0.6M, BH4 1.0M, BH4 4.5M, BH5 0.5M, BH5 2.5M, BH5 4.0M, BH6 0.2M, BH6 1.1M, BH6 3.0M, DUP1, DUP2	**07-DEC-2014**	**09-DEC-2014**	04-JAN-2015	✓	**10-DEC-2014**	04-JAN-2015	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071)							
BH1 0.1M, BH1 0.6M, BH1 3.5M, BH2 0.2M, BH2 2.0M, BH2 5.5M, BH3 0.4M, BH3 1.0M, BH3 3.0M, BH4 0.6M, BH4 1.0M, BH4 4.5M, BH5 0.5M, BH5 2.5M, BH5 4.0M, BH6 0.2M, BH6 1.1M, BH6 3.0M, DUP1, DUP2	**07-DEC-2014**	**09-DEC-2014**	21-DEC-2014	✓	**09-DEC-2014**	18-JAN-2015	✓
EP075(SIM)A: Phenolic Compounds							
Soil Glass Jar - Unpreserved (EP075(SIM))							
BH1 0.1M, BH1 0.6M, BH1 3.5M, BH2 0.2M, BH2 2.0M, BH2 5.5M, BH3 0.4M, BH3 1.0M, BH3 3.0M, BH4 0.6M, BH4 1.0M, BH4 4.5M, BH5 0.5M, BH5 2.5M, BH5 4.0M, BH6 0.2M, BH6 1.1M, BH6 3.0M, DUP1, DUP2	**07-DEC-2014**	**09-DEC-2014**	21-DEC-2014	✓	**09-DEC-2014**	18-JAN-2015	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
BH1 0.1M, BH1 0.6M, BH1 3.5M, BH2 0.2M, BH2 2.0M, BH2 5.5M, BH3 0.4M, BH3 1.0M, BH3 3.0M, BH4 0.6M, BH4 1.0M, BH4 4.5M, BH5 0.5M, BH5 2.5M, BH5 4.0M, BH6 0.2M, BH6 1.1M, BH6 3.0M, DUP1, DUP2	**07-DEC-2014**	**09-DEC-2014**	21-DEC-2014	✓	**09-DEC-2014**	18-JAN-2015	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
BH1 0.1M, BH1 0.6M, BH1 3.5M, BH2 0.2M, BH2 2.0M, BH2 5.5M, BH3 0.4M, BH3 1.0M, BH3 3.0M, BH4 0.6M, BH4 1.0M, BH4 4.5M, BH5 0.5M, BH5 2.5M, BH5 4.0M, BH6 0.2M, BH6 1.1M, BH6 3.0M, DUP1, DUP2	**07-DEC-2014**	**09-DEC-2014**	21-DEC-2014	✓	**09-DEC-2014**	21-DEC-2014	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
BH1 0.1M, BH1 0.6M, BH1 3.5M, BH2 0.2M, BH2 2.0M, BH2 5.5M, BH3 0.4M, BH3 1.0M, BH3 3.0M, BH4 0.6M, BH4 1.0M, BH4 4.5M, BH5 0.5M, BH5 2.5M, BH5 4.0M, BH6 0.2M, BH6 1.1M, BH6 3.0M, DUP1, DUP2	**07-DEC-2014**	**09-DEC-2014**	21-DEC-2014	✓	**09-DEC-2014**	21-DEC-2014	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	4	40	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
PAH/Phenols (SIM)	EP075(SIM)	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	4	38	**10.5**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	4	38	**10.5**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	20	**10.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	38	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	38	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	38	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	38	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	2	38	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-AES	EG005T	2	38	**5.3**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	20	**5.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	(APHA 21st ed., 3120; USEPA SW 846 - 6010) (ICPAES) Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	AS 3550, APHA 21st ed., 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	(USEPA SW 846 - 8015A) Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	(USEPA SW 846 - 8270B) Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	(USEPA SW 846 - 8260B) Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	USEPA 200.2 Mod. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	(USEPA SW 846 - 5030A) 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In-house, Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP075(SIM)S: Phenolic Compound Surrogates	ES1426959-007	BH3 0.4M	**2-Chlorophenol-D4**	93951-73-6	65.0 %	66-122 %	**Recovery less than lower data quality objective**
EP075(SIM)S: Phenolic Compound Surrogates	ES1426959-004	BH2 0.2M	**2.4.6-Tribromophenol**	118-79-6	31.5 %	40-138 %	**Recovery less than lower data quality objective**
EP075(SIM)S: Phenolic Compound Surrogates	ES1426959-007	BH3 0.4M	**2.4.6-Tribromophenol**	118-79-6	29.0 %	40-138 %	**Recovery less than lower data quality objective**
EP075(SIM)T: PAH Surrogates	ES1426959-004	BH2 0.2M	**2-Fluorobiphenyl**	321-60-8	127 %	70-122 %	**Recovery greater than upper data quality objective**
EP075(SIM)T: PAH Surrogates	ES1426959-016	BH6 0.2M	**4-Terphenyl-d14**	1718-51-0	129 %	65-129 %	**Recovery greater than upper data quality objective**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

ALS Environmental — CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ ADELAIDE ☐ BRISBANE ☐ CHINCHILLA ☑ DARWIN ☐ EMERALD ☐ GLADSTONE ☐ MACKAY ☐ MELBOURNE ☐ MUDGEE ☐ NEWCASTLE ☐ NOWRA ☐ PERTH ☐ ROMA ☐ SYDNEY ☐ TOWNSVILLE ☐ WOLLONGONG

CLIENT: VALLEY CIVILAB
OFFICE: THORNTON
PROJECT: SOP
PURCHASE ORDER NUMBER: VC00628
PROJECT MANAGER: K. DAWES
CONTACT PH: 0429 496618.
SAMPLER: D. SANKOWSKY SAMPLER MOBILE: 0407 434 604
COC emailed to ALS? (YES / (NO) EDD FORMAT (or default): karl.dawes@valleycivilab.com.au
Email Reports to (will default to PM if no other addresses are listed): ~~jkesservices@hotmail.com~~
Email Invoice to (will default to PM if no other addresses are listed): accounts@valleycivilab.com.au

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☐ Standard TAT (List due date):
☑ Non Standard or urgent TAT (List due date): 72 HR

ALS QUOTE NO.: SY-864-14

COC SEQUENCE NUMBER (Circle)
COC: (1) 2 3 4 5 6 7
OF: 1 (2) 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? (Yes) No N/A
Free ice/ frozen ice bricks present upon receipt? (Yes) No N/A
Random Sample Temperature on Receipt: 3.8 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 8/12/14 1700 1035	DATE/TIME: 8/12/14 1035	DATE/TIME: 8/12/14 10-35	DATE/TIME: 8/12/14 1938

COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE — SAMPLE DETAILS MATRIX: SOLID (S), WATER (W) — CONTAINER INFORMATION — ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or dissolved (field filtered bottle required). — Additional Information

LAB ID	SAMPLE ID	DATE/ TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	5-7						Additional Information
1	BH1 0.1m	7.12.14	S	J	1							S14-3609
2	BH1 0.6m											" " 3610
3	BH1 3.5m											3611
4	BH2 0.2m											3612
5	BH2 2.0m											3613
6	BH2 5.5m											3614
7	BH3 0.4m											3615
8	BH3 1.0m											3616
9	BH3 3.0m											3617
10	BH4 0.6m											3618
11	BH4 1.0m											3619
12	BH4 4.5m											3620
				TOTAL	12							

Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Valley Civilab Sample No.s

E-MAILED
TAT

Environmental Division
Sydney
Work Order
ES1426959

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; LI = Lugols Iodine Preserved; STT = Sterile Sodium Thiosulfate Preserved; Z = Zinc Acetate Preserved Bottles; E = Ed TA Preserved Bottles; ST = Sterile Bottle Soil Container Codes: ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

226501

ALS Environmental — CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ ADELAIDE ☐ BRISBANE ☐ CHINCHILLA ☐ DARWIN ☐ EMERALD ☐ GLADSTONE ☐ MACKAY ☐ MELBOURNE ☐ MUDGEE ☐ NEWCASTLE ☐ NOWRA ☐ PERTH ☐ ROMA ☐ SYDNEY ☐ TOWNSVILLE ☐ WOLLONGONG

CLIENT: VALLEY CIVILAB
OFFICE: THORNTON
PROJECT: SOP
PURCHASE ORDER NUMBER: VC00628
PROJECT MANAGER: K. DAWES
CONTACT PH: 0429496618
SAMPLER: D. SANDOWSKY SAMPLER MOBILE: 0407434604
COC emailed to ALS? (YES / NO) EDD FORMAT (or default): karl.dawes@valleycivilab.com.au
Email Reports to (will default to PM if no other addresses are listed): [illegible]
Email Invoice to (will default to PM if no other addresses are listed): accounts@valleycivilab.com.au

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☐ Standard TAT (List due date):
☑ Non Standard or urgent TAT (List due date): 72 HR.

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 (2) 3 4 5 6 7
OF: 1 (2) 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? (Yes) No N/A
Free ice / frozen ice bricks present upon receipt? (Yes) No N/A
Random Sample Temperature on Receipt: 3.8 °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
com.au KL	Ken		Sophie AS
DATE/TIME: 8/12/14 1700	DATE/TIME: 8/12/14 1035	DATE/TIME: 8/12/14 10:35	DATE/TIME: 8/12/14 1130

COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX - SOLID (S), WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE/ TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-23	W-23							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	BH5 0.2m	7.12.14	S	Sample ID on tube & vial	1									Valley Civil Lab Sample No.S. S14-3621
14	BH5 2.5m													" " 3622
15	BH5 4.0m													3623
16	BH6 0.2m													3624
17	BH6 1.1m													3625
18	BH6 3.0m													3626
19	DUP 1													3627
20	DUP 2													3628
21	BH2		W		2									3629
				TOTAL	10									

FAILED

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; LI = Lugols Iodine Preserved; STT = Sterile Sodium Thiosulfate Preserved; Z = Zinc Acetate Preserved Bottle; E = Ed TA Preserved Bottles; ST = Sterile Bottle Soil Container Codes: ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

226502

CERTIFICATE OF ANALYSIS

Work Order	: **ES1427338**	Page	: 1 of 6
Client	: **VALLEY CIVILAB**	Laboratory	: Environmental Division Sydney
Contact	: MR KARL DAWES	Contact	: Client Services
Address	: PO BOX 284 THORNTON NSW, AUSTRALIA 2322	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: karl.dawes@valleycivilab.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 49661844	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49661855	Facsimile	: +61-2-8784 8500
Project	: SOP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Order number	: VC00628		
C-O-C number	: 226502	Date Samples Received	: 09-DEC-2014
Sampler	: DS	Issue Date	: 12-DEC-2014
Site	: ----		
		No. of samples received	: 1
Quote number	: SY/752/13	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

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

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

- **Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.**
- **EG035:ES1427338 # 1 was diluted ten folds prior to digest due to high matrix interference.**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BH2	----	----	----	----
				Client sampling date / time	09-DEC-2014 18:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1427338-001	----	----	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		**0.227**	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		**0.0178**	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		**0.392**	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**4.32**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		**1.96**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.659**	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		**4.96**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		**0.0043**	----	----	----	----
EP075(SIM)A: Phenolic Compounds									
Phenol	108-95-2	1.0	µg/L		<1.0	----	----	----	----
2-Chlorophenol	95-57-8	1.0	µg/L		<1.0	----	----	----	----
2-Methylphenol	95-48-7	1.0	µg/L		<1.0	----	----	----	----
3- & 4-Methylphenol	1319-77-3	2.0	µg/L		<2.0	----	----	----	----
2-Nitrophenol	88-75-5	1.0	µg/L		<1.0	----	----	----	----
2.4-Dimethylphenol	105-67-9	1.0	µg/L		<1.0	----	----	----	----
2.4-Dichlorophenol	120-83-2	1.0	µg/L		<1.0	----	----	----	----
2.6-Dichlorophenol	87-65-0	1.0	µg/L		<1.0	----	----	----	----
4-Chloro-3-methylphenol	59-50-7	1.0	µg/L		<1.0	----	----	----	----
2.4.6-Trichlorophenol	88-06-2	1.0	µg/L		<1.0	----	----	----	----
2.4.5-Trichlorophenol	95-95-4	1.0	µg/L		<1.0	----	----	----	----
Pentachlorophenol	87-86-5	2.0	µg/L		<2.0	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		**2.0**	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BH2	----	----	----	----
				Client sampling date / time	09-DEC-2014 18:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1427338-001	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		**2.0**	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		**150**	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		**170**	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		**320**	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	>C10_C16	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		**220**	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		**220**	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		**440**	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ Total Xylenes	1330-20-7	2	µg/L		<2	----	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BH2	----	----	----	----
				Client sampling date / time	09-DEC-2014 18:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1427338-001	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates - Continued									
Phenol-d6	13127-88-3	0.1	%		26.4	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%		62.8	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%		69.7	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.1	%		60.8	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%		76.0	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%		84.6	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.1	%		91.4	----	----	----	----
Toluene-D8	2037-26-5	0.1	%		98.5	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%		91.9	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	10.0	44
2-Chlorophenol-D4	93951-73-6	14	94
2.4.6-Tribromophenol	118-79-6	17	125
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27.4	113
4-Terphenyl-d14	1718-51-0	32	112
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

QUALITY CONTROL REPORT

Work Order	: **ES1427338**	Page	: 1 of 7
Client	: **VALLEY CIVILAB**	Laboratory	: Environmental Division Sydney
Contact	: MR KARL DAWES	Contact	: Client Services
Address	: PO BOX 284 THORNTON NSW, AUSTRALIA 2322	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: karl.dawes@valleycivilab.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 49661844	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49661855	Facsimile	: +61-2-8784 8500
Project	: SOP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 226502	Date Samples Received	: 09-DEC-2014
Sampler	: DS	Issue Date	: 12-DEC-2014
Order number	: VC00628		
		No. of samples received	: 1
Quote number	: SY/752/13	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Quality Control Report contains the following information:

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

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Pabi Subba	Senior Organic Chemist	Sydney Organics
Shobhna Chandra	Metals Coordinator	Sydney Inorganics

General Comments

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

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 3752685)									
ES1427338-001	BH2	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0178	0.0178	0.0	0% - 20%
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.227	0.231	1.7	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.392	0.396	1.2	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	4.32	4.37	1.2	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	1.96	1.98	1.0	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.659	0.690	4.6	0% - 20%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	4.96	5.09	2.6	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3753380)									
ES1427539-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 3752650)									
ES1427154-001	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
ES1427154-009	Anonymous	EP080: C6 - C9 Fraction	----	20	µg/L	<20	<20	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 3752650)									
ES1427154-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
ES1427154-009	Anonymous	EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	0.0	No Limit
EP080: BTEXN (QC Lot: 3752650)									
ES1427154-001	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit
ES1427154-009	Anonymous	EP080: Benzene	71-43-2	1	µg/L	<1	<1	0.0	No Limit
		EP080: Toluene	108-88-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	2	µg/L	<2	<2	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	2	µg/L	<2	<2	0.0	No Limit
		EP080: Naphthalene	91-20-3	5	µg/L	<5	<5	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 3752685)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	96.1	79	121
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	83	113
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	103	84	116
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.0	83	117
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.9	84	116
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.0	84	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.0	77	117
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3753380)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.010 mg/L	91.2	77	115
EP075(SIM)A: Phenolic Compounds (QCLot: 3752371)								
EP075(SIM): Phenol	108-95-2	0.2	µg/L	<1.0	5 µg/L	31.6	24.5	61.9
EP075(SIM): 2-Chlorophenol	95-57-8	0.2	µg/L	<1.0	5 µg/L	66.1	63.8	110
EP075(SIM): 2-Methylphenol	95-48-7	0.2	µg/L	<1.0	5 µg/L	63.1	55.9	112
EP075(SIM): 3- & 4-Methylphenol	1319-77-3	0.4	µg/L	<2.0	10 µg/L	61.1	42.5	114
EP075(SIM): 2-Nitrophenol	88-75-5	0.2	µg/L	<1.0	5 µg/L	68.8	62.7	117
EP075(SIM): 2.4-Dimethylphenol	105-67-9	0.2	µg/L	<1.0	5 µg/L	61.2	59.9	112
EP075(SIM): 2.4-Dichlorophenol	120-83-2	0.2	µg/L	<1.0	5 µg/L	68.1	59.3	122
EP075(SIM): 2.6-Dichlorophenol	87-65-0	0.2	µg/L	<1.0	5 µg/L	67.2	64.3	118
EP075(SIM): 4-Chloro-3-Methylphenol	59-50-7	0.2	µg/L	<1.0	5 µg/L	74.9	63	119
EP075(SIM): 2.4.6-Trichlorophenol	88-06-2	0.2	µg/L	<1.0	5 µg/L	65.7	58.7	118
EP075(SIM): 2.4.5-Trichlorophenol	95-95-4	0.2	µg/L	<1.0	5 µg/L	73.8	50	108
EP075(SIM): Pentachlorophenol	87-86-5	0.4	µg/L	<2.0	10 µg/L	45.6	10	95
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3752371)								
EP075(SIM): Naphthalene	91-20-3	0.2	µg/L	<1.0	5 µg/L	66.6	58.6	119
EP075(SIM): Acenaphthylene	208-96-8	0.2	µg/L	<1.0	5 µg/L	67.9	63.6	114
EP075(SIM): Acenaphthene	83-32-9	0.2	µg/L	<1.0	5 µg/L	66.6	62.2	113
EP075(SIM): Fluorene	86-73-7	0.2	µg/L	<1.0	5 µg/L	69.2	63.9	115
EP075(SIM): Phenanthrene	85-01-8	0.2	µg/L	<1.0	5 µg/L	74.5	62.6	116
EP075(SIM): Anthracene	120-12-7	0.2	µg/L	<1.0	5 µg/L	74.0	64.3	116
EP075(SIM): Fluoranthene	206-44-0	0.2	µg/L	<1.0	5 µg/L	79.2	63.6	118
EP075(SIM): Pyrene	129-00-0	0.2	µg/L	<1.0	5 µg/L	77.5	63.1	118
EP075(SIM): Benz(a)anthracene	56-55-3	0.2	µg/L	<1.0	5 µg/L	74.0	64.1	117
EP075(SIM): Chrysene	218-01-9	0.2	µg/L	<1.0	5 µg/L	80.0	62.5	116

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 3752371) - continued								
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.2	µg/L	<1.0	5 µg/L	84.2	61.7	119
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.2	µg/L	<1.0	5 µg/L	87.1	61.7	117
EP075(SIM): Benzo(a)pyrene	50-32-8	0.2	µg/L	<0.5	5 µg/L	75.7	63.3	117
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.2	µg/L	<1.0	5 µg/L	77.3	59.9	118
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.2	µg/L	<1.0	5 µg/L	74.3	61.2	117
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.2	µg/L	<1.0	5 µg/L	77.3	59.1	118
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3752370)								
EP071: C10 - C14 Fraction	----	50	µg/L	<50	2000 µg/L	98.5	59	129
EP071: C15 - C28 Fraction	----	100	µg/L	<100	3000 µg/L	101	71	131
EP071: C29 - C36 Fraction	----	50	µg/L	<50	2000 µg/L	86.0	62	120
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3752650)								
EP080: C6 - C9 Fraction	----	20	µg/L	<20	260 µg/L	94.4	75	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3752370)								
EP071: >C10 - C16 Fraction	>C10_C16	100	µg/L	<100	2500 µg/L	100	58.9	131
EP071: >C16 - C34 Fraction	----	100	µg/L	<100	3500 µg/L	94.6	73.9	138
EP071: >C34 - C40 Fraction	----	50	µg/L	<100	1500 µg/L	96.0	67	127
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3752650)								
EP080: C6 - C10 Fraction	C6_C10	20	µg/L	<20	310 µg/L	95.1	75	127
EP080: BTEXN (QCLot: 3752650)								
EP080: Benzene	71-43-2	1	µg/L	<1	10 µg/L	89.9	70	124
EP080: Toluene	108-88-3	2	µg/L	<2	10 µg/L	93.4	65	129
EP080: Ethylbenzene	100-41-4	2	µg/L	<2	10 µg/L	96.6	70	120
EP080: meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	10 µg/L	96.4	69	121
EP080: ortho-Xylene	95-47-6	2	µg/L	<2	10 µg/L	96.2	72	122
EP080: Naphthalene	91-20-3	5	µg/L	<5	10 µg/L	108	70	124

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG020T: Total Metals by ICP-MS (QCLot: 3752685)							
ES1427591-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	107	70	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	92.9	70	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 3752685) - continued							
ES1427591-001	Anonymous	EG020A-T: Chromium	7440-47-3	1 mg/L	95.9	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	107	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	107	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	90.8	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	104	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3753380)							
ES1427539-002	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	77.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3752650)							
ES1427154-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	96.5	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3752650)							
ES1427154-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	95.4	70	130
EP080: BTEXN (QCLot: 3752650)							
ES1427154-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	78.2	70	130
		EP080: Toluene	108-88-3	25 µg/L	79.2	70	130
		EP080: Ethylbenzene	100-41-4	25 µg/L	80.7	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	80.6	70	130
		EP080: ortho-Xylene	95-47-6	25 µg/L	80.4	70	130
		EP080: Naphthalene	91-20-3	25 µg/L	101	70	130

Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080/071: Total Petroleum Hydrocarbons (QCLot: 3752650)										
ES1427154-001	Anonymous	EP080: C6 - C9 Fraction	----	325 µg/L	96.5	----	70	130	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 3752650)										
ES1427154-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	375 µg/L	95.4	----	70	130	----	----
EP080: BTEXN (QCLot: 3752650)										
ES1427154-001	Anonymous	EP080: Benzene	71-43-2	25 µg/L	78.2	----	70	130	----	----
		EP080: Toluene	108-88-3	25 µg/L	79.2	----	70	130	----	----
		EP080: Ethylbenzene	100-41-4	25 µg/L	80.7	----	70	130	----	----
		EP080: meta- & para-Xylene	108-38-3 106-42-3	25 µg/L	80.6	----	70	130	----	----

Sub-Matrix: **WATER**

				Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Report						
				Spike	Spike Recovery (%)		Recovery Limits (%)		RPDs (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	MSD	Low	High	Value	Control Limit
EP080: BTEXN (QCLot: 3752650) - continued										
ES1427154-001	Anonymous	EP080: ortho-Xylene	95-47-6	25 µg/L	80.4	----	70	130	----	----
		EP080: Naphthalene	91-20-3	25 µg/L	101	----	70	130	----	----
EG020T: Total Metals by ICP-MS (QCLot: 3752685)										
ES1427591-001	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	107	----	70	130	----	----
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	92.9	----	70	130	----	----
		EG020A-T: Chromium	7440-47-3	1 mg/L	95.9	----	70	130	----	----
		EG020A-T: Copper	7440-50-8	1 mg/L	107	----	70	130	----	----
		EG020A-T: Lead	7439-92-1	1 mg/L	107	----	70	130	----	----
		EG020A-T: Nickel	7440-02-0	1 mg/L	90.8	----	70	130	----	----
		EG020A-T: Zinc	7440-66-6	1 mg/L	104	----	70	130	----	----
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3753380)										
ES1427539-002	Anonymous	EG035T: Mercury	7439-97-6	0.010 mg/L	77.0	----	70	130	----	----

INTERPRETIVE QUALITY CONTROL REPORT

Work Order	: **ES1427338**	Page	: 1 of 5
Client	: VALLEY CIVILAB	Laboratory	: Environmental Division Sydney
Contact	: MR KARL DAWES	Contact	: Client Services
Address	: PO BOX 284 THORNTON NSW, AUSTRALIA 2322	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: karl.dawes@valleycivilab.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 49661844	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 49661855	Facsimile	: +61-2-8784 8500
Project	: SOP	QC Level	: NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Site	: ----		
C-O-C number	: 226502	Date Samples Received	: 09-DEC-2014
Sampler	: DS	Issue Date	: 12-DEC-2014
Order number	: VC00628		
		No. of samples received	: 1
Quote number	: SY/752/13	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Interpretive Quality Control Report contains the following information:

- Analysis Holding Time Compliance
- Quality Control Parameter Frequency Compliance
- Brief Method Summaries
- Summary of Outliers

Analysis Holding Time Compliance

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unspecified (EG020A-T)							
BH2	**09-DEC-2014**	**11-DEC-2014**	07-JUN-2015	✓	**12-DEC-2014**	07-JUN-2015	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unspecified (EG035T)							
BH2	**09-DEC-2014**	**----**	----	----	**12-DEC-2014**	06-JAN-2015	✓
EP080/071: Total Petroleum Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP071)							
BH2	**09-DEC-2014**	**11-DEC-2014**	16-DEC-2014	✓	**11-DEC-2014**	20-JAN-2015	✓
EP075(SIM)A: Phenolic Compounds							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
BH2	**09-DEC-2014**	**11-DEC-2014**	16-DEC-2014	✓	**11-DEC-2014**	20-JAN-2015	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Amber Glass Bottle - Unpreserved (EP075(SIM))							
BH2	**09-DEC-2014**	**11-DEC-2014**	16-DEC-2014	✓	**11-DEC-2014**	20-JAN-2015	✓
EP080: BTEXN							
Amber VOC Vial - Sulfuric Acid (EP080)							
BH2	**09-DEC-2014**	**11-DEC-2014**	23-DEC-2014	✓	**11-DEC-2014**	23-DEC-2014	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Amber VOC Vial - Sulfuric Acid (EP080)							
BH2	**09-DEC-2014**	**11-DEC-2014**	23-DEC-2014	✓	**11-DEC-2014**	23-DEC-2014	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Total Mercury by FIMS	EG035T	1	4	**25.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.0**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	2	15	**13.3**	**10.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Laboratory Control Samples (LCS)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	4	**25.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	1	**100.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	15	**6.7**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Method Blanks (MB)							
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	1	1	**100.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Mercury by FIMS	EG035T	1	4	**25.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH - Semivolatile Fraction	EP071	1	1	**100.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	15	**6.7**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Matrix Spikes (MS)							
Total Mercury by FIMS	EG035T	1	4	**25.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
Total Metals by ICP-MS - Suite A	EG020A-T	1	2	**50.0**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement
TRH Volatiles/BTEX	EP080	1	15	**6.7**	**5.0**	✓	NEPM 2013 Schedule B(3) and ALS QCS3 requirement

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 21st ed., 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 21st ed. 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	WATER	USEPA SW 846 - 8015A The sample extract is analysed by Capillary GC/FID and quantification is by comparison against an established 5 point calibration curve of n-Alkane standards. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)
PAH/Phenols (GC/MS - SIM)	EP075(SIM)	WATER	USEPA SW 846 - 8270D Sample extracts are analysed by Capillary GC/MS in SIM Mode and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH Volatiles/BTEX	EP080	WATER	USEPA SW 846 - 8260B Water samples are directly purged prior to analysis by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. Alternatively, a sample is equilibrated in a headspace vial and a portion of the headspace determined by GCMS analysis. This method is compliant with the QC requirements of NEPM (2013) Schedule B(3)

Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	USEPA SW846-3005 Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
Separatory Funnel Extraction of Liquids	ORG14	WATER	USEPA SW 846 - 3510B 100 mL to 1L of sample is transferred to a separatory funnel and serially extracted three times using 60mL DCM for each extract. The resultant extracts are combined, dehydrated and concentrated for analysis. This method is compliant with NEPM (2013) Schedule B(3) . ALS default excludes sediment which may be resident in the container.

Summary of Outliers

Outliers : Quality Control Samples

The following report highlights outliers flagged in the Quality Control (QC) Report. Surrogate recovery limits are static and based on USEPA SW 846 or ALS-QWI/EN/38 (in the absence of specific USEPA limits). This report displays QC Outliers (breaches) only.

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

- **For all matrices, no Method Blank value outliers occur.**
- **For all matrices, no Duplicate outliers occur.**
- **For all matrices, no Laboratory Control outliers occur.**
- **For all matrices, no Matrix Spike outliers occur.**

Regular Sample Surrogates

- **For all regular sample matrices, no surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

This report displays Holding Time breaches only. Only the respective Extraction / Preparation and/or Analysis component is/are displayed.

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

Outliers : Frequency of Quality Control Samples

The following report highlights breaches in the Frequency of Quality Control Samples.

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

ALS Environmental

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ ADELAIDE ☐ BRISBANE ☐ CHINCHILLA ☐ DARWIN ☐ EMERALD ☐ GLADSTONE ☐ MACKAY ☐ MELBOURNE ☐ MUDGEE ☐ NEWCASTLE ☐ NOWRA ☐ PERTH ☐ ROMA ☐ SYDNEY ☐ TOWNSVILLE ☐ WOLLONGONG

CLIENT: VALLEY CIVIL LAB
OFFICE: THORNTON
PROJECT: SOP
PURCHASE ORDER NUMBER: VL00628
PROJECT MANAGER: K. DAWES CONTACT PH: 0429496618
SAMPLER: D. SANDOWSKY SAMPLER MOBILE: 0407434604
COC emailed to ALS? (YES / NO) EDD FORMAT (or default): karl.dawes@valleycivillab.com.au
Email Reports to (will default to PM if no other addresses are listed): [illegible]
Email Invoice to (will default to PM if no other addresses are listed): accounts@valleycivillab.com.au

TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)
☐ Standard TAT (List due date):
☑ Non Standard or urgent TAT (List due date): 72 HR.

ALS QUOTE NO.:

COC SEQUENCE NUMBER (Circle)
COC: 1 (2) 3 4 5 6 7
OF: 1 (2) 3 4 5 6 7

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
com.au	Ke		Frank ALS
DATE/TIME:	DATE/TIME: 8/12/14 1035	DATE/TIME: 8/12/14 10.35	DATE/TIME: 9-12-14 1910.

COMMENTS/ SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX - SOLID (S), WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or dissolved (field filtered bottle required).		Additional Information
LAB ID	SAMPLE ID	DATE/ TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	S-27	W-27	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Valley Civil Lab Sample No.s.
	BH5 0.2m	7-12-14	S		1			S14-3621
	BH5 2.5m							" " 3622
	BH5 4.0m							3623
	BH6 0.2m							3624
	BH6 1.1m							3625
	BH6 3.0m							3626
	DUP 1							3627
	DUP 2							3628
1	BH2		W	SAMPLED 9-12-14 18:00	2			3629
				TOTAL	10			

Environmental Division
Sydney
Work Order
ES1427338
Telephone : +61-2-8784 8555

TAT

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; UI = Lugols Iodine Preserved; STT = Sterile Sodium Thiosulfate Preserved; Z = Zinc Acetate Preserved Bottle; E = Ed TA Preserved Bottles; ST = Sterile Bottle Soil Container Codes: ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

226502

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HISTORY OF TITLE TRANSACTION

Title Reference: 71/1134933

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
9/6/2016 11:06PM

FOLIO: 71/1134933

First Title(s): OLD SYSTEM
Prior Title(s): 14/1110035

Recorded	Number	Type of Instrument	C.T. Issue
3/7/2009	DP1134933	DEPOSITED PLAN	FOLIO CREATED EDITION 1
6/7/2009	AE812898	DEPARTMENTAL DEALING	
18/8/2010	DP1114423	WITHDRAWN - PRE-EXAMINATION PLAN	
16/5/2012	AG988855	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

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HISTORY OF TITLE TRANSACTION

Title Reference: 14/1110035

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
10/6/2016 12:24AM

FOLIO: 14/1110035

First Title(s): OLD SYSTEM
Prior Title(s): 79/875562 151/1108154

Recorded	Number	Type of Instrument	C.T. Issue
25/6/2007	DP1110035	DEPOSITED PLAN	FOLIO CREATED EDITION 1
26/6/2007	AD217596	DEPARTMENTAL DEALING	
2/6/2009	AE720968	DEPARTMENTAL DEALING	
9/6/2009	AE735159	DEPARTMENTAL DEALING	
3/7/2009	DP1134933	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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HISTORY OF TITLE TRANSACTION

Title Reference: 74/818981

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
14/6/2016 11:40AM

FOLIO: 74/818981

First Title(s): OLD SYSTEM
Prior Title(s): 5/774130

Recorded	Number	Type of Instrument	C.T. Issue
3/8/1992	DP818981	DEPOSITED PLAN	FOLIO CREATED EDITION 1
1/10/1992	E799640	WITHDRAWAL OF CAVEAT	
1/10/1992	E799641	WITHDRAWAL OF CAVEAT	
22/9/1993	I378527	REQUEST	
22/9/1993	I356058	REQUEST	
22/9/1993	I378525	APPLICATION	EDITION 2
18/8/1995	O470143	DEPARTMENTAL DEALING	
8/12/1995	O738097	REQUEST	EDITION 3
25/8/1997	3350461	DEPARTMENTAL DEALING	
28/1/1998	3755286	DEPARTMENTAL DEALING	
3/3/1998	DP875562	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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HISTORY OF TITLE TRANSACTION

Title Reference: 5/774130

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
14/6/2016 11:40AM

FOLIO: 5/774130

First Title(s): OLD SYSTEM
Prior Title(s): 6/740790

Recorded	Number	Type of Instrument	C.T. Issue
23/6/1988	DP774130	DEPOSITED PLAN	FOLIO CREATED EDITION 1
10/4/1989	Y27673	REQUEST	
10/4/1989	Y29791	TRANSFER GRANTING EASEMENT	EDITION 2
3/7/1990	Z98397	DEPARTMENTAL DEALING	
3/7/1990	Z80438	REQUEST	
3/7/1990	Z80439	TRANSFER OF LEASE	
3/7/1990	Z80440	TRANSFER OF LEASE	EDITION 3
3/3/1992	E295488	CAVEAT	
8/4/1992	E377182	CAVEAT	
3/8/1992	E617299	APPLICATION	
3/8/1992	DP818981	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS
17/10/2002	DP1045522	DEPOSITED PLAN	
22/11/2002	9148874	DEPARTMENTAL DEALING	FOLIO RESTORED
22/11/2002	8971451	REQUEST	FOLIO CANCELLED RESIDUE REMAINS
6/2/2008	DP1122970	DEPOSITED PLAN	
26/8/2008	AE170873	DEPARTMENTAL DEALING	
28/10/2008	AE136428	REQUEST	FOLIO CANCELLED
28/10/2008	AE292555	DEPARTMENTAL DEALING	
28/10/2008	AE292760	DEPARTMENTAL DEALING	FOLIO CANCELLED RESIDUE REMAINS
12/3/2014	AI435678	DEPARTMENTAL DEALING	
20/5/2014	AI590976	DEPARTMENTAL DEALING	FOLIO RESTORED
20/5/2014	AI374369	REQUEST	

END OF PAGE 1 - CONTINUED OVER

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
14/6/2016 11:40AM

FOLIO: 5/774130 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
20/5/2014	AI591058	DEPARTMENTAL DEALING	FOLIO CANCELLED RESIDUE REMAINS

*** END OF SEARCH ***

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HISTORY OF TITLE TRANSACTION

Title Reference: 6/740790

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
14/6/2016 11:40AM

FOLIO: 6/740790

First Title(s): OLD SYSTEM
Prior Title(s): VOL 6129 FOL 216

Recorded	Number	Type of Instrument	C.T. Issue
13/3/1987	DP740790	DEPOSITED PLAN	FOLIO CREATED EDITION 1
22/4/1988	X509870	DEPARTMENTAL DEALING	
27/5/1988	X483077	REQUEST	EDITION 2
22/6/1988	DP774130	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

PRINTED ON 14/6/2016

Land and Property Information Division

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NSW GOVERNMENT Land & Property Information

A division of the Department of Finance & Services

TITLE SEARCH

Title Reference: 71/1134933

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 71/1134933

SEARCH DATE	TIME	EDITION NO	DATE
10/6/2016	12:24 AM	1	3/7/2009

LAND

LOT 71 IN DEPOSITED PLAN 1134933
AT HOMEBUSH
LOCAL GOVERNMENT AREA AUBURN
PARISH OF CONCORD COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1134933

FIRST SCHEDULE

SYDNEY OLYMPIC PARK AUTHORITY

SECOND SCHEDULE (2 NOTIFICATIONS)

* 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S) AND EXCEPTION OF MINERALS AS REGARDS PARTS. SEE VOL 6129 FOL 216 THE TITLE DIAGRAM AND SHEET 3 OF DP849975

2 L827059 RIGHT OF WAY 20.115 METRE(S) WIDE APPURTENANT TO THE PART(S) OF THE LAND SHOWN SO BENEFITED IN THE TITLE DIAGRAM (AD) BEING THE RESIDUE OF VOL.6129 FOL.216 AS AT 28/04/1970 AFFECTING LOT 100 IN DP1042833 AND LOTS 10 & 15 IN DP778665

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

PRINTED ON 10/6/2016

** ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE.*
WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

WorkCover NSW
92-100 Donnison Street, Gosford, NSW 2250
Locked Bag 2906, Lisarow, NSW 2252
T 02 4321 5000 F 02 4325 4145
WorkCover Assistance Service 13 10 50
DX 731 Sydney workcover.nsw.gov.au

Our Ref: D14/156156
Your Ref: Karl Dawes

8 December 2014

RECEIVED
16 DEC 2014
BY:

Attention: Karl Dawes
Valley Civilab
PO BOX 3721
Thornton NSW 2322

Dear Mr Dawes,

RE SITE: Site 2A Sydney Olympic Park NSW

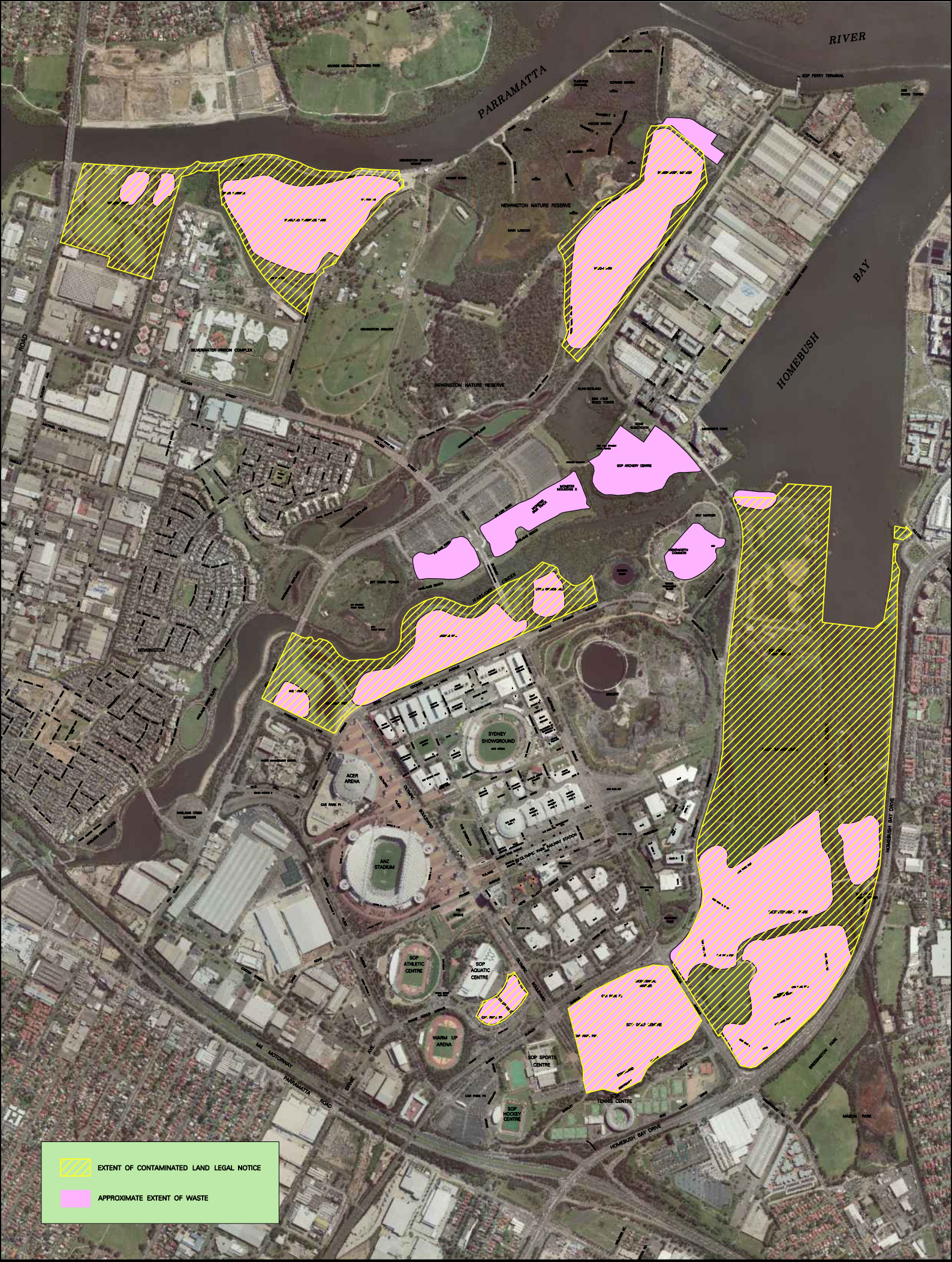
I refer to your site search request received by WorkCover NSW on 1 December 2014 requesting information on licences to keep dangerous goods for the above site.

A search of the Stored Chemical Information Database (SCID) and the microfiche records held by WorkCover NSW has not located any records pertaining to the above mentioned premises.

If you have any further queries please contact the Dangerous Goods Licensing Team on (02) 4321 5500.

Yours Sincerely

Brent Jones
Senior Licensing Officer
Dangerous Goods Team



PRODUCT OF SOPA CADD UNIT (02) 9714-7875

50m 0 50 100 150 200 250 300 350 400m

SYDNEY OLYMPIC PARK AUTHORITY
7 FIGTREE DRIVE SYDNEY OLYMPIC PARK NSW 2127
PH. (02) 9714 7300 FAX. (02) 9714 7818

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SYDNEY OLYMPIC PARK
REMEDIATED LANDFILL AREAS

DRG. NO. : 001-G-G-0061 REV. B
SCALE: 1:4000 AT A3

PLOT DATE: 25/11/08

S26 No.26005
S35 No.530

S35 No.495

S35 No.526

S35 No.226

S28 s281998004

S28 s281998005

S28 s281998006

SECTION 26 – VOLUNTARY REMEDIATATION AGREEMENT

SECTION 35 NOTICE

SECTION 28 NOTICE

IMPORTANT NOTE:
INFORMATION SHOWN ON THIS DRAWING IS INDICATIVE ONLY AND IS SUBJECT TO REVIEW.

SECTION 35 – ENVIRONMENTALLY HAZARDOUS CHEMICALS ACT
SECTION 28 & 26 – CONTAMINATED LAND MANAGEMENT ACT

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50m 0 50 100 150 200 250 300 350 400m

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SYDNEY OLYMPIC PARK

AREAS AFFECTED BY SECTION 26, 35 & 28 NOTICES

DRG. NO. : 001-G-G-0003 REV. A
SCALE: AS PER SCALE BAR

PLOT DATE: 23/03/07

118

L02/1489

Site Contamination Assessment
Sites 2 and 8
Sydney Olympic Park Town Centre
Homebush, NSW







HLA-Envirosciences Pty Limited
Environmental, Planning,
Engineering & OHS Services

Site Contamination Assessment
Sites 2 and 8
Sydney Olympic Park Town Centre
Homebush, NSW

Prepared for:

Sydney Olympic Park Authority
7 Figtree Drive,
Homebush, NSW 2127

HLA-Envirosciences Project No: J1938

by

Rachael Casson
Environmental Scientist

Alex Latham
Senior Environmental Scientist

18 December, 2002

This document was prepared for the sole use of Sydney Olympic Park Authority, and the regulatory agencies that are directly involved in this project, the only intended beneficiaries of our work. No other party should rely on the information contained herein without the prior written consent of HLA-Envirosciences Pty Limited and Sydney Olympic Park Authority.

HLA's professional opinions contained in this report are subject to modification if additional information is obtained, through further investigation, observations, or validation testing and analysis during remedial activities.

From a technical perspective, the subsurface environment presents very substantial uncertainty. It is a heterogeneous, complex environment, in which small surface features or changes in geologic conditions can have significant impacts on water and chemical movement. Major uncertainties also present difficulties in source characterisation assessment of chemical fate and transport in the environment, assessment of exposure risks and health effects, and remedial action performance.

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EXECUTIVE SUMMARY

Introduction

HLA-Envirosciences Pty Limited (HLA) was engaged by the Sydney Olympic Park Authority (SOPA) to conduct a Site Contamination Assessment of Development Site Numbers 2 and 8 (herein referred to as Site 2 and Site 8). Site 2 is located at the corner of Australia Avenue and Parkview Drive (northern side of Parkview Drive), whilst Site 8 is located in Murray Rose Avenue (opposite the Olympic Park Railway Station), Homebush, NSW (refer Figure 1).

The purpose of the investigation was to evaluate any subsurface contamination at the sites related, in particular, to the use of imported fill of unknown origin and content at both sites. The investigation has been undertaken prior to the possible divestment of Site 2 and Site 8 for future Residential and/or Commercial and Industrial land use as defined by the *Guidelines for the Site Auditor Scheme* (NSW EPA 1998). For future planning purposes, HLA has also used data collected to classify site soils for possible future excavation and off-site disposal of soils excavated for development purposes.

Site History and Use

Site 2

From the limited site history investigation, Site 2 appears to have been predominantly undeveloped between 1930 and 1995. Between 1995 and 2002 the site was developed for use as a car park and for numerous buildings.

Site 8

Site 8 formed part of the Abattoir between 1930 and 1995 and was used periodically as a car park with railway lines intersecting the site. A small building and nearby shed occupied part of the site between 1970 and 1995.

Review of pertinent literature indicates that no known or suspected industrial/putrescible landfills are present beneath either Site 2 or Site 8.

Geology and Hydrogeology

Site 2

Across Site 2, two distinct lithologies were encountered:

1. *Asphalt Car Park Area:* Soil Strata comprised fill material overlying stiff silty clay grading to weathered shale and shale (bedrock). The depth of fill material varied between 0.1metres below ground surface (mbgs) and 2.3mbgs. As anticipated the greatest depths of fill were located near the Sydney Olympic Park Railway tunnel at BH30 and BH31, while the depth of fill lessened in an easterly direction. The fill material predominantly comprised crushed sandstone and gravel in the surface fill across the site and reworked clay with sand and gravel in the south western corner (BH30 and BH31).

2. *Remaining Portion of Site:* Generally the soil strata comprised minimal fill overlying stiff silty clay grading to weathered shale and shale (bedrock). The depth of soil fill material varied between no fill and 0.2mbgs (at BH32). The fill material predominantly comprised sand and gravel.

Asbestos and brick waste containing material was not observed in the fill material during the subsurface investigation.

Saturated soils (associated with perched groundwater) were encountered in one location only, BH30, at a depth of 1.8mbgs in the lower reaches of the fill material above the natural stiff silty clay layer.

Site 8

The soil strata across Site 8 comprised fill material overlying stiff silty clay grading to weathered shale and shale (bedrock). The depth of soil fill material was typically greatest in the eastern portion of the site (BH43, BH44, BH45, BH46, BH47, BH48, BH55). The maximum depth of fill recorded at the site was 4.5mbgs in BH45. The fill material predominantly comprised reworked clay, sand, silt and gravel and may be related to earthworks associated with the development of the region for the 2000 Sydney Olympics. Asbestos and brick waste containing material was not observed in the fill material during the subsurface investigation.

The natural soil profile consisted of predominantly stiff red/brown or red/grey, low to medium plasticity clay grading to low to high strength shale bedrock.

Saturated soils were encountered in BH45 (at a depth of 0.6mbgs in the fill layer) and BH46 (at a depth of 3.2mbgs in the natural clay layer above the shale bedrock).

The geology and hydrogeology across Site 2 and Site 8 is consistent with previously conducted investigations and published geological information for the site.

Sampling Program and Results

Site 2 (BH24 to BH42)

Analysis was undertaken of 20 soil samples obtained from 19 sample locations (including 15 fill samples and five natural soil samples) for a range of potential contaminants of concern including heavy metals, cyanide, total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), phenols, organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs) and Volatile Organic Compounds (VOCs). The analysis did not identify any elevated concentrations above adopted site evaluation criteria, except for the detection of nickel concentrations above provisional phytotoxicity based investigation levels (PBILs) in the soil sample obtained from the natural clay at a depth between 0 and 0.2mbgs at BH37, which is located in the northern portion of the site.

Site 8 (BH43 to BH55)

Analysis was undertaken of 13 soil samples obtained from 13 sample locations (includes 12 fill samples and one natural soil sample) for a range of potential contaminants of concern including heavy metals, cyanide, total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), phenols, organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs) and Volatile Organic Compounds (VOCs including monocyclic aromatic hydrocarbons, oxygenated hydrocarbons, sulfonated hydrocarbons, fumigants, halogenated hydrocarbons, halogenated aromatic hydrocarbons, trialomethanes and napthalene). The analysis did not identify any elevated levels above adopted site evaluation criteria, except for the detection of copper concentrations above provisional phytotoxicity based investigation levels (PBILs) in the soil sample obtained from the fill material at a depth between 1.3 and 1.5mbgs at BH47, which is located in the eastern portion of the site.

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Site Suitability and Waste Classification

Subsurface investigations found no evidence of putrescible or industrial waste disposal areas beneath either Site 2 or Site 8. The fill material appeared to predominantly comprise reworked soils or road base type material. No asbestos containing materials were identified at either site.

The results of the investigation indicate that subsurface soil conditions at both sites are suitable for either residential land use (with minimal soil access) and or commercial/industrial land use.

If future land development includes the removal and off-site disposal of soil, soils at Site 2 may be disposed of as *Inert Waste*, per NSW EPA (1999) classifications, whilst fill material of BH53 at Site 8 may be disposed of as *Solid Waste* and the remaining Site 8 soils may be disposed of as *Inert Waste* (NSW EPA [1999]).

1.0 INTRODUCTION

1.1 Background

HLA-Envirosciences Pty Limited (HLA) was engaged by the Sydney Olympic Park Authority (SOPA) to conduct a Site Contamination Assessment (SCA) of Development Site numbers 2 and 8 (herein referred to as Site 2 and Site 8). Site 2 is located at the corner of Australia Avenue and Parkview Drive (northern side of Parkview Drive), whilst Site 8 is located in Murray Rose Avenue (opposite the Olympic Park Railway Station), Homebush, NSW (refer Figure1).

This investigation was preformed to evaluate whether gross contamination, including evaluation of the extent of landfill materials (if any), is present in the soils at either site. The information obtained may be used during possible future property divestment process.

1.2 Objectives

HLA understood the objectives of this investigation were to:

- Evaluate the condition of the two development sites with regard to potential soil contamination, relating to former site activities and the placement of imported fill of unknown origin /content;
- Provide advice on the suitability of the sites for proposed Residential (with minimal soil access) and/or Commercial/Industrial development by comparing soil analytical data against the soil investigation levels (SILs) provided in the *NSW EPA* (1998) Contaminated Site Guideline: *Guidelines for the NSW Site Auditor Scheme* and *National Environment Protection (Assessment of Site Contamination) Measure (NEPM, 1999)*; and
- Provide preliminary information on soil conditions with respect to possible future off-site disposal by comparing results to the NSW EPA (1999) Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes.

HLA notes that consistent with SOPA directives, the scope of work performed during this assessment will not necessarily fulfill all requirements of the NSW EPA Guidelines for the NSW Site Auditor Scheme as the site history review was limited in scope[1] and groundwater (including subsurface seepage at both sites) was not investigated. The work conducted however, satisfies the objectives outlined above.

2.0 SCOPE OF WORK

The following scope of work was completed during the course of the investigation:

- Review of background (site history, land use and previous environmental investigations undertaken) information on the site, as provided by SOPA. Because of the availability of historical information, a historical title search was not performed.
- Soil sampling from 19 soil bore locations across Site 2 (BH24 to BH42) and 13 soil bore locations across Site 8 (BH43 to BH55);
- An analytical program incorporating analysis for heavy metals (arsenic, cadmium, chromium, hexavalent chromium, copper, nickel, lead, zinc, mercury, beryllium and manganese), cyanide, total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, total xylenes (BTEX),

[1] The agreed scope of work did not include the review of historical land ownership records, council information or NSW EPA records.

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organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), poly cyclic aromatic hydrocarbons (**PAHs**), total **phenols** and volatile organic compounds (**VOCs** including monocyclic aromatic hydrocarbons, oxygenated hydrocarbons, sulfonated hydrocarbons, fumigants, halogenated hydrocarbons, halogenated aromatic hydrocarbons, trialomethanes and napthalene). Select samples also under went Toxicity Characteristic Leaching Procedure (TCLP) for nickel, lead, arsenic, chromium and benzo(a)pyrene (B(a)P); and

- Preparation of this report, detailing the methodologies used, review of the results and conclusions regarding the land use suitability of Sites 2 and 8.

All investigative work was conducted in accordance the following applicable guidelines:

NSW EPA (1995) Sampling Design Guidelines – were generally followed during design of the sampling and analysis plan and predetermination of data quality objectives (DQOs).

NSW EPA (1998) Guidelines for the NSW Site Auditor Scheme – were used to apply the NSW EPA decision processes for assessing redevelopment of urban sites.

NSW EPA (1997) Guidelines for Consultants Reporting on Contaminated Sites – were generally followed throughout the investigations and during preparation of this report.

NEPM (1999) Assessment of Site Contamination – was considered throughout the entire investigation.

ANZECC (1996) Guidelines for the Laboratory Analysis of Contaminated Soils – were used to ensure laboratory analysis of samples obtained from the site was conducted using appropriate methods to acceptable levels of accuracy and precision.

3.0 SITE DESCRITPTION

SITE 2

Site 2's layout and boundaries are depicted on Figure 2[3]. Site 2 comprises an area of approximately 0.8ha, of which approximately 50% is covered with an asphalt car park, 40% with a gravel surface and the remaining 10% is covered with grass. Site 2 has two distinct surface levels, the upper level being the asphalt car park in the southern portion of the site and the lower being the gravel and grassed areas. The lowest portion of the site is positioned approximately 1.5m below the surface levels of neighbouring land to the north, south and west and is level with ground to the east. A large established fig tree exists in the north western corner of the site and appeared to be healthy and not suffering stress. At the time of the investigation the site was not occupied by any building or above-ground infrastructure. However physical evidence of historical building infrastructure (including gravel and bitumen surfaced area with demolition rubble which had been collected in a skip bin), was noted during field activities in the north eastern portion of the site and on the 2002 aerial photograph (supplied by SOPA – Figure 2). The former building use is unknown.

The Olympic Park Railway line runs in a tunnel beneath the south western portion of the site. The approximate location of the tunnel is shown on Figure 3. The topographical grade of Site 2 slopes toward the north and north east.

The asphalt car park area was identified during the site inspection, as likely to contain the greatest amounts of fill.

[3] Note the layout depicted on Figure 2 is no longer current as the site buildings in the north eastern corner of the site have recently been removed, but is still adequate for the purpose of this study.

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SITE 8

The current site layout and boundaries for Site 8 are depicted on Figure 3. The entire site is covered with asphalt and used for car parking purposes. The site is not occupied by any building or infrastructure and no other notable activities/operations were observed. The site has a relatively even grade.

SOPA have not provided the legal descriptions nor the current zoning for either site.

4.0 SITE HISTORY

The following site history information was compiled from information supplied by SOPA.

4.1 Previous Investigations

Numerous environmental investigations have been conducted in the Homebush Bay area. The following reports were reviewed by HLA and contained information pertinent to the subject sites.

Coffey Partners International Pty Ltd (Coffey) – Soil and Groundwater Contamination Investigation Volume 1 – Introduction and Summary, 1991.

This report provides an introduction to the environmental investigation conducted by Coffey across an area of 660ha, including and around Site 8. The investigation did not include Site 2. The only information provided that is relevant to this investigation included:

- No soil sampling was conducted in Site 2. Five boreholes were conducted in Site 8 with two samples being collected per borehole. Laboratory testing details and results were not supplied in the report cited.
- It is likely that wastes containing dioxin were dumped at varying locations in the Homebush Bay area. The dioxin wastes were sourced from the former Union Carbide site at Rhodes.
- Geology of the region comprised: fill overlying weathered shale that graded to shale; that was underlain by sandstone.
- Regional groundwater flow direction generally followed local topography as well as being significantly influenced by the brick pit located to the north of site 2 (Figure 1).

Coffey Partners International Pty Ltd (Coffey) – Soil and Groundwater Contamination Investigation Volume 2 – Historical Research, 1991.

Coffey reviewed various council records, State Government records, previous investigations and aerial photographs for the Homebush Bay area. The review concentrated on identifying landfill operations. Numerous filled areas were identified, however Sites 2 and 8 were not located in any of these areas. No other pertinent information was obtained for either site.

CH2MHILL Australia Pty Ltd (CH2MHILL) – Olympic Site – Homebush Bay, Dioxin Review Report, 1997.

This report identified areas around Homebush Bay that dioxin waste were known or suspected to have been dumped. Site 2 and Site 8 were not among these areas. No other pertinent environmental information relating to the two sites was noted.

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4.2 Aerial Photographs

The following information was derived from reviewing copies of historical aerial photographs for the site and surrounding area between 1930 and 2002. The copied photographs were provided by SOPA[4].

Photograph Details	Description
1930 Black and white	Site 2 is clear of both vegetation and infrastructure (likely a cattle holding area), while Site 8 appears to be located on the fringes of the former abattoir. Two rail tracks run across Site 8 in a north to south orientation, no other significant building infrastructure can be observed on Site 8. Surrounding land use comprises a mix of agricultural, commercial/industrial (includes brick pit and abattoir)
1942 Black and white	The aerial photograph is grainy and of poor quality. It is evident however, that Site 2 remains undeveloped (although there's been a minor increase in tree numbers) and Site 8 is unchanged. Surrounding land use remains the same.
1955 and 1965 Black and white	The two sites and surrounding land use remains predominantly the same as 1942.
1970 and 1978 Black and white	Site 2 remains unchanged, whilst a building and nearby shed have been constructed in the south eastern portion of Site 8. Furthermore one of the railway lines (the eastern most) appears to have been changed to a roadway. The remainder of Site 8 is covered with a car park.
1978 Black and white	The two sites remain predominantly the same as above, although it appears that Site 8 is a car park area for the abattoir. Abattoir operations have expanded in the area. Regionally, commercial/industrial land use/activities have increased.
1995 Colour	Site 2 remains generally unchanged. Both railway lines have been removed from Site 8. The abattoir has been decommissioned and redevelopment works are visible. The building and associated shed in the south eastern portion of the site remain. The development of 2000 Olympic infrastructure has increased in the region.
2002 Colour	Site 2 is occupied by a car park in the southern half and numerous buildings in the northern half. Picture quality makes it difficult to determine if the buildings are demountables or permanent. The types of surface covers visible are consistent with current site observations. Site 8 is occupied by a car park, which is consistent with current site use.

[4] As the photos supplied were photomontage copies and not original stereopairs, HLA has not stereoscopically viewed the photos and therefore can not evaluate site surface level changes.

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4.3 Site History Summary

From the limited site history investigation[5], Site 2 appears to have been predominantly undeveloped between 1930 and 1995. Between 1995 and 2002 the site was developed for use as a car park and for numerous buildings.

Site 8 formed part of the Abattoir between 1930 and 1995 and was used periodically as a car park with railway lines (at grade) intersecting the site. A small building and nearby shed partially occupied the site between 1970 and 1995.

Review of pertinent literature indicates that no known or suspected industrial/putrescible landfills are present beneath either Site 2 or Site 8.

5.0 SITE CONDITIONS AND SURROUNDING ENVIRONMENT

5.1 Site Topography and Surrounding Land Uses

Site 2
The site and regional topography slopes predominantly to the north east. Land use surrounding Site 2 is summarised as follows:

- **East** – Soka Gakkai International Australia Buddhist Centre (commercial type land use).
- **South** – Parkview Drive with rail corridor and Development Site 3 opposite.
- **West** – Australia Avenue with car park areas opposite.
- **North** – Large car park area (Development Site 1).

Site 8
Site 8 has a relatively even surface grade with surrounding land use summarised as follows:

- **East** – Australia Avenue (Development Site 1 opposite).
- **South** – Murray Rose Avenue (Olympic Park Railway Station opposite).
- **West and North** – The Royal Agricultural Society Showgrounds.

5.2 Visible Evidence of Contamination

Other than evidence of filling, no other visual evidence of contamination was noted for either Site 2 or Site 8, including surface staining and/or chemical storage. No evidence of plant stress was noted.

[5] The agreed scope of work did not include the review of historical land ownership records, council information or NSW EPA records.

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6.0 GEOLOGY AND HYDROGEOLOGY

6.1 Regional Geology

The regional geology of the site consists of Middle Triassic aged Ashfield Shale of the Wianamatta Group (DMR 1983a). The Ashfield Shale consists of black to dark grey shale and laminite (DMR 1983a). Ashfield Shale is generally deeply weathered, producing low permeability clays and silts (DMR 1983b).

Major exposure of the Ashfield Shale can be seen in the nearby brick pit to the north (Figure 1).

Review of the Coffey (1991) soil and groundwater investigation of the area indicates that Hawkesbury Sandstone lies at depth beneath the Ashfield Shale (>15m).

6.2 Site Lithology

Borehole logs from HLA's investigations at Sites 2 and 8, describing the shallow subsurface soil profile encountered are included in Appendix A.

Site 2
Two distinct lithologies were encountered:

1. *Asphalt Car Park Area:* Soil Strata comprised fill material overlying stiff silty clay grading to weathered shale and shale (bedrock). The depth of fill material varied between 0.1metres below ground surface (mbgs) and 2.3mbgs. The greatest depths of fill were located near the Sydney Olympic Park Railway tunnel at BH30 and BH31. The depth of fill lessened in an easterly direction. The fill material predominantly comprised crushed sandstone and gravel in the surface fill across the car park area and reworked clay with sand and gravel in the car park's south western corner (BH30 and BH31).

2. *Remaining Portion of Site:* Generally the soil strata comprised A minimal layer of fill overlying stiff silty clay grading to weathered shale and shale (bedrock). The depth of soil fill material varied between no fill and 0.2mbgs (at BH32). The fill material predominantly comprised sand and gravel.

Fibre-cement and brick type waste material was not observed in the fill material during the subsurface investigation.

Saturated soils were encountered in one location only (BH30) at a depth of 1.8mbgs. This saturated zone was encountered in the lower reaches of the fill material perched above the natural, stiff, silty clay layer. The lack of encountered saturated soils in remaining locations indicates that the subsurface seepage is discontinuous and likely related to water infiltration and the permeable nature of the heterogeneous fill around the railway tunnel.

Site 8
Generally the soil strata across Site 8 generally comprised fill material overlying stiff silty clay grading to weathered shale and shale (bedrock). The depth of soil fill material was typically greatest in the eastern portion of the site (BH43, BH44, BH45, BH46, BH47, BH48, BH55). The greatest depth of fill recorded at the site was in excess of 4.5mbgs in BH45[6]. The fill material predominantly comprised a surface layer of concrete stabilised roadbase overlying reworked clay, sand, silt and gravel and may be related to earthworks associated with the development of the region for the 2000 Sydney Olympics.

[6] Note that the vertical extent of the fill material was not determined in BH45 due to depth limitations of the drilling rig.

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Materials containing Fibre-cement, landfill or brick type waste were not observed in the fill material during the subsurface investigation.

The natural soil profile consisted of predominantly stiff red/brown or red/grey, low to medium plasticity clay, grading to shale bedrock.

Saturated soils were encountered in BH45 (at a depth of 0.6mbgs in the fill layer) and BH46 (at a depth of 3.2mbgs in the natural clay layer perched above the shale bedrock). This perched water is likely related to suburface seepage through geological zones with higher permeability.

The encountered geology and hydrogeology across Site 2 and Site 8 is consistent with previously conducted investigations and published geological information for the sites.

6.3 Regional Hydrogeology

The scope of work did not include a search of registered water bores by the DLWC groundwater bore database, therefore HLA does not have data regarding the usage of groundwater in the vicinity of the site.

Previous groundwater studies conducted in the vicinity of Sites 2 and 8, indicate that there are two distinct non-connected groundwater systems, a shallow discontinuous perched aquifer within the fill material and a deeper aquifer within the fractures of the shale bedrock.

Previous groundwater investigations also conclude that the natural groundwater flow direction has been greatly influenced by the open cut brick pit, which behaves as a receiving sink/basin.

Any groundwater occurring in the shales and clays underlying the site is likely to be confined to zones of relatively higher permeability (i.e. fractures, clayey gravel and sandy clays) and therefore limited in extent.

6.4 Site Hydrology

As previously stated in Section 6.2, perched groundwater was encountered during the investigation at one location at Site 2 (BH30) and two locations at Site 8 (BH45 and BH46), within the heterogenous fill layer.

Groundwater under aquifer conditions was not encountered at either site during field investigations conducted to a maximum depth of 4.5 mbgs (in BH45).

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7.0 POTENTIAL AREAS AND CONTAMINANTS OF CONCERN

Based on the available site history and the site inspection the contaminants of concern associated with the imported fill material potentially include:

- Petroleum products (TPHs and BTEX).
- Pesticides (OCPs).
- PCBs.
- Heavy metals (including arsenic, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel and zinc).
- Bitumen road wastes (PAHs and total phenols).
- Volatile organic compounds (VOCs).
- Arsenic waste commonly used as a herbicide along railway lines.

8.0 SAMPLING AND ANALYSIS PLAN

The sampling plan adopted for the environmental investigation (based on information available) involved a stratified sampling pattern in accordance with ANZECC (1992) and EPA (1995) sampling guidelines. The number of sampling points conducted at each Site complies with the recommended minimum density required by the NSW EPA (1995) Sampling Design Guidelines as detailed in the following table:

Site No.	Site Area	NSW EPA (1995) recommended number of sampling points	Number of sampling points conducted	Hot Spot Detection size (m)
2	0.769ha	17	19	27
8	0.4726ha	13	13	27

The number of locations selected for each site is considered appropriate to achieve the primary objective of the investigation, which is to provide an indication of the extent and location of potential contamination (if any) on the sites. An approximate 23 m grid pattern was used during the investigation. The sampling analysis plan developed is considered sufficient to meet the objectives of the SCA requirements.

Field sampling was conducted in accordance with HLA's in-house sampling procedures. The methodology adopted for the field program is described below:

- Sampling of soil from 32 boreholes (designated BH24 to BH55 across both sites). Boreholes were drilled using an I-350 rotary drill rig with a combination of solid flight augers and direct push tube sampling method. Boreholes were advanced to the depth of undisturbed soils or refusal. The maximum depth of the investigation was 4.5mbgs at BH45.
- Samples were collected from the surficial soil material and at one metre intervals and/or at targeted levels (depending on noted lithology changes or suspected contamination).
- Samples were packed into acid washed, solvent rinsed laboratory supplied jars sealed with a teflon lined screw top lid, labelled and immediately placed on ice in a chilled cooler.
- Samples were transported on ice to the primary laboratory Australian Laboratory Services (ALS) and the secondary laboratory Labmark Laboratories Pty Ltd (Labmark) under chain of custody protocols.
- A new pair of disposable nitrile gloves was worn for the collection of each individual sample to minimise cross contamination whilst handling the soil.

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- Sampling equipment was decontaminated prior to the collection of each individual sample to minimise the risk of cross contamination. Decontamination consisted of washing the equipment with a phosphate free detergent solution (Decon 90) followed by rinsing with potable water.
- Screening of soil samples for volatile organic compounds (VOCs) was undertaken in the field using a portable photo-ionisation detector (PID). The PID was calibrated with isobutylene gas (103 ppm) before each day of field sampling was undertaken (a record of calibrations is included in Appendix A).
- Boreholes were reinstated using auger cuttings and resurfaced with concrete where necessary in paved areas.
- Borehole logs were maintained by the field scientist during drilling and are included in Appendix A.

Inaccordance with SOPA's requested scope of work, groundwater testing was not conducted.

A summary of the sample analytical program is tabulated below:

Sample Location	Depth Interval (m)	Sample Type	Natural soil or Fill	Analyses Conducted					
				TPH / BTEX	Metals	PAHs & Phenols	OCPs / PCBs	VOCs	Cyanide
SITE 2									
BH24	0.03 – 0.2	Grab	Fill	✓	✓	✓	✓	✓	✓
BH25	0.03-0.1	Grab	Fill		✓				
BH26	0.03-0.1	Grab	Fill	✓	✓				
BH27	0.03-0.1	Grab	Fill		✓				
BH28	0.03-0.1	Grab	Fill		✓	✓			
BH29	0.03-0.1	Grab	Fill		✓				
BH30	1.5-1.7	Grab	Fill	✓	✓	✓	✓		
BH31	0.8-1.0	Grab	Fill		✓		✓		
BH32	0.6-0.8	Grab	Natural		✓				✓
BH33	0-0.1	Grab	Fill		✓				
BH34	0.7-0.8	Grab	Natural	✓	✓	✓	✓		
BH35	2.0-2.1	Grab	Natural		✓				
BH36	0.4-0.5	Grab	Natural		✓				
BH37	0-0.2	Grab	Natural		✓				
BH38	0-0.1	Grab	Fill	✓	✓	✓	✓		
BH39	0.8-1.0	Grab	Natural		✓				
BH40	0-0.1	Grab	Fill		✓				
BH41	0.7-0.8	Grab	Fill		✓			✓	
BH42	0-0.2	Grab	Natural		✓				
QW02	Decontamination Rinsate water sample from sampling spatula			✓	✓	✓			
SITE 8									
BH43	0.7-0.8	Grab	Fill		✓				
BH44	0.03-0.2	Grab	Fill		✓				
BH45	0.6-0.8	Push Tube	Fill	✓	✓				
BH46	0.4-0.5	Grab	Fill	✓	✓	✓	✓		✓
BH47	1.3-1.5	Push Tube	Fill		✓				
Sample Location	Depth Interval (m)	Sample Type	Natural or Fill	Analyses Conducted					
				TPH / BTEX	Metals	PAHs & Phenols	OCPs / PCBs	VOCs	Cyanide

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SITE 8 Cont/...									
BH48	0.7-0.8	Push Tube	Fill	✓	✓	✓	✓		
BH49	0.6-0.75	Push Tube	Fill	✓	✓				✓
BH50	0.03-0.2	Grab	Fill		✓				
BH51	0.5-0.7	Push Tube	Natural		✓				
BH52	0.03-0.2	Grab	Fill		✓				
BH53	0.03-0.2	Grab	Fill		✓	✓	✓	✓	
BH54	0.03-0.2	Grab	Fill	✓	✓				
BH55	0.03-0.2	Grab	Fill		✓				
QW03	Decontamination Rinsate water sample from sampling spatula			✓	✓	✓			

Notes:
Metals are As, Be, Cd, Cr, Cu, Hg, Mn, Ni, Pb and Zn, unless noted otherwise.
VOCs include the following groups of compounds: monocyclic aromatic hydrocarbons, oxygenated hydrocarbons, sulfonated hydrocarbons, fumigants, halogenated hydrocarbons, halogenated aromatic hydrocarbons, trialomethanes and napthalene

The primary laboratory retained for the project was ALS of Smithfield, NSW, while the secondary laboratory Labmark Laboratories Pty Ltd (Labmark). ALS and Labmark (and the sub-contracted laboratory, Sydney Analytical Laboratories [SAL]) are NATA accredited for all analyses conducted. All analysis and Laboratory QC was conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Potentially Contaminated Soil (December 1999). Further laboratory information regarding analytical methods and internal QA/QC are provided in Appendix B.

9.0 QUALITY ASSURANCE AND CONTROL

9.1 QA/QC and Data Validation

A QA/QC program was designed to evaluate the overall quality and reliability of the data used in this assessment, including whether sampling and laboratory analysis procedures conducted were appropriate. Further detail is provided in Appendix B and includes the Data Quality Objectives (DQOs) for this investigation.

9.2 Data Useability

Based on an assessment of field and laboratory QA/QC data (refer Appendix B), the field investigation procedures and reported analytical results are considered to have produced valid and representative concentrations of the analysed compounds at the sample locations tested.

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10.0 BASIS FOR ASSESSMENT CRITERIA

10.1 Soil Evaluation Criteria

The current assessment criteria used in NSW to evaluate soil analytical results are based on the NSW EPA (1998) *Guidelines for the NSW Site Auditor Scheme*, NSW EPA (1994) *Guidelines for Assessing Service Station Sites* and the National Environment Protection (*Assessment of Site Contamination*) Measure (NEPM 1999). These combined guidelines present a range of Health-Based Soil Investigation Levels (SILs), provisional Phytotoxicity-Based Investigation Levels (PBILs), 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 in the NSW EPA (1998) and NEPM (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_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_2 Residential with minimal access to soil including high-rise apartments and flats.

SIL_3 Parks, recreational open space, playing fields including secondary schools.

SIL_4 Commercial or industrial.

PBILs & EILs

The PBILs (NSW EPA 1998) and EILs (NEPM 1999) have been devised for the protection of plants, 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; therefore they are intended to be applied as a screening guide only. The NSW EPA decision process for assessing urban redevelopment sites stipulates that the PBILs need to be considered on sites used for either residential purposes, or land uses including parks, recreational open space and secondary schools.

NSW EPA (1994) Sensitive Land Use Guidelines

For the assessment of petroleum hydrocarbon contamination, the NSW EPA (1998) guidelines refer to the use of the NSW EPA (1994) *Guidelines for Assessing Service Station Sites*. These guidelines contain threshold concentrations for 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 provided in NEPM (1999) for the various land use scenarios described above.

Waste Classification Criteria

Detected analyte concentrations are also compared with the *Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-Liquid Wastes – Tables A3 and A4* (NSW EPA, 1999), with the aim to provide guide classifications of site soils for future potential off-site disposal. Guidelines are referenced in Tables 1 to 4.

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Adopted Site Evaluation Criteria

Based on proposed future land uses of the site, for either residential (with minimal soil access) or commercial land use, the analytical results obtained during the investigation have been compared to both the NSW EPA (1998) SIL_2 and SIL_4 guidelines in conjunction with the NSW EPA (1994) sensitive land use guidelines for petroleum hydrocarbons and BTEX. Soil data has also been compared to SIL_5 (PBILs) guideline values to determine suitability of the soil for plant growth and NSW EPA (1999) Waste Classification criteria for future off-site disposal. The site evaluation criteria have been appended to the tables of analytical results (Tables 1 to 4) for comparison.

11.0 RESULTS

11.1 On-site Volatile Organic Compound (VOC) Screening

VOC concentrations were measured in the field using a calibrated photoionisation detector (PID), as a field screening device to identify potentially contaminated soils. The PID was used to test headspace vapours in samples stored in plastic zip lock bags. VOCs greater than 5.0ppm (levels below 5.0ppm are regarded as background levels) were not detected in any of the soil samples screened. All VOC screening results are provided on the bore logs in Appendix A.

11.2 Soil Analytical Results

The results of the laboratory analysis of soil are presented in Tables 1 to 5. Laboratory analytical reports and chain of custody documentation are provided in Appendix B. Figures 2 and 3 illustrates all soil sample locations. Results are summarised below.

11.2.1 Heavy Metals and Cyanide – Table 1

A total of 33 soil samples (includes 20 for Site 2 and 13 for Site 8) plus four duplicate samples were submitted for analysis. All detected metals and cyanide concentrations (Table 1) were below NSW EPA SIL_2 and SIL_4 guidelines.

Nickel concentrations exceeding PBIL were detected at Site 2 in the natural surface soil of BH37 (163mg/kg between 0-0.2mbgs). Reported copper concentrations in BH47 (653mg/kg at a depth between 1.3 and 1.5mbgs) at Site 8 were above PBIL.

Using total metal concentrations in conjunction with Toxicity Characteristic Leaching Procedure (TCLP) results the fill material is classified as *Inert Waste* in accordance with NSW EPA (1999) criteria, as all concentrations for both sites are below the maximum values for leachable concentration (TCLP1) and total concentration (SCC1).

11.2.2 TPH and BTEX – Table 2

A total of 11 soil samples (includes five samples for Site 2, four samples for Site 8 and two duplicate samples) were analysed for TPH and BTEX. Reported concentrations of both TPH and BTEX were below NSW EPA sensitive land use criteria and the maximum total concentration for *Inert Waste* (SCC1) guidelines in all samples submitted from both sites. It is noted that TPH concentrations (596mg/kg), below site evaluation criteria, were detected in BH54 at a depth between 0.03 and 0.2m.

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11.2.3 PAHs and Phenols – Table 3

A total of nine samples (five for Site 2 and four for Site 8) were analysed for PAHs and phenols. Analytical testing of the select samples did not detect either PAH or phenol concentrations above SIL_2 or SIL_4 guidelines at either site.

For Site 2, total PAH concentrations were below SCC1, while reported benzo (a) pyrene (BaP) concentrations were below the maximum total concentration CT1 - *Inert Waste* (with TCLP).

The reported total PAH concentrations for Site 8 were also below SCC1, while reported benzo (a) pyrene (BaP) concentrations were below the maximum total concentration CT2 - *Solid Waste* with TCLP. A statistical analysis of B(a)P data was not undertaken given, the small population number of reported B(a)P concentrations for fill samples at Site 8.

11.2.4 OCPs and PCBs – Table 4

A total of eight samples (including five samples from Site 2 and three samples from Site 8) were analysed for OCPs and PCBs. All samples analysed reported concentrations of OCPs and PCBs below laboratory practical quantitation limits and therefore below SIL_2 and SIL_4 guidelines.

OCP concentrations in samples obtained from Site 2 were below CT1 and PCB concentration were below SCC1, classifying the soil as *Inert Waste (NSW EPA, 1999)*.

In Site 8, OCP concentrations were below CT1. One PCB concentration (3.9mg/kg BH53_0.03-0.2) exceeded SCC1 but was below SCC2, classifying the fill material at Site 8 as *Solid Waste*.

11.2.5 VOCs – Table 5

Three samples (includes two from Site 2 and one from Site 8) were tested for VOCs. Laboratory testing did not detect VOCs above laboratory practical quantitation limits in these samples.

12.0 ASSESSMENT OF RISK

Based on the results of this investigation, soil conditions at the site do not pose a significant risk of harm to human health as defined in the NSW EPA Guidelines on Significant Risk of Harm and the duty to report. The elevated nickel and copper concentrations, encountered at one location in each site (BH37 – Site 2 and BH47 – Site 8), above provisional phytotoxicity based investigation levels, are not considered significant in the context of the investigation as:

- Stressed vegetation was not observed within the area of BH37 where elevated nickel concentrations were noted (i.e. the Fig tree and grassed areas in the north western corner of the site, see Figure 2). This indicates that there is unlikely to be a widespread phytotoxicity issue in site soils; and
- Future site use includes mixed residential with minimal soil access and commercial/industrial, indicating likely limited vegetation establishment at the site.

HLA notes the limitations of using total metal concentrations alone to determine site phytotoxicity issues. Given the above observations however, HLA does not consider further site specific testing is warranted.

[7] HLA note that the PQL for BaP is above the criteria set by the NSW EPA (1999) for *Inert Waste*.

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HLA considers that the potential for impact, from observed site sources, to site groundwater beneath Site 2 and Site 8 is low, given the following:

- The absence of soil contamination impact exceeding the adopted guideline levels at the site, particularly in the fill material; and
- Leachability of metals is low, as indicated by the limited TCLP testing results;
- Perched groundwater was encountered in the southern portion of Site 2 in one borehole location only (BH30) and in the eastern portion of Site 8 at two locations only (BH45 and BH46). The perched water encountered here is inferred to be associated with surface water infiltration through the heterogenous permeable fill layer overlying the less permeable clay and shale. Groundwater under aquifer conditions at both Sites is expected to exist at depth (<10mbgs) in shale; and
- The weathered shale and shale bedrock encountered beneath the majority of the site is of low permeability reducing the vertical and horizontal movement of any contaminants.

13.0 CONCLUSIONS

Mixed fill material was encountered at variable depths across both sites and predominantly comprised reworked clays with sand, silt and gravel. There was no evidence of putrescible or industrial waste disposal areas. No suspected asbestos containing materials were observed.

The results of the investigation indicate that subsurface soil conditions at both sites are suitable for either residential land use (with minimal soil access) and or commercial/industrial land use.

If future land development includes the removal and off-site disposal of soil, soils at Site 2 may be disposed of as *Inert Waste*, in accordance with NSW EPA (1999) classifications[8], whilst fill material in the area of BH53 at Site 8 (because of elevated OCP concentrations) may be disposed of as *Solid Waste* and the remaining Site 8 soils may be disposed of as *Inert Waste* (NSW EPA [1999]).

[8] Although BaP was not detected in any soil sample, HLA notes that the PQL for BaP is above the criteria set by the NSW EPA (1999) for *Inert Waste*. However given that elevated TPH concentrations were not reported and no visible signs of PAH contamination were noted (i.e. ash or bitumen), HLA consider it suitable to classify the waste as *Inert Waste*.

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14.0 REFERENCES

Australian and New Zealand Environment and Conservation Council (ANZECC, August 1996), *Guidelines for the Laboratory Analysis of Contaminated Soils*.

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CH2MHILL Australia Pty Ltd (1997). *Dioxin Review Report – Olympic Site – Homebush Bay.* Report No.: 100926.003. July 1997.

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NSW Environment Protection Authority (December 1994), *Guidelines for Assessing Service Station Sites*.

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NSW Environment Protection Authority (November 1997), *Guidelines for Consultants Reporting on Contaminated Sites*.

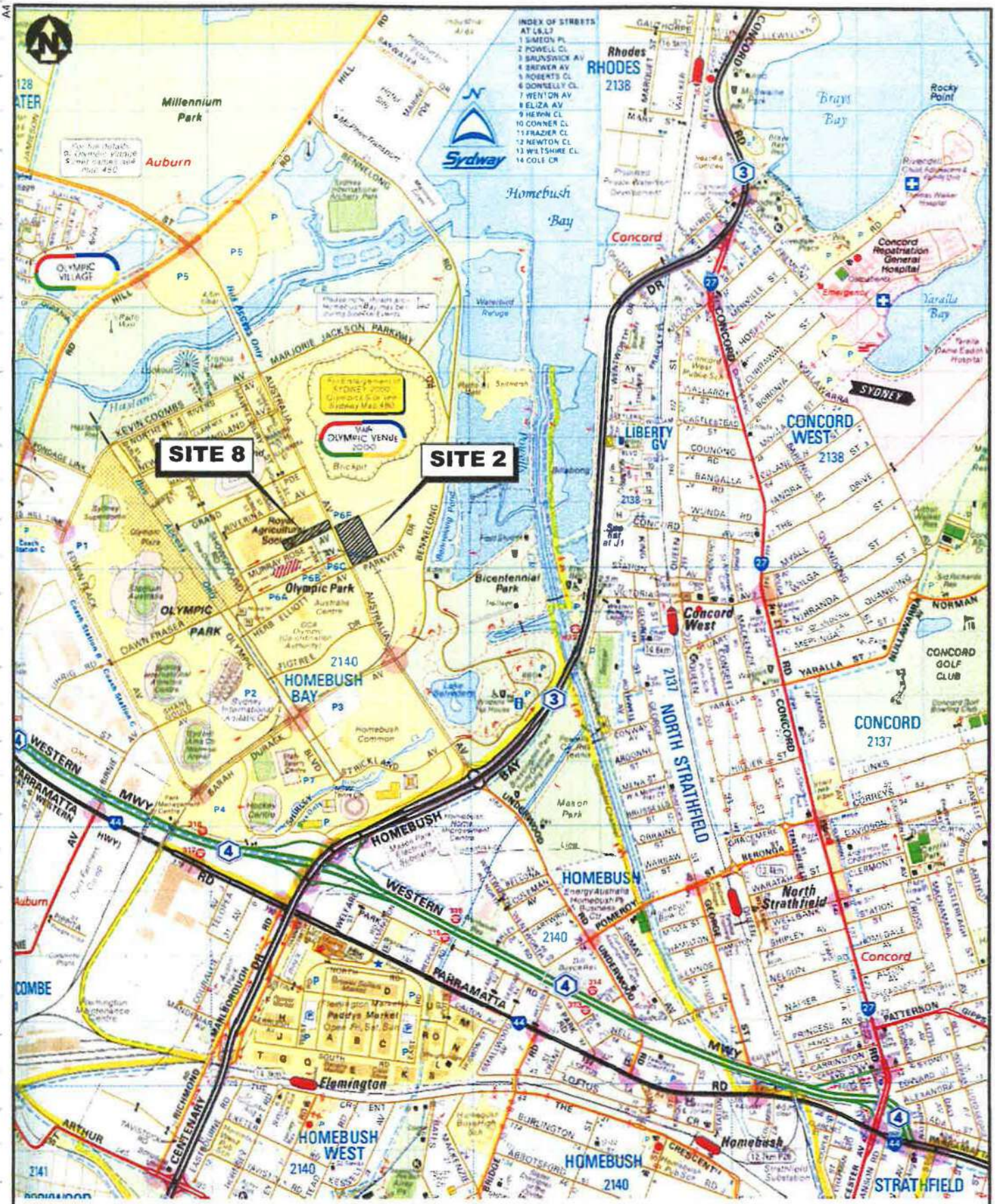
NSW Environment Protection Authority (June 1998), *Guidelines for the NSW Site Auditor Scheme.*

NSW Environment Protection Authority (May 1999), *Assessment, Classification and Management of Liquid and Non-Liquid Wastes*.

Imray, P. And Langley, A. (1996), *Health-Based Soil Investigation Levels*. National Environmental Health Forum Monographs, Soil Series No 1. South Australia Health Commission, Adelaide.

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FIGURES



Reference: Sydways Map 274, New South Wales.

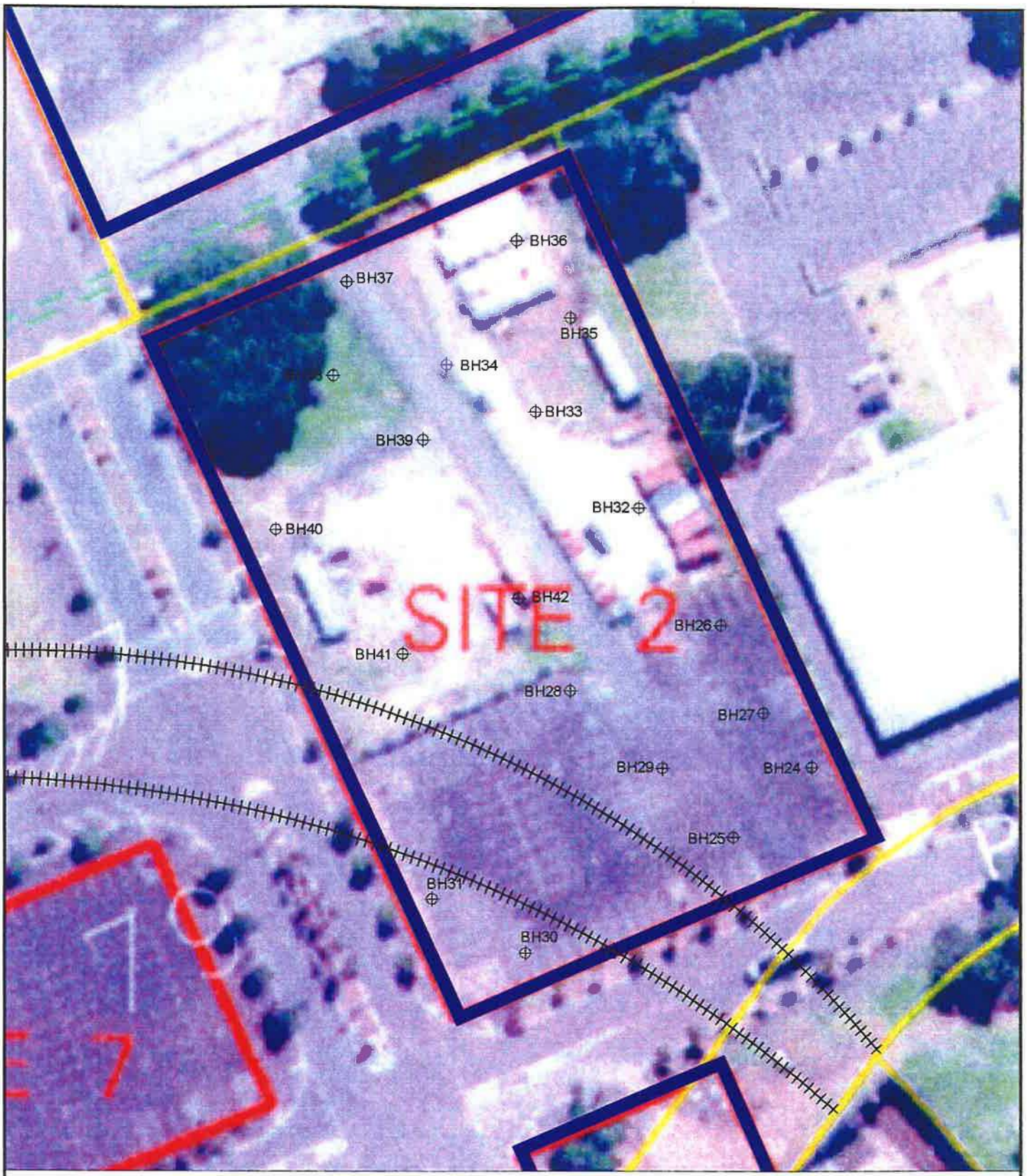
HLA-Enviros ciences Pty Limited
55-65 Grandview Street
Pymble, NSW 2073
61 2 9988 4422

SITE LOCATION MAP
Sydney Olympic Park Authority
Contamination Site Assessment - Sites 2 & 8
Homebush Bay, New South Wales

FIGURE
1

DRAWN	PROJECT-FILE NUMBER	APPROVED	DATE	REVISED DATE
LJE	J1938-004		July 2002	

A4



LEGEND

⊕BH01 BOREHOLE SAMPLE LOCATION

APPROXIMATE LOCATION OF SYDNEY OLYMPIC PARK RAILWAY LINE

Source: Plan supplied by Sydney Olympic Park Authority.

0 10 20 30 40
metres

HLA-Enviroscienses Pty Limited
55-65 Grandview Street
Pymble, NSW 2073
61 2 9988 4422

SITE LAYOUT & SAMPLING LOCATION PLAN
Sydney Olympic Park Authority
Contaminated Site Assessment - Site 2
Homebush Bay, New South Wales

FIGURE **2**

DRAWN	PROJECT-FILE NUMBER	APPROVED	DATE	REVISED DATE
LJE	J1938-006		August 2002	



LEGEND

⊕BH01 BOREHOLE SAMPLE LOCATION

0 10 20 30 40 50
metres

HLA-Envirosciences Pty Limited
55-65 Grandview Street
Pymble, NSW
61 2 9988 4422

SITE LAYOUT & SAMPLING LOCATION PLAN
Sydney Olympic Park Authority
Contaminated Site Assessment - Site 8
Homebush Bay, New South Wales

FIGURE **3**

DRAWN	PROJECT-FILE NAME	APPROVED	DATE	REVISED DATE
LJE	J1938-002		July 2002	

TABLES

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 2					
Sample ID	NSW EPA Guidlelines						BH24_0.03-0.2	BH25_0.03-0.1		BH26_0.03-0.1	DUP06	BH27_
Depth (mbgs)	Resid. with gardens & access soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0.03-0.2	0.03-0.1		0.03-0.1	Duplicate of	0.0
Material Type							Fill	Fill	TCLP	Fill	BH26_0.03-0.1	Fill
Date Sampled	(SIL_2)	(SIL_4)					14/05/02	14/05/02		14/05/02	14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	3	2	----	3	2	3
Be	80	100	3	2	0.1	100	<1	<1	----	<1	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	<1	----	<1	<1	<1
Cr	NA	NA	NA	NA	NA	NA	10	9	----	6	5	30
Cr VI	400	500	400	10	0.5	1900	----	----	----	----	----	<1
Cu	4000	5000	100	NA	NA	NA	8	19	----	7	6	11
Mn	6000	7500	NA	NA	NA	NA	119	169	----	61	53	103
Ni	2400	3000	60	4	0.2	1050	**8**	**25**	<0.1	4	3	**8**
Pb	1200	1500	600	10	0.5	1500	**12**	**17**	----	**15**	**11**	**13**
Zn	28000	35000	200	NA	NA	NA	25	35	----	35	29	31
Hg	60	75	1	0.4	0.02	50	<0.1	<0.1	----	<0.1	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	<1	----	----	----	----	----

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

"--" denotes analysis not conducted

(mbgs) denotes metres below ground surface

Guidelines are health-based soil investigation levels (SIL2 & PBIL) (EPA, 1998)

NA = No criteria defined by NSW EPA

CT1 = maximum values of total concentration for inert waste classification without determining total leachable concentrations

TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site	NSW EPA Guidlelines						SITE 2					SITE
Sample ID							.03-0.1	BH28_0.03-0.1		BH29_0.03-0.1	BH29_0.03-0.1Lab	BH30_1.5-1.7
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	-0.1	0.03-0.1		0.03-0.1	Duplicate of	1.5-1.7
Material Type							TCLP	Fill	TCLP	Fill	BH29_0.03-0.1	Fill
Date Sampled	(SIL_2)	(SIL_4)					14/05/02	14/05/02		14/05/02	14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	----	6	----	<1	2	4
Be	80	100	3	2	0.1	100	----	<1	----	<1	----	1
Cd	80	100	NA	NA	0.1	100	----	<1	----	<1	<0.5	<1
Cr	NA	NA	NA	NA	NA	NA	----	6	----	6	6	8
Cr VI	400	500	400	10	0.5	1900	<0.1	----	----	----	----	----
Cu	4000	5000	100	NA	NA	NA	----	27	----	<1	1.5	30
Mn	6000	7500	NA	NA	NA	NA	----	128	----	23	----	581
Ni	2400	3000	60	4	0.2	1050	----	**19**	----	<1	<0.5	**18**
Pb	1200	1500	600	10	0.5	1500	----	**26**	<0.1	7	9	**14**
Zn	28000	35000	200	NA	NA	NA	----	42	----	6	8	96
Hg	60	75	1	0.4	0.02	50	----	<0.1	----	<0.1	0.01	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	<1	----	----	----	----

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

"--" denotes analysis not conducted

(mbgs) denotes metres below ground surface

Guidelines are health-based soil investigation levels (SIL2 & PBIL) (EPA, 1998)

NA = No criteria defined by NSW EPA

CT1 = maximum values of total concentration for inert waste classification without determining total leachable concentrations

TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							2	
Sample ID	NSW EPA Guidelines						BH31_0.8-1.0	BH32_0.6-0.8
Depth (mbgs)	Resid. with gardens & access soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0.8-1.0	0.6-0.8
Material Type							Fill	Clay
Date Sampled	(SIL_2)	(SIL_4)					14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	14/05/02
As	400	500	20	10	0.5	500	1	9
Be	80	100	3	2	0.1	100	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	<1
Cr	NA	NA	NA	NA	NA	NA	8	22
Cr VI	400	500	400	10	0.5	1900	----	----
Cu	4000	5000	100	NA	NA	NA	5	13
Mn	6000	7500	NA	NA	NA	NA	172	9
Ni	2400	3000	60	4	0.2	1050	4	<1
Pb	1200	1500	600	10	0.5	1500	10	**20**
Zn	28000	35000	200	NA	NA	NA	22	7
Hg	60	75	1	0.4	0.02	50	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	<1

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

"--" denotes analysis not conducted

(mbgs) denotes metres below ground surface

Guidelines are health-based soil investigation levels (SIL2 & PBIL) (EPA, 1998)

NA = No criteria defined by NSW EPA

CT1 = maximum values of total concentration for inert waste classification without determining total leachable concentrations

TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 2				
Sample ID	NSW EPA Guidlelines						BH33_0-0.1		BH34_0.7-0.8	BH35_2.0-2.1	BH36_0.4-0.5
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0-0.1		0.7-0.8	2.0-2.1	0.4-0.5
Material Type							Fill	TCLP	Fill	Weathered Shale	Clay
Date Sampled	(SIL_2)	(SIL_4)					14/05/02		14/05/02	14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	7	----	6	4	5
Be	80	100	3	2	0.1	100	<1	----	<1	<1	2
Cd	80	100	NA	NA	0.1	100	<1	----	<1	<1	<1
Cr	NA	NA	NA	NA	NA	NA	17	----	29	6	15
Cr VI	400	500	400	10	0.5	1900	----	----	----	----	----
Cu	4000	5000	100	NA	NA	NA	20	----	12	25	18
Mn	6000	7500	NA	NA	NA	NA	293	----	35	11	522
Ni	2400	3000	60	4	0.2	1050	**26**	----	<1	<1	**14**
Pb	1200	1500	600	10	0.5	1500	**27**	<0.1	**15**	**13**	**18**
Zn	28000	35000	200	NA	NA	NA	50	----	6	10	80
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	----	----

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

"--" denotes analysis not conducted

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SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site	NSW EPA Guidlelines						SITE 2				
Sample ID							BH37_0-0.2		BH38_0-0.1	BH39_0-0.1	DUP08
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0-0.2		0-0.1	0-0.1	Duplicate of BH39_0-0.1
Material Type							Clay	TCLP	Fill	Fill	
Date Sampled							14/05/02		14/05/02	14/05/02	14/05/02
Units	(SIL_2) (mg/kg)	(SIL_4) (mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	4	----	9	7	8
Be	80	100	3	2	0.1	100	1	----	<1	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	----	<1	<1	<1
Cr	NA	NA	NA	NA	NA	NA	**180**	----	23	23	34
Cr VI	400	500	400	10	0.5	1900	<1	<0.1	----	----	----
Cu	4000	5000	100	NA	NA	NA	39	----	12	12	19
Mn	6000	7500	NA	NA	NA	NA	838	----	122	22	35
Ni	2400	3000	60	4	0.2	1050	163	<0.1	2	<1	2
Pb	1200	1500	600	10	0.5	1500	10	----	**22**	**13**	**20**
Zn	28000	35000	200	NA	NA	NA	94	----	21	8	12
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	----	----

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

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Guidelines are health-based soil investigation levels (SIL2 & PBIL) (EPA, 1998)

NA = No criteria defined by NSW EPA

CT1 = maximum values of total concentration for inert waste classification without determining total leachable concentrations

TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 2					
Sample ID	NSW EPA Guidlelines						BH40_0-0.1		BH41_0.7-0.8		BH42_0-0.2	
Depth (mbgs)							0-0.1		0.7-0.8		0-0.2	
Material Type	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	Fill	TCLP	Fill	TCLP	Clay	TCLP
Date Sampled							14/05/02		14/05/02		14/05/02	
Units	(SIL_2) (mg/kg)	(SIL_4) (mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)
As	400	500	20	10	0.5	500	2	----	9	----	**11**	<0.1
Be	80	100	3	2	0.1	100	<1	----	<1	----	<1	----
Cd	80	100	NA	NA	0.1	100	<1	----	<1	----	<1	----
Cr	NA	NA	NA	NA	NA	NA	6	----	39	----	25	----
Cr VI	400	500	400	10	0.5	1900	----	----	<1	<0.1	----	----
Cu	4000	5000	100	NA	NA	NA	71	----	21	----	20	----
Mn	6000	7500	NA	NA	NA	NA	541	----	157	----	179	----
Ni	2400	3000	60	4	0.2	1050	**37**	<0.1	**8**	----	**9**	----
Pb	1200	1500	600	10	0.5	1500	7	----	**33**	<0.1	**25**	----
Zn	28000	35000	200	NA	NA	NA	57	----	34	----	61	----
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	----	<0.1	----
Cyanide	2000	2500	-	32	1.6	5900	----	----	<1	----	----	----

Notes:

mg/kg = milligrams per kilogram.

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SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site	NSW EPA Guidlelines						SITE 8					
Sample ID							BH43_0.7-0.8		BH44_0.03-0.2	BH45_0.6-0.8	BH46_0.4-0.5	DUP09
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0.7-0.8		0.03-0.2	0.6-0.8	0.4-0.5	Duplicate of BH46_0.4-0.5
Material Type							Fill	TCLP	Fill	Fill	Fill	
Date Sampled							14/05/02		14/05/02	13/06/02	14/05/02	14/05/02
Units	(SIL_2) (mg/kg)	(SIL_4) (mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	5	----	4	6	3	4
Be	80	100	3	2	0.1	100	1	----	<1	<1	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	----	<1	<1	<1	<1
Cr	NA	NA	NA	NA	NA	NA	4	----	18	8	16	20
Cr VI	400	500	400	10	0.5	1900	----	----	----	----	----	----
Cu	4000	5000	100	NA	NA	NA	35	----	24	6	22	31
Mn	6000	7500	NA	NA	NA	NA	58	----	234	12	262	247
Ni	2400	3000	60	4	0.2	1050	**15**	----	**15**	<1	**13**	**11**
Pb	1200	1500	600	10	0.5	1500	**14**	<0.1	**37**	**19**	**49**	**53**
Zn	28000	35000	200	NA	NA	NA	80	----	61	10	63	64
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	<0.1	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	----	<1	----

Notes:

mg/kg = milligrams per kilogram.

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CT1 = maximum values of total concentration for inert waste classification without determining total leachable concentrations

TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 8					
Sample ID	NSW EPA Guidlelines						BH47_1.3-1.5		BH48_0.7-0.8	BH49_0.6-0.75		BH49_0.6-0.75Lab
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	1.3-1.5		0.7-0.8	0.6-0.75		Duplicate of
Material Type							Fill	TCLP	Fill	Fill	TCLP	BH49_0.6-0.75
Date Sampled							14/05/02		15/05/02	15/05/02		15/05/02
Units	(SIL_2) (mg/kg)	(SIL_4) (mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)
As	400	500	20	10	0.5	500	7	----	4	7	----	3
Be	80	100	3	2	0.1	100	<1	----	<1	<1	----	----
Cd	80	100	NA	NA	0.1	100	<1	----	<1	<1	----	<0.5
Cr	NA	NA	NA	NA	NA	NA	10	----	5	19	----	14
Cr VI	400	500	400	10	0.5	1900	----	----	----	----	<0.1	----
Cu	4000	5000	100	NA	NA	NA	615	----	25	21	----	9
Mn	6000	7500	NA	NA	NA	NA	120	----	45	166	----	----
Ni	2400	3000	60	4	0.2	1050	**5**	----	1	**7**	----	3
Pb	1200	1500	600	10	0.5	1500	**71**	<0.1	**20**	**28**	----	22
Zn	28000	35000	200	NA	NA	NA	95	----	27	55	----	25
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	<0.1	----	0.08
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	<1	----	----

Notes:

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Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site	NSW EPA Guidlelines						SITE 8				
Sample ID							BH50_0.03-0.2	BH51_0.5-0.7	BH52_0.03-0.2	BH53_0.03-0.2	
Depth (mbgs)							0.03-0.2	0.5-0.7	0.03-0.2	0.03-0.2	
Material Type	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	Fill	Weathered Shale	Fill	Fill	TCLP
Date Sampled	(SIL_2)	(SIL_4)					15/05/02	15/05/02	15/05/02	15/05/02	
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)
As	400	500	20	10	0.5	500	7	8	5	6	----
Be	80	100	3	2	0.1	100	<1	1	<1	<1	----
Cd	80	100	NA	NA	0.1	100	<1	<1	<1	<1	----
Cr	NA	NA	NA	NA	NA	NA	7	6	33	26	----
Cr VI	400	500	400	10	0.5	1900	----	----	<1	----	----
Cu	4000	5000	100	NA	NA	NA	14	55	50	37	----
Mn	6000	7500	NA	NA	NA	NA	83	30	463	310	----
Ni	2400	3000	60	4	0.2	1050	4	**8**	**22**	**18**	----
Pb	1200	1500	600	10	0.5	1500	**21**	**19**	**80**	**101**	<0.1
Zn	28000	35000	200	NA	NA	NA	31	124	97	155	----
Hg	60	75	1	0.4	0.02	50	<0.1	<0.1	<0.1	<0.1	----
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	----	----

Notes:

mg/kg = milligrams per kilogram.

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TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 8	
Sample ID	NSW EPA Guidlelines						BH54_0.03-0.2	BH55_0.03-0.2
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0.03-0.2	0.03-0.2
Material Type							Fill	Fill
Date Sampled	(SIL_2)	(SIL_4)					15/05/02	15/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	4	3
Be	80	100	3	2	0.1	100	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	<1
Cr	NA	NA	NA	NA	NA	NA	15	13
Cr VI	400	500	400	10	0.5	1900	----	----
Cu	4000	5000	100	NA	NA	NA	22	27
Mn	6000	7500	NA	NA	NA	NA	210	275
Ni	2400	3000	60	4	0.2	1050	**8**	**12**
Pb	1200	1500	600	10	0.5	1500	**57**	**40**
Zn	28000	35000	200	NA	NA	NA	77	85
Hg	60	75	1	0.4	0.02	50	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	----

Notes:

mg/kg = milligrams per kilogram.

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(mbgs) denotes metres below ground surface

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SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 2 - Soil Sample Analytical Results (TPH and BTEX)

	Site	NSW EPA Guidelines		SITE 2					
	Sample ID	Threshold concentrations for sensitive landuse	Waste Classification Inert CT1 & SCC1	BH24_0.03-0.2	BH26_0.03-0.1	DUP06	BH30_1.5-1.7	BH34_0.7-0.8	BH38_0-0.1
	Depth (mbgs)			0.03 - 0.2	0.03 - 0.1	Duplicate of BH26_0.03-0.1	1.5 - 1.7	0.7 - 0.8	0 - 0.1
	Material Type			Fill	Fill		Fill	Fill	Fill
	Date Sampled			14/05/02	14/05/02	14/05/02	14/05/02	14/05/02	14/05/02
	Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
TPH	C_6 - C_9 Fraction	65	650	<2	<2	<2	<2	<2	<2
TPH	C_{10} - C_{14} Fraction	1000	5000	<50	<50	<50	<50	<50	<50
TPH	C_{15} - C_{28} Fraction	1000	5000	<100	<100	<100	<100	<100	<100
TPH	C_{29} - C_{36} Fraction	1000	5000	<100	<100	<100	<100	<100	<100
	Benzene	1	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	1.4	28.8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Ethylbenzene	3.1	60	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	meta- & para-Xylene	NA	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	ortho-Xylene	NA	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Total Xylenes	14	100	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

(mbgs) denotes metres below ground surface

Table 2 - Soil Sample Analytical Results (TPH and BTEX)

	Site	NSW EPA Guidelines		SITE 8					
	Sample ID	Threshold concentrations for sensitive landuse	Waste Classification Inert CT1 & SCC1	BH45_0.6-0.8	BH46_0.4-0.5	BH48_0.7-0.8	BH49_0.6-0.75	BH49_0.6-0.75Lab	BH54_0.03-0.2
	Depth (mbgs)			0.6 - 0.8	0.4 - 0.5	0.7 - 0.8	0.6 - 0.75	Duplicate of	0.03 - 0.2
	Material Type			Fill	Fill	Fill	Fill	BH49_0.6-0.75	Fill
	Date Sampled			13/06/02	14/05/02	15/05/02	15/05/02	15/05/02	15/05/02
	Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
TPH	C_6 - C_9 Fraction	65	650	<2	<2	<2	<2	<10	<2
TPH	C_{10} - C_{14} Fraction	1000	5000	<50	<50	<50	<50	<50	<50
TPH	C_{15} - C_{28} Fraction	1000	5000	<100	141	<100	<100	<100	145
TPH	C_{29} - C_{36} Fraction	1000	5000	<100	<100	<100	<100	<100	101
	Benzene	1	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	1.4	28.8	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2
	Ethylbenzene	3.1	60	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2
	meta- & para-Xylene	NA	NA	<0.2	<0.2	<0.2	<0.2	<1	<0.2
	ortho-Xylene	NA	NA	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2
	Total Xylenes	14	100	<0.4	<0.4	<0.4	<0.4	<1.5	<0.4

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

(mbgs) denotes metres below ground surface

Table 3 - Soil Sample Analytical Results (PAHs and Phenols)

Site	NSW EPA Guidlelines						SITE 2				
Sample ID							BH24_0.03-0.2	BH28_0.03-0.1	BH30_1.5-1.7	BH34_0.7-0.8	BH38_0-0.1
Depth (mbgs)			Waste - Classification Inert				0.03-0.2	0.03-.1	1.5-1.7	0.7-0.8	0-0.1
Material Type	Residential with minimal soil access	Commercial / Industrial					Fill	Fill	Fill	Fill	Fill
Date Sampled	(SIL_2)	(SIL_4)	CT1	TCLP1	SCC1	SCC2	14/05/02	14/05/02	14/05/02	14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylnaphthalene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chloronapthalene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
N-2-Fluorenylacetamide	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b) & (k) fluoranthene	-	-	-	-	-	-	<1	<1	<1	<1	<1
7.12-Dimethylbenz(a)anthracene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	4	5	0.08	4	1	10	<0.5	<0.5	<0.5	<0.5	<0.5
3-Methylcholanthrene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	-	-	-	-			<0.5	<0.5	<0.5	<0.5	<0.5
Total PAHs	80	100	NA	NA	200	200	nc	nc	nc	nc	nc
Total Phenols	34000	42500	28.8	14.4	518	518	<1	<1	<1	<1	<1

Notes:

mg/kg = milligrams per kilogram

< denotes analyte not detected above indicated laboratory practical quantitation limits

- denotes no guideline value established

(mbgs) denotes metres below ground surface

---- denotes sample not analysed

Guidelines are NSW EPA (1998) health based soil investigation levels (SILs)

CT1 = maximum values of total concentration for inert waste classification without determining TCLP

SCC1 & SCC2 = maximum values for leachable concentration and total concentration when used together

Total PAH concentration calculated from sum of individual compounds quantified (nc denotes sum incalculable due to non-detection)

Bolding indicates concentrations above CT1 & SCC1

FORMAT

Table 3 - Soil Sample Analytical Results (PAHs and Phenols)

Site	NSW EPA Guidlelines						SITE 8					
Sample ID							BH46_0.4-0.5		BH48_0.7-0.8	BH53_0.03-0.2		BH53_0.4-0.6
Depth (mbgs)			Waste - Classification Inert				0.4-0.5		0.7-0.8	0.03-0.2		0.4-0.6
Material Type	Residential with minimal soil access	Commercial / Industrial					Fill	TCLP	Fill	Fill	TCLP	Clay
Date Sampled	(SIL_2)	(SIL_4)	CT1	TCLP1	SCC1	SCC2	14/05/02		15/05/02	15/05/02		15/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)
Naphthalene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
2-Methylnaphthalene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
2-Chloronapthalene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Acenaphthylene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Acenaphthene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Fluorene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Phenanthrene	-	-	-	-	-	-	1.3	----	<0.5	3	----	----
Anthracene	-	-	-	-	-	-	<0.5	----	<0.5	0.8	----	----
Fluoranthene	-	-	-	-	-	-	1.8	----	<0.5	5.6	----	----
Pyrene	-	-	-	-	-	-	1.9	----	0.7	6.6	----	----
N-2-Fluorenylacetamide	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Benz(a)anthracene	-	-	-	-	-	-	0.7	----	<0.5	2.5	----	----
Chrysene	-	-	-	-	-	-	0.6	----	<0.5	2.1	----	----
Benzo(b) & (k) fluoranthene	-	-	-	-	-	-	<1	----	<1	3	----	----
7.12-Dimethylbenz(a)anthracene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Benzo(a)pyrene	4	5	0.08	4	1	10	0.6	<0.3	<0.5	**1.8**	<0.3	<0.5
3-Methylcholanthrene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	-	-	-	-	-	-	<0.5	----	<0.5	0.7	----	----
Dibenz(a.h)anthracene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	-	-	-	-			<0.5	----	<0.5	0.9	----	----
Total PAHs	80	100	NA	NA	200	200	6.9	----	0.7	**27**	----	----
Total Phenols	34000	42500	28.8	14.4	518	518	<1	----	<1	<1	----	----

Notes:

mg/kg = milligrams per kilogram

< denotes analyte not detected above indicated laboratory practical quantitation limits

- denotes no guideline value established

(mbgs) denotes metres below ground surface

---- denotes sample not analysed

Guidelines are NSW EPA (1998) health based soil investigation levels (SILs)

CT1 = maximum values of total concentration for inert waste classification without determining TCLP

SCC1 & SCC2 = maximum values for leachable concentration and total concentration when used together

Total PAH concentration calculated from sum of individual compounds quantified (nc denotes sum incalculable due to non-detection)

Bolding indicates concentrations above CT1 & SCC1

Table 4 - Soil Sample Analytical Results (Organochlorine Pesticides and Polychlorinated Biphenyls)

Site	NSW EPA Guidelines				SITE 2				
Sample ID	Residential with minimal soil access	Commercial / Industrial	Inert Waste Classification	Solid Waste Classification	BH24_0.03-0.2	BH30_1.5-1.7	BH31_0.8-1.0	BH34_0.7-0.8	BH38_0-0.1
Depth (mbgs)					0.03-0.2	0.03-.1	1.5-1.7	0.7-0.8	0-0.1
Material Type					Fill	Fill	Fill	Clay	Fill
Date Sampled	(SIL_2)	(SIL_4)	SCC1	SCC2	14-5-02	14-5-02	14-5-02	14-5-02	14-5-02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
alpha-BHC	-	-	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
HCB	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC & gamma-BHC	-	-	****	****	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	40	50	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	40*	50*	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	-	-	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Chlordane - trans	200**	250**	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan 1	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Chlordane - cis	200	250	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	40*	50*	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
DDE	800***	1000***	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	-	-	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan 2	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
DDD	800***	1000***	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	-	-	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
DDT	800***	1000***	****	****	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2
PCB	40	50	2	<50	<0.1	<0.1	<0.1	<0.1	<0.1

Notes:
mg/kg = milligrams per kilogram
< = analyte not detected at or above indicated laboratory practical quantitation limit
(mbgs) denotes metres below ground surface
* denotes guideline for total aldrin + dieldrin concentration
** denotes combined chlordane criteria
*** denotes combined criteria for DDD + DDT + DDE
**** denotes if the total of one or all of the constituents is more than one mg/kg then the soil is considered scheduled waste
Bolding and shading indicates that reported concentration exceeds SCC1

Table 4 - Soil Sample Analytical Results (Organochlorine Pesticides and Polychlorinated Biphenyls)

Site	NSW EPA Guidelines				SITE 8		
Sample ID	Residential with minimal soil access	Commercial / Industrial	Inert Waste Classification	Solid Waste Classification	BH46_0.4-0.5	BH48_0.7-0.8	BH53_0.03-0.2
Depth (mbgs)					0.4-0.5	0.7-0.8	0.03-0.2
Material Type					Fill	Fill	Fill
Date Sampled	(SIL_2)	(SIL_4)	SCC1	SCC2	14-5-02	15-5-02	15-5-02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
alpha-BHC	-	-	****	****	<0.05	<0.05	<0.05
HCB	-	-	-	-	<0.05	<0.05	<0.05
beta-BHC & gamma-BHC	-	-	****	****	<0.1	<0.1	<0.1
delta-BHC	-	-	-	-	<0.05	<0.05	<0.05
Heptachlor	40	50	****	****	<0.05	<0.05	<0.05
Aldrin	40*	50*	****	****	<0.05	<0.05	<0.05
Heptachlor epoxide	-	-	****	****	<0.05	<0.05	<0.05
Chlordane - trans	200**	250**	****	****	<0.05	<0.05	<0.05
Endosulfan 1	-	-	-	-	<0.05	<0.05	<0.05
Chlordane - cis	200	250	****	****	<0.05	<0.05	<0.05
Dieldrin	40*	50*	****	****	<0.05	<0.05	<0.05
DDE	800***	1000***	****	****	<0.05	<0.05	<0.05
Endrin	-	-	****	****	<0.05	<0.05	<0.05
Endosulfan 2	-	-	-	-	<0.05	<0.05	<0.05
DDD	800***	1000***	****	****	<0.05	<0.05	<0.05
Endrin aldehyde	-	-	****	****	<0.05	<0.05	<0.05
Endosulfan sulfate	-	-	-	-	<0.05	<0.05	<0.05
DDT	800***	1000***	****	****	<0.2	<0.2	<0.2
Endrin ketone	-	-	-	-	<0.05	<0.05	<0.05
Methoxychlor	-	-	-	-	<0.2	<0.2	<0.2
PCB	40	50	2	<50	0.1	<0.1	**3.9**

Notes:

mg/kg = milligrams per kilogram

< = analyte not detected at or above indicated laboratory practical quantitation limit

(mbgs) denotes metres below ground surface

* denotes guideline for total aldrin + dieldrin concentration

** denotes combined chlordane criteria

*** denotes combined criteria for DDD + DDT + DDE

**** denotes if the total of one or all of the constituents is more than one mg/kg then the soil is considered scheduled waste

Bolding and shading indicates that reported concentration exceeds SCC1

Table 5 - Soil Sample Analytical Results (Volatile Organic Compounds)

Sample Location	SITE 2		SITE 8
Sample ID	BH24_0.03-0.2	BH41_0.7-0.8	BH53_0.03-0.2
Depth (mbgs)	0.03 - 0.2	0.4-0.5	0.03-0.2
Material Type	Fill	Fill	Fill
Date Sampled	14-5-02	14-5-02	15-5-02
Units	(mg/kg)	(mg/kg)	(mg/kg)
Monocyclic Aromatic Hydrocarbons			
Benzene	<0.5	<0.5	<0.5
Toluene	<0.5	<0.5	<0.5
Ethylbenzene	<0.5	<0.5	<0.5
meta & para Xylene	<0.5	<0.5	<0.5
Styrene	<0.5	<0.5	<0.5
ortho-Xylene	<0.5	<0.5	<0.5
Isopropylbenzene	<0.5	<0.5	<0.5
n-Propylbenzene	<0.5	<0.5	<0.5
1.3.5 - Trimethylbenzene	<0.5	<0.5	<0.5
sec-Butylbenzene	<0.5	<0.5	<0.5
1.2.4-Trimethylbenzene	<0.5	<0.5	<0.5
tert-Butylbenzene	<0.5	<0.5	<0.5
p-Isopropyltoluene	<0.5	<0.5	<0.5
n-Butylbenzene	<0.5	<0.5	<0.5
Oxyenated Hydrocarbons			
Vinyl Acetate	<5	<5	<5
2-Butanone	<5	<5	<5
4-Methyl-2-pentanone	<5	<5	<5
2-Hexanone	<5	<5	<5
Sulfonated Compounds			
Carbon disulfide	<0.5	<0.5	<0.5
Fumigants			
2.2-Dichloropropane	<0.5	<0.5	<0.5
1.2-Dichlorpropane	<0.5	<0.5	<0.5
cis-1.3 Dichloropropylene	<1	<1	<1
trans-1.3-Dichlorpropylene	<1	<1	<1
1.2-Dibromoethane	<0.5	<0.5	<0.5
Halogenated Aliphatic Hydrocarbons			
Dichlorodifluoromethane	<5	<5	<5
Chloromethane	<5	<5	<5
Vinyl chloride	<5	<5	<5
Bromomethane	<5	<5	<5
Chloroethane	<5	<5	<5
Trichlorofluoromethane	<5	<5	<5
1.1-Dichloroethne	<0.5	<0.5	<0.5
Iodemethane	<0.5	<0.5	<0.5
trans-1.2-Dichloroethane	<0.5	<0.5	<0.5
1.1-Dichloroethene	<0.5	<0.5	<0.5
1.1.1-Trichloroethane	<0.5	<0.5	<0.5
1.1-Dichloropropylene	<0.5	<0.5	<0.5
Carbon Tetrachloride	<0.5	<0.5	<0.5
1.2-Dichloroethane	<0.5	<0.5	<0.5
Trichloroethene	<0.5	<0.5	<0.5

Table 5 - Soil Sample Analytical Results (Volatile Organic Compounds)

Sample Location	SITE 2		SITE 8
Sample ID	BH24_0.03-0.2	BH41_0.7-0.8	BH53_0.03-0.2
Depth (mbgs)	0.03 - 0.2	0.4-0.5	0.03-0.2
Material Type	Fill	Fill	Fill
Date Sampled	14-5-02	14-5-02	15-5-02
Units	(mg/kg)	(mg/kg)	(mg/kg)
Dibromomethane	<0.5	<0.5	<0.5
1.1.2-Trichloroethane	<0.5	<0.5	<0.5
1.3-Dichloropropane	<0.5	<0.5	<0.5
Tetrachlorethene	<0.5	<0.5	<0.5
1.1.1.2-Tetrachloroethane	<0.5	<0.5	<0.5
trans-1.4-Dichloro-2-butene	<0.5	<0.5	<0.5
cis-1.4-Dichloro-2-butene	<0.5	<0.5	<0.5
1.1.2.2-Tetrachloroethane	<0.5	<0.5	<0.5
1.2.3-Trichloropropane	<0.5	<0.5	<0.5
Pentachloroethane	<0.5	<0.5	<0.5
1.2-Dibromo-3-chloropropane	<0.5	<0.5	<0.5
Hexachlorobutadiene	<0.5	<0.5	<0.5
Halogenated Aromatic Hydrocarbons			
Clorobenzene	<0.5	<0.5	<0.5
Bromobenzene	<0.5	<0.5	<0.5
2-Chlorotoluene	<0.5	<0.5	<0.5
4-Chlorotoluene	<0.5	<0.5	<0.5
1.3-Dichlorobenzene	<0.5	<0.5	<0.5
1.4-Dichlorobenzene	<0.5	<0.5	<0.5
1.2.4-Trichlorobenzene	<0.5	<0.5	<0.5
1.2.3-Trichlorobenzene	<0.5	<0.5	<0.5
Trihalomethanes			
Chloroform	<0.5	<0.5	<0.5
Bromodichloromethane	<0.5	<0.5	<0.5
Dibromodichloromethane	<0.5	<0.5	<0.5
Bromoform	<0.5	<0.5	<0.5
Napthalene			
Napthalene	<5	<5	<5

Notes:
mg/kg = milligrams per kilogram
< denotes analyte not detected at or above indicated laboratory practical quantitation limit (PQL)

HLA considers that the potential for impact, from observed site sources, to site groundwater beneath Site 2 and Site 8 is low, given the following:

- The absence of soil contamination impact exceeding the adopted guideline levels at the site, particularly in the fill material; and
- Leachability of metals is low, as indicated by the limited TCLP testing results;
- Perched groundwater was encountered in the southern portion of Site 2 in one borehole location only (BH30) and in the eastern portion of Site 8 at two locations only (BH45 and BH46). The perched water encountered here is inferred to be associated with surface water infiltration through the heterogenous permeable fill layer overlying the less permeable clay and shale. Groundwater under aquifer conditions at both Sites is expected to exist at depth (<10mbgs) in shale; and
- The weathered shale and shale bedrock encountered beneath the majority of the site is of low permeability reducing the vertical and horizontal movement of any contaminants.

13.0 CONCLUSIONS

Mixed fill material was encountered at variable depths across both sites and predominantly comprised reworked clays with sand, silt and gravel. There was no evidence of putrescible or industrial waste disposal areas. No suspected asbestos containing materials were observed.

The results of the investigation indicate that subsurface soil conditions at both sites are suitable for either residential land use (with minimal soil access) and or commercial/industrial land use.

If future land development includes the removal and off-site disposal of soil, soils at Site 2 may be disposed of as *Inert Waste*, in accordance with NSW EPA (1999) classifications[8], whilst fill material in the area of BH53 at Site 8 (because of elevated OCP concentrations) may be disposed of as *Solid Waste* and the remaining Site 8 soils may be disposed of as *Inert Waste* (NSW EPA [1999]).

[8] Although BaP was not detected in any soil sample, HLA notes that the PQL for BaP is above the criteria set by the NSW EPA (1999) for *Inert Waste*. However given that elevated TPH concentrations were not reported and no visible signs of PAH contamination were noted (i.e. ash or bitumen), HLA consider it suitable to classify the waste as *Inert Waste*.

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14.0 REFERENCES

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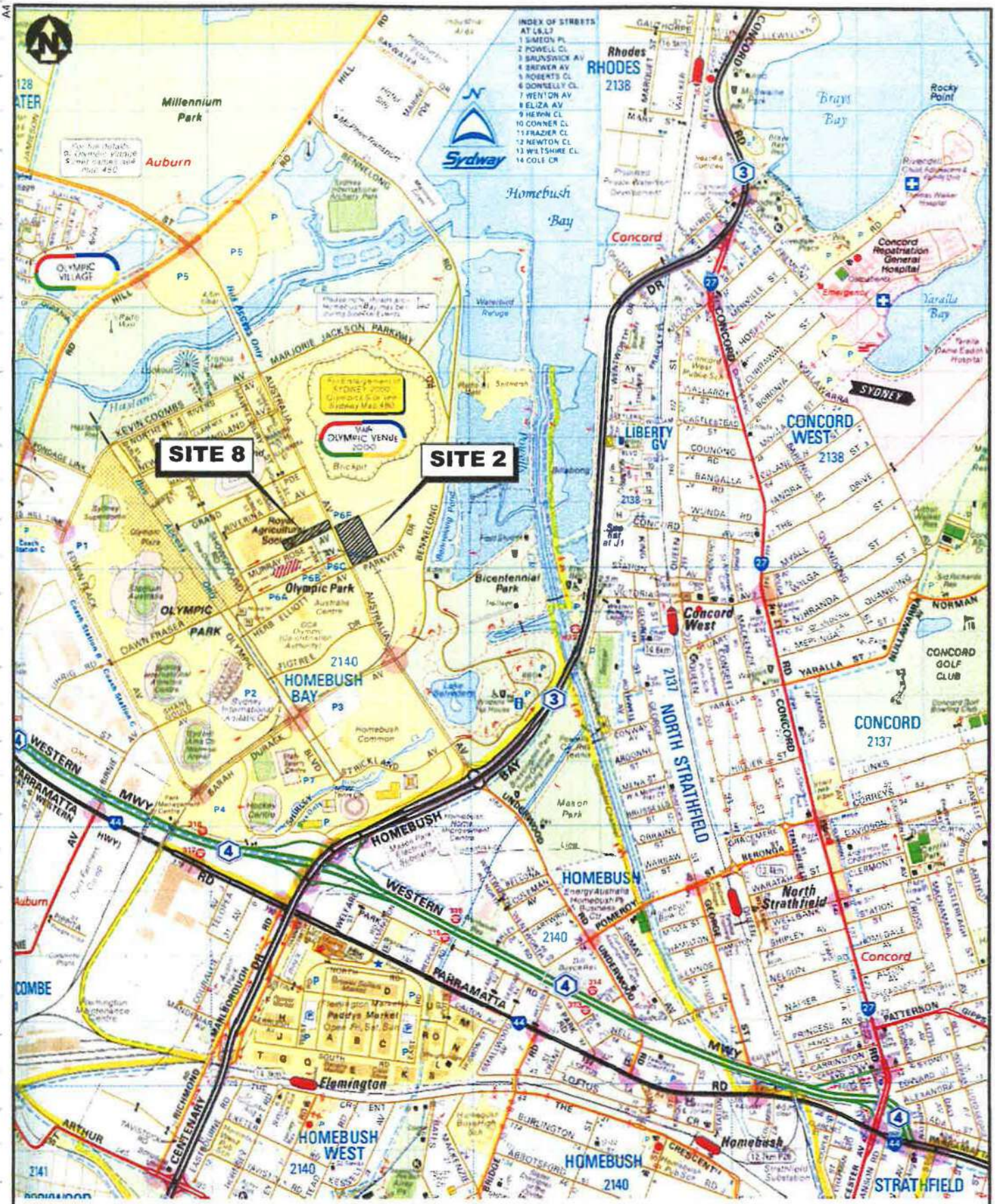
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FIGURES



Reference: Sydways Map 274, New South Wales.

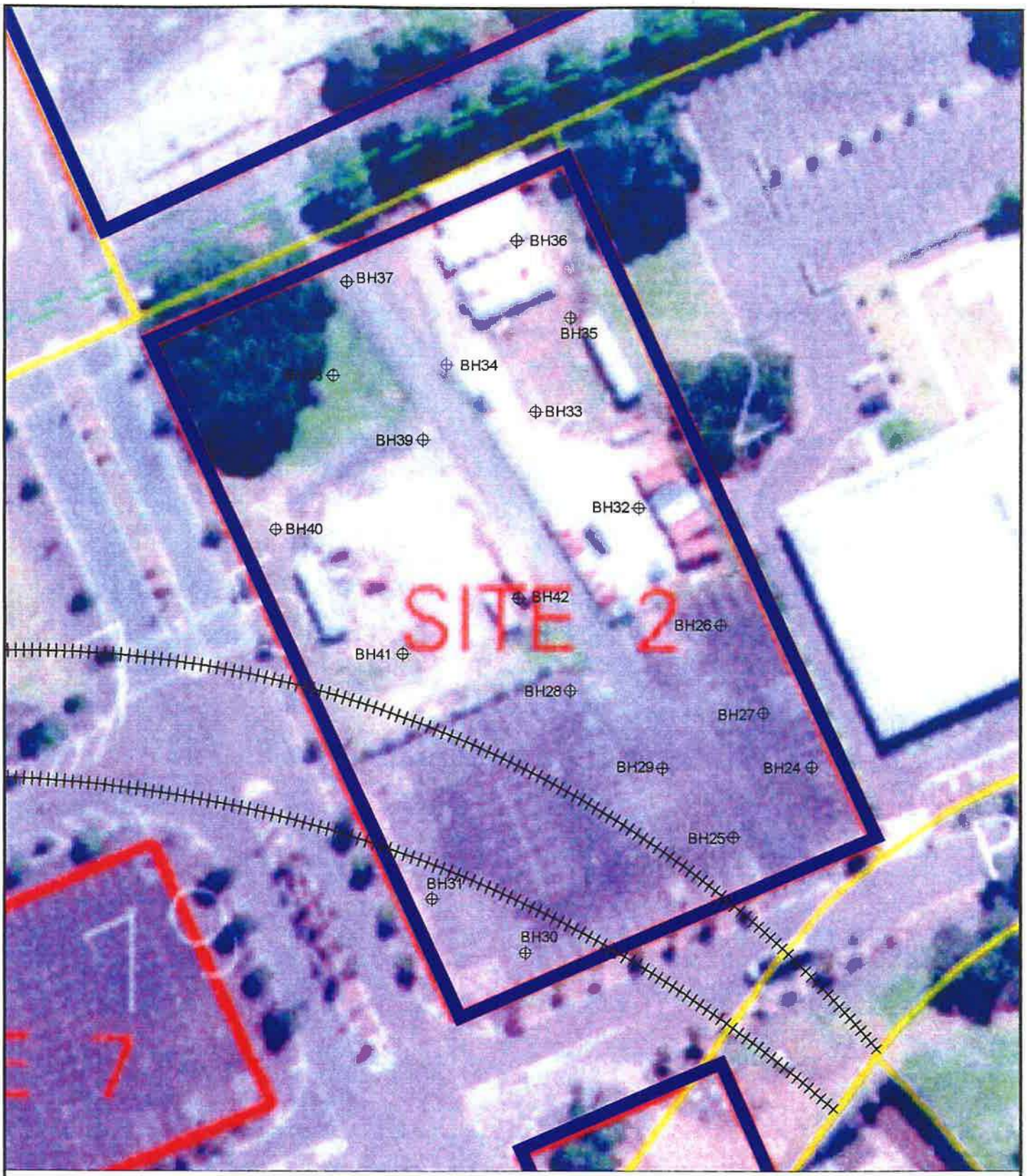
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SITE LOCATION MAP
Sydney Olympic Park Authority
Contamination Site Assessment - Sites 2 & 8
Homebush Bay, New South Wales

FIGURE
1

DRAWN	PROJECT-FILE NUMBER	APPROVED	DATE	REVISED DATE
LJE	J1938-004		July 2002	

A4



LEGEND

⊕BH01 BOREHOLE SAMPLE LOCATION

APPROXIMATE LOCATION OF SYDNEY OLYMPIC PARK RAILWAY LINE

Source: Plan supplied by Sydney Olympic Park Authority.

0 10 20 30 40
metres

HLA-Enviroscienses Pty Limited
55-65 Grandview Street
Pymble, NSW 2073
61 2 9988 4422

SITE LAYOUT & SAMPLING LOCATION PLAN
Sydney Olympic Park Authority
Contaminated Site Assessment - Site 2
Homebush Bay, New South Wales

FIGURE **2**

DRAWN	PROJECT-FILE NUMBER	APPROVED	DATE	REVISED DATE
LJE	J1938-006		August 2002	



LEGEND

⊕BH01 BOREHOLE SAMPLE LOCATION

0 10 20 30 40 50
metres

HLA-Envirosciences Pty Limited
55-65 Grandview Street
Pymble, NSW
61 2 9988 4422

SITE LAYOUT & SAMPLING LOCATION PLAN
Sydney Olympic Park Authority
Contaminated Site Assessment - Site 8
Homebush Bay, New South Wales

FIGURE **3**

DRAWN	PROJECT-FILE NAME	APPROVED	DATE	REVISED DATE
LJE	J1938-002		July 2002	

TABLES

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 2					
Sample ID	NSW EPA Guidlelines						BH24_0.03-0.2	BH25_0.03-0.1		BH26_0.03-0.1	DUP06	BH27_
Depth (mbgs)	Resid. with gardens & access soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0.03-0.2	0.03-0.1		0.03-0.1	Duplicate of	0.0
Material Type							Fill	Fill	TCLP	Fill	BH26_0.03-0.1	Fill
Date Sampled	(SIL_2)	(SIL_4)					14/05/02	14/05/02		14/05/02	14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	3	2	----	3	2	3
Be	80	100	3	2	0.1	100	<1	<1	----	<1	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	<1	----	<1	<1	<1
Cr	NA	NA	NA	NA	NA	NA	10	9	----	6	5	30
Cr VI	400	500	400	10	0.5	1900	----	----	----	----	----	<1
Cu	4000	5000	100	NA	NA	NA	8	19	----	7	6	11
Mn	6000	7500	NA	NA	NA	NA	119	169	----	61	53	103
Ni	2400	3000	60	4	0.2	1050	**8**	**25**	<0.1	4	3	**8**
Pb	1200	1500	600	10	0.5	1500	**12**	**17**	----	**15**	**11**	**13**
Zn	28000	35000	200	NA	NA	NA	25	35	----	35	29	31
Hg	60	75	1	0.4	0.02	50	<0.1	<0.1	----	<0.1	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	<1	----	----	----	----	----

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

"--" denotes analysis not conducted

(mbgs) denotes metres below ground surface

Guidelines are health-based soil investigation levels (SIL2 & PBIL) (EPA, 1998)

NA = No criteria defined by NSW EPA

CT1 = maximum values of total concentration for inert waste classification without determining total leachable concentrations

TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site	NSW EPA Guidlelines						SITE 2					SITE
Sample ID							.03-0.1	BH28_0.03-0.1		BH29_0.03-0.1	BH29_0.03-0.1Lab	BH30_1.5-1.7
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	-0.1	0.03-0.1		0.03-0.1	Duplicate of	1.5-1.7
Material Type							TCLP	Fill	TCLP	Fill	BH29_0.03-0.1	Fill
Date Sampled	(SIL_2)	(SIL_4)					14/05/02	14/05/02		14/05/02	14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	----	6	----	<1	2	4
Be	80	100	3	2	0.1	100	----	<1	----	<1	----	1
Cd	80	100	NA	NA	0.1	100	----	<1	----	<1	<0.5	<1
Cr	NA	NA	NA	NA	NA	NA	----	6	----	6	6	8
Cr VI	400	500	400	10	0.5	1900	<0.1	----	----	----	----	----
Cu	4000	5000	100	NA	NA	NA	----	27	----	<1	1.5	30
Mn	6000	7500	NA	NA	NA	NA	----	128	----	23	----	581
Ni	2400	3000	60	4	0.2	1050	----	**19**	----	<1	<0.5	**18**
Pb	1200	1500	600	10	0.5	1500	----	**26**	<0.1	7	9	**14**
Zn	28000	35000	200	NA	NA	NA	----	42	----	6	8	96
Hg	60	75	1	0.4	0.02	50	----	<0.1	----	<0.1	0.01	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	<1	----	----	----	----

Notes:

mg/kg = milligrams per kilogram.

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NA = No criteria defined by NSW EPA

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Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							2	
Sample ID	NSW EPA Guidelines						BH31_0.8-1.0	BH32_0.6-0.8
Depth (mbgs)	Resid. with gardens & access soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0.8-1.0	0.6-0.8
Material Type							Fill	Clay
Date Sampled	(SIL_2)	(SIL_4)					14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	14/05/02
As	400	500	20	10	0.5	500	1	9
Be	80	100	3	2	0.1	100	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	<1
Cr	NA	NA	NA	NA	NA	NA	8	22
Cr VI	400	500	400	10	0.5	1900	----	----
Cu	4000	5000	100	NA	NA	NA	5	13
Mn	6000	7500	NA	NA	NA	NA	172	9
Ni	2400	3000	60	4	0.2	1050	4	<1
Pb	1200	1500	600	10	0.5	1500	10	**20**
Zn	28000	35000	200	NA	NA	NA	22	7
Hg	60	75	1	0.4	0.02	50	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	<1

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

"--" denotes analysis not conducted

(mbgs) denotes metres below ground surface

Guidelines are health-based soil investigation levels (SIL2 & PBIL) (EPA, 1998)

NA = No criteria defined by NSW EPA

CT1 = maximum values of total concentration for inert waste classification without determining total leachable concentrations

TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 2				
Sample ID	NSW EPA Guidlelines						BH33_0-0.1		BH34_0.7-0.8	BH35_2.0-2.1	BH36_0.4-0.5
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0-0.1		0.7-0.8	2.0-2.1	0.4-0.5
Material Type							Fill	TCLP	Fill	Weathered Shale	Clay
Date Sampled	(SIL_2)	(SIL_4)					14/05/02		14/05/02	14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	7	----	6	4	5
Be	80	100	3	2	0.1	100	<1	----	<1	<1	2
Cd	80	100	NA	NA	0.1	100	<1	----	<1	<1	<1
Cr	NA	NA	NA	NA	NA	NA	17	----	29	6	15
Cr VI	400	500	400	10	0.5	1900	----	----	----	----	----
Cu	4000	5000	100	NA	NA	NA	20	----	12	25	18
Mn	6000	7500	NA	NA	NA	NA	293	----	35	11	522
Ni	2400	3000	60	4	0.2	1050	**26**	----	<1	<1	**14**
Pb	1200	1500	600	10	0.5	1500	**27**	<0.1	**15**	**13**	**18**
Zn	28000	35000	200	NA	NA	NA	50	----	6	10	80
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	----	----

Notes:

mg/kg = milligrams per kilogram.

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Guidelines are health-based soil investigation levels (SIL2 & PBIL) (EPA, 1998)

NA = No criteria defined by NSW EPA

CT1 = maximum values of total concentration for inert waste classification without determining total leachable concentrations

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Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site	NSW EPA Guidlelines						SITE 2				
Sample ID							BH37_0-0.2		BH38_0-0.1	BH39_0-0.1	DUP08
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0-0.2		0-0.1	0-0.1	Duplicate of BH39_0-0.1
Material Type							Clay	TCLP	Fill	Fill	
Date Sampled							14/05/02		14/05/02	14/05/02	14/05/02
Units	(SIL_2) (mg/kg)	(SIL_4) (mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	4	----	9	7	8
Be	80	100	3	2	0.1	100	1	----	<1	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	----	<1	<1	<1
Cr	NA	NA	NA	NA	NA	NA	**180**	----	23	23	34
Cr VI	400	500	400	10	0.5	1900	<1	<0.1	----	----	----
Cu	4000	5000	100	NA	NA	NA	39	----	12	12	19
Mn	6000	7500	NA	NA	NA	NA	838	----	122	22	35
Ni	2400	3000	60	4	0.2	1050	163	<0.1	2	<1	2
Pb	1200	1500	600	10	0.5	1500	10	----	**22**	**13**	**20**
Zn	28000	35000	200	NA	NA	NA	94	----	21	8	12
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	----	----

Notes:

mg/kg = milligrams per kilogram.

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"---" denotes analysis not conducted

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BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 2					
Sample ID	NSW EPA Guidlelines						BH40_0-0.1		BH41_0.7-0.8		BH42_0-0.2	
Depth (mbgs)							0-0.1		0.7-0.8		0-0.2	
Material Type	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	Fill	TCLP	Fill	TCLP	Clay	TCLP
Date Sampled							14/05/02		14/05/02		14/05/02	
Units	(SIL_2) (mg/kg)	(SIL_4) (mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)	(mg/kg)	(mg/L)
As	400	500	20	10	0.5	500	2	----	9	----	**11**	<0.1
Be	80	100	3	2	0.1	100	<1	----	<1	----	<1	----
Cd	80	100	NA	NA	0.1	100	<1	----	<1	----	<1	----
Cr	NA	NA	NA	NA	NA	NA	6	----	39	----	25	----
Cr VI	400	500	400	10	0.5	1900	----	----	<1	<0.1	----	----
Cu	4000	5000	100	NA	NA	NA	71	----	21	----	20	----
Mn	6000	7500	NA	NA	NA	NA	541	----	157	----	179	----
Ni	2400	3000	60	4	0.2	1050	**37**	<0.1	**8**	----	**9**	----
Pb	1200	1500	600	10	0.5	1500	7	----	**33**	<0.1	**25**	----
Zn	28000	35000	200	NA	NA	NA	57	----	34	----	61	----
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	----	<0.1	----
Cyanide	2000	2500	-	32	1.6	5900	----	----	<1	----	----	----

Notes:

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Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site	NSW EPA Guidlelines						SITE 8					
Sample ID							BH43_0.7-0.8		BH44_0.03-0.2	BH45_0.6-0.8	BH46_0.4-0.5	DUP09
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0.7-0.8		0.03-0.2	0.6-0.8	0.4-0.5	Duplicate of BH46_0.4-0.5
Material Type							Fill	TCLP	Fill	Fill	Fill	
Date Sampled							14/05/02		14/05/02	13/06/02	14/05/02	14/05/02
Units	(SIL_2) (mg/kg)	(SIL_4) (mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	5	----	4	6	3	4
Be	80	100	3	2	0.1	100	1	----	<1	<1	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	----	<1	<1	<1	<1
Cr	NA	NA	NA	NA	NA	NA	4	----	18	8	16	20
Cr VI	400	500	400	10	0.5	1900	----	----	----	----	----	----
Cu	4000	5000	100	NA	NA	NA	35	----	24	6	22	31
Mn	6000	7500	NA	NA	NA	NA	58	----	234	12	262	247
Ni	2400	3000	60	4	0.2	1050	**15**	----	**15**	<1	**13**	**11**
Pb	1200	1500	600	10	0.5	1500	**14**	<0.1	**37**	**19**	**49**	**53**
Zn	28000	35000	200	NA	NA	NA	80	----	61	10	63	64
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	<0.1	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	----	<1	----

Notes:

mg/kg = milligrams per kilogram.

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NA = No criteria defined by NSW EPA

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Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 8					
Sample ID	NSW EPA Guidlelines						BH47_1.3-1.5		BH48_0.7-0.8	BH49_0.6-0.75		BH49_0.6-0.75Lab
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	1.3-1.5		0.7-0.8	0.6-0.75		Duplicate of
Material Type							Fill	TCLP	Fill	Fill	TCLP	BH49_0.6-0.75
Date Sampled							14/05/02		15/05/02	15/05/02		15/05/02
Units	(SIL_2) (mg/kg)	(SIL_4) (mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)
As	400	500	20	10	0.5	500	7	----	4	7	----	3
Be	80	100	3	2	0.1	100	<1	----	<1	<1	----	----
Cd	80	100	NA	NA	0.1	100	<1	----	<1	<1	----	<0.5
Cr	NA	NA	NA	NA	NA	NA	10	----	5	19	----	14
Cr VI	400	500	400	10	0.5	1900	----	----	----	----	<0.1	----
Cu	4000	5000	100	NA	NA	NA	615	----	25	21	----	9
Mn	6000	7500	NA	NA	NA	NA	120	----	45	166	----	----
Ni	2400	3000	60	4	0.2	1050	**5**	----	1	**7**	----	3
Pb	1200	1500	600	10	0.5	1500	**71**	<0.1	**20**	**28**	----	22
Zn	28000	35000	200	NA	NA	NA	95	----	27	55	----	25
Hg	60	75	1	0.4	0.02	50	<0.1	----	<0.1	<0.1	----	0.08
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	<1	----	----

Notes:

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"--" denotes analysis not conducted

(mbgs) denotes metres below ground surface

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Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site	NSW EPA Guidlelines						SITE 8				
Sample ID							BH50_0.03-0.2	BH51_0.5-0.7	BH52_0.03-0.2	BH53_0.03-0.2	
Depth (mbgs)							0.03-0.2	0.5-0.7	0.03-0.2	0.03-0.2	
Material Type	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	Fill	Weathered Shale	Fill	Fill	TCLP
Date Sampled	(SIL_2)	(SIL_4)					15/05/02	15/05/02	15/05/02	15/05/02	
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)
As	400	500	20	10	0.5	500	7	8	5	6	----
Be	80	100	3	2	0.1	100	<1	1	<1	<1	----
Cd	80	100	NA	NA	0.1	100	<1	<1	<1	<1	----
Cr	NA	NA	NA	NA	NA	NA	7	6	33	26	----
Cr VI	400	500	400	10	0.5	1900	----	----	<1	----	----
Cu	4000	5000	100	NA	NA	NA	14	55	50	37	----
Mn	6000	7500	NA	NA	NA	NA	83	30	463	310	----
Ni	2400	3000	60	4	0.2	1050	4	**8**	**22**	**18**	----
Pb	1200	1500	600	10	0.5	1500	**21**	**19**	**80**	**101**	<0.1
Zn	28000	35000	200	NA	NA	NA	31	124	97	155	----
Hg	60	75	1	0.4	0.02	50	<0.1	<0.1	<0.1	<0.1	----
Cyanide	2000	2500	-	32	1.6	5900	----	----	----	----	----

Notes:

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"--" denotes analysis not conducted

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TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 1 - Soil Sample Analytical Results (Metals and Cyanide)

Site							SITE 8	
Sample ID	NSW EPA Guidlelines						BH54_0.03-0.2	BH55_0.03-0.2
Depth (mbgs)	Resid. with gardens & access. soil	Commercial / Industrial	PBIL	CT1 - Inert Waste	TCLP1 - Inert Waste	SCC1 - Inert Waste	0.03-0.2	0.03-0.2
Material Type							Fill	Fill
Date Sampled	(SIL_2)	(SIL_4)					15/05/02	15/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/L)	(mg/kg)	(mg/kg)	(mg/kg)
As	400	500	20	10	0.5	500	4	3
Be	80	100	3	2	0.1	100	<1	<1
Cd	80	100	NA	NA	0.1	100	<1	<1
Cr	NA	NA	NA	NA	NA	NA	15	13
Cr VI	400	500	400	10	0.5	1900	----	----
Cu	4000	5000	100	NA	NA	NA	22	27
Mn	6000	7500	NA	NA	NA	NA	210	275
Ni	2400	3000	60	4	0.2	1050	**8**	**12**
Pb	1200	1500	600	10	0.5	1500	**57**	**40**
Zn	28000	35000	200	NA	NA	NA	77	85
Hg	60	75	1	0.4	0.02	50	<0.1	<0.1
Cyanide	2000	2500	-	32	1.6	5900	----	----

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

"--" denotes analysis not conducted

(mbgs) denotes metres below ground surface

Guidelines are health-based soil investigation levels (SIL2 & PBIL) (EPA, 1998)

NA = No criteria defined by NSW EPA

CT1 = maximum values of total concentration for inert waste classification without determining total leachable concentrations

TCLP = Toxicity Characteristic Leaching Proceedure

SCC1 = maximum values of total concentrations for inert waste classification used in conjunction with total leachable concentration (TCLP)

Shading denotes detected concentrations exceed NSW PBILs

Bolding denotes detected concentrations exceed NSW EPA CT1

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 2 - Soil Sample Analytical Results (TPH and BTEX)

	Site	NSW EPA Guidelines		SITE 2					
	Sample ID	Threshold concentrations for sensitive landuse	Waste Classification Inert CT1 & SCC1	BH24_0.03-0.2	BH26_0.03-0.1	DUP06	BH30_1.5-1.7	BH34_0.7-0.8	BH38_0-0.1
	Depth (mbgs)			0.03 - 0.2	0.03 - 0.1	Duplicate of BH26_0.03-0.1	1.5 - 1.7	0.7 - 0.8	0 - 0.1
	Material Type			Fill	Fill		Fill	Fill	Fill
	Date Sampled			14/05/02	14/05/02	14/05/02	14/05/02	14/05/02	14/05/02
	Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
TPH	C_6 - C_9 Fraction	65	650	<2	<2	<2	<2	<2	<2
TPH	C_{10} - C_{14} Fraction	1000	5000	<50	<50	<50	<50	<50	<50
TPH	C_{15} - C_{28} Fraction	1000	5000	<100	<100	<100	<100	<100	<100
TPH	C_{29} - C_{36} Fraction	1000	5000	<100	<100	<100	<100	<100	<100
	Benzene	1	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	1.4	28.8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Ethylbenzene	3.1	60	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	meta- & para-Xylene	NA	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	ortho-Xylene	NA	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Total Xylenes	14	100	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

(mbgs) denotes metres below ground surface

Table 2 - Soil Sample Analytical Results (TPH and BTEX)

	Site	NSW EPA Guidelines		SITE 8					
	Sample ID	Threshold concentrations for sensitive landuse	Waste Classification Inert CT1 & SCC1	BH45_0.6-0.8	BH46_0.4-0.5	BH48_0.7-0.8	BH49_0.6-0.75	BH49_0.6-0.75Lab	BH54_0.03-0.2
	Depth (mbgs)			0.6 - 0.8	0.4 - 0.5	0.7 - 0.8	0.6 - 0.75	Duplicate of	0.03 - 0.2
	Material Type			Fill	Fill	Fill	Fill	BH49_0.6-0.75	Fill
	Date Sampled			13/06/02	14/05/02	15/05/02	15/05/02	15/05/02	15/05/02
	Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
TPH	C_6 - C_9 Fraction	65	650	<2	<2	<2	<2	<10	<2
TPH	C_{10} - C_{14} Fraction	1000	5000	<50	<50	<50	<50	<50	<50
TPH	C_{15} - C_{28} Fraction	1000	5000	<100	141	<100	<100	<100	145
TPH	C_{29} - C_{36} Fraction	1000	5000	<100	<100	<100	<100	<100	101
	Benzene	1	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
	Toluene	1.4	28.8	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2
	Ethylbenzene	3.1	60	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2
	meta- & para-Xylene	NA	NA	<0.2	<0.2	<0.2	<0.2	<1	<0.2
	ortho-Xylene	NA	NA	<0.2	<0.2	<0.2	<0.2	<0.5	<0.2
	Total Xylenes	14	100	<0.4	<0.4	<0.4	<0.4	<1.5	<0.4

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected above indicated laboratory practical quantitation limit.

(mbgs) denotes metres below ground surface

Table 3 - Soil Sample Analytical Results (PAHs and Phenols)

Site	NSW EPA Guidlelines						SITE 2				
Sample ID							BH24_0.03-0.2	BH28_0.03-0.1	BH30_1.5-1.7	BH34_0.7-0.8	BH38_0-0.1
Depth (mbgs)			Waste - Classification Inert				0.03-0.2	0.03-.1	1.5-1.7	0.7-0.8	0-0.1
Material Type	Residential with minimal soil access	Commercial / Industrial					Fill	Fill	Fill	Fill	Fill
Date Sampled	(SIL_2)	(SIL_4)	CT1	TCLP1	SCC1	SCC2	14/05/02	14/05/02	14/05/02	14/05/02	14/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Naphthalene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
2-Methylnaphthalene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
2-Chloronapthalene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
N-2-Fluorenylacetamide	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b) & (k) fluoranthene	-	-	-	-	-	-	<1	<1	<1	<1	<1
7.12-Dimethylbenz(a)anthracene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene	4	5	0.08	4	1	10	<0.5	<0.5	<0.5	<0.5	<0.5
3-Methylcholanthrene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a.h)anthracene	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g.h.i)perylene	-	-	-	-			<0.5	<0.5	<0.5	<0.5	<0.5
Total PAHs	80	100	NA	NA	200	200	nc	nc	nc	nc	nc
Total Phenols	34000	42500	28.8	14.4	518	518	<1	<1	<1	<1	<1

Notes:

mg/kg = milligrams per kilogram

< denotes analyte not detected above indicated laboratory practical quantitation limits

- denotes no guideline value established

(mbgs) denotes metres below ground surface

---- denotes sample not analysed

Guidelines are NSW EPA (1998) health based soil investigation levels (SILs)

CT1 = maximum values of total concentration for inert waste classification without determining TCLP

SCC1 & SCC2 = maximum values for leachable concentration and total concentration when used together

Total PAH concentration calculated from sum of individual compounds quantified (nc denotes sum incalculable due to non-detection)

Bolding indicates concentrations above CT1 & SCC1

FORMAT

Table 3 - Soil Sample Analytical Results (PAHs and Phenols)

Site	NSW EPA Guidlelines						SITE 8					
Sample ID							BH46_0.4-0.5		BH48_0.7-0.8	BH53_0.03-0.2		BH53_0.4-0.6
Depth (mbgs)			Waste - Classification Inert				0.4-0.5		0.7-0.8	0.03-0.2		0.4-0.6
Material Type	Residential with minimal soil access	Commercial / Industrial					Fill	TCLP	Fill	Fill	TCLP	Clay
Date Sampled	(SIL_2)	(SIL_4)	CT1	TCLP1	SCC1	SCC2	14/05/02		15/05/02	15/05/02		15/05/02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)	(mg/kg)	(ug/L)	(mg/kg)
Naphthalene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
2-Methylnaphthalene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
2-Chloronapthalene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Acenaphthylene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Acenaphthene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Fluorene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Phenanthrene	-	-	-	-	-	-	1.3	----	<0.5	3	----	----
Anthracene	-	-	-	-	-	-	<0.5	----	<0.5	0.8	----	----
Fluoranthene	-	-	-	-	-	-	1.8	----	<0.5	5.6	----	----
Pyrene	-	-	-	-	-	-	1.9	----	0.7	6.6	----	----
N-2-Fluorenylacetamide	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Benz(a)anthracene	-	-	-	-	-	-	0.7	----	<0.5	2.5	----	----
Chrysene	-	-	-	-	-	-	0.6	----	<0.5	2.1	----	----
Benzo(b) & (k) fluoranthene	-	-	-	-	-	-	<1	----	<1	3	----	----
7.12-Dimethylbenz(a)anthracene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Benzo(a)pyrene	4	5	0.08	4	1	10	0.6	<0.3	<0.5	**1.8**	<0.3	<0.5
3-Methylcholanthrene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Indeno(1.2.3.cd)pyrene	-	-	-	-	-	-	<0.5	----	<0.5	0.7	----	----
Dibenz(a.h)anthracene	-	-	-	-	-	-	<0.5	----	<0.5	<0.5	----	----
Benzo(g.h.i)perylene	-	-	-	-			<0.5	----	<0.5	0.9	----	----
Total PAHs	80	100	NA	NA	200	200	6.9	----	0.7	**27**	----	----
Total Phenols	34000	42500	28.8	14.4	518	518	<1	----	<1	<1	----	----

Notes:

mg/kg = milligrams per kilogram

< denotes analyte not detected above indicated laboratory practical quantitation limits

- denotes no guideline value established

(mbgs) denotes metres below ground surface

---- denotes sample not analysed

Guidelines are NSW EPA (1998) health based soil investigation levels (SILs)

CT1 = maximum values of total concentration for inert waste classification without determining TCLP

SCC1 & SCC2 = maximum values for leachable concentration and total concentration when used together

Total PAH concentration calculated from sum of individual compounds quantified (nc denotes sum incalculable due to non-detection)

Bolding indicates concentrations above CT1 & SCC1

Table 4 - Soil Sample Analytical Results (Organochlorine Pesticides and Polychlorinated Biphenyls)

Site	NSW EPA Guidelines				SITE 2				
Sample ID	Residential with minimal soil access	Commercial / Industrial	Inert Waste Classification	Solid Waste Classification	BH24_0.03-0.2	BH30_1.5-1.7	BH31_0.8-1.0	BH34_0.7-0.8	BH38_0-0.1
Depth (mbgs)					0.03-0.2	0.03-.1	1.5-1.7	0.7-0.8	0-0.1
Material Type					Fill	Fill	Fill	Clay	Fill
Date Sampled	(SIL_2)	(SIL_4)	SCC1	SCC2	14-5-02	14-5-02	14-5-02	14-5-02	14-5-02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
alpha-BHC	-	-	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
HCB	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
beta-BHC & gamma-BHC	-	-	****	****	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor	40	50	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin	40*	50*	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	-	-	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Chlordane - trans	200**	250**	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan 1	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Chlordane - cis	200	250	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin	40*	50*	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
DDE	800***	1000***	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin	-	-	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan 2	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
DDD	800***	1000***	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	-	-	****	****	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
DDT	800***	1000***	****	****	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin ketone	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05
Methoxychlor	-	-	-	-	<0.2	<0.2	<0.2	<0.2	<0.2
PCB	40	50	2	<50	<0.1	<0.1	<0.1	<0.1	<0.1

Notes:
mg/kg = milligrams per kilogram
< = analyte not detected at or above indicated laboratory practical quantitation limit
(mbgs) denotes metres below ground surface
* denotes guideline for total aldrin + dieldrin concentration
** denotes combined chlordane criteria
*** denotes combined criteria for DDD + DDT + DDE
**** denotes if the total of one or all of the constituents is more than one mg/kg then the soil is considered scheduled waste
Bolding and shading indicates that reported concentration exceeds SCC1

Table 4 - Soil Sample Analytical Results (Organochlorine Pesticides and Polychlorinated Biphenyls)

Site	NSW EPA Guidelines				SITE 8		
Sample ID	Residential with minimal soil access	Commercial / Industrial	Inert Waste Classification	Solid Waste Classification	BH46_0.4-0.5	BH48_0.7-0.8	BH53_0.03-0.2
Depth (mbgs)					0.4-0.5	0.7-0.8	0.03-0.2
Material Type					Fill	Fill	Fill
Date Sampled	(SIL_2)	(SIL_4)	SCC1	SCC2	14-5-02	15-5-02	15-5-02
Units	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
alpha-BHC	-	-	****	****	<0.05	<0.05	<0.05
HCB	-	-	-	-	<0.05	<0.05	<0.05
beta-BHC & gamma-BHC	-	-	****	****	<0.1	<0.1	<0.1
delta-BHC	-	-	-	-	<0.05	<0.05	<0.05
Heptachlor	40	50	****	****	<0.05	<0.05	<0.05
Aldrin	40*	50*	****	****	<0.05	<0.05	<0.05
Heptachlor epoxide	-	-	****	****	<0.05	<0.05	<0.05
Chlordane - trans	200**	250**	****	****	<0.05	<0.05	<0.05
Endosulfan 1	-	-	-	-	<0.05	<0.05	<0.05
Chlordane - cis	200	250	****	****	<0.05	<0.05	<0.05
Dieldrin	40*	50*	****	****	<0.05	<0.05	<0.05
DDE	800***	1000***	****	****	<0.05	<0.05	<0.05
Endrin	-	-	****	****	<0.05	<0.05	<0.05
Endosulfan 2	-	-	-	-	<0.05	<0.05	<0.05
DDD	800***	1000***	****	****	<0.05	<0.05	<0.05
Endrin aldehyde	-	-	****	****	<0.05	<0.05	<0.05
Endosulfan sulfate	-	-	-	-	<0.05	<0.05	<0.05
DDT	800***	1000***	****	****	<0.2	<0.2	<0.2
Endrin ketone	-	-	-	-	<0.05	<0.05	<0.05
Methoxychlor	-	-	-	-	<0.2	<0.2	<0.2
PCB	40	50	2	<50	0.1	<0.1	**3.9**

Notes:

mg/kg = milligrams per kilogram

< = analyte not detected at or above indicated laboratory practical quantitation limit

(mbgs) denotes metres below ground surface

* denotes guideline for total aldrin + dieldrin concentration

** denotes combined chlordane criteria

*** denotes combined criteria for DDD + DDT + DDE

**** denotes if the total of one or all of the constituents is more than one mg/kg then the soil is considered scheduled waste

Bolding and shading indicates that reported concentration exceeds SCC1

Table 5 - Soil Sample Analytical Results (Volatile Organic Compounds)

Sample Location	SITE 2		SITE 8
Sample ID	BH24_0.03-0.2	BH41_0.7-0.8	BH53_0.03-0.2
Depth (mbgs)	0.03 - 0.2	0.4-0.5	0.03-0.2
Material Type	Fill	Fill	Fill
Date Sampled	14-5-02	14-5-02	15-5-02
Units	(mg/kg)	(mg/kg)	(mg/kg)
Monocyclic Aromatic Hydrocarbons			
Benzene	<0.5	<0.5	<0.5
Toluene	<0.5	<0.5	<0.5
Ethylbenzene	<0.5	<0.5	<0.5
meta & para Xylene	<0.5	<0.5	<0.5
Styrene	<0.5	<0.5	<0.5
ortho-Xylene	<0.5	<0.5	<0.5
Isopropylbenzene	<0.5	<0.5	<0.5
n-Propylbenzene	<0.5	<0.5	<0.5
1.3.5 - Trimethylbenzene	<0.5	<0.5	<0.5
sec-Butylbenzene	<0.5	<0.5	<0.5
1.2.4-Trimethylbenzene	<0.5	<0.5	<0.5
tert-Butylbenzene	<0.5	<0.5	<0.5
p-Isopropyltoluene	<0.5	<0.5	<0.5
n-Butylbenzene	<0.5	<0.5	<0.5
Oxyenated Hydrocarbons			
Vinyl Acetate	<5	<5	<5
2-Butanone	<5	<5	<5
4-Methyl-2-pentanone	<5	<5	<5
2-Hexanone	<5	<5	<5
Sulfonated Compounds			
Carbon disulfide	<0.5	<0.5	<0.5
Fumigants			
2.2-Dichloropropane	<0.5	<0.5	<0.5
1.2-Dichlorpropane	<0.5	<0.5	<0.5
cis-1.3 Dichloropropylene	<1	<1	<1
trans-1.3-Dichlorpropylene	<1	<1	<1
1.2-Dibromoethane	<0.5	<0.5	<0.5
Halogenated Aliphatic Hydrocarbons			
Dichlorodifluoromethane	<5	<5	<5
Chloromethane	<5	<5	<5
Vinyl chloride	<5	<5	<5
Bromomethane	<5	<5	<5
Chloroethane	<5	<5	<5
Trichlorofluoromethane	<5	<5	<5
1.1-Dichloroethne	<0.5	<0.5	<0.5
Iodemethane	<0.5	<0.5	<0.5
trans-1.2-Dichloroethane	<0.5	<0.5	<0.5
1.1-Dichloroethene	<0.5	<0.5	<0.5
1.1.1-Trichloroethane	<0.5	<0.5	<0.5
1.1-Dichloropropylene	<0.5	<0.5	<0.5
Carbon Tetrachloride	<0.5	<0.5	<0.5
1.2-Dichloroethane	<0.5	<0.5	<0.5
Trichloroethene	<0.5	<0.5	<0.5

Table 5 - Soil Sample Analytical Results (Volatile Organic Compounds)

Sample Location	SITE 2		SITE 8
Sample ID	BH24_0.03-0.2	BH41_0.7-0.8	BH53_0.03-0.2
Depth (mbgs)	0.03 - 0.2	0.4-0.5	0.03-0.2
Material Type	Fill	Fill	Fill
Date Sampled	14-5-02	14-5-02	15-5-02
Units	(mg/kg)	(mg/kg)	(mg/kg)
Dibromomethane	<0.5	<0.5	<0.5
1.1.2-Trichloroethane	<0.5	<0.5	<0.5
1.3-Dichloropropane	<0.5	<0.5	<0.5
Tetrachlorethene	<0.5	<0.5	<0.5
1.1.1.2-Tetrachloroethane	<0.5	<0.5	<0.5
trans-1.4-Dichloro-2-butene	<0.5	<0.5	<0.5
cis-1.4-Dichloro-2-butene	<0.5	<0.5	<0.5
1.1.2.2-Tetrachloroethane	<0.5	<0.5	<0.5
1.2.3-Trichloropropane	<0.5	<0.5	<0.5
Pentachloroethane	<0.5	<0.5	<0.5
1.2-Dibromo-3-chloropropane	<0.5	<0.5	<0.5
Hexachlorobutadiene	<0.5	<0.5	<0.5
Halogenated Aromatic Hydrocarbons			
Clorobenzene	<0.5	<0.5	<0.5
Bromobenzene	<0.5	<0.5	<0.5
2-Chlorotoluene	<0.5	<0.5	<0.5
4-Chlorotoluene	<0.5	<0.5	<0.5
1.3-Dichlorobenzene	<0.5	<0.5	<0.5
1.4-Dichlorobenzene	<0.5	<0.5	<0.5
1.2.4-Trichlorobenzene	<0.5	<0.5	<0.5
1.2.3-Trichlorobenzene	<0.5	<0.5	<0.5
Trihalomethanes			
Chloroform	<0.5	<0.5	<0.5
Bromodichloromethane	<0.5	<0.5	<0.5
Dibromodichloromethane	<0.5	<0.5	<0.5
Bromoform	<0.5	<0.5	<0.5
Napthalene			
Napthalene	<5	<5	<5

Notes:
mg/kg = milligrams per kilogram
< denotes analyte not detected at or above indicated laboratory practical quantitation limit (PQL)

Table 6 - QA/QC Soil Sample Analytical Results (Metals)

Sample ID and Depth QAQC Type Material Type Date Sampled Units	BH26_0.03-0.1 Original Fill 14/05/02 (mg/kg)	DUP06 Duplicate of BH26_0.03-0.1 14/05/02 (mg/kg)	*RPD* *(%)*	BH29_0.03-0.1 Original Fill 14/05/02 (mg/kg)	BH29_0.03-0.1Lab Duplicate of BH29_0.03-0.1 14/05/02 (mg/kg)	*RPD* *(%)*	BH39_0-0.1 Original Fill 14/05/02 (mg/kg)	DUP08 Duplicate of BH39_0-0.1 14/05/02 (mg/kg)	*RPD* *(%)*
As	3	2	***40***	<1	2	*NA*	7	8	*13*
Be	<1	<1	*NA*	<1	----	*NA*	<1	<1	*NA*
Cd	<1	<1	*NA*	<1	<0.5	*NA*	<1	<1	*NA*
Cr	6	5	*18*	6	6	*0*	23	34	***39***
Cu	7	6	*15*	<1	1.5	*NA*	12	19	***45***
Mn	61	53	*14*	23	----	*NA*	22	35	***46***
Ni	4	3	*29*	<1	<0.5	*NA*	<1	2	*NA*
Pb	15	11	***31***	7	9	*25*	13	20	***42***
Zn	35	29	*19*	6	8	*29*	8	12	***40***
Hg	<0.1	<0.1	*NA*	<0.1	0.01	*NA*	<0.1	<0.1	*NA*

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected at or above indicated laboratory practical quantitation limit (PQL).

RPD = relative percentage difference.

Bolding indicates RPD outside acceptable limits.

NA RPD not calculated as one or both samples less laboratory PQL

BH##_##Lab = Interlaboratory split sample analysed by secondary laboratory Labmark

"----" denotes sample not analysed

Table 6 - QA/QC Soil Sample Analytical Results (Metals)

Sample ID and Depth QAQC Type Material Type Date Sampled Units	BH46_0.4-0.5 Original Fill 14/05/02 (mg/kg)	DUP09 Duplicate of BH46_0.4-0.5 14/05/02 (mg/kg)	*RPD* *(%)*	BH49_0.6-0.75 Original Fill 15/05/02 (mg/kg)	BH49_0.6-0.75Lab Duplicate of BH49_0.6-0.75 15/05/02 (mg/kg)	*RPD* *(%)*
As	3	4	*29*	7	3	***80***
Be	<1	<1	*NA*	<1	----	*NA*
Cd	<1	<1	*NA*	<1	<0.5	*NA*
Cr	16	20	*22*	19	14	*30*
Cu	22	31	***34***	21	9	***80***
Mn	262	247	*6*	166	----	*NA*
Ni	13	11	*17*	7	3	***80***
Pb	49	53	*8*	28	22	*24*
Zn	63	64	*2*	55	25	***75***
Hg	<0.1	<0.1	*NA*	<0.1	0.08	*NA*

Notes:

mg/kg = milligrams per kilogram.

< denotes analyte not detected at or above indicated laboratory practical quantitation limit (PQL).

RPD = relative percentage difference.

Bolding indicates RPD outside acceptable limits.

NA RPD not calculated as one or both samples less laboratory PQL

BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

"---" denotes sample not analysed

Table 7 - QA/QC Soil Sample Analytical Results (TPH and BTEX)

	Sample ID and Depth	BH26_0.03-0.1	DUP06	*RPD*	BH49_0.6-0.75	BH49_0.6-0.75Lab	*RPD*
	QAQC Type	Original	Duplicate of		Original	Duplicate of	
	Material Type	Fill	BH26_0.03-0.1		Fill	BH49_0.6-0.75	
	Date Sampled	14/05/02	14/05/02		15/05/02	15/05/02	
	Units	(mg/kg)	(mg/kg)	*(%)*	(mg/kg)	(mg/kg)	*(%)*
TPH	C_6 - C_9 Fraction	<2	<2	*NA*	<2	<10	*NA*
TPH	C_{10} - C_{14} Fraction	<50	<50	*NA*	<50	<50	*NA*
TPH	C_{15} - C_{28} Fraction	<100	<100	*NA*	<100	<100	*NA*
TPH	C_{29} - C_{36} Fraction	<100	<100	*NA*	<100	<100	*NA*
BTEX	Benzene	<0.2	<0.2	*NA*	<0.2	<0.2	*NA*
BTEX	Toluene	<0.2	<0.2	*NA*	<0.2	<0.5	*NA*
BTEX	Ethylbenzene	<0.2	<0.2	*NA*	<0.2	<0.5	*NA*
BTEX	meta- & para-Xylene	<0.2	<0.2	*NA*	<0.2	<1	*NA*
BTEX	ortho-Xylene	<0.2	<0.2	*NA*	<0.2	<0.5	*NA*
BTEX	Total Xylenes	<0.4	<0.4	*NA*	<0.4	<1.5	*NA*

Notes:
mg/kg = milligrams per kilogram.
< denotes analyte not detected at or above indicated laboratory practical quantitation limit (PQL)
RPD = relative percentage difference.
BH##_##Lab = interlaboratory split sample analysed by secondary laboratory Labmark

Table 8 - QA/QC Water Sample Analytical Results (TPH and BTEX)

	Sample ID Sample Type Date Sampled	Units	QW02 Rinsate 14/05/02	QW03 Rinsate 15/05/02
TPH	C_6 - C_9 Fraction	µg/l	<20	<20
	C_{10} - C_{14} Fraction	µg/l	<50	<50
	C_{15} - C_{28} Fraction	µg/l	<100	<100
	C_{29} - C_{36} Fraction	µg/l	<50	<50
BTEX	Benzene	µg/l	<1	<1
	Toluene	µg/l	<2	<2
	Ethylbenzene	µg/l	<2	<2
	meta + para Xylene	µg/l	<2	<2
	ortho Xylene	µg/l	<2	<2

Notes:

µg/l = micrograms per litre

< denotes analyte not detected above indicated laboratory practical quantitation limit.

Table 9 - QA/QC Water Sample Analytical Results (Heavy Metals and PAHs)

	Sample ID Material Type Date Sampled	Units	QW02 Rinsate 14/05/02	QW03 Rinsate 15/05/02
Heavy Metals	As	µg/l	<1	<1
	Be	µg/l	<1	<1
	Cd	µg/l	<1	<1
	Cr	µg/l	<1	<1
	Cr (CrVI)	µg/l	-	-
	Cu	µg/l	<1	<1
	Mn	µg/l	4	7
	Ni	µg/l	<1	<1
	Pb	µg/l	<1	4
	Zn	µg/l	3	6
	Hg	µg/l	<0.1	<0.1
PAHs	Naphthalene	µg/l	<2	<2
	Acenaphthylene	µg/l	<2	<2
	Acenaphthene	µg/l	<2	<2
	Fluorene	µg/l	<2	<2
	Phenanthrene	µg/l	<2	<2
	Anthracene	µg/l	<2	<2
	Fluoranthene	µg/l	<2	<2
	Pyrene	µg/l	<2	<2
	Benz(a)anthracene	µg/l	<2	<2
	Chrysene	µg/l	<2	<2
	Benzo(b)&(k)fluoranthene	µg/l	<4	<4
	Benzo(a) pyrene	µg/l	<2	<2
	Indeno(1,2,3-c,d)pyrene	µg/l	<2	<2
	Dibenz(a,h)anthracene	µg/l	<2	<2
	Benzo(g,h,i)perylene	µg/l	<2	<2
	Sum of reported PAH's	µg/l	--	--

Notes:

µg/l = micrograms per litre

< denotes analyte not detected above indicated laboratory practical quantitation limit.

Total PAH concentration calculated from sum of individual compounds quantified (nc denotes sum incalculable due to non-detection)

APPENDIX A

PID: Minirae 2

Date	Job No	Staff	Calibration	Comments
25/9/01	J1725/7	GM	Reading 102	
26/9/01	J1725/7	GM	103	
27/9/01	J1725/7	GM	103	
28/9/01	J1725/7	GM	102	
2/10/01	J1725/7	GM	102	
3/10/01	J1698	GM	103	
5/11/01	J1817	GM	102	OK
12/11/01	J1334	AD	102	OK.
5/6/02	J1720	KR	101.1	Mini 10w
21/2/02	J1347	AD	103	OK
23/4/02	J1227	AD	102.6	OK.
16/01/02	J1877	AD	102.9	OK
21/01/02	J1377	AD	102.6	OK.
28/1/02	J1883	AD	102.5	OK.
5/2/02	J1883	AD	102	Photovac P.I) OK
28/02/02	J1882	KAC	102.2	OK.
15/03/02	J1792	KAC	102.4	OK.
19/03/02	J1792	KAC	103.1	hired Minirae.
25/3/02	DC250	WW	103.1	WW.
2/4/02	J1923	AD	104	
10/4/02	J1896	AD	104	
11/04/02	DC253	WW	103.2	OK.
4/5/02	J1964	AD	103	OK.
6/5/02	J1964	AD	103.8	OK
13/5/2	J1938	KAC	102.1	OK } PHOTOVAC
14/5/2	J1938	KAC	103.1	OK } PHOTOVAC
15/5/2	J1938	KAC	103.3	OK } PHOTOVAC
16/5/02	J1928	AD	103.5	Ok Calibrated
20/5/02	J1950	AD	102.5	Ok Minirae.
23/5/2	J1951	KAC	102.8	OK.
[redacted]				
31/05/02	J1737	AD	102.7	OK (Minirae)
31/5/02	[redacted]			
1/6/02	J1973	AD	103	OK (Minirae)
2/6/02	J1948	ST	102	OK
2/7/02	J1698	ST	102	OK
3/7/02	J1698	AD	103	Spot on / (Minirae 2000 - hired)
5/7/02	J1698	ST	OK	Minirae 2000
6/7/02	J1698	ST	103	Minirae 2000
7/7/02	J1698	ST	103	Minirae 2000
8/7/02	J1698	ST	102	Minirae 2000
9/7/02	J1698	ST	103	Minirae 2000
10/7/02	J1698	ST	102	" "

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BORING LOG

BH24

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH24_ 0.03-0.2	*			Bitumen	0.03
							SAND (crushed sandstone) with gravel (FILL), white/black/brown, loose, slightly moist to dry	0.30
							Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist	
ND			BH24_ 0.8-1.0		1			
ND			BH24_ 1.8-2.0		2			2.00
							Borehole terminated in weathered shale Total Depth: 2.00 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH25

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH25_ 0.03-0.1	*			Bitumen	0.03
							SAND with gravel (FILL), brown, loose, slightly moist	0.10
							Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist	
ND			BH25_ 0.8-1.0		1			1.00
							Borehole terminated in weathered shale Total Depth: 1.00 m	

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BORING LOG

BH26

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH26_ 0.03-0.1 DUP06	*			Bitumen	0.03
							SAND (crushed sandstone) with gravel (FILL), brown, loose, slightly moist to dry	0.20
ND			BH26_ 0.4-0.6				Silty CLAY (CH), red/brown, stiff, medium to high plasticity, slightly moist	
ND					1			
								1.50
ND			BH26_ 1.5-1.7				SHALE (Bedrock), high strength, brown, slightly moist to dry	1.70
							Auger refusal on shale Total Depth: 1.70 m	

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BORING LOG

BH27

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH27_ 0.03-0.1	*			Bitumen	0.03
							SAND (crushed sandstone) with gravel (FILL), yellow/white/brown, loose, slightly moist to dry	0.10
							Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist	
ND			BH27_ 0.8-1.0					
					1		Borehole terminated in weathered shale Total Depth: 1.00 m	1.00

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BORING LOG

BH28

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH28_ 0.03-0.1	*			Bitumen	0.03
							Sandy CLAY with gravel (FILL), brown, soft, low plasticity, slightly moist	0.20
							Silty CLAY with gravel (FILL), black, soft, low plasticity, slightly moist	0.60
							Silty CLAY (CL), red/brown, very stiff, slightly moist to dry, low plasticity	
ND			BH28_ 0.8-1.0		1			
								1.50
ND			BH28_ 1.5-1.7				Weathered SHALE (Bedrock), low to high strength, grey/brown, slightly moist	1.70
							Auger refusal on shale Total Depth: 1.70 m	

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BORING LOG

BH29

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH29_ 0.03-0.1	✳			Bitumen	0.03
							SAND (crushed sandstone) with gravel (FILL), brown/white/red, loose, slightly moist to dry	
								0.60
							Silty CLAY (CL), red/brown, stiff, low plasticity, slightly moist to dry	0.80
ND			BH29_ 0.8-1.0		1		Weathered SHALE (Bedrock), low to high strength, grey/brown, slightly moist	
								1.30
							Borehole terminated in weathered shale Total Depth: 1.30 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH30

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH30_0.03-0.1				Bitumen	0.03
							CLAY with sand and gravel (FILL), brown/white/red, soft, slightly moist to saturated	
ND			BH30_0.6-0.8		1			
ND			BH30_1.5-1.7	*			▽	
ND			BH30_1.8-2.0		2			
								2.30
ND			BH30_2.3-2.5				Silty CLAY (CL), grey/red, stiff, low plasticity, slightly moist	
								2.70
							Borehole terminated on shale Total Depth: 2.70 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH31

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH31_ 0.03-0.1 DUP07				Bitumen SAND with gravel (FILL), brown, loose, slightly moist to dry	0.03
							CLAY with sand and gravel (FILL), brown/white/red, soft, slightly moist to dry	0.40
ND			BH31_ 0.8-1.0	*	1			
							Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist to dry	1.50
ND			BH31_ 1.8-2.0		2			2.00
							Borehole terminated in weathered shale Total Depth: 2.00 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH32

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is gravel

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH32_ 0.0-0.2				SAND with gravel (FILL), brown, loose, slightly moist to dry	0.20
							Silty CLAY (CL), red/brown, very stiff, low plasticity, slightly moist to dry	
ND			BH32_ 0.6-0.8	*	1			
								1.50
							Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist	
ND			BH32_ 1.8-2.0		2			2.00
							Borehole terminated in weathered shale Total Depth: 2.00 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH33

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is gravel

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH33_ 0.0-0.1	✳			SAND with gravel (FILL), brown, loose, slightly moist to dry	0.10
							Silty CLAY (CL), red/brown, very stiff, low plasticity, slightly moist to dry	
ND			BH33_ 0.7-0.8		1			
								1.50
ND			BH33_ 1.5-1.7				Laminated CLAY with weathered shale (CL), low to zero plasticity, light grey, slightly moist	1.70
							Borehole terminated in clay and weathered shale Total Depth: 1.70 m	

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BORING LOG

BH34

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is gravel

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH34_ 0.0-0.1				SAND with gravel (FILL), brown, loose, slightly moist to dry	0.10
							Silty CLAY (CL), red/brown, very stiff, low plasticity, slightly moist to dry	
ND			BH34_ 0.7-0.8	*	1			
								1.50
ND			BH34_ 1.5-1.7				Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist	1.70
							Borehole terminated in weathered shale Total Depth: 1.70 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH36

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is clay

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH36_ 0.0-0.1				Silty CLAY (CL), red/brown to grey/red, very stiff, low plasticity, slightly moist to dry	
ND			BH36_ 0.4-0.5	*	1			
ND			BH36_ 1.8-1.9				Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist	1.80
							Borehole terminated in weathered shale Total Depth: 1.90 m	1.90

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BORING LOG

BH37

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is gravel

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH37_ 0.0-0.2	*			Silty CLAY (CL), red/brown to grey/red, very stiff, low to zero plasticity, slightly moist to dry	
ND			BH37_ 0.7-0.8		1			
								1.60
							Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist to dry	
ND			BH37_ 2.0-2.1		2			2.10
							Borehole terminated in weathered shale Total Depth: 2.10 m	

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BORING LOG

BH38

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 -Surface cover is grass

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH38_ 0.0-0.1	✳			Silty SAND (FILL), brown, loose, slightly moist to dry	0.10
							Silty CLAY (CL), red/brown to grey/red, very stiff, low plasticity, slightly moist to dry	
ND			BH38_ 0.8-1.0		1			
								1.50
							Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist to dry	
ND			BH38_ 1.7-1.8					1.80
							Borehole terminated in weathered shale Total Depth: 1.80 m	

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BORING LOG

BH40

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is gravel

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH40_ 0.0-0.1	*			Sandy GRAVEL (FILL), brown, loose, slightly moist to dry	0.10
							Silty CLAY (CL), red/brown to grey/red, very stiff, low to zero plasticity, slightly moist to dry	
ND			BH40_ 0.7-0.8		1			
					2		Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist	1.90
ND			BH40_ 2.2-2.4					2.40
							Borehole terminated in weathered shale Total Depth: 2.40 m	

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BORING LOG

BH41

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 - Surface cover is gravel

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH41_0.0-0.1 BH41_0-0.1Lab				Sandy GRAVEL (FILL), brown, loose, slightly moist to dry Silty CLAY with gravel (FILL), dark brown and green, soft, slightly moist to dry	0.10
ND			BH41_0.7-0.8	*				
					1		Silty CLAY (CL), grey/red, very stiff, low plasticity, slightly moist to dry	1.00
ND			BH41_1.4-1.5					
							Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist to dry	1.70
ND			BH41_2.0-2.1		2			
							Borehole terminated in weathered shale Total Depth: 2.10 m	2.10

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BORING LOG

BH42

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 2 -Surface cover is grass

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH42_ 0.0-0.2	*			Silty CLAY (CL), red/brown to grey/red, very stiff, low to zero plasticity, slightly moist to dry	
ND			BH42_ 0.8-1.0		1			1.00
							Weathered SHALE (Bedrock), low to high strength, brown, slightly moist	
ND			BH42_ 1.4-1.5					1.50
							Borehole terminated in weathered shale Total Depth: 1.50 m	

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BORING LOG

BH43

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH43_ 0.03-0.1				Bitumen	0.03
							Sandy GRAVEL (FILL), brown, loose, slightly moist to dry, road base	0.20
							Silty CLAY with gravel (FILL), black/brown, soft, slightly moist to dry	
ND			BH43_ 0.7-0.8	*	1			
ND			BH43_ 1.4-1.5					
ND			BH43_ 1.9-2.0		2		Silty CLAY (CL) with minor shale, grey/brown, stiff, low to zero plasticity, slightly moist	1.90
							Weathered SHALE (Bedrock), low strength, grey/brown, slightly moist	2.20
ND			BH43_ 2.5-2.7					
							Borehole terminated in weathered shale Total Depth: 2.70 m	2.70

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BORING LOG

BH44

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH44_0.03-0.1	*			Sandy GRAVEL (FILL), brown, loose, slightly moist to dry, road base	
								0.20
ND			BH44_0.4-0.5				Sandy silty CLAY with gravel and brick (FILL), brown/black/red, soft, slightly moist	
					1			
ND			BH44_1.4-1.5					
ND			BH44_1.9-2.0		2			
								2.00
							Silty CLAY (CL), grey/brown, very stiff, low to zero plasticity, slightly moist to dry	
								2.30
							Weathered SHALE (Bedrock), low strength, brown, slightly moist to dry	
ND			BH44_2.5-2.7					
								2.70
							Borehole terminated in weathered shale Total Depth: 2.70 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH45

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Direct-Push
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 02/06/2013
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH45_0.03-0.2				Bitumen Sandy GRAVEL roadbase (FILL), brown, slightly moist to dry	0.03
ND			BH45_0.4-0.5				Reworked CLAY with gravel (Fill), red/grey/pink, soft, slightly moist to saturated to slightly moist	0.40
			BH45_0.6-0.8	*	1			
ND			BH45_1.4-1.5					
ND			BH45_1.9-2.0		2			
			BH45_2.8-3.0		3			
			BH45_4.3-4.5		4			
							Borehole terminated in fill Total Depth: 4.50 m	4.50

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH46

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid Stem Auger / Direct-Push
SAMPLING METHOD Grab / Push Tube
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Bitumen	0.03
							Sandy GRAVEL stabilised with concrete (FILL), brown, dense, slightly moist	0.20
							Concrete	0.40
ND			BH46_ 0.4-0.5 DUP09	*			Sandy CLAY(FILL), brown, soft, slightly moist	0.50
							CLAY with shale (FILL), grey/pink to brown/yellow, slightly moist, stiff	
					1			
ND			BH46_ 1.4-1.5					1.50
							Sandy CLAY with gravel (FILL), grey, stiff, slightly moist	1.80
							CLAY with shale (FILL), red to pink/grey, slightly moist, stiff	
ND					2			
ND			BH46_ 2.8-3.0					3.00
ND			BH46_ 3.0-3.2		3		▽ Silty CLAY (CL), low plasticity, brown, soft, saturated	3.20
ND			BH46_ 3.2-3.5				Weathered SHALE (Bedrock), low strength, grey/yellow, slightly moist	3.50
							Push Tube refusal on shale Total Depth: 3.50 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH47

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid Stem Auger / Direct-Push
SAMPLING METHOD Grab / Push Tube
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 14/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
							Bitumen	0.03
							Sandy GRAVEL stabilised with concrete (FILL), brown, dense, slightly moist	0.20
							Concrete	
ND			BH47_ 0.4-0.5				Sandy CLAY(FILL), brown, soft, slightly moist	0.40
							CLAY with gravel (FILL), red/grey, slightly moist, stiff	0.60
					1			
ND			BH47_ 1.3-1.5	*			CLAY with sand and gravel (FILL), brown/grey, slightly moist, stiff	1.30
							Reworked CLAY with gravel adn shale (FILL), brown/grey, slightly moist, stiff, with burnt timber	1.50
ND			BH47_ 1.9-2.0		2			
ND			BH47_ 2.8-3.0		3		Weathered SHALE (Bedrock), low strength, grey/yellow, slightly moist to dry	3.00
ND			BH47_ 3.5-3.7					
					4		Push Tube refusal on shale Total Depth: 4.00 m	4.00

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BORING LOG

BH48

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid-Stem Auger
SAMPLING METHOD Grab
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 15/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH48_ 0.03-0.2				Bitumen	0.03
							Sandy silty CLAY with shale (FILL), brown, slightly moist to moist	
ND			BH48_ 0.7-0.8		1			
ND								
					2			
ND			BH48_ 2.2-2.3					
								2.50
ND			BH48_ 2.5-2.7				Silty CLAY (FILL) orange/brown/grey, stiff, low to medium plasticity, slightly moist to dry, with burnt wood	
					3			
								3.20
							Weathered SHALE (Bedrock), low strength, brown, slightly moist to dry	
ND			BH48_ 3.6-3.8					
								3.80
							Auger refusal on shale Total Depth: 3.80 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH49

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid Stem Auger / Direct-Push
SAMPLING METHOD Grab / Push Tube
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 15/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH49_ 0.03-0.2 DUP10				Bitumen	0.03
							Sandy GRAVEL stabilised with concrete (FILL), brown, dense, slightly moist	0.20
							Sandy silty CLAY (FILL) with gravel, brown and black, slightly moist, with burnt material	
ND			BH49_ 0.6-0.75	*				
			BH49_ 0.6-0.75Lab					0.80
							Silty CLAY (CL), red/brown to grey/orange, stiff, low to zero plasticity, slightly moist to dry	
					1			
ND			BH49_ 1.3-1.5					
					2			
								2.20
							Weathered SHALE (Bedrock), low strength, grey/orange, slightly moist to dry	
ND			BH49_ 2.3-2.5					2.50
							Push Tube refusal on shale Total Depth: 2.50 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH50

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid Stem Auger / Direct-Push
SAMPLING METHOD Grab / Push Tube
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 15/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH50_ 0.03-0.2	✳			Bitumen	0.03
							Sandy GRAVEL stabilised with concrete (FILL), brown, dense, slightly moist	0.20
							Weathered SHALE (Bedrock), low strength, grey, slightly moist	
ND			BH50_ 0.4-0.5					
ND			BH50_ 0.8-1.0					
					1			1.00
							Push Tube refusal on shale Total Depth: 1.00 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

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BORING LOG

BH51

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid Stem Auger / Direct-Push
SAMPLING METHOD Grab / Push Tube
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 15/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH51_ 0.03-0.2				Bitumen	0.03
							Sandy GRAVEL stabilised with concrete (FILL), brown, dense, slightly moist	0.20
							Weathered SHALE (Bedrock), low strength, brown to dark grey, slightly moist to dry	
ND			BH51_ 0.5-0.7					0.70
							Push Tube refusal on shale Total Depth: 0.70 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

HLA-Envirosciences Pty Limited
55-65 Grandview Street
Pymble NSW 2073
Telephone: (02) 9988 4422
Fax: (02) 9988 4441

BORING LOG

BH52

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid Stem Auger / Direct-Push
SAMPLING METHOD Grab / Push Tube
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 15/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH52_ 0.03-0.2	✳			Bitumen	0.03
							Sandy GRAVEL stabilised with concrete (FILL), brown, dense, slightly moist	0.30
							Weathered SHALE (Bedrock), low strength, brown to dark grey, slightly moist to dry	
ND			BH52_ 0.45-0.65					0.65
							Push Tube refusal on shale Total Depth: 0.65 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

HLA-Envirosciences Pty Limited
55-65 Grandview Street
Pymble NSW 2073
Telephone: (02) 9988 4422
Fax: (02) 9988 4441

BORING LOG

BH53

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid Stem Auger / Direct-Push
SAMPLING METHOD Grab / Push Tube
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 15/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH53_ 0.03-0.2	*			Bitumen	0.03
							Sandy GRAVEL with clay (FILL), grey/brown, loose, moist	0.40
ND			BH53_ 0.4-0.6				Silty CLAY (CL), light-grey/orange, very stiff, low to zero plasticity, slightly moist to dry, laminated clay with shale lenses	
					1			1.40
ND			BH53_ 1.4-1.5				Weathered SHALE (Bedrock), high strength, brown to dark grey, slightly moist	1.50
							Push Tube refusal on shale Total Depth: 1.50 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

HLA-Envirosciences Pty Limited
55-65 Grandview Street
Pymble NSW 2073
Telephone: (02) 9988 4422
Fax: (02) 9988 4441

BORING LOG

BH54

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid Stem Auger / Direct-Push
SAMPLING METHOD Grab / Push Tube
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 15/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH54_ 0.03-0.2	*			Bitumen	0.03
							Sandy GRAVEL with silt (FILL), brown, loose, moist	0.40
ND			BH54_ 0.4-0.6				Weathered SHALE (Bedrock), low strength, light grey, slightly moist to dry	0.60
							Push Tube refusal on shale Total Depth: 0.60 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

HLA-Envirosciences Pty Limited
55-65 Grandview Street
Pymble NSW 2073
Telephone: (02) 9988 4422
Fax: (02) 9988 4441

BORING LOG

BH55

PROJECT NUMBER J1938
PROJECT NAME SOPA
LOCATION Homebush - Development Sites 2 & 8
DRILLING METHOD Solid Stem Auger / Direct-Push
SAMPLING METHOD Grab / Push Tube
SURFACE ELEVATION
WELL HEAD/TOC
LOGGED BY R. Casson
COMMENTS SITE 8 - Surface cover is bitumen (30mm)

DATE 15/05/2002
BLANK
SCREEN
GRAVEL PACK
SANITARY SEAL/BENTONITE
STABILISED WATER LEVEL
GROUND WATER ELEVATION

PID (ppm)	BLOW COUNTS	RECOVERY	SAMPLE NUMBER	ANALYSED	DEPTH (m BGL)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH
ND			BH55_ 0.03-0.2 DUP11	*			Bitumen	0.03
							Sandy GRAVEL (FILL), brown, loose, moist	
							Silty CLAY with gravel (FILL), red/brown, slightly moist, low plasticity	0.30
ND							Sandy CLAY (FILL), black/brown, soft, slightly moist, with shale	0.60
					1			
ND			BH55_ 1.2-1.3				CLAY with gravel (FILL), dark brown, soft, moist, low plasticity	1.15
							Silty CLAY (CL), red/brown, stiff, low plasticity, slightly moist	1.40
ND								
					2			
ND			BH55_ 2.4-2.5					
								2.75
ND			BH55_ 2.8-3.0				Weathered SHALE (Bedrock), low strength, light grey to grey/orange, slightly moist to dry	
					3			3.00
							Push Tube refusal on shale Total Depth: 3.00 m	

BORING / WELL CONSTRUCTION LOG J1938.GPJ HLA_SYD.GDT 22/08/02

APPENDIX B

The following sections describe components of the Quality Assurance and Control Plan for the Site Contamination Assessment conducted at Site 2 and Site 8, which complement the measures described in the report. An evaluation of the conformance of the results of the investigation against predetermined data quality objectives (DQOs) is also included.

B1.1 Laboratory Data Quality Objectives

Listed below are the predetermined DQOs defined for the assessment of the laboratory analytical data:

- All sample analyses to be conducted using National Association of Testing Authorities (NATA) registered methods in accordance with ANZECC (1996) and NEPM (1999) guidelines;
- Maximum acceptable sample holding time is 14 days for organic analyses and 6 months for metal analyses. Mercury (Hg) to be analysed within 28 days of sample collection;
- Samples were appropriately preserved and handled;
- Laboratory method blank analyses required to be below the limits of reporting (PQLs);
- Surrogate compound concentrations required to be spiked at similar concentration to sample results;
- All PQLs must be less than the assessment criteria;
- The relative percent difference (RPDs) of duplicates or replicates will be determined and compared to the following criteria for acceptability. The acceptance criteria are based on both HLA's experience and the criteria listed in AS 4482.1 of 1997:
  - Less than 30 percent for field duplicates and laboratory split samples;
  - Less than 30 percent for laboratory duplicates where the detection is less than 10 times the LOR; and
  - Less than 20 percent for laboratory duplicates where the detection is greater than 10 times the PQL.
- RPDs for Control Spike Duplicates were compared to an acceptable limit of 20%.
- RPDs for Matrix Spike Duplicates were compared to an acceptable limit of 20%.
- Percent recoveries of control spikes and matrix spikes were compared to an acceptable range of 70–130 %. Where this range was exceeded, reference to the laboratories internal DQO limits was made. In addition, percentage recoveries of surrogates were also compared to the USEPA surrogate recovery limits.

In HLA's experience, since samples to be analysed for volatiles cannot be homogenised, the RPD results obtained for duplicate samples and repeat analyses will typically not provide an assessment of laboratory precision, but rather an indication of homogeneity of the distribution of the analyte within the sample. Any exceedences of the above acceptable limits were professionally assessed to determine the affect, if any on the overall usability or validity of the field sample data.

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B1.2 Chemical Analysis

The primary laboratory used for sample analysis was Australian Laboratory Services (ALS) and the secondary laboratory used to analyse triplicate samples was Labmark Laboratory Services (Labmark). Both laboratories are NATA accredited for all analyses conducted. The following table presents a summary of the analytical methods used by the laboratories and endorsed by ANZECC (1996):

Analytical Methodologies Used By ALS

Analyte	Matrix	Laboratory and Method No.	Reference Method
As, Be, Cd, Cr, Cu, Mn, Pb, Ni, Zn	Soil	ALS – EG-005T	US EPA 3051, US EPA SW-846, US EPA 6010, APHA 3500
Hg	Soil	ALS – EG-035T	APHA 20th ed 3112 Hg-B
TPH	Soil	ALS – EP-071-SS	US EPA 8015 (MOD)/GCMS/FID US EPA 8260/GCMS
	Water	ALS – EP-071-WW	US EPA 8015 (MOD)/GCMS/FID US EPA 8260/GCMS
BTEX	Soil	ALS – EP-080-SS	US EPA 8260/GCMS
	Water	ALS – EP-080-SS	US EPA 8260/GCMS
PAH	Soil	ALS – EP-075B-SS	US EPA 8270/GCMS
OCP	Soil	ALS – EP-068A-SS	US EPA 8270B/GCMS
PCB	Soil	ALS – EP-066	US EPA 8270B/GCMS
Cyanide (Total)	Soil	ALS – EK-026	APHA 4500-CN C&N
PH	Soil	ALS – EA-005	APHA 20th ed 4500 H+
VOCs	Soil	ALS – EP-074 & EP-075	US EPA 5030 A & US EPA 8260A US EPA 8270 B
TCLP – Metals	Soil	EG – 005C	US EPA 1311
– B(a)P	Soil	EP – 075B - WS	US EPA 1311
Asbestos	Soil / Fibrous Sheet	Method 6	Polarised Light Microscopy in conjunction with Dispersion Staining

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Analytical Methodologies Used By LabMark

Analyte	Matrix	Laboratory Method No.	Reference Method
Metals	Soil	3050 – digestion & Flame AAS, 7061 – digestion & HG/AAS & 7471 – digestion, reduction & CV/AAS	USEPA SW846, 6010
TPH	Soil	Purge & Trap GC/PID & GC/FID	USEPA 8015 (MOD)/GCMS/FID USEPA 8260/GCMS
BTEX	Soil	Purge & Trap GC/PID	USEPA 8260/GCMS

Laboratory Blanks

Laboratory or control blanks consist of reagents specific to each individual analytical method and are prepared and analysed by laboratories in the same manner as regular samples. The preparation and analysis of laboratory blanks enables the measurement of contamination within the laboratory.

Ideally, no contamination should be present in blanks. However, in the event that contamination is detected, the following actions are taken:

- The organic test results are not to be corrected by subtracting any blank value;
- If an analyte is found in a blank but not a sample, no action is taken;
- No absolute results are reported unless the analyte concentration within a sample exceeds 10 times the amount in any blank for common contaminants (dichloromethane, acetone, phthalates, and 2-butanone), or five times the amount for any other analyte; and
- Professional judgment is used where little or no contamination is present in the associated blanks, but contamination is suspected in actual samples.

Laboratory blanks are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per batch.

Laboratory Duplicates

Laboratory duplicate samples are prepared in the laboratory by splitting a field sample and analysing it as two independent samples. The analysis of laboratory duplicate samples provides an indication of analytical precision and may be influenced by sample heterogeneity. The laboratory duplicate RPDs are used to assess laboratory precision.

Laboratory duplicates are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per batch.

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Laboratory Control Samples

Laboratory control samples (LCS) or Quality Control check samples are prepared within the laboratory by spiking an aliquot of an appropriate clean matrix reagent with known concentrations of specific analytes. The check sample is then analysed and the results are used to assess the laboratory performance on sample preparation and analysis procedure. Certified reference material may also be used to assess analytical accuracy independent of the investigations.

Accuracy is assessed by calculation of percent recovery (PR):

$$PR = X / T \times 100\%$$

Where: X is the measured analyte concentration
T is the "true" value

To evaluate percent recovery, the quality control limits that the laboratories have calculated are assessed following the procedures required by the US EPA. Ideally, all calculated recovery values should be within acceptance limits, which for the case of metals consists of historical analyte recoveries as experienced by the laboratory. However, in the event that control limit outliers are reported, professional judgement is used to assess the extent to which such results may affect the overall useability of the data. LCSs are typically analysed at a frequency of 1 in 20, with a minimum of one analysed per analytical batch.

Matrix Spikes

Matrix spikes are samples prepared within the laboratory by dividing a field sample into two aliquots, then spiking each with identical concentrations of the analytes. The matrix spike, and matrix spike duplicate, are then analysed separately and the results compared to determine the effects of the sample matrix on the accuracy and precision of the analytes. Accuracy is assessed by the calculation of the percent recovery (PR) for matrix spikes:

$$PR = \frac{(SSR - SR)}{SA} \times 100\%$$

Where: SSR is the spiked sample result
SR is the sample result
SA is the spike added

Note that when the sample concentration is less than the instrument detection level, then a value of SR = 0 is recommended.

Surrogates

Surrogates are compounds which are similar to the organic analytes of interest in chemical composition, extraction, and chromatography, but which are not normally found in field samples. Surrogates are generally spiked into all sample aliquots prior to preparation and analysis. Percent recoveries are

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calculated for each surrogate, providing an indication of analytical accuracy. US EPA methodology (SW – 846) requires that surrogate testing be performed whenever analysing by Gas Chromatography or HPLC.

In order to compare analytical accuracy, it is usually necessary to spike a range of surrogate compounds of different chemical properties into each sample aliquot.

USEPA Method 8000 (7) provides that the laboratory may calculate its own surrogate recovery limit should the EPA not specify a limit. In the absence of specified PR criteria for individual surrogates or laboratory calculated control limit, the general acceptance criteria for quality control measurements employed were taken from USEPA guidelines (5) which are summarised below:

< 10%	Unacceptable low recovery which may result in negative detections.
10% to 25%	Recoveries are sufficiently low that results provide only an estimate of analyte concentration.
25% to 130%	Acceptable recovery.
> 130%	Unacceptable high recovery which may result in false high detections.

Ideally, all calculated surrogate recovery values should be within acceptable limits. In the event that some recoveries lie outside the control limits, the USEPA guidance documents provide criteria for surrogate recovery results to assign a level of confidence in the results of actual sample analyses. USEPA protocols identify the need to test a minimum of three surrogates for each analytical group.

C2.0 DATA VALIDATION

The overall assessment of the quality of the data obtained during the investigation is discussed below in terms of the following data quality indicators.

B2.1 Precision

Precision – or variability of the data was assessed by determining RPDs between the original and duplicated analyses. Three field duplicate soil samples (DUP06, DUP08 and DUP09) were sent to the primary laboratory (ALS) and were variably analysed for heavy metals, cyanide, TPH and BTEX. Two field duplicate samples (BH29_0.03-0.1Lab and BH49_0.6-0.75BH06_0-0.3Lab) were sent to the secondary laboratory (Labmark) and were analysed for metals, TPH and BTEX.

RPDs were calculated for all analytes for all original and duplicate samples, the results of which are included in the analytical summary Tables 6 and 7.

The RPDs for TPH and BTEX were unable to be calculated as results were below laboratory practical quantitation Limits (PQLs) and as such the precision of the laboratory results is considered adequate. The following details instances where the RPD values exceed the predetermined DQOs.

B2.3 Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represent a characteristic of parameter variations at sampling points or environmental conditions. Sample representativeness is controlled through selecting sampling locations that exemplify site conditions and obtaining suitable samples from these sites. Sampling rationale is discussed in the body of the report.

Sample selection and analysis was conducted in order to meet the specific objectives of the particular phase of work, specifically assess any imported fill material. Analysis for the contaminants of concern was selectively conducted on soil as indicated in analytical summary tables. Based on the sampling and analytical regime undertaken, the results obtained are considered to be sufficiently representative of the subsurface conditions at the site.

B2.4 Comparability

Comparability expresses the confidence with which one data set can be compared with another. In order to assess comparability, field sampling procedures, laboratory sample preparation procedures, analytical procedures, and reporting units must be known and similar to established protocols, as was the case during this investigation. Qualitatively, data subjected to strict QA/QC procedures will be deemed more reliable, and therefore more comparable, than other data. This investigation involved predominantly two consecutive days of soil subsurface field investigation (excludes BH46), as such the data collected is considered intrinsically comparable. Furthermore all of the field investigation was undertaken by the same Environmental Scientist and all of the laboratory analysis was conducted by the same laboratories, confirming good comparability of subsurface investigation.

B2.5 Completeness

The completeness of data is defined as the percentage of analytical results that are considered valid. Valid chemical data are values that have been identified as acceptable or acceptable as qualified during the data validation process. The completeness is a comparison of the total number of samples accepted against the total number of samples, calculated as a percentage. The project goal for completeness is 90%. Completeness also includes checking that all entries in the database are correct, properly entered, and that any typographical errors in the database are corrected and the data are re-entered properly. Completeness is defined as:

$$\text{Completeness} = \frac{\textit{number of acceptable items}}{\textit{total number of items}} \times 100\%$$

All samples collected and analysed complied with the predetermined DQOs as such the data obtained is considered to be 100% quantitative and complete.

B2.6 Overall Assessment

Based on an assessment of field and laboratory QA/QC data, the reported analytical results are considered to be valid and representative of concentrations of the analysed compounds at the sample locations tested.

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APPENDIX C

SRAES33564

ALS Environmental

SAMPLE RECEIPT ADVICE

COMPANY: HLA-ENVIROSCIENCES PTY LTD
ATTENTION: MS RACHAEL CASSON
DATE: May. 21, 2002
FROM: Karin White, ENV SYDNEY

ALS has received samples pertaining to your reference: 119254

For future reference the batch number on this order is: ES33564

All samples and paper work were received in good order.
Samples have been received within recommended holding times.
Samples chilled when received.
Sample containers do not comply to pretreatment/preservation standards (AS,APHA,USEPA)
Please direct any turnaround/technical queries to Michael Heery.
Any queries relating to sample condition/numbering/breakages should be directed to Wael Saleh.
ANALYTICAL WORK FOR THIS BATCH WILL BE CONDUCTED AT ALS SYDNEY
All aqueous samples are stored for two weeks and solid samples for three months from the date of completion of the batch, unless specific arrangements are made otherwise.

Purchase Order Number: 119254
Project Name: J1938/1-HOMEBUSH

You can expect results to be reported as detailed below:

All Environmental Results May. 24, 2002

Comments: HNO3 field filtered preserved samples should be supplied for dissolved metal analysis.

A L S - SERVICING YOUR NEEDS BETTER

AUSTRALIAN LABORATORY SERVICES P/L
ABN: 84 009 936 029

BRISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
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Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449

NOTE: 5 ESKIES - LABELLED RACHAEL CASSON HLA

PREBOOKED JOB (NANTHINI)

CHAIN OF CUSTODY

0413 645 857

HLA

HLA - Enviroscience Pty Limited

55 65 Grandview Street
PO Box 726
Pymble NSW 2073 Australia

Tel: 61 2 9988 4422
Fax: 61 2 9988 4441
E-mail: mail@syd.hla-enviro.com.au

Laboratory Details

Lab. Name: ALS
Lab. Address: 277 WOODPARK RD SMITHFIELD
Contact Name: NANTHINI
Lab. Ref:

Tel: 8784 8555
Fax: 8784 8500
Preliminary Report by:
Final Report by: 24/5/02
Lab Quote No:

Sampled By: RACHAEL CASSON
HLA Project No: J1938/1
Project Name: HOMEBUSH
PO No. 114254

Specifications:

	Yes (tick)
1 Urgent TAT required? (please circle: 24hr 48hr _____days)	
2 Fast TAT Guarantee Required?	
3 Is any sediment layer present in waters to be excluded from extractions?	
4 % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5 Special storage requirements? (details: _____)	
6 Shell Quality Partnership:	
7 Report Format: (Fax) Hardcopy (Email): rcasson@syd.hla-enviro.com.au	

Analysis Request

Lab ID	Sample ID	Sampling Date	Matrix: soil	water	other	Preservation: filt'ed	acid	Ice	other	Container (No. & type)	BTEX + TPH	Metals*	PAH's	OCP	OPP	PCB	SVOC*	VOC*	TPH	Lead	TCLP Heavy Metals	TCLP PAH's	Phenols (TOTAL)	VHC	Speciated TPH	Other: Cyanide	Other: HOLD
1	BH24_0.03-0.2	14/5/2	X					X		1 x 250ml glass jar with Teflon lid.	X	X	X	X		X		X					X			X	
	BH24_0.8-1.0 (H)																										X
	BH24_1.8-2.0 (H)																										X
2	BH25_0.03-0.1											X															
	BH25_0.8-1.0 (H)																										X
3	BH26_0.03-0.1						/				X	X															
	BH26_0.4-0.6 (H)																										X
4	BH27_0.03-0.1											X															
	BH27_0.8-1.0 (H)																										X
	BH26_1.5-1.7 (H)																										X
5	BH28_0.03-0.1											X	X										X			X	
	BH28_0.8-1.0 (H)																										X
	BH28_1.5-1.7 (H)																										X

Batch No.: E8335/64 ☑ ORG
Batched date: 14/5/2
☑ Soil ☐ Ambient
☐ Water ☑ Chilled
☐ Other ___ c
☐ Subcontract Work
☐ Bottle Return
☐ Imm. Anal. Action:

34 x jnr for Cyan
2 x 1L S
2 x 1L P
4 x VS HCl

Lab Report No
Esky ID

* Metals Required (Delete elements not applied): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: R. CASSON
Signed:
Date: 17/5/2

Relinquished by:
Signed:
Date:

CHAIN OF CUSTODY

HLA

HLA - Enviroscience Pty Limited - Newcastle		**Laboratory Details**	Tel: 8784 8555
18 Warabrook Blvd	Tel: 61 2 4968 0044	Lab. Name: ALS	Fax:
PO Box 73	Fax: 61 2 4968 0005	Lab. Address:	Prelimanary Report by: 24/5/2
HRMC NSW 2310 Australia	E-mail: mail@hla-enviro.com.au	Contact Name:	Final Report by:
		Lab. Ref:	Lab Quote No:
Sampled By: RACHAEL CASSON	HLA Project No: 31938/1	Project Name: HOMEBUSH	PO No. 119254

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email: _____	

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: fil'ed	Preservation: acid	Preservation: Ice	Preservation: other	Container (No. & type)	BTEX + TPH	Metals*	PAH's	OCP	OPP	PCB	SVOC	VOC	TPH	Lead	TCLP Heavy Metals	TCLP PAH's	Phenols	VHC	Speciated TPH	Other: Cyanide	Other: HOLD
(6)	BH29_0.03-0.1 •	14/5/2	X					X		1 x 250ml plastic jar with PE/Eq lid		X															
•	BH29_0.8-1.0 (H) •		↓					↓		↓																	X
	BH30_0.03-0.1 (H) •																										X
	BH30_0.6-0.8 (H) •																										X
(7)	BH30-1.5-1.7 •										X	X	X	X		X							X				
	BH30_1.8-2.0 (H) •																										X
	BH30_2.3-2.5 (H) •																										X
	BH31_0.03-0.1 (H) •																										X
(8)	BH31_0.8-1.0 •											X		X		X											
	BH31_1.8-2.0 (H) •																										X
	BH32_0-0.2 (H) •																										X
(9)	BH32_0.6-0.8 •											X														X	
	BH32_1.8-2.0 (H) •		↓					↓		↓																	X

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.

Esky ID

Relinquished by: R. CASSON Signed: Date: 17/5/2

Relinquished by: Signed: Date:

CHAIN OF CUSTODY

HLA

HLA - Enviroscience Pty Limited - Newcastle	**Laboratory Details**
18 Warabrook Blvd	Tel: 61 2 4968 0044
PO Box 73	Fax: 61 2 4968 0005
HRMC NSW 2310 Australia	E-mail: mail@hla-enviro.com.au
	Lab. Name: ALS
	Lab. Address:
	Contact Name:
	Lab. Ref:
	Tel: 8784 8555
	Fax:
	Prelimanary Report by: 24/5/12
	Final Report by:
	Lab Quote No:

Sampled By: RACHAEL CASSON | HLA Project No: J1938 | Project Name: HOMEBUSH | PO No. 19254

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email: _____	

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: Ice	Preservation: other	Container (No. & type)	Analysis Request: BTEX + TPH	Metals*	PAH's	OCP	OPP	PCB	SVOC	VOC	TPH	Lead	TCLP Heavy Metals	TCLP PAH's	Phenols (TOTAL)	VHC	Speciated TPH	Other: HOLD
(10)	BH33_0-0.1 •	14/5/12	X					X		1x250ml glass jar with Teflon lid		X													
	BH33_0.7-0.8 (H) •																								X
	BH33_1.5-1.7 (H) •																								X
	BH34_0-0.1 (H) •																								X
(11)	BH34_0.7-0.8 •										X	X	X	X		X							X		
	BH24_1.5-1.7 (H) •																								X
	BH35_0-0.1 (H) •																								X
	BH35_0.7-0.8 (H) •																								X
	BH35_2.0-2.1 (12) •											X													
	BH36_0-0.1 (H) •																								X
	BH36_0.4-0.5 (13) •											X													
	BH36_1.8-1.9 (H) •																								X
	BH37_0-0.2 (N) •											X													

Lab No.: ☐ ORC ES1255L4 — Cooled date: ____ — Ice ☐ Ambient — Water ☐ Chilled (11) — Other ____ °C — ☐ Subcontract Work — ☐ Metals Return — ☐ Interm. Anal. Attached

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.:

Esky ID:

Relinquished by: R. CASSON | Signed: | Date: 17/5/12

Relinquished by: | Signed: | Date:

CHAIN OF CUSTODY

HLA

HLA - Enviroscienses Pty Limited - Newcastle	
18 Warabrook Blvd	Tel: 61 2 4968 0044
PO Box 73	Fax: 61 2 4968 0005
HRMC NSW 2310 Australia	E-mail: mail@hla-enviro.com.au

Laboratory Details

Lab. Name: ALS	Tel: 8784 8555
Lab. Address:	Fax:
Contact Name:	Prelimanary Report by: 24/5/2
Lab. Ref:	Final Report by:
	Lab Quote No:

Sampled By: RACHAEL CASSON | HLA Project No: 41938/1 | Project Name: HOMEBUSH | PO No. 192154

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: ☐ Fax ☐ Hardcopy ☐ Email: _____	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	water	other	Preservation: fil'ed	acid	ice	other	Container (No. & type)	BTEX + TPH	Metals*	PAH's	OCP	OPP	PCB	SVOC	VOC	TPH	Lead	TCLP Heavy Metals	TCLP PAH's	Phenols (TOTALS)	VHC	Speciated TPH	Other: Cyanide	Other: OH&G
	BH37_0.7-0.8 (H)	14/5/2	X					X		1x 250ml sp/ss jar with teflon lid																	X
	BH37_2.0-2.1 (H)																										X
ES3356Y	BH38_0-0.1 (15)										X	X	X	X		X							X				
	BH38_0.8-1.0 (H)																										X
	BH38_1.7-1.8 (H)																										X
	BH39_0-0.1 (H)																										X
	BH39_0.8-1.0 (16)											X															
	BH39_1.9-2.0 (H)																										X
	BH40_0-0.1 (17)											X															
	BH40_0.8-0.7 (H)																										X
	BH40_2.2-2.4 (H)																										X
	BH41_0-0.1 (H)																										X
	BH41_0.7-0.8 (18)	√						√		J		X						X							X		

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No.

Esky ID

Relinquished by: R. CASSON | Signed: | Date: 17/5/2

Recieved by: | Signed: | Date:

Relinquished by: | Signed: | Date:

Recieved by: | Signed: | Date:

Batch No: ☐ JIC
ES3356Y
Batched date: _____
☐ Soil ☐ Ambient
☐ Water ☐ Chilled
☐ Other ___°C
☐ Subcontract Work
☐ Bottle Return
☐ Imm. Anal. Actioned

CHAIN OF CUSTODY

HLA

HLA - Envirosciences Pty Limited
55-65 Grandview Street
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 9988 4422
Fax: 61 2 9988 4441
E-mail: mail@syd.hla-enviro.com.au

Laboratory Details
Lab. Name: ALS
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Prelimanary Report by: 24/5/2
Final Report by:
Lab Quote No:

Sampled By: RACHAEL CASSON
HLA Project No: 37933/1
Project Name: HOMEBUSH.
PO No. 119254

Specifications:

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr _____days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: _____)	
6. Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email: _____	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: fill'ed	Preservation: acid	Preservation: Ice	Preservation: other	Container (No. & type)	BTEX + TPH	Metals*	PAH's	OCP	OPP	PCB	SVOC	VOC	TPH	Lead	TCLP Heavy Metals	TCLP PAH's	Phenols	VHC	Speciated TPH	Other: HOLD
	BH41_1.4-1.5 (H)	14/5/2	X					X		1x 250ml glass jar with teflon lid															X
	BH41_2-2.1 (H)																								X
Work No.: ES33564	BH42_0-0.2 (19)											X													
Batched date:	BH42_0.8-1.0 (H)																								X
Soil / Ambient / Water / Chilled / Other ___°C	BH42_1.4-1.5 (H)																								X
Subcontract Work / Bottle Return / Trans. Anal. Actioned	BH43_0.03-0.1 (H)																								X
	BH43_0.7-0.8 (20)											X													
	BH43_1.4-1.5 (H)																								X
	BH43_1.9-2.0 (21)																								X
	BH43_2.5-2.7 (H)																								X
	BH44_0.03-0.2 (2)											X													
	BH44_0.4-0.5 (H)																								X
	B44_1.4-1.5 (H)																								X

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No

Esky ID

Relinquished by: R. CASSON Signed: Date: 17/5/2

Recieved by: Signed: Date:

Relinquished by: Signed: Date:

Recieved by:

CHAIN OF CUSTODY

HLA

HLA - Envirosciences Pty Limited
55-65 Grandview Street
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 9988 4422
Fax: 61 2 9988 4441
E-mail: mail@syd.hla-enviro.com.au

Laboratory Details
Lab. Name: ALS
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Prelimanary Report by: 24/5/2
Final Report by:
Lab Quote No:

Sampled By: RACHAEL CASSIN
HLA Project No: J1938/1
Project Name: HOMEBUSH
PO No. 119254

Specifications:

	Yes (tick)
1 Urgent TAT required? (please circle: 24hr 48hr _____days)	
2 Fast TAT Guarantee Required?	
3 Is any sediment layer present in waters to be excluded from extractions?	
4 % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5 Special storage requirements? (details: _____)	
6 Shell Quality Partnership:	
7 Report Format: Fax Hardcopy Email: _____	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: fill'ed	Preservation: acid	Preservation: Ice	Preservation: other	Container (No. & type)	BTEX + TPH	Metals*	PAH's	OCP	OPP	PCB	SVOC	VOC	TPH	Lead	TCLP Heavy Metals	TCLP PAH's	Phenols (TOTALS)	VHC	Speciated TPH	Other: HOLD
	BH46_2.8-3.0 (H)	14/5/2	X					X		1x 250ml glass jar with teflon l.d																X
	BH46_3.0-3.2 (H)	•																								X
	BH46_3.2-3.5 (H)	•																								X
	DUP06	(24)									X	X														
	DUP07 (H)	•																								X
	DUP08	(25)	↓									X														
	DUP09	(26)	↓									X														
	QWC2 (36)	↓		X			X			2 bottles 2 vials	X	X	X	-	Changed		COC	Ref	R.L.						X
	BH48_0.03-0.2 (H)	15/5/2	X							1x 250ml glass jar with teflon l.d										20	15	12	D			
	BH48_0.7-0.8	(27)									X	X	X	X		X							X			
	BH48_2.2-2.3 (H)	•																								X
	BH48_2.5-2.7 (H)	•																								X
	BH48_3.6-3.7 (H)	•	↓					↓																		X

Lab No.: 833564
Cooled
Received date: _____
Soil / Ambient
Water / Chilled
Other ___°C
Subcontract Work
Bottle Return
Comm. Anal. Actioned

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments: NA QWC1 NOT FIELD FILTERED OR ACID PRESERVED

Lab Report No.
Esky ID

Relinquished by: R. CASSIN Signed: Date: 17/5/2

Received by: Signed: Date:

Relinquished by: Signed: Date:

Received by: Signed: Date:

8 of 9

CHAIN OF CUSTODY

HLA - Enviroscience Pty Limited
55-65 Grandview Street
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 9988 4422
Fax: 61 2 9988 4441
E-mail: mail@syd.hla-enviro.com.au

Laboratory Details
Lab. Name: ALS
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by: 24/5/12
Final Report by:
Lab Quote No:

Sampled By: RACHAEL CASSON
HLA Project No: J1933/1
Project Name: HOMEBUSH
PO No. 119254

Specifications:

	Yes (tick)
1 Urgent TAT required? (please circle: 24hr 48hr _____days)	
2 Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4 % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5 Special storage requirements? (details: _____)	
6 Shell Quality Partnership:	
7. Report Format: Fax Hardcopy Email: _____	

Lab. ID No.: ☐ Cool
E333564
Cool date:
☐ Ambient
☐ Chilled
Other ___°C
☐ Subcontract Work
☐ Bottle Return
☐ Return Amal. Actioned

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	BTEX + TPH	Metals*	PAH's	OCP	OPP	PCB	SVOC	VOC	TPH	Lead	TCLP Heavy Metals	TCLP PAH's	Phenols	VHC	Speciated TPH	Other: Cyanide	Other: HOLD
	BH49_0.03-0.2 (H)	15/5/12	X					X		1x 250 ml glass jar with teflon lid																X	X
	BH49_0.6-0.75 (28)										X	X														X	
	BH49_1.3-1.5 (H)																										X
	BH49_2.3-2.5 (H)																										X
	BH50_0.03-0.2 (29)											X															
	BH50_0.4-0.5 (H)																										X
	BH50_0.8-1.0 (H)																										X
	BH51_0.03-0.2 (H)																										X
	BH51_0.5-0.7 (30)											X															
	BH52_0.03-0.2 (31)											X															
	BH52_0.45-0.65 (H)																										X
	BH53_0.03-0.2 (32)											X	X	X		X		X					X				
	BH53_0.4-0.6 (H)																										X

* Metals Required (Delete elements not required): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Lab Report No

Esky ID

Relinquished by: R CASSON
Signed:
Date: 17/5/12
Relinquished by:
Signed:
Date:

CHAIN OF CUSTODY

HLA - Envirosciences Pty Limited
55 65 Grandview Street
PO Box 726
Pymble NSW 2073 Australia
Tel: 61 2 9988 4422
Fax: 61 2 9988 4441
E-mail: mail@syd.hla-envlro.com.au

Laboratory Details
Lab. Name: ALS
Lab. Address:
Contact Name:
Lab. Ref:
Tel:
Fax:
Preliminary Report by: 24/5/2
Final Report by:
Lab Quote No:

Sampled By: RACHAEL CASSON
HLA Project No: J1938/1
Project Name: HOMEBUSH.
PO No. 119254

Specifications:

	Yes (tick)
1 Urgent TAT required? (please circle: 24hr 48hr _____days)	
2 Fast TAT Guarantee Required?	
3 Is any sediment layer present in waters to be excluded from extractions?	
4 % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5 Special storage requirements? (details: _____)	
6 Shell Quality Partnership:	
7 Report Format: Fax Hardcopy Email: _____	

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	BTEX + TPH	Metals*	PAH's	OCP	OPP	PCB	SVOC	VOC	TPH	Lead	TCLP Heavy Metals	TCLP PAH's	Phenols	VHC	Speciated TPH	Other: HOLD
	BH53_1.4-1.5 (H)	15/5/2	X					X		1x 250ml glass jar with teflon lid.															X
	BH54_0.03-0.2	(33)	↓					↓		↓	X	X														
	BH54_0.4-0.6	(H)																							X	
	BH55_0.03-0.2	(34)										X														
	BH55_1.2-1.3	(H)																							X	
	BH55_2.4-2.5	(H)																							X	
	BH55_2.8-3.0	(H)	↓																						X	
	QW03_15/5/2	(35)		X			X	↓		2 BOTTLES 2 VIALS	X	X	X													
	Dup8 -	14/5/2	X	} X Added by Elvis 18/5/2 }																						
	Dup10 -	15/5/2	X																							
	Dup11 -	15/5/2	X	} place on hold as rec 18-5-12																						

Work No: ☐ ORG es33564
Required date: _____
☐ Cool ☐ Ambient
☐ Water ☐ Chilled
☐ Other ___°C
☐ Subcontract Work
☐ Bottle Return
☐ Imm. Anal. Actioned

* Metals Required (Delete elements not required) As Cd Cr Cu Ni Pb Zn Hg

Comments: NOTE QW03 NOT FIELD FILTERED OR ACID PRESERVED

Relinquished by: R. CASSON Signed: Date: 17/5/12 Relinquished by: Signed: Date:

Lab Report No. Esky ID

RECEIVED
04 JUN 2002

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES33564
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	0
ADDRESS:	P O BOX 726 PYMBLE NSW 2073	**LABORATORY:**	SYDNEY
		DATE RECEIVED:	17/05/2002
		DATE COMPLETED:	30/05/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	119254	**No. of SAMPLES:**	34
PROJECT:	J1938/1-HOMEBUSH		

COMMENTS

Samples as received digested by USEPA method 200.2 (mod) prior to the determination of metals. Results reported on a dry weight basis. Manganese spike recovery for samples BH44_0.03-0.2 and SP52_0.03-0.2 not determined due to background levels of this analyte. Sample BH52_0.03-0.2 shows poor precision for various analytes due to sample heterogeneity. All analysis and Laboratory QC conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Potentially Contaminated Soil (December 1999).

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
Fax: 61-2-8784 8500
Email: michael.heery@alsenviro.com

Signatory

LABORATORIES

AUSTRALASIA		*AMERICAS*
Brisbane	*Hong Kong*	*Vancouver*
Melbourne	*Singapore*	*Santiago*
Sydney	*Kuala Lumpur*	*Antofagasta*
Newcastle	*Bogor*	*Lima*
Auckland	*Mumbai*	

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

NATA No. 10918

Batch: ES[illegible]64
Sub Batch: 0
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	2	3	4	5	6	7	8	9	10
		Date Sampled		14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_ 0.03-0.2	BH25_ 0.03-0.1	BH26_ 0.03-0.1	BH27_ 0.03-0.1	BH28_ 0.03-0.1	BH29_ 0.03-0.1	BH30_ 1.5-1.7	BH31_ 0.8-1.0	BH32_ 0.6-0.8	BH33_ 0-0.1
EA-055	Moisture Content (dried @ 103'C)	%	0.1	8.9	4.4	1.3	7.0	10.1	5.1	10.7	7.5	25.1	15.7
EG-005T	Arsenic - Total	mg/kg	1	3	2	3	3	6	<1	4	1	9	7
EG-005T	Beryllium - Total	mg/kg	1	<1	<1	<1	<1	<1	<1	1	<1	<1	<1
EG-005T	Cadmium - Total	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG-005T	Chromium - Total	mg/kg	1	10	9	6	30	6	6	8	8	22	17
EG-005T	Copper - Total	mg/kg	1	8	19	7	11	27	<1	30	5	13	20
EG-005T	Manganese - Total	mg/kg	1	119	169	61	103	128	23	581	172	9	293
EG-005T	Nickel - Total	mg/kg	1	8	25	4	8	19	<1	18	4	<1	26
EG-005T	Lead - Total	mg/kg	1	12	17	15	13	26	7	14	10	20	27
EG-005T	Zinc - Total	mg/kg	1	25	35	35	31	42	6	96	22	7	50
EG-035T	Mercury - Total	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EK-031A	Total Cyanide	mg/kg	1	<1	----	----	----	<1	----	----	----	<1	----
EP-035	Phenols	mg/kg	1	<1	----	----	----	<1	----	<1	----	----	----

Batch: E[illegible]564
Sub Batch: 0
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		11	12	13	14	15	16	17	18	19	20
		Date Sampled		14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH34_ 0.7-0.8	BH35_ 2.0-2.1	BH36_ 0.4-0.5	BH37_ 0-0.2	BH38_ 0-0.1	BH39_ 0.8-1.0	BH40_ 0-0.1	BH41_ 0.7-0.8	BH42_ 0-0.2	BH43_ 0.7-0.8
EA-055	Moisture Content (dried @ 103'C)	%	0.1	27.3	27.0	16.4	15.2	24.2	25.5	8.1	13.5	11.6	10.7
EG-005T	Arsenic - Total	mg/kg	1	6	4	5	4	9	7	2	9	11	5
EG-005T	Beryllium - Total	mg/kg	1	<1	<1	2	1	<1	<1	<1	<1	<1	1
EG-005T	Cadmium - Total	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG-005T	Chromium - Total	mg/kg	1	29	6	15	180	23	23	6	39	25	4
EG-005T	Copper - Total	mg/kg	1	12	25	18	39	12	12	71	21	20	35
EG-005T	Manganese - Total	mg/kg	1	35	11	522	838	122	22	541	157	179	58
EG-005T	Nickel - Total	mg/kg	1	<1	<1	14	163	2	<1	37	8	9	15
EG-005T	Lead - Total	mg/kg	1	15	13	18	10	22	13	7	33	25	14
EG-005T	Zinc - Total	mg/kg	1	6	10	80	94	21	8	57	34	61	80
EG-035T	Mercury - Total	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EK-031A	Total Cyanide	mg/kg	1	----	----	----	----	----	----	----	<1	----	----
EP-035	Phenols	mg/kg	1	<1	----	----	----	<1	----	----	----	----	----

Batch: E[illegible]564
Sub Batch: 0
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		21	22	23	24	25	26	27	28	29	30
		Date Sampled		14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	15/05/2002	15/05/2002	15/05/2002	15/05/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH44_ 0.03-0.2	BH46_ 0.4-0.5	BH47_ 1.3-1.5	DUP06	DUP08	DUP09	BH48_ 0.7-0.8	BH49_ 0.6-0.75	BH50_ 0.03-0.2	BH51_ 0.5-0.7
EA-055	Moisture Content (dried @ 103'C)	%	0.1	13.7	10.4	12.2	8.9	26.4	12.2	11.0	12.3	20.4	6.9
EG-005T	Arsenic - Total	mg/kg	1	4	3	7	2	8	4	4	7	7	8
EG-005T	Beryllium - Total	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1
EG-005T	Cadmium - Total	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
EG-005T	Chromium - Total	mg/kg	1	18	16	10	5	34	20	5	19	7	6
EG-005T	Copper - Total	mg/kg	1	24	22	653	6	19	31	25	21	14	55
EG-005T	Manganese - Total	mg/kg	1	234	262	120	53	35	247	45	166	83	30
EG-005T	Nickel - Total	mg/kg	1	15	13	5	3	2	11	1	7	4	8
EG-005T	Lead - Total	mg/kg	1	37	49	71	11	20	53	20	28	21	19
EG-005T	Zinc - Total	mg/kg	1	61	63	95	29	12	64	27	55	31	124
EG-035T	Mercury - Total	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
EK-031A	Total Cyanide	mg/kg	1	----	<1	----	----	----	----	----	<1	----	----
EP-035	Phenols	mg/kg	1	----	<1	----	----	----	----	<1	----	----	----

Batch: E[illegible]564
Sub Batch: 0
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		31	32	33	34						
		Date Sampled		15/05/2002	15/05/2002	15/05/2002	15/05/2002						
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH52_ 0.03-0.2	BH53_ 0.03-0.2	BH54_ 0.03-0.2	BH55_ 0.03-0.2						
EA-055	Moisture Content (dried @ 103'C)	%	0.1	28.6	8.7	13.0	13.1						
EG-005T	Arsenic - Total	mg/kg	1	5	6	4	3						
EG-005T	Beryllium - Total	mg/kg	1	<1	<1	<1	<1						
EG-005T	Cadmium - Total	mg/kg	1	<1	<1	<1	<1						
EG-005T	Chromium - Total	mg/kg	1	33	26	15	13						
EG-005T	Copper - Total	mg/kg	1	50	37	22	27						
EG-005T	Manganese - Total	mg/kg	1	463	310	210	275						
EG-005T	Nickel - Total	mg/kg	1	22	18	8	12						
EG-005T	Lead - Total	mg/kg	1	80	101	57	40						
EG-005T	Zinc - Total	mg/kg	1	97	155	77	85						
EG-035T	Mercury - Total	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1						
EK-031A	Total Cyanide	mg/kg	1	----	----	----	----						
EP-035	Phenols	mg/kg	1	----	<1	----	----						

B[illegible]: E[illegible]564
Sub Batch: 0
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	1	11	11	21	21	31	31	200	201
		Date Sampled		14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	15/05/2002	15/05/2002	17/05/2002	17/05/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_0.03-0.2_MS	BH24_0.03-0.2_CHK	BH34_0.7-0.8_MS	BH34_0.7-0.8_CHK	BH44_0.03-0.2_MS	BH44_0.03-0.2_CHK	BH52_0.03-0.2_MS	BH52_0.03-0.2_CHK	METHOD BLANK1	LCS1
				CHECKS AND SPIKES									
EA-055	Moisture Content (dried @ 103'C)	%	0.1	----	8.9	----	27.3	----	13.3	----	22.1	----	----
EG-005T	Arsenic - Total	mg/kg	1	99.0%	3	77.0%	7	101%	3	103%	5	<1	96.0%
EG-005T	Beryllium - Total	mg/kg	1	98.0%	<1	99.0%	<1	99.0%	<1	99.0%	<1	<1	----
EG-005T	Cadmium - Total	mg/kg	1	105%	<1	102%	<1	97.0%	<1	99.0%	<1	<1	91.0%
EG-005T	Chromium - Total	mg/kg	1	101%	11	90.0%	25	104%	13	86.0%	17	<1	90.0%
EG-005T	Copper - Total	mg/kg	1	106%	9	103%	12	96.0%	48	70.0%	29	<1	93.0%
EG-005T	Manganese - Total	mg/kg	1	93.0%	116	88.0%	34	Not Det'd	226	Not Det'd	290	<1	----
EG-005T	Nickel - Total	mg/kg	1	101%	8	102%	1	100%	10	98.0%	13	<1	91.0%
EG-005T	Lead - Total	mg/kg	1	108%	12	96.0%	15	107%	34	116%	52	<1	87.0%
EG-005T	Zinc - Total	mg/kg	1	107%	26	102%	7	125%	52	79.0%	66	<1	92.0%
EG-035T	Mercury - Total	mg/kg	0.1	106%	<0.1	98.0%	<0.1	112%	<0.1	106%	<0.1	<0.1	99.0%
EK-031A	Total Cyanide	mg/kg	1	96.0%	<1	----	----	----	----	----	----	<1	102%
EP-035	Phenols	mg/kg	1	98.0%	<1	----	----	----	----	----	----	<1	85.0%

Batch: E[illegible]564
Sub Batch: 0
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		205	206								
		Date Sampled		17/05/2002	17/05/2002								
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK2	LCS2								
				CHECKS AND SPIKES									
EA-055	Moisture Content (dried @ 103'C)	%	0.1	----	----								
EG-005T	Arsenic - Total	mg/kg	1	<1	92.0%								
EG-005T	Beryllium - Total	mg/kg	1	<1	----								
EG-005T	Cadmium - Total	mg/kg	1	<1	85.0%								
EG-005T	Chromium - Total	mg/kg	1	<1	85.0%								
EG-005T	Copper - Total	mg/kg	1	<1	86.0%								
EG-005T	Manganese - Total	mg/kg	1	<1	----								
EG-005T	Nickel - Total	mg/kg	1	<1	85.0%								
EG-005T	Lead - Total	mg/kg	1	<1	90.0%								
EG-005T	Zinc - Total	mg/kg	1	<1	93.0%								
EG-035T	Mercury - Total	mg/kg	0.1	<0.1	97.0%								
EK-031A	Total Cyanide	mg/kg	1	----	----								
EP-035	Phenols	mg/kg	1	----	----								

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES33564
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	1
ADDRESS:	P O BOX 726 PYMBLE NSW 2073	**LABORATORY:**	SYDNEY
		DATE RECEIVED:	17/05/2002
		DATE COMPLETED:	30/05/2002
		SAMPLE TYPE:	WATER
ORDER No.:	119254	**No. of SAMPLES:**	2
PROJECT:	J1938/1-HOMEBUSH		

COMMENTS

This report supersedes any previous preliminary reports of the same batch number.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

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SMITHFIELD NSW 2164

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Signatory

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NATA No. 10918

Batch: ES33564
Sub Batch: 1
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		35	36								
		Date Sampled		15/05/2002	14/05/2002								
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	QW03_ 15/5/02	QW02_								
EG-020F	Arsenic - Filtered	mg/L	0.001	<0.001	<0.001								
EG-020F	Beryllium - Filtered	mg/L	0.001	<0.001	<0.001								
EG-020F	Cadmium - Filtered	mg/L	0.001	<0.001	<0.001								
EG-020F	Chromium - Filtered	mg/L	0.001	<0.001	<0.001								
EG-020F	Copper - Filtered	mg/L	0.001	0.005	<0.001								
EG-020F	Manganese - Filtered	mg/L	0.001	0.007	0.004								
EG-020F	Nickel - Filtered	mg/L	0.001	<0.001	<0.001								
EG-020F	Lead - Filtered	mg/L	0.001	<0.001	<0.001								
EG-020F	Zinc - Filtered	mg/L	0.001	0.006	0.003								
EG-035F	Mercury - Filtered	mg/L	0.0001	<0.0001	<0.0001								

Batch: ES33564
Sub Batch: 1
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		200	201	202							
		Date Sampled		17/05/2002	17/05/2002	17/05/2002							
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK1	LCS1	MS1							
				CHECKS AND SPIKES									
EG-020F	Arsenic - Filtered	mg/L	0.001	<0.001	94.0%	108%							
EG-020F	Beryllium - Filtered	mg/L	0.001	<0.001	103%	104%							
EG-020F	Cadmium - Filtered	mg/L	0.001	<0.001	104%	99.0%							
EG-020F	Chromium - Filtered	mg/L	0.001	<0.001	93.0%	103%							
EG-020F	Copper - Filtered	mg/L	0.001	<0.001	97.0%	100%							
EG-020F	Manganese - Filtered	mg/L	0.001	<0.001	100%	91.0%							
EG-020F	Nickel - Filtered	mg/L	0.001	<0.001	97.0%	107%							
EG-020F	Lead - Filtered	mg/L	0.001	<0.001	95.0%	104%							
EG-020F	Zinc - Filtered	mg/L	0.001	<0.001	100%	101%							
EG-035F	Mercury - Filtered	mg/L	0.0001	<0.0001	94.0%	103%							

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES33564
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	2
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 726	**DATE RECEIVED:**	17/05/2002
	PYMBLE NSW 2073	**DATE COMPLETED:**	30/05/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	119254	**No. of SAMPLES:**	8
PROJECT:	J1938/1-HOMEBUSH		

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis. All analysis and Laboratory QC conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Potentially Contaminated Soil (December 1999).

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

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Signatory

LABORATORIES

AUSTRALASIA		*AMERICAS*
Brisbane	*Hong Kong*	*Vancouver*
Melbourne	*Singapore*	*Santiago*
Sydney	*Kuala Lumpur*	*Antofagasta*
Newcastle	*Bogor*	*Lima*
Auckland	*Mumbai*	

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NATA No. 10918

Batch: ES33564
Sub Batch: 2
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	7	8	11	15	22	27	32		
		Date Sampled		14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	15/05/2002	15/05/2002		
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_ 0.03-0.2	BH30_ 1.5-1.7	BH31_ 0.8-1.0	BH34_ 0.7-0.8	BH38_ 0-0.1	BH46_ 0.4-0.5	BH48_ 0.7-0.8	BH53_ 0.03-0.2		
EA-055	Moisture Content (dried @ 103'C)	%	0.1	8.5	10.7	7.5	27.3	24.2	10.4	11.0	8.7		
EP-066-SS	Total Polychlorinated biphenyls	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	3.9		
EP-066-SS	Suspected Arochlor Source			----	----	----	----	----	A1254	----	A1254		
EP-066S-SS	**POLYCHLORINATED BIPHENYL SURROGATE**												
EP-066S-SS	Decachlorobiphenyl	%	1	90	85	81	80	78	81	76	87		

Batch: ES33564
Sub Batch: 2
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		100	101	102	103	104					
		Date Sampled		17/05/2002	17/05/2002	17/05/2002	17/05/2002	17/05/2002					
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK1	NPCBS485 SCS	NPCBS485 DCS	NPCBS485 MS	NPCBS485 MSD					
				CHECKS AND SPIKES									
EA-055	Moisture Content (dried @ 103'C)	%	0.1	----	----	----	----	----					
EP-066-SS	Total Polychlorinated biphenyls	mg/kg	0.1	<0.1	87.0%	89.0%	83.0%	83.0%					
EP-066-SS	Suspected Arochlor Source			----	----	----	----	----					
EP-066S-SS	**POLYCHLORINATED BIPHENYL SURROGATE**												
EP-066S-SS	Decachlorobiphenyl	%	1	92	88	94	104	104					

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES33564
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	3
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 726 PYMBLE NSW 2073	**DATE RECEIVED:**	17/05/2002
		DATE COMPLETED:	30/05/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	119254	**No. of SAMPLES:**	8
PROJECT:	J1938/1-HOMEBUSH		

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis. All analysis and Laboratory QC conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Potentially Contaminated Soil (December 1999).

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

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Signatory

LABORATORIES

AUSTRALASIA		*AMERICAS*
Brisbane	*Hong Kong*	*Vancouver*
Melbourne	*Singapore*	*Santiago*
Sydney	*Kuala Lumpur*	*Antofagasta*
Newcastle	*Bogor*	*Lima*
Auckland	*Mumbai*	

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NATA No. 10918

Batch: ES033564
Sub Batch: 3
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	7	8	11	15	22	27	32		
		Date Sampled		14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	15/05/2002	15/05/2002		
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_ 0.03-0.2	BH30_ 1.5-1.7	BH31_ 0.8-1.0	BH34_ 0.7-0.8	BH38_ 0-0.1	BH46_ 0.4-0.5	BH48_ 0.7-0.8	BH53_ 0.03-0.2		
EA-055	Moisture Content (dried @ 103'C)	%	0.1	8.9	10.7	7.5	27.3	24.2	10.4	11.0	8.7		
EP-068A-SS	**ORGANOCHLORINE PESTICIDES**												
EP-068A-SS	alpha-BHC	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	HCB	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	beta-BHC & gamma-BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1		
EP-068A-SS	delta-BHC	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Heptachlor	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Aldrin	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Chlordane - trans	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Endosulfan 1	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Chlordane - cis	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Dieldrin	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	DDE	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Endrin	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Endosulfan 2	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	DDD	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	DDT	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
EP-068A-SS	Endrin ketone	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		
EP-068A-SS	Methoxychlor	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2		
EP-068S-SS	**ORGANOCHLORINE PESTICIDE SURROGATE**												
EP-068S-SS	Dibromo-DDE	%	1	100	103	104	101	98	91	99	108		

Batch: E333364
Sub Batch: 3
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		100	101	102	103	104					
		Date Sampled		17/05/2002	17/05/2002	17/05/2002	17/05/2002	17/05/2002					
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK	NOCOPS1074 SCS	NOCOPS1074 DCS	NOCOPS1074 MS	NOCOPS1074 MSD					
				CHECKS AND SPIKES									
EA-055	Moisture Content (dried @ 103'C)	%	0.1	----	----	----	----	----					
EP-068A-SS	**ORGANOCHLORINE PESTICIDES**												
EP-068A-SS	alpha-BHC	mg/kg	0.05	<0.05	87.3%	88.7%	----	----					
EP-068A-SS	HCB	mg/kg	0.05	<0.05	83.2%	86.9%	----	----					
EP-068A-SS	beta-BHC & gamma-BHC	mg/kg	0.1	<0.1	90.9%	91.3%	84.0%	87.6%					
EP-068A-SS	delta-BHC	mg/kg	0.05	<0.05	86.4%	85.3%	----	----					
EP-068A-SS	Heptachlor	mg/kg	0.05	<0.05	82.8%	84.4%	68.5%	67.7%					
EP-068A-SS	Aldrin	mg/kg	0.05	<0.05	87.9%	89.0%	74.9%	86.5%					
EP-068A-SS	Heptachlor epoxide	mg/kg	0.05	<0.05	84.7%	86.0%	----	----					
EP-068A-SS	Chlordane - trans	mg/kg	0.05	<0.05	84.4%	83.8%	----	----					
EP-068A-SS	Endosulfan 1	mg/kg	0.05	<0.05	88.7%	89.6%	----	----					
EP-068A-SS	Chlordane - cis	mg/kg	0.05	<0.05	85.1%	85.2%	----	----					
EP-068A-SS	Dieldrin	mg/kg	0.05	<0.05	86.7%	87.4%	94.6%	85.0%					
EP-068A-SS	DDE	mg/kg	0.05	<0.05	86.8%	87.1%	----	----					
EP-068A-SS	Endrin	mg/kg	0.05	<0.05	94.2%	95.9%	75.9%	79.3%					
EP-068A-SS	Endosulfan 2	mg/kg	0.05	<0.05	87.5%	88.9%	----	----					
EP-068A-SS	DDD	mg/kg	0.05	<0.05	83.4%	83.4%	----	----					
EP-068A-SS	Endrin aldehyde	mg/kg	0.05	<0.05	86.9%	85.4%	----	----					
EP-068A-SS	Endosulfan sulfate	mg/kg	0.05	<0.05	86.0%	86.1%	----	----					
EP-068A-SS	DDT	mg/kg	0.2	<0.2	92.1%	91.9%	79.9%	68.8%					
EP-068A-SS	Endrin ketone	mg/kg	0.05	<0.05	93.2%	85.9%	----	----					
EP-068A-SS	Methoxychlor	mg/kg	0.2	<0.2	95.0%	85.4%	----	----					
EP-068S-SS	**ORGANOCHLORINE PESTICIDE SURROGATE**												
EP-068S-SS	Dibromo-DDE	%	1	87	96	91	82	90					

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES33564
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	4
ADDRESS:	P O BOX 726 PYMBLE NSW 2073	**LABORATORY:**	SYDNEY
		DATE RECEIVED:	17/05/2002
		DATE COMPLETED:	30/05/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	119254	**No. of SAMPLES:**	10
PROJECT:	J1938/1-HOMEBUSH		

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis. All analysis and Laboratory QC conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Potentially Contaminated Soil (December 1999).

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
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Signatory

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NATA No. 10918

Batch: E333564
Sub Batch: 4
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	3	7	11	15	22	24	27	28	33
		Date Sampled		14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	15/05/2002	15/05/2002	15/05/2002
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_ 0.03-0.2	BH26_ 0.03-0.1	BH30_ 1.5-1.7	BH34_ 0.7-0.8	BH38_ 0-0.1	BH46_ 0.4-0.5	DUP06	BH48_ 0.7-0.8	BH49_ 0.6-0.75	BH54_ 0.03-0.2
EA-055	Moisture Content (dried @ 103'C)	%	0.1	8.5	1.3	10.7	27.3	24.2	10.4	8.9	11.0	12.3	13.0
EP-071-SS	**TOTAL PETROLEUM HYDROCARBONS**												
EP-071-SS	C6 - C9 Fraction	mg/kg	2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
EP-071-SS	C10 - C14 Fraction	mg/kg	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
EP-071-SS	C15 - C28 Fraction	mg/kg	100	<100	<100	<100	<100	<100	141	<100	<100	<100	145
EP-071-SS	C29 - C36 Fraction	mg/kg	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	101
EP-080-SS	**BTEX**												
EP-080-SS	Benzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EP-080-SS	Toluene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EP-080-SS	Chlorobenzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EP-080-SS	Ethylbenzene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EP-080-SS	meta- & para-Xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EP-080-SS	ortho-Xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
EP-080S-SS	**VOLATILE TPH/BTEX COMPOUND SURROGATES**												
EP-080S-SS	1.2-Dichloroethane-D4	%	1	98	101	102	95	99	97	101	89	95	110
EP-080S-SS	Toluene-D8	%	1	105	92	95	89	93	88	96	91	92	101
EP-080S-SS	4-Bromofluorobenzene	%	1	91	91	95	91	90	88	94	86	88	98

Batch: E3335564
Sub Batch: 4
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION										
		Laboratory I.D.		100	101	102	103	104						
		Date Sampled		17/05/2002	17/05/2002	17/05/2002	17/05/2002	17/05/2002						
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK1	NTPHT3297 SCS	NTPHT3297 DCS	NTPHT3297 MS	NTPHT3297 MSD						
				CHECKS AND SPIKES										
EA-055	Moisture Content (dried @ 103'C)	%	0.1	----	----	----	----	----						
EP-071-SS	**TOTAL PETROLEUM HYDROCARBONS**													
EP-071-SS	C6 - C9 Fraction	mg/kg	2	<2	98.0%	94.0%	94.0%	94.0%						
EP-071-SS	C10 - C14 Fraction	mg/kg	50	<50	100%	98.0%	120%	121%						
EP-071-SS	C15 - C28 Fraction	mg/kg	100	<100	98.0%	99.0%	104%	104%						
EP-071-SS	C29 - C36 Fraction	mg/kg	100	<100	112%	111%	----	----						
EP-080-SS	**BTEX**													
EP-080-SS	Benzene	mg/kg	0.2	<0.2	102%	101%	99.0%	98.0%						
EP-080-SS	Toluene	mg/kg	0.2	<0.2	102%	101%	84.0%	84.0%						
EP-080-SS	Chlorobenzene	mg/kg	0.2	<0.2	103%	101%	101%	102%						
EP-080-SS	Ethylbenzene	mg/kg	0.2	<0.2	103%	104%	----	----						
EP-080-SS	meta- & para-Xylene	mg/kg	0.2	<0.2	105%	105%	----	----						
EP-080-SS	ortho-Xylene	mg/kg	0.2	<0.2	107%	107%	----	----						
EP-080S-SS	**VOLATILE TPH/BTEX COMPOUND SURROGATES**													
EP-080S-SS	1.2-Dichloroethane-D4	%	1	106	104	104	107	102						
EP-080S-SS	Toluene-D8	%	1	110	102	105	103	107						
EP-080S-SS	4-Bromofluorobenzene	%	1	98	107	105	107	109						

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES33564
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	5
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 726	**DATE RECEIVED:**	17/05/2002
	PYMBLE NSW 2073	**DATE COMPLETED:**	30/05/2002
		SAMPLE TYPE:	WATER
ORDER No.:	119254	**No. of SAMPLES:**	2
PROJECT:	J1938/1-HOMEBUSH		

COMMENTS

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
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Signatory

LABORATORIES

AUSTRALASIA		*AMERICAS*
Brisbane	*Hong Kong*	*Vancouver*
Melbourne	*Singapore*	*Santiago*
Sydney	*Kuala Lumpur*	*Antofagasta*
Newcastle	*Bogor*	*Lima*
Auckland	*Mumbai*	

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NATA No. 10918

Batch: E3335564
Sub Batch: 5
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		35	36								
		Date Sampled		15/05/2002	14/05/2002								
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	QW03_ 15/5/02	QW02_								
EP-071-WS	**TOTAL PETROLEUM HYDROCARBONS**												
EP-071-WS	C6 - C9 Fraction	ug/L	20	<20	<20								
EP-071-WS	C10 - C14 Fraction	ug/L	50	<50	<50								
EP-071-WS	C15 - C28 Fraction	ug/L	100	<100	<100								
EP-071-WS	C29 - C36 Fraction	ug/L	50	<50	<50								
EP-080-WS	**BTEX**												
EP-080-WS	Benzene	ug/L	1	<1	<1								
EP-080-WS	Toluene	ug/L	2	<2	<2								
EP-080-WS	Chlorobenzene	ug/L	2	<2	<2								
EP-080-WS	Ethylbenzene	ug/L	2	<2	<2								
EP-080-WS	meta- & para-Xylene	ug/L	2	<2	<2								
EP-080-WS	ortho-Xylene	ug/L	2	<2	<2								
EP-080S-WS	**VOLATILE TPH/BTEX COMPOUND SURROGATES**												
EP-080S-WS	1.2-Dichloroethane-D4	%	1	98	101								
EP-080S-WS	Toluene-D8	%	1	95	97								
EP-080S-WS	4-Bromofluorobenzene	%	1	91	93								

Batch: E[illegible]564
Sub Batch: 5
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION										
		Laboratory I.D.		100	101	102								
		Date Sampled		17/05/2002	17/05/2002	17/05/2002								
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK	NTPHW1183 SCS	NTPHW1183 DCS								
				CHECKS AND SPIKES										
EP-071-WS	**TOTAL PETROLEUM HYDROCARBONS**													
EP-071-WS	C6 - C9 Fraction	ug/L	20	<20	95.0%	97.0%								
EP-071-WS	C10 - C14 Fraction	ug/L	50	<50	99.0%	99.0%								
EP-071-WS	C15 - C28 Fraction	ug/L	100	<100	108%	104%								
EP-071-WS	C29 - C36 Fraction	ug/L	50	<50	98.0%	93.0%								
EP-080-WS	**BTEX**													
EP-080-WS	Benzene	ug/L	1	<1	104%	95.0%								
EP-080-WS	Toluene	ug/L	2	<2	102%	95.0%								
EP-080-WS	Chlorobenzene	ug/L	2	<2	101%	98.0%								
EP-080-WS	Ethylbenzene	ug/L	2	<2	99.0%	96.0%								
EP-080-WS	meta- & para-Xylene	ug/L	2	<2	100%	96.0%								
EP-080-WS	ortho-Xylene	ug/L	2	<2	101%	97.0%								
EP-080S-WS	**VOLATILE TPH/BTEX COMPOUND SURROGATES**													
EP-080S-WS	1.2-Dichloroethane-D4	%	1	99	109	98								
EP-080S-WS	Toluene-D8	%	1	96	106	98								
EP-080S-WS	4-Bromofluorobenzene	%	1	92	108	99								

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES33564
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	6
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 726	**DATE RECEIVED:**	17/05/2002
	PYMBLE NSW 2073	**DATE COMPLETED:**	30/05/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	119254	**No. of SAMPLES:**	3
PROJECT:	J1938/1-HOMEBUSH		

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis. All analysis and Laboratory QC conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Potentially Contaminated Soil (December 1999).

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
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SMITHFIELD NSW 2164

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Signatory

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NATA No. 10918

Batch: ES33564
Sub Batch: 6
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	18	32							
		Date Sampled		14/05/2002	14/05/2002	15/05/2002							
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_ 0.03-0.2	BH41_ 0.7-0.8	BH53_ 0.03-0.2							
EA-055	Moisture Content (dried @ 103°C)	%	0.1	8.9	13.5	8.7							
EP-074A-SS	**MONOCYCLIC AROMATIC HYDROCARBONS**												
EP-074A-SS	Benzene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	Toluene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	Ethylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	meta- & para-Xylene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	Styrene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	ortho-Xylene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	Isopropylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	n-Propylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	1.3.5-Trimethylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	sec-Butylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	1.2.4-Trimethylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	tert-Butylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	p-Isopropyltoluene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074A-SS	n-Butylbenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074B-SS	**OXYGENATED HYDROCARBONS**												
EP-074B-SS	Vinyl Acetate	mg/kg	5	<5	<5	<5							
EP-074B-SS	2-Butanone (MEK)	mg/kg	5	<5	<5	<5							
EP-074B-SS	4-Methyl-2-pentanone (MIBK)	mg/kg	5	<5	<5	<5							
EP-074B-SS	2-Hexanone (MBK)	mg/kg	5	<5	<5	<5							
EP-074C-SS	**SULFONATED COMPOUNDS**												
EP-074C-SS	Carbon disulfide	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074D-SS	**FUMIGANTS**												
EP-074D-SS	2.2-Dichloropropane	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074D-SS	1.2-Dichloropropane	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074D-SS	cis-1.3-Dichloropropylene	mg/kg	1	<1	<1	<1							
EP-074D-SS	trans-1.3-Dichloropropylene	mg/kg	1	<1	<1	<1							
EP-074D-SS	1.2-Dibromoethane (EDB)	mg/kg	0.5	<0.5	<0.5	<0.5							
EP-074E-SS	**HALOGENATED ALIPHATIC HYDROCARBONS (VOL)**												
EP-074E-SS	Dichlorodifluoromethane	mg/kg	5	<5	<5	<5							
EP-074E-SS	Chloromethane	mg/kg	5	<5	<5	<5							
EP-074E-SS	Vinyl chloride	mg/kg	5	<5	<5	<5							
EP-074E-SS	Bromomethane	mg/kg	5	<5	<5	<5							

Batch: ES3[illegible]
Sub Batch: 6
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	18	32							
		Date Sampled		14/05/2002	14/05/2002	15/05/2002							
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_ 0.03-0.2	BH41_ 0.7-0.8	BH53_ 0.03-0.2							
?-074E-SS	Chloroethane	mg/kg	5	<5	<5	<5							
?-074E-SS	Trichlorofluoromethane	mg/kg	5	<5	<5	<5							
?-074E-SS	1.1-Dichloroethene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	Iodomethane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	trans-1.2-Dichloroethene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.1-Dichloroethane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	cis-1.2-Dichloroethene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.1.1-Trichloroethane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.1-Dichloropropylene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	Carbon tetrachloride	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.2-Dichloroethane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	Trichloroethene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	Dibromomethane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.1.2-Trichloroethane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.3-Dichloropropane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	Tetrachloroethene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.1.1.2-Tetrachloroethane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	trans-1.4-Dichloro-2-butene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	cis-1.4-Dichloro-2-butene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.1.2.2-Tetrachloroethane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.2.3-Trichloropropane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	Pentachloroethane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	1.2-Dibromo-3-chloropropane	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074E-SS	Hexachlorobutadiene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074F-SS	**HALOGENATED AROMATIC HYDROCARBONS**												
?-074F-SS	Chlorobenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074F-SS	Bromobenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074F-SS	2-Chlorotoluene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074F-SS	4-Chlorotoluene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074F-SS	1.3-Dichlorobenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074F-SS	1.4-Dichlorobenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074F-SS	1.2-Dichlorobenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074F-SS	1.2.4-Trichlorobenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074F-SS	1.2.3-Trichlorobenzene	mg/kg	0.5	<0.5	<0.5	<0.5							
?-074G-SS	TRIHALOMETHANES (VOLATILES)												

Batch: ES3[illegible]
Sub Batch: 6
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	18	32							
		Date Sampled		,14/05/2002	14/05/2002	15/05/2002							
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_ 0.03-0.2	BH41_ 0.7-0.8	BH53_ 0.03-0.2							
P-074G-SS	Chloroform	mg/kg	0.5	<0.5	<0.5	<0.5							
P-074G-SS	Bromodichloromethane	mg/kg	0.5	<0.5	<0.5	<0.5							
P-074G-SS	Dibromochloromethane	mg/kg	0.5	<0.5	<0.5	<0.5							
P-074G-SS	Bromoform	mg/kg	0.5	<0.5	<0.5	<0.5							
P-074H-SS	**NAPHTHALENE**												
P-074H-SS	Naphthalene	mg/kg	5	<5	<5	<5							
P-074S-SS	**VOLATILE COMPOUND SURROGATES**												
P-074S-SS	1.2-Dichloroethane-D4	%	1	92	80	88							
P-074S-SS	Toluene-D8	%	1	98	93	95							
P-074S-SS	4-Bromofluorobenzene	%	1	96	84	94							

Batch: ES[illegible]4
Sub Batch: 6
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		100	101	102	103	104					
		Date Sampled		17/05/2002	17/05/2002	17/05/2002	17/05/2002	17/05/2002					
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK1	NVSCS485 SCS	NVSCS485 DCS	NVSCS485 MS	NVSCS485 MSD					
				CHECKS AND SPIKES									
A-055	Moisture Content (dried @ 103'C)	%	0.1	----	----	----	----	----					
P-074A-SS	**MONOCYCLIC AROMATIC HYDROCARBONS**												
P-074A-SS	Benzene	mg/kg	0.5	<0.5	92.3%	104%	110%	107%					
P-074A-SS	Toluene	mg/kg	0.5	<0.5	100%	107%	90.2%	83.2%					
P-074A-SS	Ethylbenzene	mg/kg	0.5	<0.5	93.0%	104%	----	----					
P-074A-SS	meta- & para-Xylene	mg/kg	0.5	<0.5	95.2%	103%	----	----					
P-074A-SS	Styrene	mg/kg	0.5	<0.5	91.6%	98.1%	----	----					
P-074A-SS	ortho-Xylene	mg/kg	0.5	<0.5	92.7%	108%	----	----					
P-074A-SS	Isopropylbenzene	mg/kg	0.5	<0.5	92.5%	110%	----	----					
P-074A-SS	n-Prqpylbenzene	mg/kg	0.5	<0.5	95.8%	104%	----	----					
P-074A-SS	1.3.5-Trimethylbenzene	mg/kg	0.5	<0.5	102%	109%	----	----					
P-074A-SS	sec-Butylbenzene	mg/kg	0.5	<0.5	97.9%	109%	----	----					
P-074A-SS	1.2.4-Trimethylbenzene	mg/kg	0.5	<0.5	98.1%	106%	----	----					
P-074A-SS	tert-Butylbenzene	mg/kg	0.5	<0.5	101%	109%	----	----					
P-074A-SS	p-Isopropyltoluene	mg/kg	0.5	<0.5	98.1%	109%	----	----					
P-074A-SS	n-Butylbenzene	mg/kg	0.5	<0.5	96.6%	107%	----	----					
P-074B-SS	**OXYGENATED HYDROCARBONS**												
P-074B-SS	Vinyl Acetate	mg/kg	5	<5	96.7%	99.5%	----	----					
P-074B-SS	2-Butanone (MEK)	mg/kg	5	<5	91.3%	101%	----	----					
P-074B-SS	4-Methyl-2-pentanone (MIBK)	mg/kg	5	<5	93.7%	102%	----	----					
P-074B-SS	2-Hexanone (MBK)	mg/kg	5	<5	95.8%	91.9%	----	----					
P-074C-SS	**SULFONATED COMPOUNDS**												
P-074C-SS	Carbon disulfide	mg/kg	0.5	<0.5	96.1%	93.7%	----	----					
P-074D-SS	**FUMIGANTS**												
P-074D-SS	2.2-Dichloropropane	mg/kg	0.5	<0.5	96.6%	91.3%	----	----					
P-074D-SS	1.2-Dichloropropane	mg/kg	0.5	<0.5	94.3%	102%	----	----					
P-074D-SS	cis-1.3-Dichloropropylene	mg/kg	1	<1	98.6%	98.7%	----	----					
P-074D-SS	trans-1.3-Dichloropropylene	mg/kg	1	<1	99.8%	95.6%	----	----					
P-074D-SS	1.2-Dibromoethane (EDB)	mg/kg	0.5	<0.5	89.0%	91.0%	----	----					
P-074E-SS	**HALOGENATED ALIPHATIC HYDROCARBONS (VOL)**												
P-074E-SS	Dichlorodifluoromethane	mg/kg	5	<5	100%	103%	----	----					
P-074E-SS	Chloromethane	mg/kg	5	<5	102%	106%	----	----					

Batch: ES3[illegible]
Sub Batch: 6
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION										
		Laboratory I.D.		100	101	102	103	104						
		Date Sampled		17/05/2002	17/05/2002	17/05/2002	17/05/2002	17/05/2002						
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK1	NVSCS485 SCS	NVSCS485 DCS	NVSCS485 MS	NVSCS485 MSD						
				CHECKS AND SPIKES										
P-074E-SS	Vinyl chloride	mg/kg	5	<5	94.2%	99.3%	----	----						
P-074E-SS	Bromomethane	mg/kg	5	<5	95.4%	98.5%	----	----						
P-074E-SS	Chloroethane	mg/kg	5	<5	101%	108%	----	----						
P-074E-SS	Trichlorofluoromethane	mg/kg	5	<5	94.7%	106%	----	----						
P-074E-SS	1.1-Dichloroethene	mg/kg	0.5	<0.5	105%	108%	107%	96.1%						
P-074E-SS	Iodomethane	mg/kg	0.5	<0.5	99.3%	94.4%	----	----						
P-074E-SS	trans-1.2-Dichloroethene	mg/kg	0.5	<0.5	96.5%	99.8%	----	----						
P-074E-SS	1.1-Dichloroethane	mg/kg	0.5	<0.5	98.8%	110%	----	----						
P-074E-SS	cis-1.2-Dichloroethene	mg/kg	0.5	<0.5	94.5%	108%	----	----						
P-074E-SS	1.1.1-Trichloroethane	mg/kg	0.5	<0.5	90.7%	95.7%	----	----						
P-074E-SS	1.1-Dichloropropylene	mg/kg	0.5	<0.5	93.7%	104%	----	----						
P-074E-SS	Carbon tetrachloride	mg/kg	0.5	<0.5	100%	108%	----	----						
P-074E-SS	1.2-Dichloroethane	mg/kg	0.5	<0.5	90.2%	96.2%	----	----						
P-074E-SS	Trichloroethene	mg/kg	0.5	<0.5	94.3%	101%	87.3%	86.9%						
P-074E-SS	Dibromomethane	mg/kg	0.5	<0.5	89.3%	95.5%	----	----						
P-074E-SS	1.1.2-Trichloroethane	mg/kg	0.5	<0.5	91.8%	105%	----	----						
P-074E-SS	1.3-Dichloropropane	mg/kg	0.5	<0.5	93.0%	93.6%	----	----						
P-074E-SS	Tetrachloroethene	mg/kg	0.5	<0.5	102%	105%	----	----						
P-074E-SS	1.1.1.2-Tetrachloroethane	mg/kg	0.5	<0.5	92.2%	99.2%	----	----						
P-074E-SS	trans-1.4-Dichloro-2-butene	mg/kg	0.5	<0.5	97.1%	87.0%	----	----						
P-074E-SS	cis-1.4-Dichloro-2-butene	mg/kg	0.5	<0.5	105%	93.0%	----	----						
P-074E-SS	1.1.2.2-Tetrachloroethane	mg/kg	0.5	<0.5	88.4%	109%	----	----						
P-074E-SS	1.2.3-Trichloropropane	mg/kg	0.5	<0.5	90.0%	90.0%	----	----						
P-074E-SS	Pentachloroethane	mg/kg	0.5	<0.5	108%	96.5%	----	----						
P-074E-SS	1.2-Dibromo-3-chloropropane	mg/kg	0.5	<0.5	97.9%	90.4%	----	----						
P-074E-SS	Hexachlorobutadiene	mg/kg	0.5	<0.5	93.9%	105%	----	----						
P-074F-SS	HALOGENATED AROMATIC HYDROCARBONS													
P-074F-SS	Chlorobenzene	mg/kg	0.5	<0.5	94.9%	106%	94.9%	90.3%						
P-074F-SS	Bromobenzene	mg/kg	0.5	<0.5	94.5%	109%	----	----						
P-074F-SS	2-Chlorotoluene	mg/kg	0.5	<0.5	95.3%	105%	----	----						
P-074F-SS	4-Chlorotoluene	mg/kg	0.5	<0.5	96.8%	107%	----	----						
P-074F-SS	1.3-Dichlorobenzene	mg/kg	0.5	<0.5	97.7%	107%	----	----						

Batch: ES3[illegible]
Sub Batch: 6
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		100	101	102	103	104					
		Date Sampled		17/05/2002	17/05/2002	17/05/2002	17/05/2002	17/05/2002					
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK1	NVSCS485 SCS	NVSCS485 DCS	NVSCS485 MS	NVSCS485 MSD					
				CHECKS AND SPIKES									
P-074F-SS	1.4-Dichlorobenzene	mg/kg	0.5	<0.5	99.8%	107%	----	----					
P-074F-SS	1.2-Dichlorobenzene	mg/kg	0.5	<0.5	108%	105%	----	----					
P-074F-SS	1.2.4-Trichlorobenzene	mg/kg	0.5	<0.5	97.8%	109%	----	----					
P-074F-SS	1.2.3-Trichlorobenzene	mg/kg	0.5	<0.5	105%	97.9%	----	----					
P-074G-SS	**TRIHALOMETHANES (VOLATILES)**												
P-074G-SS	Chloroform	mg/kg	0.5	<0.5	93.3%	98.2%	----	----					
P-074G-SS	Bromodichloromethane	mg/kg	0.5	<0.5	89.6%	92.3%	----	----					
P-074G-SS	Dibromochloromethane	mg/kg	0.5	<0.5	99.1%	97.9%	----	----					
P-074G-SS	Bromoform	mg/kg	0.5	<0.5	103%	93.7%	----	----					
P-074H-SS	**NAPHTHALENE**												
P-074H-SS	Naphthalene	mg/kg	5	<5	106%	105%	----	----					
P-074S-SS	**VOLATILE COMPOUND SURROGATES**												
P-074S-SS	1.2-Dichloroethane-D4	%	1	111	105	117	96	93					
P-074S-SS	Toluene-D8	%	1	103	96	109	97	86					
P-074S-SS	4-Bromofluorobenzene	%	1	105	95	113	96	88					

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES33564
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	7
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 726	**DATE RECEIVED:**	17/05/2002
	PYMBLE NSW 2073	**DATE COMPLETED:**	30/05/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	119254	**No. of SAMPLES:**	8
PROJECT:	J1938/1-HOMEBUSH		

COMMENTS

Samples analysed on an as received basis. Results reported on a dry weight basis. All analysis and Laboratory QC conducted in accordance with Schedule B(3) NEPM Guideline on Laboratory Analysis of Potentially Contaminated Soil (December 1999).

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
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Signatory

LABORATORIES

AUSTRALASIA
Brisbane, Melbourne, Sydney, Newcastle, Auckland, Hong Kong, Singapore, Kuala Lumpur, Bogor, Mumbai

AMERICAS
Vancouver, Santiago, Antofagasta, Lima

This Laboratory is accredited by the National Association of Testing Authorities, Australia. The test(s) reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.

NATA No. 10918

Batch: ES3[illegible]
Sub Batch: 7
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	5	7	11	15	22	27	32		
		Date Sampled		14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	15/05/2002	15/05/2002		
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_ 0.03-0.2	BH28_ 0.03-0.1	BH30_ 1.5-1.7	BH34_ 0.7-0.8	BH38_ 0-0.1	BH46_ 0.4-0.5	BH48_ 0.7-0.8	BH53_ 0.03-0.2		
⅄-055	Moisture Content (dried @ 103'C)	%	0.1	8.9	10.1	10.7	27.3	24.2	10.4	11.0	8.7		
ɔ-075A-SS	**PHENOLS**												
ɔ-075A-SS	Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	2-Chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	2-Methylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	3- & 4-Methylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	2-Nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	2.4-Dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	2.4-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	2.6-Dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	4-Chloro-3-methylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	2.4.6-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	2.4.5-Trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075A-SS	Pentachlorophenol	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1		
ɔ-075B-SS	**POLYNUCLEAR AROMATICS**												
ɔ-075B-SS	Naphthalene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075B-SS	2-Methylnaphthalene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075B-SS	2-Chloronaphthalene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075B-SS	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075B-SS	Acenaphthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075B-SS	Fluorene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075B-SS	Phenanthrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.3	<0.5	3.0		
ɔ-075B-SS	Anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.8		
ɔ-075B-SS	Fluoranthene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.8	<0.5	5.6		
ɔ-075B-SS	Pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1.9	0.7	6.6		
ɔ-075B-SS	N-2-Fluorenylacetamide	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075B-SS	Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7	<0.5	2.5		
ɔ-075B-SS	Chrysene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	2.1		
ɔ-075B-SS	Benzo(b) & (k)fluoranthene	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	3		
ɔ-075B-SS	7.12-Dimethylbenz(a)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075B-SS	Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	1.8		
ɔ-075B-SS	3-Methylcholanthrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		
ɔ-075B-SS	Indeno(1.2.3-cd)pyrene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.7		
ɔ-075B-SS	Dibenz(a.h)anthracene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5		

Batch: ES3[illegible]4
Sub Batch: 7
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	5	7	11	15	22	27	32		
		Date Sampled		14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	14/05/2002	15/05/2002	15/05/2002		
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH24_ 0.03-0.2	BH28_ 0.03-0.1	BH30_ 1.5-1.7	BH34_ 0.7-0.8	BH38_ 0-0.1	BH46_ 0.4-0.5	BH48_ 0.7-0.8	BH53_ 0.03-0.2		
P-075B-SS	Benzo(g.h.i)perylene	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.9		
P-075S-SS	**ACID EXTRACTABLE SURROGATES**												
P-075S-SS	2-Fluorophenol	%	1	115	93	108	97	99	83	110	111		
P-075S-SS	Phenol-D6	%	1	95	78	83	80	85	92	94	108		
P-075S-SS	2-Chlorophenol-D4	%	1	100	81	96	86	90	72	99	99		
P-075S-SS	2.4.6-Tribromophenol	%	1	84	73	85	74	82	47	92	45		
P-075T-SS	**BASE/NEUTRAL EXTRACTABLE SURROGATES**												
P-075T-SS	Nitrobenzene-D5	%	1	94	76	89	80	82	92	90	104		
P-075T-SS	1.2-Dichlorobenzene-D4	%	1	91	76	87	80	82	91	90	103		
P-075T-SS	2-Fluorobiphenyl	%	1	95	82	94	85	87	99	98	115		
P-075T-SS	Anthracene-d10	%	1	117	102	114	109	109	116	118	120		
P-075T-SS	p-Terphenyl-D14	%	1	102	88	100	89	96	106	106	119		

Batch: ES3[illegible]
Sub Batch: 7
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION										
		Laboratory I.D.		100	101	102	103	104						
		Date Sampled		17/05/2002	17/05/2002	17/05/2002	17/05/2002	17/05/2002						
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK	NSVOCS1738 SCS	NSVOCS1738 DCS	NSVOCS1738 MS	NSVOCS1738 MSD						
				CHECKS AND SPIKES										
A-055	Moisture Content (dried @ 103'C)	%	0.1	----	----	----	----	----						
P-075A-SS	**PHENOLS**													
P-075A-SS	Phenol	mg/kg	0.5	<0.5	79.2%	83.6%	81.9%	83.0%						
P-075A-SS	2-Chlorophenol	mg/kg	0.5	<0.5	84.4%	86.8%	88.0%	85.9%						
P-075A-SS	2-Methylphenol	mg/kg	0.5	<0.5	86.7%	92.4%	----	----						
P-075A-SS	3- & 4-Methylphenol	mg/kg	0.5	<0.5	70.0%	74.3%	----	----						
P-075A-SS	2-Nitrophenol	mg/kg	0.5	<0.5	80.4%	75.1%	80.0%	81.0%						
P-075A-SS	2.4-Dimethylphenol	mg/kg	0.5	<0.5	78.1%	80.4%	----	----						
P-075A-SS	2.4-Dichlorophenol	mg/kg	0.5	<0.5	83.5%	85.0%	----	----						
P-075A-SS	2.6-Dichlorophenol	mg/kg	0.5	<0.5	82.6%	81.8%	----	----						
P-075A-SS	4-Chloro-3-methylphenol	mg/kg	0.5	<0.5	83.4%	82.5%	88.2%	88.7%						
P-075A-SS	2.4.6-Trichlorophenol	mg/kg	0.5	<0.5	81.8%	83.1%	----	----						
P-075A-SS	2.4.5-Trichlorophenol	mg/kg	0.5	<0.5	79.1%	86.6%	----	----						
P-075A-SS	Pentachlorophenol	mg/kg	1	<1	57.0%	58.8%	85.6%	81.7%						
P-075B-SS	**POLYNUCLEAR AROMATICS**													
P-075B-SS	Naphthalene	mg/kg	0.5	<0.5	83.9%	84.1%	----	----						
P-075B-SS	2-Methylnaphthalene	mg/kg	0.5	<0.5	84.5%	82.7%	----	----						
P-075B-SS	2-Chloronaphthalene	mg/kg	0.5	<0.5	81.8%	82.7%	----	----						
P-075B-SS	Acenaphthylene	mg/kg	0.5	<0.5	77.0%	77.9%	----	----						
P-075B-SS	Acenaphthene	mg/kg	0.5	<0.5	81.5%	81.9%	89.1%	86.2%						
P-075B-SS	Fluorene	mg/kg	0.5	<0.5	80.5%	81.2%	----	----						
P-075B-SS	Phenanthrene	mg/kg	0.5	<0.5	81.5%	82.6%	----	----						
P-075B-SS	Anthracene	mg/kg	0.5	<0.5	83.0%	81.8%	----	----						
P-075B-SS	Fluoranthene	mg/kg	0.5	<0.5	84.4%	80.3%	----	----						
P-075B-SS	Pyrene	mg/kg	0.5	<0.5	84.9%	79.6%	92.5%	90.1%						
P-075B-SS	N-2-Fluorenylacetamide	mg/kg	0.5	<0.5	82.4%	77.0%	----	----						
P-075B-SS	Benz(a)anthracene	mg/kg	0.5	<0.5	82.2%	79.1%	----	----						
P-075B-SS	Chrysene	mg/kg	0.5	<0.5	84.4%	79.2%	----	----						
P-075B-SS	Benzo(b) & (k)fluoranthene	mg/kg	1	<1	82.8%	81.5%	----	----						
P-075B-SS	7.12-Dimethylbenz(a)anthracene	mg/kg	0.5	<0.5	68.4%	67.7%	----	----						
P-075B-SS	Benzo(a)pyrene	mg/kg	0.5	<0.5	79.2%	79.2%	----	----						
P-075B-SS	3-Methylcholanthrene	mg/kg	0.5	<0.5	80.1%	75.7%	----	----						

Batch: ES33564
Sub Batch: 7
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		100	101	102	103	104					
		Date Sampled		17/05/2002	17/05/2002	17/05/2002	17/05/2002	17/05/2002					
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK	NSVOCS1738 SCS	NSVOCS1738 DCS	NSVOCS1738 MS	NSVOCS1738 MSD					
				CHECKS AND SPIKES									
P-075B-SS	Indeno(1.2.3-cd)pyrene	mg/kg	0.5	<0.5	82.8%	83.8%	----	----					
P-075B-SS	Dibenz(a.h)anthracene	mg/kg	0.5	<0.5	83.2%	81.2%	----	----					
P-075B-SS	Benzo(g.h.i)perylene	mg/kg	0.5	<0.5	85.0%	81.2%	----	----					
P-075S-SS	**ACID EXTRACTABLE SURROGATES**												
P-075S-SS	2-Fluorophenol	%	1	109	107	104	101	98					
P-075S-SS	Phenol-D6	%	1	104	93	95	93	90					
P-075S-SS	2-Chlorophenol-D4	%	1	104	91	91	90	85					
P-075S-SS	2.4.6-Tribromophenol	%	1	91	86	85	90	83					
P-075T-SS	**BASE/NEUTRAL EXTRACTABLE SURROGATES**												
P-075T-SS	Nitrobenzene-D5	%	1	93	81	83	87	82					
P-075T-SS	1.2-Dichlorobenzene-D4	%	1	90	83	84	80	77					
P-075T-SS	2-Fluorobiphenyl	%	1	101	88	89	88	83					
P-075T-SS	Anthracene-d10	%	1	104	87	83	88	84					
P-075T-SS	p-Terphenyl-D14	%	1	103	92	85	87	82					

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES33564
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	8
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 726	**DATE RECEIVED:**	17/05/2002
	PYMBLE NSW 2073	**DATE COMPLETED:**	30/05/2002
		SAMPLE TYPE:	WATER
ORDER No.:	119254	**No. of SAMPLES:**	2
PROJECT:	J1938/1-HOMEBUSH		

COMMENTS

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

Address
277-289 Woodpark Road
SMITHFIELD NSW 2164

Phone: 61-2-8784 8555
Fax: 61-2-8784 8500
Email: michael.heery@alsenviro.com

Signatory

LABORATORIES

AUSTRALASIA		*AMERICAS*
Brisbane	*Hong Kong*	*Vancouver*
Melbourne	*Singapore*	*Santiago*
Sydney	*Kuala Lumpur*	*Antofagasta*
Newcastle	*Bogor*	*Lima*
Auckland	*Mumbai*	

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NATA No. 10918

Batch: ES35504
Sub Batch: 8
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		35	36								
		Date Sampled		15/05/2002	14/05/2002								
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	QW03_ 15/5/02	QW02_								
P-075B-WS	**POLYNUCLEAR AROMATICS**												
P-075B-WS	Naphthalene	ug/L	2	<2	<2								
P-075B-WS	2-Methylnaphthalene	ug/L	2	<2	<2								
P-075B-WS	2-Chloronaphthalene	ug/L	2	<2	<2								
P-075B-WS	Acenaphthylene	ug/L	2	<2	<2								
P-075B-WS	Acenaphthene	ug/L	2	<2	<2								
P-075B-WS	Fluorene	ug/L	2	<2	<2								
P-075B-WS	Phenanthrene	ug/L	2	<2	<2								
P-075B-WS	Anthracene	ug/L	2	<2	<2								
P-075B-WS	Fluoranthene	ug/L	2	<2	<2								
P-075B-WS	Pyrene	ug/L	2	<2	<2								
P-075B-WS	N-2-Fluorenylacetamide	ug/L	2	<2	<2								
P-075B-WS	Benz(a)anthracene	ug/L	2	<2	<2								
P-075B-WS	Chrysene	ug/L	2	<2	<2								
P-075B-WS	Benzo(b) & (k)fluoranthene	ug/L	4	<4	<4								
P-075B-WS	7.12-Dimethylbenz(a)anthracene	ug/L	2	<2	<2								
P-075B-WS	Benzo(a)pyrene	ug/L	2	<2	<2								
P-075B-WS	3-Methylcholanthrene	ug/L	2	<2	<2								
P-075B-WS	Indeno(1.2.3-cd)pyrene	ug/L	2	<2	<2								
P-075B-WS	Dibenz(a.h)anthracene	ug/L	2	<2	<2								
P-075B-WS	Benzo(g.h.i)perylene	ug/L	2	<2	<2								
P-075T-WS	**BASE/NEUTRAL EXTRACTABLE SURROGATES**												
P-075T-WS	Nitrobenzene-D5	%	1	87	81								
P-075T-WS	1.2-Dichlorobenzene-D4	%	1	73	70								
P-075T-WS	2-Fluorobiphenyl	%	1	82	82								
P-075T-WS	Anthracene-d10	%	1	114	111								
P-075T-WS	p-Terphenyl-D14	%	1	100	99								

Batch: ES33
Sub Batch: 8
Date of Issue: 30/05/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference: J1938/1-HOMEBUSH

QUALITY CONTROL REPORT

METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	SAMPLE IDENTIFICATION									
	Laboratory I.D.			100	101	102							
	Date Sampled			17/05/2002	17/05/2002	17/05/2002							
				METHOD BLANK	NSVOCW1128 SCS	NSVOCW1128 DCS							
				CHECKS AND SPIKES									
-075B-WS	**POLYNUCLEAR AROMATICS**												
-075B-WS	Naphthalene	ug/L	2	<2	89.4%	81.1%							
-075B-WS	2-Methylnaphthalene	ug/L	2	<2	89.6%	83.3%							
-075B-WS	2-Chloronaphthalene	ug/L	2	<2	87.3%	92.9%							
-075B-WS	Acenaphthylene	ug/L	2	<2	89.6%	82.7%							
-075B-WS	Acenaphthene	ug/L	2	<2	97.2%	83.6%							
-075B-WS	Fluorene	ug/L	2	<2	90.9%	81.0%							
-075B-WS	Phenanthrene	ug/L	2	<2	95.6%	84.4%							
-075B-WS	Anthracene	ug/L	2	<2	97.4%	86.8%							
-075B-WS	Fluoranthene	ug/L	2	<2	96.9%	84.4%							
-075B-WS	Pyrene	ug/L	2	<2	93.2%	83.6%							
-075B-WS	N-2-Fluorenylacetamide	ug/L	2	<2	90.3%	83.8%							
-075B-WS	Benz(a)anthracene	ug/L	2	<2	96.5%	84.8%							
-075B-WS	Chrysene	ug/L	2	<2	97.2%	86.2%							
-075B-WS	Benzo(b) & (k)fluoranthene	ug/L	4	<4	93.6%	89.2%							
-075B-WS	7.12-Dimethylbenz(a)anthracene	ug/L	2	<2	82.8%	81.4%							
-075B-WS	Benzo(a)pyrene	ug/L	2	<2	92.7%	88.3%							
-075B-WS	3-Methylcholanthrene	ug/L	2	<2	87.7%	87.1%							
-075B-WS	Indeno(1.2.3-cd)pyrene	ug/L	2	<2	92.1%	91.2%							
-075B-WS	Dibenz(a.h)anthracene	ug/L	2	<2	90.6%	89.9%							
-075B-WS	Benzo(g.h.i)perylene	ug/L	2	<2	91.6%	90.4%							
-075T-WS	**BASE/NEUTRAL EXTRACTABLE SURROGATES**												
-075T-WS	Nitrobenzene-D5	%	1	83	100	77							
-075T-WS	1.2-Dichlorobenzene-D4	%	1	103	72	67							
-075T-WS	2-Fluorobiphenyl	%	1	72	76	69							
-075T-WS	Anthracene-d10	%	1	90	102	89							
-075T-WS	p-Terphenyl-D14	%	1	103	96	85							

ALS Environmental

ORGANICS QUALITY CONTROL REPORT

BATCH NO: ES33564

DATE BATCH RECEIVED: 18/05/02

CLIENT: HLA Enviroscience

DATE BATCH COMPLETED: 30/05/02

PROJECT: j1938/1

Method Code	Test	Matrix	Method Reference		QC Lot Number	Date Samples Extracted	Date Samples Analysed
			Extraction	Analysis			
EP-066	PCB	Soil	Tumbler	USEPA 8270B	NPCBS485	23/05/02	27/05/02
EP-068	Pesticides	Soil	Tumbler	USEPA 8270B	NOCOPS1074	23/05/02	24/05/02
EP-071	TPH(SV)	Water	USEPA 3510B	USEPA 8015A	NTPHW1183	21/05/02	24/05/02
EP-071	TPH(SV)	Soil	Tumbler	USEPA 8015A	NTPHT3297	23/05/02	24/05/02
EP-071/80	TPH(V)/BTEX	Water	USEPA 5030A	USEPA 8260A	NVOCW1183	24/05/02	24/05/02
EP-071/80	TPH(V)/BTEX	Soil	USEPA 5030A	USEPA 8260A	NVOCS3297	22/05/02	23/05/02
EP-074	Volatiles Scan	Soil	USEPA 5030A	USEPA 8260A	NVSCS485	22/05/02	24/05/02
EP-075	SV Scan	Water	USEPA 3510B	USEPA 8270B	NSVOCW1128	21/05/02	24/05/02
EP-075	SV Scan	Soil	Tumbler	USEPA 8270B	NSVOCS1738	23/05/02	24/05/02

Where applicable, internal standards are added to sample extracts prior to instrumental analysis. Absolute peak areas and retention times fall within the criteria specified in the individual methods. Continuing Calibration (CC) standards are run at the frequency of 1 in every 20 samples.

Abbreviations: SV = semivolatile, V = volatile

*: In-house methods

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-066 : PCB

QC LOT No. : NPCBS485 ANALYST : K. SHARARA
MATRIX: Soil

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Conc	DCS Conc	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	Low	High	%
EP-066 : PCB									
Total PCBs	<LOR	0.50	0.44	0.44	88	2	67	117	20
EP-066 : PCB SURROGATE									
Decachlorobiphenyl	92%	0.50	88.1	93.5	91	6	69	117	20

COMMENTS:
1) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/07)
2) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL -- MATRIX SPIKE / DUPLICATE

ALS EP-066 : PCB ANALYSIS

QC LOT No. : NPCBS485 ANALYST : K. SHARARA
MATRIX : Soil SPIKED SAMPLE : ES33414-17

COMPOUND	Sample Results	Spike Level	QCSPIKE RESULTS				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
EP-066 : PCB							
Total PCBs	<LOR	0.50	0.41	0.42	83	0	20
EP-066 : PCB SURROGATE							
Decachlorobiphenyl	0	0.50	104	104	104	0	20

COMMENTS :

1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07)
2) * : RPD falls outside the recommended control limit.

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-066 : PCB

QC LOT No : NPCBS485
MATRIX : Soil

ANALYST : K. SHARAR

COMPOUND	QC DUPLICATE RESULTS		
	ES33414 10	**ES33414** 10D	RPD
	mg/kg	mg/kg	%
EP-066 : PCB			
Total PCBs	<LOR	<LOR	--
EP-066 : PCB SURROGATE			
Decachlorobiphenyl	99.37	107.76	8

BATCH QUALITY CONTROL – DUPLICATE

ALS EP-066 : PCB

QC LOT No. : NPCBS485
MATRIX: Soil

ANALYST : K. SHARARA

COMPOUND	QC DUPLICATE RESULTS		
	ES33414 17	ES33414 17D	RPD
	mg/kg	mg/kg	%
EP-066 : PCB			
Total PCBs	<LOR	<LOR	-
EP-066 : PCB SURROGATE			
Decachlorobiphenyl	106.23	104.31	1.8

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-068 : Pesticides

QC LOT No. : NOCOPS1074 ANALYST K. SHARARA

MATRIX: Soils

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	%		%	%	Low	High	%
EP068A : OC Pesticides									
a-BHC	<0.025	0.25	87.3	88.7	88	1.59	77.6	104	0 - 20
HCB	<0.025	0.25	83.2	86.9	85.1	4.35	75.8	112	0 - 20
b- & g-BHC	<0.05	0.5	90.9	91.3	91.1	0.44	84.3	101	0 - 20
d-BHC	<0.025	0.25	86.4	85.3	85.9	1.28	78.9	103	0 - 20
Heptachlor	<0.025	0.25	82.8	84.4	83.6	1.91	80	109	0 - 20
Aldrin	<0.025	0.25	87.9	89	88.5	1.24	85.4	108	0 - 20
Heptachlor epoxide	<0.025	0.25	84.7	86	85.4	1.52	78.7	105	0 - 20
Chlordane peak no 1	<0.025	0.25	84.4	83.8	84.1	0.71	72.6	99.8	0 - 20
Endosulfan 1	<0.025	0.25	88.7	89.6	89.2	1.01	84.2	106	0 - 20
Chlordane peak no. 2	<0.025	0.25	85.1	85.2	85.2	0.12	81.4	106	0 - 20
Dieldrin	<0.025	0.25	86.7	87.4	87.1	0.8	79.8	102	0 - 20
DDE	<0.025	0.25	86.8	87.1	87	0.35	77.4	99.5	0 - 20
Endrin	<0.025	0.25	94.2	95.9	95.1	1.79	81.6	105	0 - 20
Endosulfan 2	<0.025	0.25	87.5	88.9	88.2	1.59	80.6	107	0 - 20
DDD	<0.025	0.25	83.4	83.4	83.4	0	77.8	98.4	0 - 20
Endrin aldehyde	<0.025	0.25	86.9	85.4	86.2	1.74	81.5	99	1 - 20
Endosulfan sulfate	<0.025	0.25	86	86.1	86.1	0.12	79.9	101	0 - 20
DDT	<0.1	0.25	92.1	91.9	92	0.22	79.9	101	0 - 20
Endrin ketone	<0.025	0.25	93.2	85.9	89.6	8.15	70.6	102	0 - 20
Methoxychlor	<0.1	0.25	95	85.4	90.2	10.6	79.9	108	0 - 20
EP068B : OP Pesticides									
Dichlorvos	<0.025	0.25	82	82.8	82.4	0.97	80.6	103	0 - 20
Demeton-s-methyl	<0.025	0.25	80.9	85.3	83.1	5.29	76.8	104	0 - 20
Monocroptophos	<0.1	0.25	91.5	89.4	90.5	2.32	79.6	107	0 - 20
Dimethoate	<0.025	0.25	83.6	86.7	85.2	3.64	77.9	97.1	0 - 20
Diazinon	<0.025	0.25	86.9	88.9	87.9	2.28	85.1	104	0 - 20
Chlorpyrifos methyl	<0.025	0.25	87.7	89.7	88.7	2.25	81.7	104	0 - 20
Parathion methyl	<0.1	0.25	96.6	94.8	95.7	1.88	79.6	102	0 - 20
Malathion	<0.025	0.25	86.3	86.5	86.4	0.23	84.2	101	0 - 20
Fenthion	<0.025	0.25	94.8	95	94.9	0.21	79.7	101	0 - 20
Chlorpyrifos	<0.025	0.25	87.8	88.5	88.2	0.79	81.4	103	0 - 20
Parathion	<0.1	0.25	90.6	87.8	89.2	3.14	78.1	103	0 - 20
Pirimphos ethyl	<0.025	0.25	85.2	85.4	85.3	0.23	79.5	102	0 - 20
Chlorfenvinphos Z	<0.025	0.25	80.3	83.2	81.8	3.55	78.6	106	0 - 20
Bromophos ethyl	<0.025	0.25	82.8	82.3	82.6	0.61	80.8	103	0 - 20
Fenamiphos	<0.025	0.25	80.3	82.2	81.3	2.34	77	107	0 - 20
Prothiofos	<0.025	0.25	85	84.1	84.6	1.06	77.3	106	0 - 20
Ethion	<0.025	0.25	98.4	96.9	97.7	1.54	80	104	0 - 20
Carbofenthion	<0.025	0.25	84.4	82.8	83.6	1.91	79	104	0 - 20
Azinphos methyl	<0.025	0.25	82.4	80.7	81.6	2.08	79.4	108	0 - 20

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-068 : Pesticides

QC LOT No. : NOCOPS1074 ANALYST K. SHARARA

MATRIX: Soils

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	%		%	%	Low	High	%
EP068C : Triazines									
Simazine	<0.025	0.25	93.5	85.5	89.5	8.94	73.5	103	0 - 20
Atrazine	<0.025	0.25	83.7	88.9	86.3	6.03	54.1	109	0 - 20
EP068D :Pyrethroids									
Cypermethrins(multipeaks)	<0.1	0.25	88.6	84.3	86.5	4.97	80.9	101	0 - 20
EP068S : OC Surrogate									
Dibromo-DDE	86.6%	0.5	95.9	90.8	93.4	5.46	80.2	118	0 - 20
EP068T : OP Surrogate									
DEF	81.9%	0.5	97.1	91.8	94.5	5.61	85.1	111	0 - 20

COMMENTS:

1) The recovery control limits are based on ALS laboratory statistical data. (Method QWI-ORG/07)

2) The control limits on RPD (relative percent deviation) are fixed.

3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL – MATRIX SPIKE/DUPLICATE

ALS EP-068 : Semivolatile Organic Compounds

QC LOT No.: NOCOPS1074 ANALYST: K. SHARARA

MATRIX: Soils Sample ID: ES33517-8

COMPOUND	Sample Results	Spike Level	SPIKE QC RESULTS				Cont. Limit
			MS Rec.	MSD Rec.	Average Rec.	RPD	RPD
	mg/kg	mg/kg	%	%	%	%	%
EP068A : OC Pesticides							
b- & g-BHC	<0.05	0.25	84	87.6	85.8	4.2	0 - 20
Heptachlor	<0.025	0.25	68.5	67.7	68.1	1.17	0 - 20
Aldrin	<0.025	0.25	74.9	86.5	80.7	14.4	0 - 20
Dieldrin	1.86	0.25	94.6	85	89.8	10.7	0 - 20
Endrin	<0.025	1	75.9	79.3	77.6	4.38	0 - 20
DDT	<0.1	1	79.9	68.8	74.4	14.9	0 - 20
EP068 : OP Pesticides							
Diazinon	<0.025	0.25	89.3	95	92.2	6.19	0 - 20
Chlorpyrifos methyl	<0.025	0.25	81.5	86.8	84.2	6.3	0 - 20
Pirimiphos ethyl	<0.025	0.25	68.2	74.3	71.3	8.56	0 - 20
Bromophos ethyl	<0.025	0.25	81.7	88.6	85.2	8.1	0 - 20
Prothiofos	<0.025	0.25	84.3	95	89.7	11.9	0 - 20
EP068S : OC Surrogate							
Dibromo-DDE	97.2%	0.5	82.1	90.1	86.1	9.29	0 - 20
EP068T : OP Surrogate							
DEF	106%	0.5	86.2	93.7	90	8.34	0 - 20

COMMENTS:

1) The RPD control limits are fixed.

2) *: RPD falls outside the recommended control limit.

BATCH QUALITY CONTROL – DUPLICATE

ALS EP-068 : Pesticides

QC LOT No.: NOCOPS1074
MATRIX: Soils
ANALYST: K SHARARA

COMPOUND	LOR	QC DUPLICATE RESULTS			
		ES33517 7	ES33517 7D	RPD	Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP068A : OC Pesticides					
a-BHC	0.025	<0.025	<0.025	n/a	
HCB	0.025	<0.025	<0.025	n/a	
b- & g-BHC	0.05	<0.05	<0.05	n/a	
d-BHC	0.025	<0.025	<0.025	n/a	
Heptachlor	0.025	<0.025	<0.025	n/a	
Aldrin	0.025	<0.025	<0.025	n/a	
Heptachlor epoxide	0.025	<0.025	<0.025	n/a	
Chlordane peak no 1	0.025	0.044	0.0416	5.61	No limit
Endosulfan 1	0.025	<0.025	<0.025	n/a	
Chlordane peak no. 2	0.025	<0.025	<0.025	n/a	
Dieldrin	0.025	0.22	0.207	6.09	No limit
DDE	0.025	0.0536	0.0508	5.36	No limit
Endrin	0.025	<0.025	<0.025	n/a	
Endosulfan 2	0.025	<0.025	<0.025	n/a	
DDD	0.025	<0.025	<0.025	n/a	
Endrin aldehyde	0.025	<0.025	<0.025	n/a	
Endosulfan sulfate	0.025	<0.025	<0.025	n/a	
DDT	0.1	<0.1	<0.1	n/a	
Endrin ketone	0.025	<0.025	<0.025	n/a	
Methoxychlor	0.1	<0.1	<0.1	n/a	
EP068B : OP Pesticides					
Dichlorvos	0.025	<0.025	<0.025	n/a	
Demeton-s-methyl	0.025	<0.025	<0.025	n/a	
Monocroptophos	0.1	<0.1	<0.1	n/a	
Dimethoate	0.025	<0.025	<0.025	n/a	
Diazinon	0.025	<0.025	<0.025	n/a	
Chlorpyrifos methyl	0.025	<0.025	<0.025	n/a	
Parathion methyl	0.1	<0.1	<0.1	n/a	
Malathion	0.025	<0.025	<0.025	n/a	
Fenthion	0.025	<0.025	<0.025	n/a	
Chlorpyrifos	0.025	<0.025	<0.025	n/a	
Parathion	0.1	<0.1	<0.1	n/a	
Pirimphos ethyl	0.025	<0.025	<0.025	n/a	
Chlorfenvinphos E	0.025	<0.025	<0.025	n/a	
Chlorfenvinphos Z	0.025	<0.025	<0.025	n/a	
Bromophos ethyl	0.025	<0.025	<0.025	n/a	
Fenamiphos	0.025	<0.025	<0.025	n/a	
Prothiofos	0.025	<0.025	<0.025	n/a	
Ethion	0.025	<0.025	<0.025	n/a	
Carbofenthion	0.025	<0.025	<0.025	n/a	
Azinphos methyl	0.025	<0.025	<0.025	n/a	

BATCH QUALITY CONTROL – DUPLICATE

ALS EP-068 : Pesticides

QC LOT No. : NOCOPS1074
MATRIX : Soils
ANALYST: K SHARARA

COMPOUND	LOR	QC DUPLICATE RESULTS			
		ES33517 7	ES33517 7D	RPD	Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP068C : Triazines					
Simazine	0.025	<0.025	<0.025	n/a	
Atrazine	0.025	<0.025	<0.025	n/a	
EP068D : Pyrethroids					
Cypermethrins(multipeaks)	0.1	<0.1	<0.1	n/a	
EP068S : OC Surrogate					
Dibromo-DDE	1%	101%	102%	0.985	0 - 20
EP068T : OP Surrogate					
DEF	1%	106%	109%	2.79	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-068 : Pesticides

QC LOT No. : NOCOPS1074
MATRIX : Soils
ANALYST: K SHARARA

COMPOUND	LOR	QC DUPLICATE RESULTS			
		ES33517 8	ES33517 8D	RPD	Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP068A : OC Pesticides					
a-BHC	0.025	<0.025	<0.025	n/a	
HCB	0.025	<0.025	<0.025	n/a	
b- & g-BHC	0.05	<0.05	<0.05	n/a	
d-BHC	0.025	<0.025	<0.025	n/a	
Heptachlor	0.025	<0.025	<0.025	n/a	
Aldrin	0.025	<0.025	<0.025	n/a	
Heptachlor epoxide	0.025	0.056	0.0519	7.6	No limit
Chlordane peak no 1	0.025	0.168	0.159	5.5	No limit
Endosulfan 1	0.025	<0.025	<0.025	n/a	
Chlordane peak no. 2	0.025	0.0358	0.0343	4.28	No limit
Dieldrin	0.025	1.86	1.83	1.63	0 - 20
DDE	0.025	0.0506	0.049	3.21	No limit
Endrin	0.025	<0.025	<0.025	n/a	
Endosulfan 2	0.025	<0.025	<0.025	n/a	
DDD	0.025	0.0253	0.0252	0.396	No limit
Endrin aldehyde	0.025	<0.025	<0.025	n/a	
Endosulfan sulfate	0.025	<0.025	<0.025	n/a	
DDT	0.1	<0.1	<0.1	n/a	
Endrin ketone	0.025	<0.025	<0.025	n/a	
Methoxychlor	0.1	<0.1	<0.1	n/a	
EP068B : OP Pesticides					
Dichlorvos	0.025	<0.025	<0.025	n/a	
Demeton-s-methyl	0.025	<0.025	<0.025	n/a	
Monocroptophos	0.1	<0.1	<0.1	n/a	
Dimethoate	0.025	<0.025	<0.025	n/a	
Diazinon	0.025	<0.025	<0.025	n/a	
Chlorpyrifos methyl	0.025	<0.025	<0.025	n/a	
Parathion methyl	0.1	<0.1	<0.1	n/a	
Malathion	0.025	<0.025	<0.025	n/a	
Fenthion	0.025	<0.025	<0.025	n/a	
Chlorpyrifos	0.025	<0.025	<0.025	n/a	
Parathion	0.1	<0.1	<0.1	n/a	
Pirimphos ethyl	0.025	<0.025	<0.025	n/a	
Chlorfenvinphos E	0.025	<0.025	<0.025	n/a	
Chlorfenvinphos Z	0.025	<0.025	<0.025	n/a	
Bromophos ethyl	0.025	<0.025	<0.025	n/a	
Fenamiphos	0.025	<0.025	<0.025	n/a	
Prothiofos	0.025	<0.025	<0.025	n/a	
Ethion	0.025	<0.025	<0.025	n/a	
Carbofenthion	0.025	<0.025	<0.025	n/a	
Azinphos methyl	0.025	<0.025	<0.025	n/a	

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-068 : Pesticides

QC LOT No NOCOPS1074
MATRIX : Soils
ANALYST: K. SHARARA

COMPOUND	LOR	QC DUPLICATE RESULTS			
		ES33517 8	ES33517 8D	RPD	Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP068C : Triazines					
Simazine	0.025	<0.025	<0.025	n/a	
Atrazine	0.025	<0.025	<0.025	n/a	
EP068D : Pyrethroids					
Cypermethrins(multipeaks)	0.1	<0.1	<0.1	n/a	
EP068S : OC Surrogate					
Dibromo-DDE	1%	97.2%	93.7%	3.67	0 - 20
EP068T : OP Surrogate					
DEF	1%	106%	107%	0.939	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOCW 1183
Semi-Vol QC Lot : NTPHW1183

MATRIX : Water

COMPOUND	BATCH ADJ. (MDL)	Blank Conc.	Spike Conc.	Spike Results				Control Limits		
				SCS Conc.	DCS Conc.	Av. Rec.	RPD	Recovery %		RPD
	ug/L	ug/L	ug/L	ug/L	ug/L	%	%	Low	High	%
C6-C9	20	<LOR	200	189	194	96	2	94	106	20
C10-C14	25	<LOR	200	197	198	99	1	70	113	20
C15-C28	25	<LOR	200	216	207	106	4	82	115	20
C29-C36	25	<LOR	200	196	186	95	5	74	119	20

COMMENTS:

1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
2) * : Recovery or RPD falls outside the recommended control limit.
3) MDL = Method Detection Limit
4) LOR = Level Of Reporting

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No. : NVOCW 1183 MATRIX : Water

COMPOUND	BATCH ADJ. (MDL)	Blank Conc.	Spike Conc.	Spike Results				Control Limits		
				SCS Conc.	DCS Conc.	Av. Rec.	RPD	Recovery %		RPD
	ug/L	ug/L	ug/L	ug/L	ug/L	%	%	Low	High	%
Benzene	1.0	<LOR	10	10.35	9.51	99	8	87	115	20
Toluene	1.0	<LOR	10	10.15	9.51	98	7	87	114	20
Chlorobenzene	1.0	<LOR	10	10.05	9.82	99	2	89	112	20
Ethylbenzene	1.0	<LOR	10	9.90	9.58	97	3	88	115	20
m- & p-Xylene	1.0	<LOR	10	10.04	9.56	98	5	89	115	20
o-Xylene	1.0	<LOR	10	10.08	9.67	99	4	89	114	20

COMMENTS :

1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
2) * : Recovery or RPD falls outside the recommended control limit.
3) MDL = Method Detection Limit
4) LOR = Level Of Reporting

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-071 : Total Petroleum Hydrocarbons by Fractions

Vol QC Lot : NVOCS3297
Semivol QC Lot NTPHT3297

MATRIX : Soil

COMPOUND	BATCH ADJ. (MDL)	Blank Conc.	Spike Conc.	Spike Results				Control Limits		
				SCS Conc.	DCS Conc.	Av. Rec.	RPD	Recovery %		RPD
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	Low	High	%
C6-C9	2.0	<LOR	20	19.5	18.9	96	4	92	109	20
C10-C14	25	<LOR	200	200	196	99	2	80	122	20
C15-C28	50	<LOR	200	196	198	99	1	79	120	20
C29-C36	50	<LOR	200	224	222	111	1	82	126	20

COMMENTS:

1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
2) * : Recovery or RPD falls outside the recommended control limit.
3) MDL = Method Detection Limit
4) LOR = Level Of Reporting

BATCH QUALITY CONTROL - CONTROL SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No : NVOCS3297 MATRIX : Soil

COMPOUND	BATCH ADJ. (MDL)	Blank Conc.	Spike Conc.	Spike Results				Control Limits		
				SCS Conc.	DCS Conc.	Av. Rec.	RPD	Recovery %		RPD
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%	%	Low	High	%
Benzene	0.1	<LOR	1.0	1.02	1.01	102	1	86	111	20
Toluene	0.1	<LOR	1.0	1.02	1.01	101	1	81	115	20
Chlorobenzene	0.1	<LOR	1.0	1.03	1.01	102	2	84	112	20
Ethylbenzene	0.1	<LOR	1.0	1.03	1.04	103	1	85	112	20
m- & p-Xylene	0.1	<LOR	1.0	1.05	1.05	105	0	84	110	20
o-Xylene	0.1	<LOR	1.0	1.07	1.07	107	0	86	108	20

COMMENTS :

1) The control limits are based on ALS laboratory statistical data (Method QWI-ORG/07).
2) * : Recovery or RPD falls outside the recommended control limit.
3) MDL = Method Detection Limit
4) LOR = Level Of Reporting

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS **EP-071 : Total Petroleum Hydrocarbons by Fractions**

Vol QC Lot : NVOCS3297
Semivol QC Lot : NTPHT3297

SPIKED SAMPLE : ES33467-3
MATRIX : SOIL

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
C6-C9	<LOR	10	9.4	9.4	94	0	20
C10-C14	<LOR	430	516	520	120	1	20
C15-C28	<LOR	1570	1634	1636	104	0	20
C29-C36	<LOR	N/A	–	–	–	–	–

COMMENTS :

1) LOR: level of reporting
2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)
3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL - MATRIX SPIKE/DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No NVOCS3297

SPIKED SAMPLE : ES33467-3
MATRIX : SOIL

COMPOUND	Sample Results	Spike Level	Spike Results				Control Limits
			MS Conc	MSD Conc	Av. Rec.	RPD	
	mg/kg	mg/kg	mg/kg	mg/kg	%	%	RPD
Benzene	<LOR	2.5	2.5	2.5	98	1	20
Toluene	<LOR	2.5	2.1	2.1	84	0	20
Chlorobenzene	<LOR	2.5	2.5	2.6	101	1	20

COMMENTS :

1) LOR: level of reporting

2) The control limits are based on ALS laboratory statistical data. (Method QWI-ORG/06)

3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-071 : **Total Petroleum Hydrocarbons by Fractions**

SEMIVOLATILES QC LOT NO NTPHT3297 ANALYST: NENSI.K.
VOLATILES QC LOT No.: NVOCS3297 MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	ES33467 2	ES33467 2DUP	RPD
	mg/kg	mg/kg	%
C 6-C 9	<LOR	<LOR	--
C10-C14	40	38	5
C15-C28	338	348	3
C29-C36	<LOR	<LOR	--

BATCH QUALITY CONTROL – DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No NVOCS3297 Analyst : A.ROSSI
MATRIX : Soil

	QC DUPLICATE RESULTS		
COMPOUND	ES33467 2	ES33467 2DUP	RPD
	mg/kg	mg/kg	%
Benzene	<LOR	<LOR	--
Toluene	<LOR	<LOR	--
Chlorobenzene	<LOR	<LOR	--
Ethylbenzene	<LOR	<LOR	--
m- & p-Xylene	<LOR	<LOR	--
o-Xylene	<LOR	<LOR	--

BATCH QUALITY CONTROL -- DUPLICATE

ALS **EP-071 : Total Petroleum Hydrocarbons by Fractions**

SEMIVOLATILES QC LOT NO.: NTPHT3297 ANALYST: NENSI.K.
VOLATILES QC LOT No.: NVOCS3297 MATRIX : Soil

COMPOUND	QC DUPLICATE RESULTS		
	ES33467 3	ES33467 3DUP	RPD
	mg/kg	mg/kg	%
C 6-C 9	**<LOR**	**<LOR**	--
C10-C14	**<LOR**	**<LOR**	--
C15-C28	**286**	**234**	20
C29-C36	**<LOR**	**<LOR**	--

BATCH QUALITY CONTROL – DUPLICATE

ALS EP-080 : BTEX ANALYSIS

QC Lot No NVOCS3297 Analyst : A.ROSSI
MATRIX : Soil

	QC DUPLICATE RESULTS		
COMPOUND	**ES33467** 3	**ES33467** 3DUP	**RPD**
	mg/kg	mg/kg	%
Benzene	**<LOR**	**<LOR**	--
Toluene	**<LOR**	**<LOR**	--
Chlorobenzene	**<LOR**	**<LOR**	--
Ethylbenzene	**<LOR**	**<LOR**	--
m- & p-Xylene	**<LOR**	**<LOR**	--
o-Xylene	**<LOR**	**<LOR**	--

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No. : NVSCS485 ANALYST A.ROSSI

MATRIX: Soils

	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
COMPOUND	mg/kg	mg/kg	%		%	%	Low	High	%
EP-074A-SS : Monocyclic Aromatics									
Benzene	<LOR	1.0	92.3	104	98.2	11.9	78.5	125	0 - 20
Toluene	<LOR	1.0	100	107	104	6.76	76.2	126	0 - 20
Ethylbenzene	<LOR	1.0	93	104	98.5	11.2	81.7	121	0 - 20
m & p-Xylene	<LOR	2.0	95.2	103	99.1	7.87	80.1	119	0 - 20
Styrene	<LOR	1.0	91.6	98.1	94.9	6.85	80.3	122	0 - 20
o-Xylene	<LOR	1.0	92.7	108	100	15.2	79.6	119	0 - 20
Isopropylbenzene	<LOR	1.0	92.5	110	101	17.3	78.4	121	0 - 20
n-Propylbenzene	<LOR	1.0	95.8	104	99.9	8.21	80	117	0 - 20
1,3,5-Trimethylbenzene	<LOR	1.0	102	109	106	6.64	81	116	0 - 20
sec-Butylbenzene	<LOR	1.0	97.9	109	103	10.7	78.9	117	0 - 20
1,2,4-Trimethylbenzene	<LOR	1.0	98.1	106	102	7.74	83	115	0 - 20
tert-Butylbenzene	<LOR	1.0	101	109	105	7.62	81.6	119	0 - 20
p-Isopropyltoluene	<LOR	1.0	98.1	109	104	10.5	81.2	120	0 - 20
n-Butylbenzene	<LOR	1.0	96.6	107	102	10.2	80.8	116	0 - 20
EP-074B-SS : Oxygenated Compounds									
2-Propanone(Acetone)	<LOR	10.0	105	95.8	100	9.16	70.1	133	0 - 20
Vinyl acetate	<LOR	10.0	96.7	99.5	98.1	2.85	73.2	123	0 - 20
2-Butanone (MEK)	<LOR	10.0	91.3	101	96.2	10.1	71.1	134	0 - 20
4-Methyl-2-pentanone (MIBK	<LOR	10.0	93.7	102	97.9	8.48	75.3	126	0 - 20
2-Hexanone (MBK)	<LOR	10.0	95.8	91.9	93.9	4.16	73.7	132	0 - 20
EP-074C-SS : Sulfonated Compounds									
Carbondisulfide	<LOR	1.0	96.1	93.7	94.9	2.53	75.8	122	0 - 20
EP-07D-SS : Fumigants									
2,2-Dichloropropane	<LOR	1.0	96.6	91.3	94	5.64	69.6	118	0 - 20
1,2-Dichloropropane	<LOR	1.0	94.3	102	98.2	7.85	80.6	119	0 - 20
cis-1,3-Dichloropropene	<LOR	2.0	98.6	98.7	98.7	0.1	75.4	124	0 - 20
trans-1,3-Dichloropropene	<LOR	2.0	99.8	95.6	97.7	4.3	77.2	122	0 - 20
1,2-Dibromoethane	<LOR	1.0	89	91	90	2.22	80.5	123	0 - 20

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No. : NVSCS485 ANALYST A.ROSSI

MATRIX: Soils

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	%		%	%	Low	High	%
EP-074E-SS : Chlorinated Aliphatic Compounds									
Dichlorodifluoromethane	<LOR	10.0	100	103	102	2.96	75.6	128	0 - 20
Chloromethane	<LOR	10.0	102	106	104	3.85	75	129	0 - 20
Vinyl chloride	<LOR	10.0	94.2	99.3	96.8	5.27	74.1	127	0 - 20
Bromomethane	<LOR	10.0	95.4	98.5	97	3.2	77.9	124	0 - 20
Chloroethane	<LOR	10.0	101	108	105	6.7	71.2	127	0 - 20
Trichlorofluoromethane	<LOR	10.0	94.7	106	100	11.3	74.2	128	0 - 20
1,1-Dichloroethene	<LOR	1.0	105	108	107	2.82	76.2	119	0 - 20
Iodomethane	<LOR	1.0	99.3	94.4	96.9	5.06	73.3	131	0 - 20
Methylene chloride	<LOR	1.0	95.8	103	99.4	7.24	72.8	132	0 - 20
trans-1,2-Dichloroethene	<LOR	1.0	96.5	99.8	98.2	3.36	80.8	117	0 - 20
1,1-Dichloroethane	<LOR	1.0	98.8	110	104	10.7	78.2	126	0 - 20
cis-1,2-Dichloroethene	<LOR	1.0	94.5	108	101	13.3	80.9	119	0 - 20
1,1,1-Trichloroethane	<LOR	1.0	90.7	95.7	93.2	5.36	81.6	115	0 - 20
1,1-Dichloropropylene	<LOR	1.0	93.7	104	98.9	10.4	77.2	123	0 - 20
Carbon tetrachloride	<LOR	1.0	100	108	104	7.69	74.9	127	0 - 20
1,2-Dichloroethane	<LOR	1.0	90.2	96.2	93.2	6.44	81.7	123	0 - 20
Trichloroethene	<LOR	1.0	94.3	101	97.7	6.86	80.4	127	0 - 20
Dibromomethane	<LOR	1.0	89.3	95.5	92.4	6.71	78.9	125	0 - 20
1,1,2-Trichloroethane	<LOR	1.0	91.8	105	98.4	13.4	82.1	123	0 - 20
1,3-Dichloropropane	<LOR	1.0	93	93.6	93.3	0.64	80.5	123	0 - 20
Tetrachloroethene	<LOR	1.0	102	105	104	2.9	81.7	128	0 - 20
1,1,1,2-Tetrachloroethane	<LOR	1.0	92.2	99.2	95.7	7.31	76.7	123	0 - 20
trans-1,4-Dichloro-2-butene	<LOR	1.0	97.1	87	92.1	11	73.8	123	0 - 20
cis-1,4-Dichloro-2-butene	<LOR	1.0	104	93	98.5	11.2	64.3	133	0 - 20
1,1,2,2-Tetrachloroethane	<LOR	1.0	88.4	109	98.7	20.9 *	77.9	129	0 - 20
1,2,3-Trichloropropane	<LOR	1.0	90	90	90	0	71.9	128	0 - 20
Pentachloroethane	<LOR	1.0	108	96.5	102	11.2	65.3	136	0 - 20
1,2-Dibromo-3-chloropropane	<LOR	1.0	97.9	90.4	94.2	7.97	76.3	123	0 - 20
Hexachlorobutadiene	<LOR	1.0	93.9	105	99.5	11.2	73.9	122	0 - 20

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No. : NVSCS485 ANALYST A.ROSSI

MATRIX: Soils

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	%		%	%	Low	High	%
EP-074F-SS : Chlorinated Aromatic Compounds									
Chlorobenzene	<LOR	1.0	94.9	106	100	11.1	83.6	121	0 - 20
Bromobenzene	<LOR	1.0	94.5	109	102	14.3	85.1	119	0 - 20
2-Chlorotoluene	<LOR	1.0	95.3	105	100	9.69	81.1	117	0 - 20
4-Chlorotoluene	<LOR	1.0	96.8	107	102	10	83.9	115	0 - 20
1,3-Dichlorobenzene	<LOR	1.0	97.7	107	102	9.09	84.6	113	0 - 20
1,4-Dichlorobenzene	<LOR	1.0	99.8	107	103	6.96	82.1	117	0 - 20
1,2-Dichlorobenzene	<LOR	1.0	108	105	107	2.82	84.9	117	0 - 20
1,2,4-Trichlorobenzene	<LOR	1.0	97.8	109	103	10.8	82.7	117	0 - 20
1,2,3-Trichlorobenzene	<LOR	1.0	105	97.9	101	7	84.9	119	0 - 20
EP-074G-SS : Trihalomethanes									
Chloroform	<LOR	1.0	93.3	98.2	95.8	5.12	84.6	116	0 - 20
Bromodichloromethane	<LOR	1.0	89.6	92.3	91	2.97	81.3	120	0 - 20
Dibromochloromethane	<LOR	1.0	99.1	97.9	98.5	1.22	76.2	130	0 - 20
Bromoform	<LOR	1.0	103	93.7	98.4	9.46	78.9	126	0 - 20
EP-074H-SS : PAH									
Naphthalene	<LOR	1.0	106	105	106	0.95	86.8	121	0 - 20
EP-074J-SS : Nitrogenated Compounds									
Acrylonitrile	--	1.0	--	--	n/a	n/a	0	100	0 - 20
EP-074S-SS : Surrogates									
1,2-Dichloroethane-d4	111%	5.0	105	117	111	10.8	80	120	0 - 20
Toluene-d8	102%	5.0	96.1	109	103	12.6	81	117	0 - 20
4-Bromofluorobenzene	105%	5.0	95.2	113	104	17.1	74	121	0 - 20

COMMENTS:

1) The recovery control limits are based on ALS laboratory statistical data. (Method QWI-ORG/07)

2) The control limits on RPD (relative percent deviation) are fixed.

3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No. : NVSCS485
MATRIX : Soils
ANALYST: A.ROSSI

COMPOUND	LOR	QC DUPLICATE RESULTS ES33452 17	QC DUPLICATE RESULTS ES33452 17D	RPD RPD	RPD Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-074A-SS : Monocyclic Aromatics					
Benzene	0.5	<LOR	<LOR	n/a	
Toluene	0.5	<LOR	<LOR	n/a	
Ethylbenzene	0.5	<LOR	<LOR	n/a	
m & p-Xylene	0.5	<LOR	<LOR	n/a	
Styrene	0.5	<LOR	<LOR	n/a	
o-Xylene	0.5	<LOR	<LOR	n/a	
Isopropylbenzene	0.5	<LOR	<LOR	n/a	
n-Propylbenzene	0.5	<LOR	<LOR	n/a	
1,3,5-Trimethylbenzene	0.5	<LOR	<LOR	n/a	
sec-Butylbenzene	0.5	<LOR	<LOR	n/a	
1,2,4-Trimethylbenzene	0.5	<LOR	<LOR	n/a	
tert-Butylbenzene	0.5	<LOR	<LOR	n/a	
p-Isopropyltoluene	0.5	<LOR	<LOR	n/a	
n-Butylbenzene	0.5	<LOR	<LOR	n/a	
EP-074B-SS : Oxygenated Compounds					
2-Propanone(Acetone)	5	<LOR	<LOR	n/a	
Vinyl acetate	5	<LOR	<LOR	n/a	
2-Butanone (MEK)	5	<LOR	<LOR	n/a	
4-Methyl-2-pentanone (MIBK)	5	<LOR	<LOR	n/a	
2-Hexanone (MBK)	5	<LOR	<LOR	n/a	
EP-074C-SS : Sulfonated Compounds					
Carbondisulfide	0.5	<LOR	<LOR	n/a	
EP-07D-SS : Fumigants					
2,2-Dichloropropane	0.5	<LOR	<LOR	n/a	
1,2-Dichloropropane	0.5	<LOR	<LOR	n/a	
cis-1,3-Dichloropropene	1	<LOR	<LOR	n/a	
trans-1,3-Dichloropropene	1	<LOR	<LOR	n/a	
1,2-Dibromoethane	0.5	<LOR	<LOR	n/a	

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No. : NVSCS485
MATRIX : Soils
ANALYST: A.ROSSI

COMPOUND	LOR	QC DUPLICATE RESULTS ES33452 17	QC DUPLICATE RESULTS ES33452 17D	RPD RPD	RPD Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-074E-SS : Chlorinated Aliphatic Compounds					
Dichlorodifluoromethane	5	<LOR	<LOR	n/a	
Chloromethane	5	<LOR	<LOR	n/a	
Vinyl chloride	5	<LOR	<LOR	n/a	
Bromomethane	5	<LOR	<LOR	n/a	
Chloroethane	5	<LOR	<LOR	n/a	
Trichlorofluoromethane	5	<LOR	<LOR	n/a	
1,1-Dichloroethene	0.5	<LOR	<LOR	n/a	
Iodomethane	0.5	<LOR	<LOR	n/a	
Methylene chloride	0.5	<LOR	<LOR	n/a	
trans-1,2-Dichloroethene	0.5	<LOR	<LOR	n/a	
1,1-Dichloroethane	0.5	<LOR	<LOR	n/a	
cis-1,2-Dichloroethene	0.5	<LOR	<LOR	n/a	
1,1,1-Trichloroethane	0.5	<LOR	<LOR	n/a	
1,1-Dichloropropylene	0.5	<LOR	<LOR	n/a	
Carbon tetrachloride	0.5	<LOR	<LOR	n/a	
1,2-Dichloroethane	0.5	<LOR	<LOR	n/a	
Trichloroethene	0.5	<LOR	<LOR	n/a	
Dibromomethane	0.5	<LOR	<LOR	n/a	
1,1,2-Trichloroethane	0.5	<LOR	<LOR	n/a	
1,3-Dichloropropane	0.5	<LOR	<LOR	n/a	
Tetrachloroethene	0.5	<LOR	<LOR	n/a	
1,1,1,2-Tetrachloroethane	0.5	<LOR	<LOR	n/a	
trans-1,4-Dichloro-2-butene	0.5	<LOR	<LOR	n/a	
cis-1,4-Dichloro-2-butene	0.5	<LOR	<LOR	n/a	
1,1,2,2-Tetrachloroethane	0.5	<LOR	<LOR	n/a	
1,2,3-Trichloropropane	0.5	<LOR	<LOR	n/a	
Pentachloroethane	0.5	<LOR	<LOR	n/a	
1,2-Dibromo-3-chloropropane	0.5	<LOR	<LOR	n/a	
Hexachlorobutadiene	0.5	<LOR	<LOR	n/a	

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No. : NVSCS485
MATRIX : Soils
ANALYST: A.ROSSI

COMPOUND	LOR	QC DUPLICATE RESULTS ES33452 17	QC DUPLICATE RESULTS ES33452 17D	RPD RPD	RPD Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-074F-SS : Chlorinated Aromatic Compounds					
Chlorobenzene	0.5	<LOR	<LOR	n/a	
Bromobenzene	0.5	<LOR	<LOR	n/a	
2-Chlorotoluene	0.5	<LOR	<LOR	n/a	
4-Chlorotoluene	0.5	<LOR	<LOR	n/a	
1,3-Dichlorobenzene	0.5	<LOR	<LOR	n/a	
1,4-Dichlorobenzene	0.5	<LOR	<LOR	n/a	
1,2-Dichlorobenzene	0.5	<LOR	<LOR	n/a	
1,2,4-Trichlorobenzene	0.5	<LOR	<LOR	n/a	
1,2,3-Trichlorobenzene	0.5	<LOR	<LOR	n/a	
EP-074G-SS : Trihalomethanes					
Chloroform	0.5	<LOR	<LOR	n/a	
Bromodichloromethane	0.5	<LOR	<LOR	n/a	
Dibromochloromethane	0.5	<LOR	<LOR	n/a	
Bromoform	0.5	<LOR	<LOR	n/a	
EP-074H-SS : PAH					
Naphthalene	5	<LOR	<LOR	n/a	
EP-074J-SS : Nitrogenated Compounds					
Acrylonitrile	--	--	--	n/a	
EP-074S-SS : Surrogates					
1,2-Dichloroethane-d4	1%	95.3%	92.5%	2.98	0 - 20
Toluene-d8	1%	98.6%	95.1%	3.61	0 - 20
4-Bromofluorobenzene	1%	95.8%	92.8%	3.18	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No. : NVSCS485
MATRIX : Soils
ANALYST: A.ROSSI

COMPOUND	LOR	QC DUPLICATE RESULTS ES33452 19	QC DUPLICATE RESULTS ES33452 19D	RPD RPD	RPD Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-074A-SS : Monocyclic Aromatics					
Benzene	0.5	<LOR	<LOR	n/a	
Toluene	0.5	<LOR	<LOR	n/a	
Ethylbenzene	0.5	<LOR	<LOR	n/a	
m & p-Xylene	0.5	<LOR	<LOR	n/a	
Styrene	0.5	<LOR	<LOR	n/a	
o-Xylene	0.5	<LOR	<LOR	n/a	
Isopropylbenzene	0.5	<LOR	<LOR	n/a	
n-Propylbenzene	0.5	<LOR	<LOR	n/a	
1,3,5-Trimethylbenzene	0.5	<LOR	<LOR	n/a	
sec-Butylbenzene	0.5	<LOR	<LOR	n/a	
1,2,4-Trimethylbenzene	0.5	<LOR	<LOR	n/a	
tert-Butylbenzene	0.5	<LOR	<LOR	n/a	
p-Isopropyltoluene	0.5	<LOR	<LOR	n/a	
n-Butylbenzene	0.5	<LOR	<LOR	n/a	
EP-074B-SS : Oxygenated Compounds					
2-Propanone(Acetone)	5	<LOR	<LOR	n/a	
Vinyl acetate	5	<LOR	<LOR	n/a	
2-Butanone (MEK)	5	<LOR	<LOR	n/a	
4-Methyl-2-pentanone (MIBK)	5	<LOR	<LOR	n/a	
2-Hexanone (MBK)	5	<LOR	<LOR	n/a	
EP-074C-SS : Sulfonated Compounds					
Carbondisulfide	0.5	<LOR	<LOR	n/a	
EP-07D-SS : Fumigants					
2,2-Dichloropropane	0.5	<LOR	<LOR	n/a	
1,2-Dichloropropane	0.5	<LOR	<LOR	n/a	
cis-1,3-Dichloropropene	1	<LOR	<LOR	n/a	
trans-1,3-Dichloropropene	1	<LOR	<LOR	n/a	
1,2-Dibromoethane	0.5	<LOR	<LOR	n/a	

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No. : NVSCS485
MATRIX : Soils
ANALYST: A.ROSSI

COMPOUND	LOR	QC DUPLICATE RESULTS ES33452 19	QC DUPLICATE RESULTS ES33452 19D	RPD RPD	RPD Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-074E-SS : Chlorinated Aliphatic Compounds					
Dichlorodifluoromethane	5	<LOR	<LOR	n/a	
Chloromethane	5	<LOR	<LOR	n/a	
Vinyl chloride	5	<LOR	<LOR	n/a	
Bromomethane	5	<LOR	<LOR	n/a	
Chloroethane	5	<LOR	<LOR	n/a	
Trichlorofluoromethane	5	<LOR	<LOR	n/a	
1,1-Dichloroethene	0.5	<LOR	<LOR	n/a	
Iodomethane	0.5	<LOR	<LOR	n/a	
Methylene chloride	0.5	<LOR	<LOR	n/a	
trans-1,2-Dichloroethene	0.5	<LOR	<LOR	n/a	
1,1-Dichloroethane	0.5	<LOR	<LOR	n/a	
cis-1,2-Dichloroethene	0.5	<LOR	<LOR	n/a	
1,1,1-Trichloroethane	0.5	<LOR	<LOR	n/a	
1,1-Dichloropropylene	0.5	<LOR	<LOR	n/a	
Carbon tetrachloride	0.5	<LOR	<LOR	n/a	
1,2-Dichloroethane	0.5	<LOR	<LOR	n/a	
Trichloroethene	0.5	<LOR	<LOR	n/a	
Dibromomethane	0.5	<LOR	<LOR	n/a	
1,1,2-Trichloroethane	0.5	<LOR	<LOR	n/a	
1,3-Dichloropropane	0.5	<LOR	<LOR	n/a	
Tetrachloroethene	0.5	<LOR	<LOR	n/a	
1,1,1,2-Tetrachloroethane	0.5	<LOR	<LOR	n/a	
trans-1,4-Dichloro-2-butene	0.5	<LOR	<LOR	n/a	
cis-1,4-Dichloro-2-butene	0.5	<LOR	<LOR	n/a	
1,1,2,2-Tetrachloroethane	0.5	<LOR	<LOR	n/a	
1,2,3-Trichloropropane	0.5	<LOR	<LOR	n/a	
Pentachloroethane	0.5	<LOR	<LOR	n/a	
1,2-Dibromo-3-chloropropane	0.5	<LOR	<LOR	n/a	
Hexachlorobutadiene	0.5	<LOR	<LOR	n/a	

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No.: NVSCS485
MATRIX: Soils
ANALYST: A.ROSSI

COMPOUND	LOR	QC DUPLICATE RESULTS ES33452 19	QC DUPLICATE RESULTS ES33452 19D	RPD RPD	RPD Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-074F-SS : Chlorinated Aromatic Compounds					
Chlorobenzene	0.5	<LOR	<LOR	n/a	
Bromobenzene	0.5	<LOR	<LOR	n/a	
2-Chlorotoluene	0.5	<LOR	<LOR	n/a	
4-Chlorotoluene	0.5	<LOR	<LOR	n/a	
1,3-Dichlorobenzene	0.5	<LOR	<LOR	n/a	
1,4-Dichlorobenzene	0.5	<LOR	<LOR	n/a	
1,2-Dichlorobenzene	0.5	<LOR	<LOR	n/a	
1,2,4-Trichlorobenzene	0.5	<LOR	<LOR	n/a	
1,2,3-Trichlorobenzene	0.5	<LOR	<LOR	n/a	
EP-074G-SS : Trihalomethanes					
Chloroform	0.5	0.347	0.353	1.71	No limit
Bromodichloromethane	0.5	<LOR	<LOR	n/a	
Dibromochloromethane	0.5	<LOR	<LOR	n/a	
Bromoform	0.5	<LOR	<LOR	n/a	
EP-074H-SS : PAH					
Naphthalene	5	<LOR	<LOR	n/a	
EP-074J-SS : Nitrogenated Compounds					
Acrylonitrile	--	--	--	n/a	
EP-074S-SS : Surrogates					
1,2-Dichloroethane-d4	1%	94.9%	87.4%	8.23	0 - 20
Toluene-d8	1%	94.4%	88.9%	6	0 - 20
4-Bromofluorobenzene	1%	90%	85.4%	5.25	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL -- MATRIX SPIKE/DUPLICATE

ALS EP-074 : Volatile Organic Compounds

QC LOT No. : NVSCS485 ANALYST : A.ROSSI

MATRIX: Soils Sample ID: ES33452-17

COMPOUND	Sample Results	Spike Level	SPIKE QC RESULTS				Cont. Limit
			MS Rec.	MSD Rec.	Average Rec.	RPD	RPD
	mg/kg	mg/kg	%	%	%	%	%
EP-074A-SS : Monocyclic Aromatics							
Benzene	<LOR	2.5	110	107	109	2.76	0 - 35
Toluene	<LOR	2.5	90.2	83.2	86.7	8.07	0 - 35
EP-074E-SS : Chlorinated Aliphatic Compounds							
1,1-Dichloroethene	<LOR	2.5	107	96.1	102	10.7	0 - 35
Trichloroethene	<LOR	2.5	87.3	86.9	87.1	0.459	0 - 35
EP-074F-SS : Chlorinated Aromatic Compounds							
Chlorobenzene	<LOR	2.5	94.9	90.3	92.6	4.97	0 - 35
EP-074S-SS : Surrogates							
1,2-Dichloroethane-d4	95.3%	5	95.6	93.3	94.5	2.44	0 - 35
Toluene-d8	98.6%	5	97.3	86.3	91.8	12	0 - 35
4-Bromofluorobenzene	95.8%	5	95.8	88.2	92	8.26	0 - 35

COMMENTS:

1) The RPD control limits are fixed.

2) *: RPD falls outside the recommended control limit.

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCW1128 ANALYST E. FADJAR

MATRIX: Waters

	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
COMPOUND	ug/L	ug/L	%		%	%	Low	High	%
EP-075A : PHENOLS									
Phenol	<2.0	5.0	42.2	39.6	40.9	6.36	29.8	58.6	0 - 35
2-Chlorophenol	<2.0	5.0	91	73.9	82.5	20.7	63.6	118	0 - 35
2-Methylphenol	<2.0	5.0	92.6	86.8	89.7	6.47	57.4	105	0 - 35
4-Methylphenol	<2.0	10.0	81.9	81.1	81.5	0.98	50.4	95.8	0 - 35
2-Nitrophenol	<2.0	5.0	91.3	76.8	84.1	17.3	57.2	121	0 - 35
2,4-Dimethylphenol	<2.0	5.0	89.1	81.2	85.2	9.28	65.3	107	0 - 35
2,4-Dichlorophenol	<2.0	5.0	85.5	67.7	76.6	23.2	59.6	109	0 - 35
2,6-Dichlorophenol	<2.0	5.0	88.6	83.4	86	6.05	63.8	118	0 - 35
4-Chloro-3-methylphenol	<2.0	5.0	85	85.3	85.2	0.35	61.5	115	0 - 35
2,4,6-Trichlorophenol	<2.0	5.0	86.9	95.6	91.3	9.53	48.6	129	0 - 35
2,4,5-Trichlorophenol	<2.0	5.0	80	85.4	82.7	6.53	50.1	118	0 - 35
Pentachlorophenol	<4.0	10.0	52.5	41.3	46.9	23.9	2.66	91.4	0 - 35
EP-075B : POLYAROMATIC HYDROCARBONS									
Naphthalene	<2.0	5.0	89.4	81.1	85.3	9.74	61.6	115	0 - 35
2-Methylnaphthalene	<2.0	5.0	89.6	83.3	86.5	7.29	59.8	118	0 - 35
2-Chloronaphthalene	<2.0	5.0	87.3	92.9	90.1	6.22	64.7	115	0 - 35
Acenaphthylene	<2.0	5.0	89.6	82.7	86.2	8.01	60.1	122	0 - 35
Acenaphthene	<2.0	5.0	97.2	83.6	90.4	15	64.6	117	0 - 35
Fluorene	<2.0	5.0	90.9	81	86	11.5	64.5	117	0 - 35
Phenanthrene	<2.0	5.0	95.6	84.4	90	12.4	66	122	0 - 35
Anthracene	<2.0	5.0	97.4	86.8	92.1	11.5	65.1	124	0 - 35
Fluoranthene	<2.0	5.0	96.9	84.4	90.7	13.8	60.9	126	0 - 35
Pyrene	<2.0	5.0	93.2	83.6	88.4	10.9	66.8	121	0 - 35
N-2-Fluorenylacetamide	<2.0	5.0	90.3	83.8	87.1	7.47	55.6	118	0 - 35
Benz(a)anthracene	<2.0	5.0	96.5	84.8	90.7	12.9	66.2	121	0 - 35
Chrysene	<2.0	5.0	97.2	86.2	91.7	12	62.8	126	0 - 35
Benzo(b)&(k)fluoranthene	<4.0	10.0	93.6	89.2	91.4	4.81	63.9	117	0 - 35
7,12-Dimethylbenz(a)anthracene	<2.0	5.0	82.8	81.4	82.1	1.71	65.7	104	0 - 35
Benzo(a)pyrene	<2.0	5.0	92.7	88.3	90.5	4.86	62.9	118	0 - 35
3-Methylchloanthrene	<2.0	5.0	87.7	87.1	87.4	0.69	63.7	111	0 - 35
Indeno(1,2,3-cd)pyrene	<2.0	5.0	92.1	91.2	91.7	0.98	56.7	118	0 - 35
Dibenz(a,h)anthracene	<2.0	5.0	90.6	89.9	90.3	0.78	56.7	119	0 - 35
Benzo(g,h,i)perylene	<2.0	5.0	91.6	90.4	91	1.32	53.8	120	0 - 35

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No.: NSVOCW1128 ANALYST E. FADJAR

MATRIX: Waters

	Blank	Spike	SPIKE QC RESULTS				Control Limits		
	Conc	Level	SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
COMPOUND	ug/L	ug/L	%		%	%	Low	High	%
EP-075S : ACID EXTRACTABLE SURROGATES									
2-Fluorophenol	54.9%	10.0	62.6	46.5	54.6	29.5	34.3	115	0 - 35
Phenol-d6	33.3%	10.0	43.1	30.8	37	33.3	26.7	55.1	0 - 35
2-Chlorophenol-d4	85.2%	10.0	96.4	75.8	86.1	23.9	35.4	147	0 - 35
2,4,6-Tribromophenol	95.5%	10.0	93.8	79.2	86.5	16.9	51.7	121	0 - 35
EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES									
Nitrobenzene-d5	82.7%	10.0	99.8	77.2	88.5	25.5	66.3	122	0 - 35
1,2-Dichlorobenzene-d4	103%	10.0	72.3	67.1	69.7	7.46	41.3	99.9	0 - 35
2-Fluorobiphenyl	72%	10.0	75.5	69.4	72.5	8.42	49.4	119	0 - 35
Anthracene-d10	89.7%	10.0	102	88.7	95.4	13.9	64.6	128	0 - 35
4-Terphenyl-d14	103%	10.0	95.7	84.8	90.3	12.1	57	140	0 - 35

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1738 ANALYST ALICE TAT

MATRIX: Soils

	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
COMPOUND	mg/kg	mg/kg	%		%	%	Low	High	%
EP-075A : PHENOLS									
Phenol	<0.25	1.25	79.2	83.6	81.4	5.41	73.1	132	0 - 35
2-Chlorophenol	<0.25	1.25	84.4	86.8	85.6	2.8	75.7	123	0 - 35
2-Methylphenol	<0.25	1.25	86.7	92.4	89.6	6.37	70.4	117	0 - 35
4-Methylphenol	<0.25	2.5	70	74.3	72.2	5.96	62	117	0 - 35
2-Nitrophenol	<0.25	1.25	80.4	75.1	77.8	6.82	57.3	117	0 - 35
2,4-Dimethylphenol	<0.25	1.25	78.1	80.4	79.3	2.9	42.4	113	0 - 35
2,4-Dichlorophenol	<0.25	1.25	83.5	85	84.3	1.78	65	108	0 - 35
2,6-Dichlorophenol	<0.25	1.25	82.6	81.8	82.2	0.97	71.2	116	0 - 35
4-Chloro-3-methylphenol	<0.25	1.25	83.4	82.5	83	1.08	65.6	123	0 - 35
2,4,6-Trichlorophenol	<0.25	1.25	81.8	83.1	82.5	1.58	56.4	119	0 - 35
2,4,5-Trichlorophenol	<0.25	1.25	79.1	86.6	82.9	9.05	59.4	125	0 - 35
Pentachlorophenol	<0.5	2.5	57	58.8	57.9	3.11	11	106	0 - 35
EP-075B : POLYAROMATIC HYDROCARBONS									
Naphthalene	<0.25	1.25	83.9	84.1	84	0.24	75.7	117	0 - 35
2-Methylnaphthalene	<0.25	1.25	84.5	82.7	83.6	2.15	67.3	119	0 - 35
2-Chloronaphthalene	<0.25	1.25	81.8	82.7	82.3	1.09	63	121	0 - 35
Acenaphthylene	<0.25	1.25	77	77.9	77.5	1.16	62.6	117	0 - 35
Acenaphthene	<0.25	1.25	81.5	81.9	81.7	0.49	69.3	122	0 - 35
Fluorene	<0.25	1.25	80.5	81.2	80.9	0.87	69.2	119	0 - 35
Phenanthrene	<0.25	1.25	81.5	82.6	82.1	1.34	76.2	116	0 - 35
Anthracene	<0.25	1.25	83	81.8	82.4	1.46	69.5	121	0 - 35
Fluoranthene	<0.25	1.25	84.4	80.3	82.4	4.98	74.3	117	0 - 35
Pyrene	<0.25	1.25	84.9	79.6	82.3	6.44	65	124	0 - 35
N-2-Fluorenylacetamide	<0.25	1.25	82.4	77	79.7	6.78	56.7	121	0 - 35
Benz(a)anthracene	<0.25	1.25	82.2	79.1	80.7	3.84	68.3	121	0 - 35
Chrysene	<0.25	1.25	84.4	79.2	81.8	6.36	66.8	121	0 - 35
Benzo(b)&(k)fluoranthene	<0.5	2.5	82.8	81.5	82.2	1.58	64.5	125	0 - 35
7,12-Dimethylbenz(a)anthracene	<0.25	1.25	68.4	67.7	68.1	1.03	54.8	116	0 - 35
Benzo(a)pyrene	<0.25	1.25	79.2	79.2	79.2	0	64	124	0 - 35
3-Methylchloanthrene	<0.25	1.25	80.1	75.7	77.9	5.65	55.9	122	0 - 35
Indeno(1,2,3-cd)pyrene	<0.25	1.25	82.8	83.8	83.3	1.2	56.9	127	0 - 35
Dibenz(a,h)anthracene	<0.25	1.25	83.2	81.2	82.2	2.43	49.1	131	0 - 35
Benzo(g,h,i)perylene	<0.25	1.25	85	81.2	83.1	4.57	17.9	161	0 - 35

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1738 ANALYST ALICE TAT

MATRIX: Soils

	Blank	Spike	SPIKE QC RESULTS				Control Limits		
	Conc	Level	SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
COMPOUND	mg/kg	mg/kg	%		%	%	Low	High	%
EP-075S : ACID EXTRACTABLE SURROGATES									
2-Fluorophenol	109%	2.5	107	103	105	3.81	83	135	0 - 35
Phenol-d6	104%	2.5	92.8	94.7	93.8	2.03	77.7	132	0 - 35
2-Chlorophenol-d4	103%	2.5	90.6	91.4	91	0.88	79.7	128	0 - 35
2,4,6-Tribromophenol	90.6%	2.5	85.9	85.1	85.5	0.94	59.9	129	0 - 35
EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES									
Nitrobenzene-d5	93.4%	2.5	81.4	83.4	82.4	2.43	65.1	125	0 - 35
1,2-Dichlorobenzene-d4	89.9%	2.5	83	84.2	83.6	1.44	59.1	119	0 - 35
2-Fluorobiphenyl	101%	2.5	88.3	88.9	88.6	0.68	65.5	126	0 - 35
Anthracene-d10	104%	2.5	86.8	83.2	85	4.24	77	126	0 - 35
4-Terphenyl-d14	103%	2.5	91.7	84.6	88.2	8.05	75.6	135	0 - 35

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1738
MATRIX : Soils
ANALYST: ALICE TAT

COMPOUND	LOR	QC DUPLICATE RESULTS ES33357 1	ES33357 1D	RPD	
				RPD	Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-075A : PHENOLS					
Phenol	0.25	<0.25	<0.25	n/a	
2-Chlorophenol	0.25	<0.25	<0.25	n/a	
2-Methylphenol	0.25	<0.25	<0.25	n/a	
4-Methylphenol	0.25	<0.25	<0.25	n/a	
2-Nitrophenol	0.25	<0.25	<0.25	n/a	
2,4-Dimethylphenol	0.25	<0.25	<0.25	n/a	
2,4-Dichlorophenol	0.25	<0.25	<0.25	n/a	
2,6-Dichlorophenol	0.25	<0.25	<0.25	n/a	
4-Chloro-3-methylphenol	0.25	<0.25	<0.25	n/a	
2,4,6-Trichlorophenol	0.25	<0.25	<0.25	n/a	
2,4,5-Trichlorophenol	0.25	<0.25	<0.25	n/a	
Pentachlorophenol	0.5	<0.5	<0.5	n/a	
EP-075B : POLYNUCLEAR AROMATIC HYDROCARBONS					
Naphthalene	0.25	<0.25	<0.25	n/a	
2-Methylnaphthalene	0.25	<0.25	<0.25	n/a	
2-Chloronaphthalene	0.25	<0.25	<0.25	n/a	
Acenaphthylene	0.25	<0.25	<0.25	n/a	
Acenaphthene	0.25	<0.25	<0.25	n/a	
Fluorene	0.25	<0.25	<0.25	n/a	
Phenanthrene	0.25	<0.25	<0.25	n/a	
Anthracene	0.25	<0.25	<0.25	n/a	
Fluoranthene	0.25	<0.25	<0.25	n/a	
Pyrene	0.25	<0.25	<0.25	n/a	
N-2-Fluorenylacetamide	0.25	<0.25	<0.25	n/a	
Benz(a)anthracene	0.25	<0.25	<0.25	n/a	
Chrysene	0.25	<0.25	<0.25	n/a	
Benzo(b)&(k)fluoranthene	0.5	<0.5	<0.5	n/a	
7,12-Dimethylbenz(a)anthracene	0.25	<0.25	<0.25	n/a	
Benzo(a)pyrene	0.25	<0.25	<0.25	n/a	
3-Methylchloanthrene	0.25	<0.25	<0.25	n/a	
Indeno(1,2,3-cd)pyrene	0.25	<0.25	<0.25	n/a	
Dibenz(a,h)anthracene	0.25	<0.25	<0.25	n/a	
Benzo(g,h,i)perylene	0.25	<0.25	<0.25	n/a	

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1738
MATRIX : Soils
ANALYST: ALICE TAT

COMPOUND	LOR	QC DUPLICATE RESULTS		RPD	
		ES33357 1	ES33357 1D	RPD	Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-075S : ACID EXTRACTABLE SURROGATES					
2-Fluorophenol	1%	94%	90.2%	4.13	0 - 35
Phenol-d6	1%	86.1%	82.8%	3.91	0 - 35
2-Chlorophenol-d4	1%	85%	83.1%	2.26	0 - 35
2,4,6-Tribromophenol	1%	81.4%	73.8%	9.79	0 - 35
EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES					
Nitrobenzene-d5	1%	85.4%	82.2%	3.82	0 - 35
1,2-Dichlorobenzene-d4	1%	76.7%	76.9%	0.26	0 - 35
2-Fluorobiphenyl	1%	85.5%	81.4%	4.91	0 - 35
Anthracene-d10	1%	92.4%	90.8%	1.75	0 - 35
4-Terphenyl-d14	1%	90%	86.3%	4.2	0 - 35

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1738
MATRIX : Soils
ANALYST: ALICE TAT

COMPOUND	LOR	QC DUPLICATE RESULTS ES33357 9	ES33357 9D	RPD RPD	Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-075A : PHENOLS					
Phenol	0.25	<0.25	<0.25	n/a	
2-Chlorophenol	0.25	<0.25	<0.25	n/a	
2-Methylphenol	0.25	<0.25	<0.25	n/a	
4-Methylphenol	0.25	<0.25	<0.25	n/a	
2-Nitrophenol	0.25	<0.25	<0.25	n/a	
2,4-Dimethylphenol	0.25	<0.25	<0.25	n/a	
2,4-Dichlorophenol	0.25	<0.25	<0.25	n/a	
2,6-Dichlorophenol	0.25	<0.25	<0.25	n/a	
4-Chloro-3-methylphenol	0.25	<0.25	<0.25	n/a	
2,4,6-Trichlorophenol	0.25	<0.25	<0.25	n/a	
2,4,5-Trichlorophenol	0.25	<0.25	<0.25	n/a	
Pentachlorophenol	0.5	<0.5	<0.5	n/a	
EP-075B : POLYNUCLEAR AROMATIC HYDROCARBONS					
Naphthalene	0.25	<0.25	<0.25	n/a	
2-Methylnaphthalene	0.25	<0.25	<0.25	n/a	
2-Chloronaphthalene	0.25	<0.25	<0.25	n/a	
Acenaphthylene	0.25	<0.25	<0.25	n/a	
Acenaphthene	0.25	<0.25	<0.25	n/a	
Fluorene	0.25	<0.25	<0.25	n/a	
Phenanthrene	0.25	<0.25	<0.25	n/a	
Anthracene	0.25	<0.25	<0.25	n/a	
Fluoranthene	0.25	<0.25	<0.25	n/a	
Pyrene	0.25	<0.25	<0.25	n/a	
N-2-Fluorenylacetamide	0.25	<0.25	<0.25	n/a	
Benz(a)anthracene	0.25	<0.25	<0.25	n/a	
Chrysene	0.25	<0.25	<0.25	n/a	
Benzo(b)&(k)fluoranthene	0.5	<0.5	<0.5	n/a	
7,12-Dimethylbenz(a)anthracene	0.25	<0.25	<0.25	n/a	
Benzo(a)pyrene	0.25	<0.25	<0.25	n/a	
3-Methylchloanthrene	0.25	<0.25	<0.25	n/a	
Indeno(1,2,3-cd)pyrene	0.25	<0.25	<0.25	n/a	
Dibenz(a,h)anthracene	0.25	<0.25	<0.25	n/a	
Benzo(g,h,i)perylene	0.25	<0.25	<0.25	n/a	

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1738
MATRIX : Soils
ANALYST: ALICE TAT

COMPOUND	LOR	QC DUPLICATE RESULTS ES33357 9	QC DUPLICATE RESULTS ES33357 9D	RPD RPD	RPD Cont. Limit
	mg/kg	mg/kg	mg/kg	%	
EP-075S : ACID EXTRACTABLE SURROGATES					
2-Fluorophenol	1%	91.3%	106%	14.9	0 - 35
Phenol-d6	1%	95.6%	104%	8.42	0 - 35
2-Chlorophenol-d4	1%	88.2%	101%	13.5	0 - 35
2,4,6-Tribromophenol	1%	90.2%	97.3%	7.57	0 - 35
EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES					
Nitrobenzene-d5	1%	86.1%	94.6%	9.41	0 - 35
1,2-Dichlorobenzene-d4	1%	80.7%	92.2%	13.3	0 - 35
2-Fluorobiphenyl	1%	91%	102%	11.4	0 - 35
Anthracene-d10	1%	89.3%	99%	10.3	0 - 35
4-Terphenyl-d14	1%	86.5%	94.6%	8.95	0 - 35

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL -- MATRIX SPIKE/DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCS1738 ANALYST : ALICE TAT

MATRIX: Soils Sample ID: ES33357-9

COMPOUND	Sample Results	Spike Level	SPIKE QC RESULTS				Cont. Limit
			MS Rec.	MSD Rec.	Average Rec.	RPD	RPD
	mg/kg	mg/kg	%	%	%	%	%
EP-075A : PHENOLS							
Phenol	<0.25	5	81.9	83	82.5	1.33	0 - 35
2-Chlorophenol	<0.25	5	88	85.9	87	2.42	0 - 35
2-Nitrophenol	<0.25	5	80	81	80.5	1.24	0 - 35
4-Chloro-3-methylphenol	<0.25	5	88.2	88.7	88.5	0.565	0 - 35
Pentachlorophenol	<0.5	5	85.6	81.7	83.7	4.66	0 - 35
EP-075B : POLYAROMATIC HYDROCARBONS							
Acenaphthene	<0.25	5	89.1	86.2	87.7	3.31	0 - 35
Pyrene	<0.25	5	92.5	90.1	91.3	2.63	0 - 35
EP-075S : ACID EXTRACTABLE SURROGATES							
2-Fluorophenol	91.3%	2.5	101	97.7	99.4	3.32	0 - 35
Phenol-d6	95.6%	2.5	92.9	89.9	91.4	3.28	0 - 35
2-Chlorophenol-d4	88.2%	2.5	90.4	85.3	87.9	5.81	0 - 35
2,4,6-Tribromophenol	90.2%	2.5	90.4	83	86.7	8.54	0 - 35
EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES							
Nitrobenzene-d5	86.1%	2.5	87.1	82.1	84.6	5.91	0 - 35
1,2-Dichlorobenzene-d4	80.7%	2.5	79.7	76.6	78.2	3.97	0 - 35
2-Fluorobiphenyl	91%	2.5	88.4	82.7	85.6	6.66	0 - 35
Anthracene-d10	89.3%	2.5	87.9	83.6	85.8	5.01	0 - 35
4-Terphenyl-d14	86.5%	2.5	86.5	82.2	84.4	5.1	0 - 35

COMMENTS:

1) The RPD control limits are fixed.

2) *: RPD falls outside the recommended control limit.

SRAES34003

ALS Environmental

SAMPLE RECEIPT ADVICE

COMPANY: HLA-ENVIROSCIENCES PTY LTD
ATTENTION: MS RACHAEL CASSON
DATE: Jun. 11, 2002
FROM: Karin White, ENV SYDNEY

ALS has received samples pertaining to your reference: HOMEBUSH-J1938

For future reference the batch number on this order is: ES34003

All samples and paper work were received in good order.
Samples have been received within recommended holding times.
Samples chilled when received.
Samples received in appropriately pretreated and preserved containers.
Please direct any turnaround/technical queries to Michael Heery.
Any queries relating to sample condition/numbering/breakages should be directed to Wael Saleh.
ANALYTICAL WORK FOR THIS BATCH WILL BE CONDUCTED AT ALS SYDNEY
All aqueous samples are stored for two weeks and solid samples for three months from the date of completion of the batch, unless specific arrangements are made otherwise.

Purchase Order Number: HOMEBUSH-J1938

You can expect results to be reported as detailed below:

All Environmental Results	Jun. 17, 2002

Comments: This is a rebatch of ES33564.

A L S - SERVICING YOUR NEEDS BETTER

AUSTRALIAN LABORATORY SERVICES P/L
ABN: 84 009 936 029

BRISBANE	SYDNEY	MELBOURNE	NEWCASTLE	AUCKLAND
Tel: 61-7-3243 7222	Tel: 61-2-8784 8555	Tel: 61-3-9538 4444	Tel: 61-2-4968 9433	Tel: 64-9-379 9437
Fax: 61-7-3243 7218	Fax: 61-2-8784 8500	Fax: 61-3-9538 4400	Fax: 61-2-4968 0349	Fax: 64-9-379 1449

FACSIMILE TRANSMISSION

REBATCH.

To: ALS

Attention: Nanthini

Fax Number: 8784 8500

From: Rachael Casson

Date: 31 May 2002

FAXED

Subject: Additional Analysis

Project Number: Homebush – J1938

Number of pages (including this cover sheet): 3

Documents faxed in this transmission to follow by mail: No

Batch No.: ☐ ORG
ES 34003
batched date: 7/6/2
☑ Soil ☑ Ambient
☐ Water ☐ Chilled
☐ Other ___°C
☐ Subcontract Work
☐ Bottle Return
☐ Imm. Anal. Actioned
14 x Soil Jars
am TAM

Message:

Nanthini,

Could you please arrange for the following additional analysis for ALS project ES33564 to be undertaken:

- Hexavalent Chromium for (1) BH37_0-0.2, (2) BH41_0.7-0.8, (3) BH27_0.03-0.1, (4) BH52_0.03-0.2 and ~~BH46_0.4-0.5;~~ ✗
- Benzo (a) Pyrene (B(a)P) for (5) BH53_0.4-0.6;
- TCLP – Nickel for (6) BH25_0.03-0.1, BH37_0-0.2, (7) BH40_0-0.1, ~~BH44_0.05-0.2~~ ✗ and ~~BH52_0.03-0.1;~~ ✗
- TCLP – Lead for (8) BH28_0.03-0.1, (9) BH33_0-0.1, BH41_0.7-0.8, (10) BH47_1.3-1.5 and (11) BH53_0.03-0.2;
- TCLP – Arsenic for (12) BH42_0-0.2;
- TCLP B(a)P for (13) ~~BH46_0.4-0.5~~ and BH53_0.03-0.2. Please analyse these samples using the lowest PQL. Also note that the samples are outside of recommended holding times; and
- TCLP – Chromium IV for BH37_0-0.2, BH41_0.7-0.8, BH27_0.03-0.1, (14) BH49_0.6-0.75 and BH46_0.4-0.5. ✗

✗ – insufficient sample. Client will get back with additional samples for analysis if

7/6/02

Cancel as per conv. w/RC.

7/6/1620.

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Pymble NSW 2073

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ALS Environmental

RECEIVED
21 JUN 2002

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES34003
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	0
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 726	**DATE RECEIVED:**	07/06/2002
	PYMBLE NSW 2073	**DATE COMPLETED:**	16/06/2002
		SAMPLE TYPE:	SOIL
ORDER No.:	HOMEBUSH-J1938	**No. of SAMPLES:**	4
PROJECT:			

COMMENTS

Cr6+ determined on a 1:5 soil/water extract. Results reported on a dry weight basis.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

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Signatory Greg Vogel

LABORATORIES

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Brisbane	*Hong Kong*	*Vancouver*
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Auckland	*Mumbai*	

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NATA No. 10918

Ba... E...03

CERTIFICATE OF ANALYSIS

Sub Batch: 0
Date of Issue: 18/06/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference:

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	2	3	4						
		Date Sampled											
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH37_ 0-0.2	BH41_ 0.7-0.8	BH27_ 0.03-0.1	BH52_ 0.03-0.2						
EA-055	Moisture Content (dried @ 103'C)	%	0.1	14.1	14.8	7.5	21.7						
EG-050	Hexavalent Chromium	mg/kg	1	<1	<1	<1	<1						

Batch: ES34003
Sub Batch: 0
Date of Issue: 18/06/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference:

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION										
		Laboratory I.D.		200	201	202								
		Date Sampled		07/06/2002	07/06/2002	07/06/2002								
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK	LCS	MS								
				CHECKS AND SPIKES										
EA-055	Moisture Content (dried @ 103'C)	%	0.1	----	----	----								
EG-050	Hexavalent Chromium	mg/kg	1	<1	100%	98.0%								

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES34003
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	1
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 726	**DATE RECEIVED:**	07/06/2002
	PYMBLE NSW 2073	**DATE COMPLETED:**	16/06/2002
		SAMPLE TYPE:	TCLP LEACHATE
ORDER No.:	HOMEBUSH-J1938	**No. of SAMPLES:**	11
PROJECT:			

COMMENTS

The concentrations reported are those determined on the TCLP leachate.

Extraction fluid #1 pH 4.88-4.98.

NOTES

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Auckland	*Mumbai*	

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NATA No. 10918

Batch: E[illegible]03
Sub Batch: 1
Date of Issue: 18/06/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference:

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		1	2	3	6	7	8	9	10	11	12
		Date Sampled											
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH37_ 0-0.2	BH41_ 0.7-0.8	BH27_ 0.03-0.1	BH25_ 0.03-0.1	BH40_ 0-0.1	BH28_ 0.03-0.1	BH33_ 0-0.1	BH47_ 1.3-1.5	BH53_ 0.03-0.2	BH42_ 0-0.2
ALS1	Initial pH		0.1	8.9	5.3	7.8	8.0	8.3	7.6	6.8	8.4	9.9	5.5
ALS2	After HCl pH		0.1	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.9	1.7
ALS3	Extraction Fluid Number		1	1	1	1	1	1	1	1	1	1	1
ALS4	pH After Extract		0.1	5.5	4.9	5.0	5.0	5.3	5.0	5.1	5.9	8.4	4.9
EG-005C	Arsenic - TCLP	mg/L	0.1	----	----	----	----	----	----	----	----	----	<0.1
EG-005C	Nickel - TCLP	mg/L	0.1	<0.1	----	----	<0.1	<0.1	----	----	----	----	----
EG-005C	Lead - TCLP	mg/L	0.1	----	<0.1	----	----	----	<0.1	<0.1	<0.1	<0.1	----
EG-050C	Hexavalent Chromium - TCLP	mg/L	0.1	<0.1	<0.1	<0.1	----	----	----	----	----	----	----

Ba ES 03
Sub Batch: 1
Date of Issue: 18/06/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference:

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION										
		Laboratory I.D.		14										
		Date Sampled												
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH49_ 0.6-0.75										
ALS1	Initial pH		0.1	5.7										
ALS2	After HCl pH		0.1	1.6										
ALS3	Extraction Fluid Number		1	1										
ALS4	pH After Extract		0.1	4.9										
EG-005C	Arsenic - TCLP	mg/L	0.1	----										
EG-005C	Nickel - TCLP	mg/L	0.1	----										
EG-005C	Lead - TCLP	mg/L	0.1	----										
EG-050C	Hexavalent Chromium - TCLP	mg/L	0.1	<0.1										

Ba[illegible] E[illegible]03

Sub Batch: 1

Date of Issue: 18/06/2002

Client: HLA-ENVIROSCIENCES PTY LTD

Client Reference:

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		200	201	202							
		Date Sampled		07/06/2002	07/06/2002	07/06/2002							
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK	LCS	MS							
				CHECKS AND SPIKES									
ALS1	Initial pH		0.1	----	----	----							
ALS2	After HCl pH		0.1	----	----	----							
ALS3	Extraction Fluid Number		1	----	----	----							
ALS4	pH After Extract		0.1	----	----	----							
EG-005C	Arsenic - TCLP	mg/L	0.1	<0.1	104%	113%							
EG-005C	Nickel - TCLP	mg/L	0.1	<0.1	102%	109%							
EG-005C	Lead - TCLP	mg/L	0.1	<0.1	103%	111%							
EG-050C	Hexavalent Chromium - TCLP	mg/L	0.1	<0.1	----	----							

Batch: ES[illegible]03
Sub Batch: 2
Date of Issue: 18/06/2002
Client: HLA-ENVIROSCIENCES PTY LTD
Client Reference:

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		5									
		Date Sampled											
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH53_ 0.4-0.6									
EA-055	Moisture Content (dried @ 103°C)	%	0.1	10.8									
EP-076A-SS	**POLYNUCLEAR AROMATIC HYDROCARBONS**												
EP-076A-SS	Benzo(a)pyrene	mg/kg	0.5	<0.5									
EP-076S-SS	**SURROGATE COMPOUNDS**												
EP-076S-SS	2-Fluorobiphenyl	%	1	102									
EP-076S-SS	Anthracene-d10	%	1	107									
EP-076S-SS	p-Terphenyl-d14	%	1	101									

Ba[illegible] EL[illegible]03

Sub Batch: 2

Date of Issue: 18/06/2002

Client: HLA-ENVIROSCIENCES PTY LTD

Client Reference:

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		100	101	102							
		Date Sampled		07/06/2002	07/06/2002	07/06/2002							
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK	NEP076S586 SCS	NEP076S586 DCS							
				CHECKS AND SPIKES									
EA-055	Moisture Content (dried @ 103'C)	%	0.1	----	----	----							
EP-076A-SS	**POLYNUCLEAR AROMATIC HYDROCARBONS**												
EP-076A-SS	Benzo(a)pyrene	mg/kg	0.5	<0.5	93.3%	88.2%							
EP-076S-SS	**SURROGATE COMPOUNDS**												
EP-076S-SS	2-Fluorobiphenyl	%	1	95	91	92							
EP-076S-SS	Anthracene-d10	%	1	108	95	96							
EP-076S-SS	p-Terphenyl-d14	%	1	109	102	101							

ALS Environmental

CERTIFICATE OF ANALYSIS

CONTACT:	MS RACHAEL CASSON	**BATCH:**	ES34003
CLIENT:	HLA-ENVIROSCIENCES PTY LTD	**SUB BATCH:**	3
ADDRESS:		**LABORATORY:**	SYDNEY
	P O BOX 726	**DATE RECEIVED:**	07/06/2002
	PYMBLE NSW 2073	**DATE COMPLETED:**	16/06/2002
		SAMPLE TYPE:	TCLP LEACHATE
ORDER No.:	HOMEBUSH-J1938	**No. of SAMPLES:**	2
PROJECT:			

COMMENTS

The concentrations reported are those determined on the TCLP leachate.

Extraction fluid #1 pH 4.88-4.98. Extraction fluid #2 pH 2.83-2.93.

NOTES

This is the Final Report and supersedes any preliminary reports with this batch number.
All pages of this report have been checked and approved for release.

ISSUING LABORATORY: SYDNEY

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Signatory

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NATA No. 10918

Ba... EL...03

Sub Batch: 3

Date of Issue: 18/06/2002

Client: HLA-ENVIROSCIENCES PTY LTD

Client Reference:

CERTIFICATE OF ANALYSIS

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		11	13								
		Date Sampled											
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	BH53_ 0.03-0.2	BH46_ 0.4-0.5								
ALS1	Initial pH		0.1	9.9	10.3								
ALS2	After HCl pH		0.1	1.9	8.2								
ALS3	Extraction Fluid Number		1	1	2								
ALS4	pH After Extract		0.1	8.4	8.0								
EP-075B-WS	**POLYNUCLEAR AROMATICS**												
EP-075B-WS	Benzo(a)pyrene	ug/L	0.3	<0.3	<0.3								
EP-075T-WS	**BASE/NEUTRAL EXTRACTABLE SURROGATES**												
EP-075T-WS	Nitrobenzene-D5	%	1	77	85								
EP-075T-WS	1.2-Dichlorobenzene-D4	%	1	76	81								
EP-075T-WS	2-Fluorobiphenyl	%	1	74	83								
EP-075T-WS	Anthracene-d10	%	1	86	94								
EP-075T-WS	p-Terphenyl-D14	%	1	75	82								

E h: 1003

Sub Batch: 3

Date of Issue: 18/06/2002

Client: HLA-ENVIROSCIENCES PTY LTD

Client Reference:

QUALITY CONTROL REPORT

				SAMPLE IDENTIFICATION									
		Laboratory I.D.		100	101	102							
		Date Sampled		07/06/2002	07/06/2002	07/06/2002							
METHOD	ANALYSIS DESCRIPTION	UNIT	LOR	METHOD BLANK	NSVOCW1134 SCS	NSVOCW1134 DCS							
				CHECKS AND SPIKES									
ALS1	Initial pH		0.1	----	----	----							
ALS2	After HCl pH		0.1	----	----	----							
ALS3	Extraction Fluid Number		1	----	----	----							
ALS4	pH After Extract		0.1	----	----	----							
EP-075B-WS	**POLYNUCLEAR AROMATICS**												
EP-075B-WS	Benzo(a)pyrene	ug/L	0.3	<0.3	91.5%	109%							
EP-075T-WS	**BASE/NEUTRAL EXTRACTABLE SURROGATES**												
EP-075T-WS	Nitrobenzene-D5	%	1	103	104	103							
EP-075T-WS	1.2-Dichlorobenzene-D4	%	1	71	84	95							
EP-075T-WS	2-Fluorobiphenyl	%	1	85	95	112							
EP-075T-WS	Anthracene-d10	%	1	69	70	81							
EP-075T-WS	p-Terphenyl-D14	%	1	63	61	69							

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCW1134 ANALYST E. FADJAR

MATRIX: Waters

	Blank	Spike	SPIKE QC RESULTS				Control Limits		
	Conc	Level	SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
COMPOUND	ug/L	ug/L	%		%	%	Low	High	%
EP-075A : PHENOLS									
Phenol	<2.0	5.0	43.8	50.7	47.3	14.6	20.4	63.7	0 - 35
2-Chlorophenol	<2.0	5.0	94.7	112	103	16.7	47	129	0 - 35
2-Methylphenol	<2.0	5.0	84	98.4	91.2	15.8	43.3	116	0 - 35
4-Methylphenol	<2.0	10.0	77	89	83	14.5	35.4	109	0 - 35
2-Nitrophenol	<2.0	5.0	101	117	109	14.7	40	133	0 - 35
2,4-Dimethylphenol	<2.0	5.0	91.3	107	99.2	15.8	43.8	118	0 - 35
2,4-Dichlorophenol	<2.0	5.0	94.5	114	104	18.7	42	130	0 - 35
2,6-Dichlorophenol	<2.0	5.0	99.7	104	102	4.22	43.6	135	0 - 35
4-Chloro-3-methylphenol	<2.0	5.0	95.2	103	99.1	7.87	41.9	129	0 - 35
2,4,6-Trichlorophenol	<2.0	5.0	95.4	110	103	14.2	43.1	130	0 - 35
2,4,5-Trichlorophenol	<2.0	5.0	94.1	102	98.1	8.06	39	128	0 - 35
Pentachlorophenol	<4.0	10.0	71.7	91	81.4	23.7	0	107	0 - 35
EP-075B : POLYAROMATIC HYDROCARBONS									
Naphthalene	<2.0	5.0	95.4	112	104	16	47	131	0 - 35
2-Methylnaphthalene	<2.0	5.0	98.1	116	107	16.7	47.2	131	0 - 35
2-Chloronaphthalene	<2.0	5.0	94.2	113	104	18.1	47.6	127	0 - 35
Acenaphthylene	<2.0	5.0	97.5	115	106	16.5	43.2	129	0 - 35
Acenaphthene	<2.0	5.0	99	117	108	16.7	48.5	132	0 - 35
Fluorene	<2.0	5.0	97.7	114	106	15.4	46.8	130	0 - 35
Phenanthrene	<2.0	5.0	101	117	109	14.7	52	132	0 - 35
Anthracene	<2.0	5.0	98.9	120	109	19.3	48.7	135	0 - 35
Fluoranthene	<2.0	5.0	104	121	113	15.1	49	128	0 - 35
Pyrene	<2.0	5.0	101	120	111	17.2	50.1	127	0 - 35
N-2-Fluorenylacetamide	<2.0	5.0	98.6	117	108	17.1	50.1	122	0 - 35
Benz(a)anthracene	<2.0	5.0	102	121	112	17	48.8	127	0 - 35
Chrysene	<2.0	5.0	103	117	110	12.7	47	128	0 - 35
Benzo(b)&(k)fluoranthene	<4.0	10.0	94.7	108	101	13.1	46.2	127	0 - 35
7,12-Dimethylbenz(a)anthracene	<2.0	5.0	81.9	96.1	89	16	41.3	110	0 - 35
Benzo(a)pyrene	<2.0	5.0	91.5	109	100	17.5	47.6	123	0 - 35
3-Methylchloanthrene	<2.0	5.0	101	117	109	14.7	39.9	136	0 - 35
Indeno(1,2,3-cd)pyrene	<2.0	5.0	93.7	112	103	17.8	41.3	129	0 - 35
Dibenz(a,h)anthracene	<2.0	5.0	94.4	113	104	17.9	40.3	129	0 - 35
Benzo(g,h,i)perylene	<2.0	5.0	93.5	110	102	16.2	46.1	127	0 - 35

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-075 : Semivolatile Organic Compounds

QC LOT No. : NSVOCW1134 ANALYST E. FADJAR

MATRIX: Waters

	Blank	Spike	SPIKE QC RESULTS				Control Limits		
	Conc	Level	SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
COMPOUND	ug/L	ug/L	%		%	%	Low	High	%
EP-075S : ACID EXTRACTABLE SURROGATES									
2-Fluorophenol	72.7%	10.0	66.2	75.1	70.7	12.6	32.8	96.5	0 - 35
Phenol-d6	43.5%	10.0	42.4	47.9	45.2	12.2	22.7	57.5	0 - 35
2-Chlorophenol-d4	99.9%	10.0	98.3	113	106	13.9	57.6	127	0 - 35
2,4,6-Tribromophenol	84.6%	10.0	99.7	118	109	16.8	50.4	130	0 - 35
EP-075T : BASE/NEUTRAL EXTRACTABLE SURROGATES									
Nitrobenzene-d5	103%	10.0	104	103	104	0.97	57.4	132	0 - 35
1,2-Dichlorobenzene-d4	70.7%	10.0	84.1	95	89.6	12.2	39.8	107	0 - 35
2-Fluorobiphenyl	84.5%	10.0	95.4	112	104	16	41.8	125	0 - 35
Anthracene-d10	69.4%	10.0	70.3	80.9	75.6	14	60.9	131	0 - 35
4-Terphenyl-d14	62.7%	10.0	61.3	68.7	65	11.4	57.4	128	0 - 35

BATCH QUALITY CONTROL -- CONTROL SPIKE/DUPLICATE

ALS EP-076 : Polynuclear Aromatic Hydrocarbons

QC LOT No. : NEP076S-586 ANALYST: E. FADJAR

MATRIX: Soils

COMPOUND	Blank Conc	Spike Level	SPIKE QC RESULTS				Control Limits		
			SCS Rec.	DCS Rec.	Average Rec.	RPD	Rec.		RPD
	mg/kg	mg/kg	%		%	%	Low	High	%
EP-076A : Polynuclear Aromatic Hydrocarbons									
Naphthalene	<0.25	4.0	87.3	91.6	89.5	4.81	79.7	105	0 - 20
Acenaphthylene	<0.25	4.0	87.6	92.6	90.1	5.55	79.1	107	0 - 20
Acenaphthene	<0.25	4.0	87.5	86.2	86.9	1.5	76.3	111	0 - 20
Fluorene	<0.25	4.0	93.7	86.4	90.1	8.11	78.3	103	0 - 20
Phenanthrene	<0.25	4.0	89.5	92.7	91.1	3.51	78.6	108	0 - 20
Anthracene	<0.25	4.0	91.8	94.6	93.2	3	81.1	104	0 - 20
Fluoranthene	<0.25	4.0	87.3	91.3	89.3	4.48	76.2	114	0 - 20
Pyrene	<0.25	4.0	87.9	96.6	92.3	9.43	76.2	117	0 - 20
Benzo(a)anthracene	<0.25	4.0	79.4	89.5	84.5	12	69.8	116	0 - 20
Chrysene	<0.25	4.0	91.2	97.7	94.5	6.88	77.3	111	0 - 20
Benzo(b)fluoranthene	<0.25	4.0	89.4	97.4	93.4	8.57	73.3	108	0 - 20
Benzo(k)fluoranthene	<0.25	4.0	103	103	103	0	79.5	109	0 - 20
Benzo(a)pyrene	<0.25	4.0	93.3	88.2	90.8	5.62	75	107	0 - 20
Indeno(1.2.4.cd)pyrene	<0.25	4.0	88.9	87.5	88.2	1.59	73.8	110	0 - 20
Dibenzo(a.h)anthracene	<0.25	4.0	93.4	91.4	92.4	2.16	76	105	0 - 20
Benzo(g.h.I)perylene	<0.25	4.0	93.4	92.5	93	0.97	76.1	107	0 - 20
EP-076S : PAH Surrogates									
2-Fluorobiphenyl	94.6%	4.0	90.7	91.9	91.3	1.31	74.2	116	0 - 20
Anthracene-d10	108%	4.0	95.3	96.2	95.8	0.94	77.2	116	0 - 20
4-Terphenyl-d14	109%	4.0	102	101	102	0.99	90.6	119	0 - 20

COMMENTS:

1) The recovery control limits are based on ALS laboratory statistical data. (Method QWI-ORG/07)

2) The control limits on RPD (relative percent deviation) are fixed.

3) * : Recovery or RPD falls outside of the recommended control limits.

BATCH QUALITY CONTROL -- MATRIX SPIKE/DUPLICATE

ALS EP-076 : Polynuclear Aromatic Hydrocarbons

QC LOT No. : NEP076S-586 ANALYST : E. FADJAR

MATRIX: Soils Sample ID: ES33588-8

COMPOUND	Sample Results	Spike Level	SPIKE QC RESULTS				Cont. Limit
			MS Rec.	MSD Rec.	Average Rec.	RPD	RPD
	mg/kg	mg/kg	%	%	%	%	%
EP-076A : Polynuclear Aromatic Hydrocarbons							
Acenaphthene	<0.25	10	92.2	92.7	92.5	0.541	0 - 35
Pyrene	<0.25	10	93.3	93.8	93.6	0.534	0 - 35
EP-076S : PAH Surrogates							
2-Fluorobiphenyl	95.1%	4	104	95.7	99.9	8.31	0 - 35
Anthracene-d10	95%	4	95.5	90.9	93.2	4.94	0 - 35
4-Terphenyl-d14	108%	4	110	103	107	6.57	0 - 35

COMMENTS:

1) The RPD control limits are fixed.

2) *: RPD falls outside the recommended control limit.

Quality, Service, Support

Final
Certificate
of Analysis

Laboratory Report: 012159

Client Name:	HLA - Envirosciences Pty Limited
Client Reference:	Homebush
Contact Name:	Rachael Casson
Chain of Custody:	119238
Sample Matrix:	SOIL

Date Received: 20/5/02
Date Reported: 29/5/02

Laboratory DQO Summary

Result Annotation

DQO:	Data Quality Objective	s:	matrix spike recovery	p:	pending
EQL:	Estimated Quantitation Limit	d:	laboratory duplicate	lcs:	laboratory control sample
<EQL:	less that reported EQL value	t:	laboratory triplicate	crm:	certified reference material
--:	not applicable	r:	RPD	mb:	method blank

Results in this Final Certificate of Analysis are covered by NATA Accreditation 13542 (ISO 17025), unless otherwise stated.

Quality Assurance Criteria

* Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples (minimum)
	lcs, crm, method blank:	1 per analytical batch
	surrogate spike:	surrogate addition per target organic method
* Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples (minimum)
	laboratory triplicate:	reported when duplicate RPD values exceed acceptance criteria
* Holding Times:	general soils, waters:	Moisture content same day as sample extraction for analyte. VOC's 14 days water, 14 days soil. VAC's 14 days acidified water. SVOC's 7 days water, 14 days soil. Metals 6 months general elements, 28 days mercury. TCLP extracted & analysed 14 days. ZHE-TCLP extracted & analysed 7 days. Refer to LabMark Preservation & THT table.
* Confirmation:	target organic analyses:	GC/MS, or confirmatory column.
* Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL).

Quality Control - Global Acceptance Criteria

* Accuracy:	spike, lcs, crm, surrogate:	General analytes 70% - 130% Recovery. Phenol analytes 50% - 130% Recovery. Organophosphorous Pesticide analytes 60% - 130% Recovery. Chromium 62% - 120% Recovery.
* Precision:	method blank:	Not detected above 95% of the reported EQL.
	laboratory replicate RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL), 0-100% (<5xEQL).

Quality, Service, Support

Final
Certificate
of Analysis

Laboratory Report: 012159

Quality Control NEPC-1999 Guideline Compliance

1. General

A. Sample results are analysed as received. Sample results are uncorrected for matrix spike, lcs or surrogate recovery data.
B. EQL's are matrix dependent and may be increased due to sample dilution or matrix interference.
C. Laboratory QA/QC samples are specific from this project, and include the laboratory ID as your reference.
D. Inter-laboratory proficiency results are available upon request. NATA accrediation details available at www.nata.asn.au.
E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.
F. Recovery data outside of Global Acceptance Criteria is investigated and compared to Specific Acceptance Criteria derived from historical results. If recovery falls below 20% the relevant results for that compound are treated as not reliable.

2. Chain of Custody (COC) & Sample Receipt Note (SRN) Requirements:

A. Copy of COC attached, indicating receipt signature, date and time of laboratory receipt unless noted.
B. SRN issued to client upon sample receipt & login verification.
C. Preservation & sampling date details specified on COC, unless noted.
D. Sample Integrity & VTSR Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA Registered Methods

A. NATA accreditation held for each method and sample matrix type reported, unless noted below.
B. NATA accredited in-house laboratory methods are referenced from NEPC, modified USEPA / APHA documents.
C. Analytical method descriptions including references appear in report body.
D. Subcontracted analyses:
Acid extractable metals contracted by Sydney Analytical Laboratories, NATA accreditation No.1884.

4. Additional comments specific to this report:

A. SAL reference; SAL11914 issued on 26/05/02.

Laboratory QA/QC Self Assessment data shall relate specifically to QA/QC results as performed as part of sample analysis, and may only provide an indication of sample result quality. Acceptance of this Self Assessment certificate does not preclude any requirement for a QA/QC review by a registered contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC Self Assessment references available upon request.

Authorising Chemist:
Quality Control (NATA signatory)

Authorising Chemist:
Operations (NATA signatory)

LabMark Pty Limited * Unit 12/18 Leighton Place ASQUITH NSW 2077 Australia * PO Box 641 HORNSBY NSW 1630 * Tel: 61-2-94766533 *
Fax: 61-2-9476 8219 * Email: labmark@ozemail.com.au * Web: www.labmark.com.au

BATCH QUALITY CONTROL – DUPLICATE

ALS EP-076 : Polynuclear Aromatic Hydrocarbons

QC LOT No. : NEP076S-586
MATRIX : Soils
ANALYST: E. FADJAR

COMPOUND	LOR	QC DUPLICATE RESULTS ES33588 3	ES33588 3D	RPD	
	mg/kg	mg/kg	mg/kg	RPD %	Cont. Limit
EP-076A : Polynuclear Aromatic Hydrocarbons					
Naphthalene	0.25	<0.25	<0.25	n/a	
Acenaphthylene	0.25	<0.25	<0.25	n/a	
Acenaphthene	0.25	<0.25	<0.25	n/a	
Fluorene	0.25	<0.25	<0.25	n/a	
Phenanthrene	0.25	<0.25	<0.25	n/a	
Anthracene	0.25	<0.25	<0.25	n/a	
Fluoranthene	0.25	<0.25	<0.25	n/a	
Pyrene	0.25	<0.25	<0.25	n/a	
Benzo(a)anthracene	0.25	<0.25	<0.25	n/a	
Chrysene	0.25	<0.25	<0.25	n/a	
Benzo(b)fluoranthene	0.25	<0.25	<0.25	n/a	
Benzo(k)fluoranthene	0.25	<0.25	<0.25	n/a	
Benzo(a)pyrene	0.25	<0.25	<0.25	n/a	
Indeno(1.2.4.cd)pyrene	0.25	<0.25	<0.25	n/a	
Dibenzo(a.h)anthracene	0.25	<0.25	<0.25	n/a	
Benzo(g.h.I)perylene	0.25	<0.25	<0.25	n/a	
EP-076S : PAH Surrogates					
2-Fluorobiphenyl	1%	99.2%	108%	8.49	0 - 20
Anthracene-d10	1%	91.8%	93.3%	1.62	0 - 20
4-Terphenyl-d14	1%	104%	107%	2.84	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

BATCH QUALITY CONTROL -- DUPLICATE

ALS EP-076 : Polynuclear Aromatic Hydrocarbons

QC LOT No. : NEP076S-586
MATRIX : Soils
ANALYST: E. FADJAR

COMPOUND	LOR	QC DUPLICATE RESULTS ES33588 8	QC DUPLICATE RESULTS ES33588 8D	RPD	
	mg/kg	mg/kg	mg/kg	RPD %	Cont. Limit
EP-076A : Polynuclear Aromatic Hydrocarbons					
Naphthalene	0.25	<0.25	<0.25	n/a	
Acenaphthylene	0.25	<0.25	<0.25	n/a	
Acenaphthene	0.25	<0.25	<0.25	n/a	
Fluorene	0.25	<0.25	<0.25	n/a	
Phenanthrene	0.25	<0.25	<0.25	n/a	
Anthracene	0.25	<0.25	<0.25	n/a	
Fluoranthene	0.25	<0.25	<0.25	n/a	
Pyrene	0.25	<0.25	<0.25	n/a	
Benzo(a)anthracene	0.25	<0.25	<0.25	n/a	
Chrysene	0.25	<0.25	<0.25	n/a	
Benzo(b)fluoranthene	0.25	<0.25	<0.25	n/a	
Benzo(k)fluoranthene	0.25	<0.25	<0.25	n/a	
Benzo(a)pyrene	0.25	<0.25	<0.25	n/a	
Indeno(1.2.4.cd)pyrene	0.25	<0.25	<0.25	n/a	
Dibenzo(a.h)anthracene	0.25	<0.25	<0.25	n/a	
Benzo(g.h.i)perylene	0.25	<0.25	<0.25	n/a	
EP-076S : PAH Surrogates					
2-Fluorobiphenyl	1%	95.1%	104%	8.94	0 - 20
Anthracene-d10	1%	95%	94.7%	0.316	0 - 20
4-Terphenyl-d14	1%	108%	115%	6.28	0 - 20

Note: The permitted range for RPD (relative percent deviation) is specified in ALS Method QWI-EN/38 and is dependent on the magnitude of results in comparison to the level of reporting:
Result < 10 times LOR, no limit.
Result between 10 and 20 times LOR, 0% - 50%.
Results > 20 times LOR, 0% - 20%.

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Quality, Service, Support

Sample Receipt Notice

Please Specifiy Quotation Number!

Laboratory Report: 012159

Client Name:	HLA - Envirosciences Pty Limited	Quotation Number:	na
Project Name:	Homebush		
Project Number:	J1938/1		
Contact Name:	Rachael Casson	Date Received:	20/05/2002
Chain of Custody:	119238		
Sample Matrix:	SOIL	Fax Number:	02 9988 4441

Your laboratory contact for this project is: Geoff Weir, geoffweir@labmark.com.au

Preliminary Report Due	Wednesday, May 29, 2002	No surcharge applied
Sample Receipt:	COC received with samples. Report number and lab ID's defined on COC. Samples received in good order . Samples received with cooling media: Crushed ice . Measured temperature 4.2 degrees C. Security seals intact . Sample container & sample integrity suitable . Comments: Organics results by 29/05/02. Metals results by 30/05/02.	
Holding Times:	Date received allows for sufficient time to meet Technical Holding Times.	
Preservation:	Chemical preservation of samples satisfactory for requested analytes.	
Important Notes:	Sample Disposal of soil and water samples shall be 21 days after laboratory receipt, unless otherwise requested in writing by the client.	
Subcontracted Analyses:	Acid extractable metals contracted to Sydney Analytical Laboratories, NATA accreditation No.1884.	

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Laboratory Report No: 01[illegible]

Page: 1 of 2

Final

Certificate of Analysis

Client Name: HLA - Envirosciences Pty Limited

Contact Name: Rachael Casson

Client Reference Homebush J1938/1

plus cover page

Date: 29/5/02

This report supercedes reports issued on: N/A

Laboratory Identification			9243	lcs	mb							
Sample Identification			BH49	QC	QC							
Depth (m)			0.6-0.75	--	--							
Sampling Date recorded on COC			15/5/02	--	--							
Laboratory Extraction Date			22/5/02	--	--							
Laboratory Analysis Date			22/5/02	--	--							
Method	**BTEX by P&T**	**EQL**										
E002.2	Benzene	0.2	<0.2	96%	<0.2							
	Toluene	0.5	<0.5	97%	<0.5							
	Ethylbenzene	0.5	<0.5	95%	<0.5							
	meta- and para-Xylene	1	<1	95%	<1							
	ortho-Xylene	0.5	<0.5	93%	<0.5							
	Total Xylene	--	--	--	--							
	CDFB (Surr @ 10mg/kg)	--	*90%*	*93%*	*96%*							
Method	**Volatile TPH by P&T**	**EQL**										
E003.2	C6 - C9 Fraction	10	<10	99%	<10							
Method	**Petroleum Hydrocarbons (TPH)**	**EQL**										
E006.2	C10 - C14 Fraction	50	<50	--	<50							
	C15 - C28 Fraction	100	<100	103%	<100							
	C29 - C36 Fraction	100	<100	--	<100							
	Sum of TPH C10 - C36	--	--	--	--							

Results expressed in mg/kg (ppm) dry weight unless otherwise specified

Comments:

BTEX E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID.
VTPH E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
TPH E006.2: 8-10g soil extracted with 20ml DCM/Acetone (8:2). Analysis by GC/FID.

Authorising Chemist: Ivan Povolny

NATA No. 13542

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Laboratory Report No. 012159 Page 2 of 2

Client Name: HLA - Envirosciences Pty Limited plus cover page

Contact Name: Rachael Casson **Date:** 29/5/02

Client Reference Homebush J1938/1 This report supercedes reports issued on: N/A

Certificate of Analysis

Laboratory Identification			9240	9242	9243	9243d	9243r	crm	mb			
Sample Identification			BH06	BH29	BH49	QC	QC	QC	QC			
Depth (m)			0-0.3	0.03-0.1	0.6-0.75	--	--	--	--			
Sampling Date recorded on COC			13/5/02	14/5/02	15/5/02	--	--	--	--			
Laboratory Extraction Date			22/5/02	22/5/02	22/5/02	--	--	--	--			
Laboratory Analysis Date			22/5/02	22/5/02	22/5/02	--	--	--	--			
Method	**Acid extractable metals**	**EQL**										
3050	Cadmium	0.5	<0.5	<0.5	<0.5	<0.5	--	--	<0.5			
	Chromium	0.5	11	6.0	14	16	13%	67%	<0.5			
	Copper	0.5	26	1.5	9.0	9.5	5%	108%	<0.5			
	Nickel	0.5	16	<0.5	3.0	4.0	29%	90%	<0.5			
	Lead	0.5	19	9.0	22	25	13%	101%	<0.5			
	Zinc	0.5	47	8.0	25	27	8%	101%	<0.5			
Method	**Acid extractable metals**	**EQL**										
7061	Arsenic	0.5	3.5	2.0	3.0	3.5	15%	90%	<0.5			
Method	**Acid extractable metals**	**EQL**										
7471	Mercury	0.005	0.090	0.010	0.080	0.080	0.0%	85%	<0.005			

Results expressed in mg/kg (ppm) dry weight unless otherwise specified

Comments:

METALS 3050: 2.5g digested in HNO3/H2O2. Analysis by Flame AAS.
METALS 7061: 2.5g digested with HNO3/H2O2/H2SO4. Analysis by HG/AAS.
METALS 7471: 1g digested with aqua regia and reduced with SnCl2. Analysis by CV/AAS.

Authorising Chemist: Ivan Povolny

NATA No. 13542

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Client Name: HLA - Envirosciences Pty Limited plus cover page

Contact Name: Rachael Casson **Date:** 29/5/02

Client Reference Homebush J1938/1 This report supercedes reports issued on: N/A

Certificate of Analysis

Laboratory Identification			9243	lcs	mb							
Sample Identification			BH49	QC	QC							
Depth (m)			0.6-0.75	--	--							
Sampling Date recorded on COC			15/5/02	--	--							
Laboratory Extraction Date			22/5/02	--	--							
Laboratory Analysis Date			22/5/02	--	--							
Method	**BTEX by P&T**	**EQL**										
E002.2	Benzene	0.2	<0.2	96%	<0.2							
	Toluene	0.5	<0.5	97%	<0.5							
	Ethylbenzene	0.5	<0.5	95%	<0.5							
	meta- and para-Xylene	1	<1	95%	<1							
	ortho-Xylene	0.5	<0.5	93%	<0.5							
	Total Xylene	--	--	--	--							
	CDFB (Surr @ 10mg/kg)	--	*90%*	*93%*	*96%*							
Method	**Volatile TPH by P&T**	**EQL**										
E003.2	C6 - C9 Fraction	10	<10	99%	<10							
Method	**Petroleum Hydrocarbons (TPH)**	**EQL**										
E006.2	C10 - C14 Fraction	50	<50	--	<50							
	C15 - C28 Fraction	100	<100	103%	<100							
	C29 - C36 Fraction	100	<100	--	<100							
	Sum of TPH C10 - C36	--	--	--	--							

Results expressed in mg/kg (ppm) dry weight unless otherwise specified

Comments:

BTEX E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID.
VTPH E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
TPH E006.2: 8-10g soil extracted with 20ml DCM/Acetone (8:2). Analysis by GC/FID.

Authorising Chemist: Ivan Povolny

No. 13542

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CHAIN OF CUSTODY

HLA

HLA - Environsciences Pty Limited
5 65 Granal.iew Street
PBox 726
nnkle NSW 2073 Australia
Tel: 61 2 9980 4422
Fax: 61 2 9980 4441
E mail: mail@syd.hla-enviro.com.au

Laboratory Details
Lab. Name: LABMARK
Lab. Address:
Contact Name:
Lab. Ref:

Tel: 9
Fax:
Preliminary Report by: 24/5/02
Final Report by:
Lab Quote No:

mpled By: RACHAEL CASSON | HLA Project No: J1938/1 | Project Name: HOMEBUSH | PO No. 19238

Specifications:

	Yes (tick)
Urgent TAT required? (please circle: 24hr 48hr ____days)	
Fast TAT Guarantee Required?	
Is any sediment layer present in waters to be excluded from extractions?	
% extraneous material removed from samples to be reported as per NEPM 5.1.17	
Special storage requirements? (details: ____)	
Shell Quality Partnership	

Report Format: Fax Hardcopy Email: ____

Lab ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: other	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: BTEX + TPH	Metals*	PAH's	OCP	OPP	PCB	SVOC	VOC	TPH	Lead	TCLP Heavy Metals	TCLP PAH's	Phenols	VHC	Speciated TPH	Other: HOLD
9240	BH06_0-0.3	13/5/2	X					X		1 x 125ml Ja + 2 Teflon lid		X													
9241	BH16_0-0.2	13/5/2	↓																						X
9242	BH29_0.03-0.1	14/5/2										X													
9243	BH49_0.6_0.75	15/5/2									X	X													X
9244	BH41_0-0.1	14/5/2	↓																						

Analysis Request: Other

Tab Report No: 012159

Analysis (Circle elements req'd): As Cd Cr Cu Ni Pb Zn Hg

Comments:

Relinquished by: RACHAEL CASSON Signed: Date: 17/5/2

Relinquished by: Signed: Date

DISTRIBUTION

Site Contamination Assessment,
Sites 2 and 8
Sydney Olympic Park Town Centre
Homebush, NSW

Sydney Olympic Park Authority (SOPA)
7 Figtree Drive,
Homebush, NSW 2127

21 August 2002

2.... Copies	Mr Mike Doyle SOPA 7 Figtree Drive, Homebush, NSW 2127
Original	HLA Project File
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Quality Control Reviewer

Paul McCabe
Principal Environmental Scientist

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Paul McCabe
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Fax: (+61 7) 4953 0868
Email: hlamack@mack.hla-enviro.com.au

Appendix D

Laboratory Certificates of Analysis

Chain of Custody Documentation

Sample Receipt Advice

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

CERTIFICATE OF ANALYSIS 200566

Client Details

Client	Douglas Partners Pty Ltd
Attention	Paul Gorman, Tom Graham
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86411.00, Carpark P6D**
Number of Samples	23 Soil
Date samples received	12/09/2018
Date completed instructions received	12/09/2018

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	19/09/2018
Date of Issue	19/09/2018

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

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

Asbestos Approved By
Analysed by Asbestos Approved Identifier: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Lucy Zhu, Asbsestos Analyst
Matthew Tang, Asbsestos Analyst
Nancy Zhang, Assistant Lab Manager
Nick Sarlamis, Inorganics Supervisor
Phalak Inthakesone, Organics Development Manager, Sydney

Authorised By



Jacinta Hurst, Laboratory Manager

VOCs in soil						
Our Reference		200566-2	200566-7	200566-12	200566-15	200566-18
Your Reference	UNITS	BH1	BH2	BH4	BH5	BH6
Depth		0.5	2.5	0.5	2.5	1.0
Date Sampled		28/08/2018	02/09/2018	27/08/2018	03/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Dichlorodifluoromethane	mg/kg	<1	<1	<1	<1	<1
Chloromethane	mg/kg	<1	<1	<1	<1	<1
Vinyl Chloride	mg/kg	<1	<1	<1	<1	<1
Bromomethane	mg/kg	<1	<1	<1	<1	<1
Chloroethane	mg/kg	<1	<1	<1	<1	<1
Trichlorofluoromethane	mg/kg	<1	<1	<1	<1	<1
1,1-Dichloroethene	mg/kg	<1	<1	<1	<1	<1
trans-1,2-dichloroethene	mg/kg	<1	<1	<1	<1	<1
1,1-dichloroethane	mg/kg	<1	<1	<1	<1	<1
cis-1,2-dichloroethene	mg/kg	<1	<1	<1	<1	<1
bromochloromethane	mg/kg	<1	<1	<1	<1	<1
chloroform	mg/kg	<1	<1	<1	<1	<1
2,2-dichloropropane	mg/kg	<1	<1	<1	<1	<1
1,2-dichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1,1-trichloroethane	mg/kg	<1	<1	<1	<1	<1
1,1-dichloropropene	mg/kg	<1	<1	<1	<1	<1
Cyclohexane	mg/kg	<1	<1	<1	<1	<1
carbon tetrachloride	mg/kg	<1	<1	<1	<1	<1
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
dibromomethane	mg/kg	<1	<1	<1	<1	<1
1,2-dichloropropane	mg/kg	<1	<1	<1	<1	<1
trichloroethene	mg/kg	<1	<1	<1	<1	<1
bromodichloromethane	mg/kg	<1	<1	<1	<1	<1
trans-1,3-dichloropropene	mg/kg	<1	<1	<1	<1	<1
cis-1,3-dichloropropene	mg/kg	<1	<1	<1	<1	<1
1,1,2-trichloroethane	mg/kg	<1	<1	<1	<1	<1
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-dichloropropane	mg/kg	<1	<1	<1	<1	<1
dibromochloromethane	mg/kg	<1	<1	<1	<1	<1
1,2-dibromoethane	mg/kg	<1	<1	<1	<1	<1
tetrachloroethene	mg/kg	<1	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	mg/kg	<1	<1	<1	<1	<1
chlorobenzene	mg/kg	<1	<1	<1	<1	<1
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1

VOCs in soil						
Our Reference		200566-2	200566-7	200566-12	200566-15	200566-18
Your Reference	UNITS	BH1	BH2	BH4	BH5	BH6
Depth		0.5	2.5	0.5	2.5	1.0
Date Sampled		28/08/2018	02/09/2018	27/08/2018	03/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
bromoform	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
styrene	mg/kg	<1	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	mg/kg	<1	<1	<1	<1	<1
o-Xylene	mg/kg	<1	<1	<1	<1	<1
1,2,3-trichloropropane	mg/kg	<1	<1	<1	<1	<1
isopropylbenzene	mg/kg	<1	<1	<1	<1	<1
bromobenzene	mg/kg	<1	<1	<1	<1	<1
n-propyl benzene	mg/kg	<1	<1	<1	<1	<1
2-chlorotoluene	mg/kg	<1	<1	<1	<1	<1
4-chlorotoluene	mg/kg	<1	<1	<1	<1	<1
1,3,5-trimethyl benzene	mg/kg	<1	<1	<1	<1	<1
tert-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,2,4-trimethyl benzene	mg/kg	<1	<1	<1	<1	<1
1,3-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
sec-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,4-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
4-isopropyl toluene	mg/kg	<1	<1	<1	<1	<1
1,2-dichlorobenzene	mg/kg	<1	<1	<1	<1	<1
n-butyl benzene	mg/kg	<1	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	mg/kg	<1	<1	<1	<1	<1
1,2,4-trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
hexachlorobutadiene	mg/kg	<1	<1	<1	<1	<1
1,2,3-trichlorobenzene	mg/kg	<1	<1	<1	<1	<1
Surrogate Dibromofluorometha	%	101	102	102	112	113
Surrogate aaa-Trifluorotoluene	%	93	81	90	86	89
Surrogate Toluene-d_8	%	98	72	94	93	94
Surrogate 4-Bromofluorobenzene	%	96	90	100	99	97

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		200566-2	200566-3	200566-4	200566-5	200566-7
Your Reference	UNITS	BH1	BD1/20180508	BH1	BH2	BH2
Depth		0.5	-	1.0	0.1	2.5
Date Sampled		28/08/2018	28/08/2018	28/08/2018	02/09/2018	02/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	15/09/2018	15/09/2018	15/09/2018	14/09/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_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
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	93	101	107	102	81

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		200566-8	200566-9	200566-11	200566-12	200566-13
Your Reference	UNITS	BD1/20180902	BH3	BH3	BH4	BH4
Depth		-	0.5	2.5	0.5	2.5
Date Sampled		02/09/2018	29/08/2018	29/08/2018	27/08/2018	27/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	15/09/2018	15/09/2018	15/09/2018	14/09/2018	15/09/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_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
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	101	100	102	90	104

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		200566-14	200566-15	200566-18	200566-20	200566-21
Your Reference	UNITS	BH5	BH5	BH6	BH6	Trip Blank
Depth		0.5	2.5	1.0	2.5	-
Date Sampled		03/09/2018	03/09/2018	04/09/2018	04/09/2018	-
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	15/09/2018	14/09/2018	14/09/2018	15/09/2018	15/09/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
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	[NA]
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	104	86	89	106	104

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		200566-22
Your Reference	UNITS	Trip Spike
Depth		-
Date Sampled		-
Type of sample		Soil
Date extracted	-	13/09/2018
Date analysed	-	15/09/2018
Benzene	mg/kg	95%
Toluene	mg/kg	95%
Ethylbenzene	mg/kg	96%
m+p-xylene	mg/kg	95%
o-Xylene	mg/kg	95%
Surrogate aaa-Trifluorotoluene	%	95

svTRH (C10-C40) in Soil						
Our Reference		200566-2	200566-3	200566-4	200566-5	200566-7
Your Reference	UNITS	BH1	BD1/20180508	BH1	BH2	BH2
Depth		0.5	-	1.0	0.1	2.5
Date Sampled		28/08/2018	28/08/2018	28/08/2018	02/09/2018	02/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{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	130	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	130	<50
Surrogate o-Terphenyl	%	88	87	88	99	86

svTRH (C10-C40) in Soil						
Our Reference		200566-8	200566-9	200566-11	200566-12	200566-13
Your Reference	UNITS	BD1/20180902	BH3	BH3	BH4	BH4
Depth		-	0.5	2.5	0.5	2.5
Date Sampled		02/09/2018	29/08/2018	29/08/2018	27/08/2018	27/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	14/09/2018	14/09/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{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
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	83	87	86	92	86

svTRH (C10-C40) in Soil					
Our Reference		200566-14	200566-15	200566-18	200566-20
Your Reference	UNITS	BH5	BH5	BH6	BH6
Depth		0.5	2.5	1.0	2.5
Date Sampled		03/09/2018	03/09/2018	04/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
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	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	89	90	86

PAHs in Soil						
Our Reference		200566-2	200566-4	200566-5	200566-7	200566-9
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0.5	1.0	0.1	2.5	0.5
Date Sampled		28/08/2018	28/08/2018	02/09/2018	02/09/2018	29/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
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	<0.1	<0.1	0.4	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.7	<0.1	0.2
Pyrene	mg/kg	<0.1	<0.1	0.7	0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.3	<0.1	0.1
Chrysene	mg/kg	0.1	<0.1	0.3	<0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.5	<0.2	0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.3	0.08	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	0.2	<0.1	0.1
Total +ve PAH's	mg/kg	0.1	<0.05	3.5	0.2	1.2
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	0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	109	99	99	100	97

PAHs in Soil						
Our Reference		200566-11	200566-12	200566-13	200566-14	200566-15
Your Reference	UNITS	BH3	BH4	BH4	BH5	BH5
Depth		2.5	0.5	2.5	0.5	2.5
Date Sampled		29/08/2018	27/08/2018	27/08/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
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	<0.1	0.2	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.8	<0.1	<0.1	0.3
Pyrene	mg/kg	<0.1	1	<0.1	<0.1	0.4
Benzo(a)anthracene	mg/kg	<0.1	0.6	<0.1	<0.1	0.2
Chrysene	mg/kg	<0.1	0.6	<0.1	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	1	<0.2	<0.2	0.5
Benzo(a)pyrene	mg/kg	<0.05	0.88	<0.05	<0.05	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.4	<0.1	<0.1	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	0.6	<0.1	<0.1	0.2
Total +ve PAH's	mg/kg	<0.05	6.5	<0.05	<0.05	2.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	1.3	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	1.3	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	1.3	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	98	98	98	93	100

PAHs in Soil			
Our Reference		200566-18	200566-20
Your Reference	UNITS	BH6	BH6
Depth		1.0	2.5
Date Sampled		04/09/2018	04/09/2018
Type of sample		Soil	Soil
Date extracted	-	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	14/09/2018
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	0.2	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	99	97

Organochlorine Pesticides in soil						
Our Reference		200566-2	200566-4	200566-5	200566-7	200566-9
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0.5	1.0	0.1	2.5	0.5
Date Sampled		28/08/2018	28/08/2018	02/09/2018	02/09/2018	29/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	96	101	95	97	94

Organochlorine Pesticides in soil						
Our Reference		200566-11	200566-12	200566-13	200566-14	200566-15
Your Reference	UNITS	BH3	BH4	BH4	BH5	BH5
Depth		2.5	0.5	2.5	0.5	2.5
Date Sampled		29/08/2018	27/08/2018	27/08/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	99	101	99	98

Organochlorine Pesticides in soil			
Our Reference		200566-18	200566-20
Your Reference	UNITS	BH6	BH6
Depth		1.0	2.5
Date Sampled		04/09/2018	04/09/2018
Type of sample		Soil	Soil
Date extracted	-	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018
HCB	mg/kg	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	98	95

Organophosphorus Pesticides						
Our Reference		200566-2	200566-4	200566-5	200566-7	200566-9
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0.5	1.0	0.1	2.5	0.5
Date Sampled		28/08/2018	28/08/2018	02/09/2018	02/09/2018	29/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
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	%	96	101	95	97	94

Organophosphorus Pesticides						
Our Reference		200566-11	200566-12	200566-13	200566-14	200566-15
Your Reference	UNITS	BH3	BH4	BH4	BH5	BH5
Depth		2.5	0.5	2.5	0.5	2.5
Date Sampled		29/08/2018	27/08/2018	27/08/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
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	%	97	99	101	99	98

Organophosphorus Pesticides			
Our Reference		200566-18	200566-20
Your Reference	UNITS	BH6	BH6
Depth		1.0	2.5
Date Sampled		04/09/2018	04/09/2018
Type of sample		Soil	Soil
Date extracted	-	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Surrogate TCMX	%	98	95

PCBs in Soil						
Our Reference		200566-2	200566-4	200566-5	200566-7	200566-9
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0.5	1.0	0.1	2.5	0.5
Date Sampled		28/08/2018	28/08/2018	02/09/2018	02/09/2018	29/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	96	101	95	97	94

PCBs in Soil						
Our Reference		200566-11	200566-12	200566-13	200566-14	200566-15
Your Reference	UNITS	BH3	BH4	BH4	BH5	BH5
Depth		2.5	0.5	2.5	0.5	2.5
Date Sampled		29/08/2018	27/08/2018	27/08/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	97	99	101	99	98

PCBs in Soil			
Our Reference		200566-18	200566-20
Your Reference	UNITS	BH6	BH6
Depth		1.0	2.5
Date Sampled		04/09/2018	04/09/2018
Type of sample		Soil	Soil
Date extracted	-	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCLMX	%	98	95

Acid Extractable metals in soil						
Our Reference		200566-2	200566-3	200566-4	200566-5	200566-7
Your Reference	UNITS	BH1	BD1/20180508	BH1	BH2	BH2
Depth		0.5	-	1.0	0.1	2.5
Date Sampled		28/08/2018	28/08/2018	28/08/2018	02/09/2018	02/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	<4	<4	6	<4	<4
Cadmium	mg/kg	<0.4	0.4	<0.4	0.5	<0.4
Chromium	mg/kg	8	11	23	18	6
Copper	mg/kg	49	100	19	47	34
Lead	mg/kg	18	18	18	55	16
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	32	34	3	15	11
Zinc	mg/kg	140	130	8	100	33

Acid Extractable metals in soil						
Our Reference		200566-8	200566-9	200566-11	200566-12	200566-13
Your Reference	UNITS	BD1/20180902	BH3	BH3	BH4	BH4
Depth		-	0.5	2.5	0.5	2.5
Date Sampled		02/09/2018	29/08/2018	29/08/2018	27/08/2018	27/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	<4	6	<4	9	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	0.4	<0.4
Chromium	mg/kg	6	16	4	20	9
Copper	mg/kg	36	20	19	18	30
Lead	mg/kg	12	19	12	25	12
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	7	1	5	3
Zinc	mg/kg	39	26	9	21	15

Acid Extractable metals in soil					
Our Reference		200566-14	200566-15	200566-18	200566-20
Your Reference	UNITS	BH5	BH5	BH6	BH6
Depth		0.5	2.5	1.0	2.5
Date Sampled		03/09/2018	03/09/2018	04/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Arsenic	mg/kg	5	5	5	5
Cadmium	mg/kg	<0.4	<0.4	0.4	<0.4
Chromium	mg/kg	7	7	5	4
Copper	mg/kg	25	35	39	22
Lead	mg/kg	14	18	20	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	11	35	8
Zinc	mg/kg	51	57	150	43

Misc Soil - Inorg						
Our Reference		200566-2	200566-4	200566-5	200566-7	200566-9
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0.5	1.0	0.1	2.5	0.5
Date Sampled		28/08/2018	28/08/2018	02/09/2018	02/09/2018	29/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		200566-11	200566-12	200566-13	200566-14	200566-15
Your Reference	UNITS	BH3	BH4	BH4	BH5	BH5
Depth		2.5	0.5	2.5	0.5	2.5
Date Sampled		29/08/2018	27/08/2018	27/08/2018	03/09/2018	03/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg			
Our Reference		200566-18	200566-20
Your Reference	UNITS	BH6	BH6
Depth		1.0	2.5
Date Sampled		04/09/2018	04/09/2018
Type of sample		Soil	Soil
Date prepared	-	13/09/2018	13/09/2018
Date analysed	-	13/09/2018	13/09/2018
Total Phenolics (as Phenol)	mg/kg	<5	<5

Moisture						
Our Reference		200566-2	200566-3	200566-4	200566-5	200566-7
Your Reference	UNITS	BH1	BD1/20180508	BH1	BH2	BH2
Depth		0.5	-	1.0	0.1	2.5
Date Sampled		28/08/2018	28/08/2018	28/08/2018	02/09/2018	02/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Moisture	%	11	11	25	13	14

Moisture						
Our Reference		200566-8	200566-9	200566-11	200566-12	200566-13
Your Reference	UNITS	BD1/20180902	BH3	BH3	BH4	BH4
Depth		-	0.5	2.5	0.5	2.5
Date Sampled		02/09/2018	29/08/2018	29/08/2018	27/08/2018	27/08/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Moisture	%	12	18	11	13	12

Moisture						
Our Reference		200566-14	200566-15	200566-17	200566-18	200566-20
Your Reference	UNITS	BH5	BH5	BH6	BH6	BH6
Depth		0.5	2.5	0.5	1.0	2.5
Date Sampled		03/09/2018	03/09/2018	04/09/2018	04/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Moisture	%	10	9.1	6.9	7.0	9.8

Asbestos ID - soils						
Our Reference		200566-2	200566-4	200566-9	200566-13	200566-18
Your Reference	UNITS	BH1	BH1	BH3	BH4	BH6
Depth		0.5	1.0	0.5	2.5	1.0
Date Sampled		28/08/2018	28/08/2018	29/08/2018	27/08/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	19/09/2018	19/09/2018	19/09/2018	19/09/2018	19/09/2018
Sample mass tested	g	Approx. 35g	Approx. 25g	Approx. 30g	Approx. 30g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown clayey soil & rocks	Brown coarse-grained soil & rocks	Brown clayey soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils		
Our Reference		200566-20
Your Reference	UNITS	BH6
Depth		2.5
Date Sampled		04/09/2018
Type of sample		Soil
Date analysed	-	19/09/2018
Sample mass tested	g	Approx. 35g
Sample Description	-	Grey clayey soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

Asbestos ID - soils NEPM						
Our Reference		200566-1	200566-5	200566-10	200566-12	200566-16
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH6
Depth		0.1	0.1	1.0	0.5	0.1
Date Sampled		28/08/2018	02/09/2018	29/08/2018	27/08/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Sample mass tested	g	351.63	345.79	680.74	517.8	1,016.02
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM			
Our Reference		200566-19	200566-23
Your Reference	UNITS	BH6	BH5
Depth		1.5	1.0
Date Sampled		04/09/2018	-
Type of sample		Soil	Soil
Date analysed	-	14/09/2018	14/09/2018
Sample mass tested	g	862.55	770.09
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–
FA and AF Estimation*	g	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001

Misc Inorg - Soil				
Our Reference		200566-4	200566-7	200566-11
Your Reference	UNITS	BH1	BH2	BH3
Depth		1.0	2.5	2.5
Date Sampled		28/08/2018	02/09/2018	29/08/2018
Type of sample		Soil	Soil	Soil
Date prepared	-	17/09/2018	17/09/2018	17/09/2018
Date analysed	-	17/09/2018	17/09/2018	17/09/2018
pH 1:5 soil:water	pH Units	5.3	5.9	5.2

CEC				
Our Reference		200566-4	200566-7	200566-11
Your Reference	UNITS	BH1	BH2	BH3
Depth		1.0	2.5	2.5
Date Sampled		28/08/2018	02/09/2018	29/08/2018
Type of sample		Soil	Soil	Soil
Date prepared	-	18/09/2018	18/09/2018	18/09/2018
Date analysed	-	18/09/2018	18/09/2018	18/09/2018
Exchangeable Ca	meq/100g	0.4	2.2	<0.1
Exchangeable K	meq/100g	0.4	0.4	0.2
Exchangeable Mg	meq/100g	3.7	3.2	2.1
Exchangeable Na	meq/100g	1.3	1.4	0.85
Cation Exchange Capacity	meq/100g	5.7	7.2	3.2

PFAs in Soils Short					
Our Reference		200566-5	200566-13	200566-15	200566-17
Your Reference	UNITS	BH2	BH4	BH5	BH6
Depth		0.1	2.5	2.5	0.5
Date Sampled		02/09/2018	27/08/2018	03/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.2	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	1.2	<0.1	<0.1	<0.1
Perfluorooctanoic acid PFOA	µg/kg	0.2	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate $^{13}C_8$ *PFOS*	%	93	109	112	110
Surrogate $^{13}C_2$ *PFOA*	%	106	109	110	106
Extracted ISTD $^{18}O_2$ *PFHxS*	%	91	91	89	94
Extracted ISTD $^{13}C_4$ *PFOS*	%	88	91	86	84
Extracted ISTD $^{13}C_4$ *PFOA*	%	100	93	96	100
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	151	115	130	119
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	#	92	133	98
Total Positive PFHxS & PFOS	µg/kg	1.4	<0.1	<0.1	<0.1
Total Positive PFOS & PFOA	µg/kg	1.4	<0.1	<0.1	<0.1
Total Positive PFAS	µg/kg	1.6	<0.1	<0.1	<0.1

Metals in TCLP USEPA1311					
Our Reference		200566-2	200566-5	200566-15	200566-20
Your Reference	UNITS	BH1	BH2	BH5	BH6
Depth		0.5	0.1	2.5	2.5
Date Sampled		28/08/2018	02/09/2018	03/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018
pH of soil for fluid# determ.	pH units	7.3	10.7	6.8	6.1
pH of soil TCLP (after HCl)	pH units	1.6	3.5	1.6	1.6
Extraction fluid used	-	1	1	1	1
pH of final Leachate	pH units	5.0	8.5	5.0	5.0
Arsenic in TCLP	mg/L	<0.05	<0.05	<0.05	<0.05
Cadmium in TCLP	mg/L	<0.01	<0.01	<0.01	<0.01
Chromium in TCLP	mg/L	<0.01	0.02	<0.01	<0.01
Copper in TCLP	mg/L	0.02	0.02	0.01	0.02
Lead in TCLP	mg/L	<0.03	<0.03	<0.03	<0.03
Mercury in TCLP	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Nickel in TCLP	mg/L	0.1	<0.02	0.03	0.03
Zinc in TCLP	mg/L	0.4	<0.02	0.1	0.1

PAHs in TCLP (USEPA 1311)					
Our Reference		200566-2	200566-5	200566-15	200566-20
Your Reference	UNITS	BH1	BH2	BH5	BH6
Depth		0.5	0.1	2.5	2.5
Date Sampled		28/08/2018	02/09/2018	03/09/2018	04/09/2018
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	13/09/2018	13/09/2018	13/09/2018	13/09/2018
Date analysed	-	14/09/2018	14/09/2018	14/09/2018	14/09/2018
Naphthalene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Acenaphthylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Acenaphthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Fluorene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Phenanthrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Fluoranthene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Chrysene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002	<0.002	<0.002	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001	<0.001	<0.001	<0.001
Total +ve PAH's	mg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	101	98	77	99

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
EXTRACT.7	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using in house method INORG-004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
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-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. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Leachates are extracted with Dichloromethane and analysed by GC-MS.
Org-012	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.
Org-012	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. 'EQ 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. 'EQ 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. 'EQ 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.

Method ID	Methodology Summary
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
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-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. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
Org-035	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.1 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.
Org-035_2	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.1 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-7
Date extracted	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			14/09/2018	2	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-014	<1	2	<1	<1	0	93	80
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-014	<1	2	<1	<1	0	102	83
2,2-dichloropropane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-014	<1	2	<1	<1	0	103	80
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	2	<1	<1	0	101	82
1,1-dichloropropene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-014	<0.2	2	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-014	<1	2	<1	<1	0	99	83
bromodichloromethane	mg/kg	1	Org-014	<1	2	<1	<1	0	93	79
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-014	<0.5	2	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-014	<1	2	<1	<1	0	73	79
1,2-dibromoethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-014	<1	2	<1	<1	0	72	75
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-014	<2	2	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-7
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-014	100	2	101	113	11	103	100
Surrogate aaa-Trifluorotoluene	%		Org-014	90	2	93	91	2	101	85
Surrogate Toluene-d_8	%		Org-014	75	2	98	93	5	73	92
Surrogate 4-Bromofluorobenzene	%		Org-014	112	2	96	99	3	105	104

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
chloroform	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
2,2-dichloropropane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,1-dichloropropene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-014	[NT]	15	<0.2	<0.2	0	[NT]	[NT]
dibromomethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
trichloroethene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
bromodichloromethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-014	[NT]	15	<0.5	<0.5	0	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,2-dibromoethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
bromoform	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-014	[NT]	15	<2	<2	0	[NT]	[NT]
styrene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
bromobenzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-014	[NT]	15	112	102	9	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-014	[NT]	15	86	87	1	[NT]	[NT]
Surrogate Toluene-d_8	%		Org-014	[NT]	15	93	94	1	[NT]	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-014	[NT]	15	99	102	3	[NT]	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-7
Date extracted	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			15/09/2018	2	14/09/2018	14/09/2018		15/09/2018	14/09/2018
TRH C_6 - C_9	mg/kg	25	Org-016	<25	2	<25	<25	0	111	87
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	2	<25	<25	0	111	87
Benzene	mg/kg	0.2	Org-016	<0.2	2	<0.2	<0.2	0	112	86
Toluene	mg/kg	0.5	Org-016	<0.5	2	<0.5	<0.5	0	112	85
Ethylbenzene	mg/kg	1	Org-016	<1	2	<1	<1	0	109	87
m+p-xylene	mg/kg	2	Org-016	<2	2	<2	<2	0	110	88
o-Xylene	mg/kg	1	Org-016	<1	2	<1	<1	0	110	86
naphthalene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	106	2	93	91	2	110	85

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	15	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	15	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	15	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	15	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	15	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	15	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	15	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	15	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	15	86	87	1	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-7
Date extracted	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	2	<50	<50	0	118	72
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	2	<100	<100	0	89	73
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	2	<100	<100	0	90	81
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	2	<50	<50	0	118	72
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	2	<100	<100	0	89	73
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	2	<100	<100	0	90	81
Surrogate o-Terphenyl	%		Org-003	89	2	88	90	2	113	86

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	15	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	15	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	15	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	15	89	87	2	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-7
Date extracted	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			14/09/2018	2	14/09/2018	14/09/2018		14/09/2018	14/09/2018
Naphthalene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	103	90
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	101	84
Phenanthrene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	110	100
Anthracene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	109	102
Pyrene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	102	95
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	2	0.1	0.1	0	97	94
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	2	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	2	<0.05	<0.05	0	114	103
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	102	2	109	103	6	100	96

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	14/09/2018	14/09/2018		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	15	0.3	0.4	29	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	15	0.4	0.5	22	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	15	0.2	0.3	40	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	15	0.2	0.3	40	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	15	0.5	0.5	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	15	0.3	0.4	29	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	15	0.2	0.2	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	15	0.2	0.2	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	15	100	99	1	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-7
Date extracted	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
HCB	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	93	88
gamma-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	86	80
Heptachlor	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	97	93
delta-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	89	84
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	93	88
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	90	85
Dieldrin	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	98	92
Endrin	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	105	100
pp-DDD	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	85	78
Endosulfan II	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	91	84
Methoxychlor	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	101	2	96	97	1	116	112

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	15	98	96	2	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-7
Date extracted	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	92	88
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	113	104
Dimethoate	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	101	103
Fenitrothion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	97	104
Malathion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	78	65
Parathion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	106	96
Ronnel	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	98	94
Surrogate TCMX	%		Org-008	101	2	96	97	1	96	95

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	15	98	96	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-7
Date extracted	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	101	97
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	101	2	96	97	1	96	95

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	15	98	96	2	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-7
Date prepared	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Arsenic	mg/kg	4	Metals-020	<4	2	<4	<4	0	106	85
Cadmium	mg/kg	0.4	Metals-020	<0.4	2	<0.4	<0.4	0	99	90
Chromium	mg/kg	1	Metals-020	<1	2	8	9	12	103	87
Copper	mg/kg	1	Metals-020	<1	2	49	43	13	110	84
Lead	mg/kg	1	Metals-020	<1	2	18	16	12	104	92
Mercury	mg/kg	0.1	Metals-021	<0.1	2	0.1	<0.1	0	100	113
Nickel	mg/kg	1	Metals-020	<1	2	32	28	13	103	82
Zinc	mg/kg	1	Metals-020	<1	2	140	120	15	99	91

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	15	5	4	22	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	15	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	15	7	7	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	15	35	34	3	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	15	18	17	6	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	15	11	11	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	15	57	55	4	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	200566-4
Date prepared	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Date analysed	-			13/09/2018	2	13/09/2018	13/09/2018		13/09/2018	13/09/2018
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	2	<5	<5	0	103	104

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Date analysed	-			[NT]	15	13/09/2018	13/09/2018		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	15	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			17/09/2018	[NT]	[NT]	[NT]	[NT]	17/09/2018	[NT]
Date analysed	-			17/09/2018	[NT]	[NT]	[NT]	[NT]	17/09/2018	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			18/09/2018	4	18/09/2018	18/09/2018		18/09/2018	[NT]
Date analysed	-			18/09/2018	4	18/09/2018	18/09/2018		18/09/2018	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	4	0.4	0.3	29	96	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	4	0.4	0.3	29	106	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	4	3.7	3.2	14	97	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	4	1.3	1.1	17	100	[NT]

QUALITY CONTROL: PFAs in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			14/09/2018	15	14/09/2018	14/09/2018		14/09/2018	[NT]
Date analysed	-			14/09/2018	15	14/09/2018	14/09/2018		14/09/2018	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-035	<0.1	15	<0.1	<0.1	0	111	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-035	<0.1	15	<0.1	<0.1	0	95	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-035	<0.1	15	<0.1	<0.1	0	89	[NT]
6:2 FTS	µg/kg	0.1	Org-035	<0.1	15	<0.1	<0.1	0	108	[NT]
8:2 FTS	µg/kg	0.1	Org-035	<0.1	15	<0.1	<0.1	0	116	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-035	109	15	112	110	2	101	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-035_2	99	15	110	114	4	100	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-035	101	15	89	93	4	96	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-035	87	15	86	83	4	100	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-035	114	15	96	94	2	112	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-035	120	15	130	128	2	110	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-035	101	15	133	105	24	89	[NT]

QUALITY CONTROL: Metals in TCLP USEPA1311						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			14/09/2018	2	14/09/2018	14/09/2018		14/09/2018	[NT]
Date analysed	-			14/09/2018	2	14/09/2018	14/09/2018		14/09/2018	[NT]
Arsenic in TCLP	mg/L	0.05	Metals-020 ICP-AES	<0.05	2	<0.05	<0.05	0	104	[NT]
Cadmium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	2	<0.01	<0.01	0	100	[NT]
Chromium in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	2	<0.01	<0.01	0	100	[NT]
Copper in TCLP	mg/L	0.01	Metals-020 ICP-AES	<0.01	2	0.02	0.01	67	112	[NT]
Lead in TCLP	mg/L	0.03	Metals-020 ICP-AES	<0.03	2	<0.03	<0.03	0	102	[NT]
Mercury in TCLP	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	2	<0.0005	<0.0005	0	103	[NT]
Nickel in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	2	0.1	0.1	0	102	[NT]
Zinc in TCLP	mg/L	0.02	Metals-020 ICP-AES	<0.02	2	0.4	0.4	0	97	[NT]

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			13/09/2018	[NT]	[NT]	[NT]	[NT]	13/09/2018	[NT]
Date analysed	-			14/09/2018	[NT]	[NT]	[NT]	[NT]	14/09/2018	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	77	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	80	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	84	[NT]
Anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	82	[NT]
Pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	75	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	78	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	77	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-012	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	85	[NT]	[NT]	[NT]	[NT]	82	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics 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.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Note: All samples analysed as received. However, samples 200566-1 & 5 are below the minimum 500mL sample volume as per National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

Asbestos: A portion of the supplied samples were sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples requested for asbestos testing were sub-sampled from jars provided by the client.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No: 86411.00	**Suburb:** Olympic Park	**To:** ELS	
Project Name: Carpark P6D	**Order Number**		
Project Manager: Tom Graham	**Sampler:**	**Attn:** Aileen Hie	
Emails: tom.graham@douglaspartners.com.au		**Phone:**	
Date Required: Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☒		**Email:**	
Prior Storage: ☒ Esky ☒ Fridge ☐ Shelved	Do samples contain 'potential' HBM? Yes ☐ No ☒ (If YES, then handle, transport and store in accordance with FPM HAZID)		

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	PFAS Short Suite	VOC	TCLP (PAH + 8m)	pH, CEC	Asbestos 500 mL	Combo 1m	TRH + BTEX	Hold	Notes/preservation
BH1 - 0.1	1	28/08/18	S	P						X				
BH1 - 0.5	2	28/08/18	S	G	X		X	X						
BD1/20180828	3	28/08/18	S	G							X			
BH1 - 1.0	4	28/08/18	S	G	X				X					
BH2 - 0.1	5	02/09/18	S	G+P	X	X		X		X				
BH2 - 1.0	6	02/09/18	S	G									X	
BH2 - 2.5	7	02/09/18	S	G	X		X		X					
BD1/20180902	8	02/09/18	S	G							X			
BH3 - 0.5	9	29/08/18	S	G	X									
BH3 - 1.0	10	29/08/18	S	G						X				
BH3 - 2.5	11	29/08/18	S	G	X				X					
BH4 - 0.5	12	27/08/18	S	G+P	X		X			X				
BH4 - 2.5	13	27/08/18	S	G	X	X								
BH5 - 0.5	14	03/09/18	S	G+P	X					X				
BH5 - 2.5	15	03/09/18	S	G	X	X	X	X						
PQL (S) mg/kg												**ANZECC PQLs req'd for all water analytes** ☐		

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 202566
Date Received: 12/9/18
Time Received: 2215
Received By: MT
Temp: Cool/Ambient 12.0
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 202566

Total number of samples in container: 24 **Relinquished by:** TG **Transported to laboratory by:** Courier

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: **Received by:** Ming Yan To **Date & Time:** 12/9/18 2215

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86411.00	**Suburb:** Olympic Park	**To:** ELS
Project Name:	Carpark P6D	**Order Number**	
Project Manager:	Tom Graham	**Sampler:**	**Attn:** Aileen Hie
Emails:	tom.graham@douglaspartners.com.au		**Phone:**
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☒		**Email:**
Prior Storage:	☐ Esky ☒ Fridge ☐ Shelved	Do samples contain 'potential' HBM? Yes ☐	No ☒ (If YES, then handle, transport and store in accordance with FPM HAZID)

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8a	PFAS Short Suite	VOC	ICLP (PAH + 8m)	pH, CEC	Asbestos 500 mL	Combo 1m	TRH + BTEX	Hold	Notes/preservation
BH6 - 0.1	16	04/09/18	S	P						X				
BH6 - 0.5	17	04/09/18	S	G		X								
BH6 - 1.0	18	04/09/18	S	G	X		X							
BD1/20180904	—	04/09/18	S	G							X			Please despatch to Eurofins MGT
BH6 - 1.5	19	04/09/18	S	P						X				
BH6 - 2.5	20	04/09/18	S	G	X			X						
Trip Blank	21		S	G								X		
Trip Spike	22		S	G								X		
MT — (extra) BH5-1.0	23													
PQL (S) mg/kg												**ANZECC PQLs req'd for all water analytes** ☐		

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 200566

Total number of samples in container: 24 **Relinquished by:** **Transported to laboratory by:** Courier

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: **Received by:** Ming Yan To **Date & Time:** 12/9/18 12:15

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
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SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Paul Gorman, Tom Graham

Sample Login Details

Your reference	86411.00, Carpark P6D
Envirolab Reference	200566
Date Sample Received	12/09/2018
Date Instructions Received	12/09/2018
Date Results Expected to be Reported	19/09/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	23 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12.0
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	Misc Inorg - Soil	CEC	PFAs in Soils Short	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Arsenic in TCLP	Cadmium in TCLP	Chromium in TCLP	Copper in TCLP	Lead in TCLP	Mercury in TCLP	Nickel in TCLP	Zinc in TCLP	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP
BH1-0.1											✓																									
BH1-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BD1/20180508		✓	✓					✓																												
BH1-1.0		✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓																							
BH2-0.1		✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH2-1.0																																				
BH2-2.5	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓																							
BD1/20180902		✓	✓					✓																												
BH3-0.5		✓	✓	✓	✓	✓	✓	✓	✓	✓																										
BH3-1.0											✓																									
BH3-2.5		✓	✓	✓	✓	✓	✓	✓	✓			✓	✓																							
BH4-0.5	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓																									
BH4-2.5		✓	✓	✓	✓	✓	✓	✓	✓	✓				✓																						
BH5-0.5		✓	✓	✓	✓	✓	✓	✓	✓																											
BH5-2.5	✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH6-0.1											✓																									
BH6-0.5														✓																							
BH6-1.0	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																										
BH6-1.5											✓																									
BH6-2.5		✓	✓	✓	✓	✓	✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Sample ID	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	On Hold
BH1-0.1								
BH1-0.5	✓	✓	✓	✓	✓	✓	✓	
BD1/20180508								
BH1-1.0								
BH2-0.1	✓	✓	✓	✓	✓	✓	✓	
BH2-1.0								✓
BH2-2.5								
BD1/20180902								
BH3-0.5								
BH3-1.0								
BH3-2.5								
BH4-0.5								
BH4-2.5								
BH5-0.5								
BH5-2.5	✓	✓	✓	✓	✓	✓	✓	
BH6-0.1								
BH6-0.5								
BH6-1.0								
BH6-1.5								
BH6-2.5	✓	✓	✓	✓	✓	✓	✓	

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Sample ID	VOCs in soil	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	Misc Inorg - Soil	CEC	PFAs in Soils Short	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Arsenic in TCLP	Cadmium in TCLP	Chromium in TCLP	Copper in TCLP	Lead in TCLP	Mercury in TCLP	Nickel in TCLP	Zinc in TCLP	Naphthalene in TCLP	Acenaphthylene in TCLP	Acenaphthene in TCLP	Fluorene in TCLP	Phenanthrene in TCLP	Anthracene in TCLP	Fluoranthene in TCLP	Pyrene in TCLP	Benzo(a)anthracene in TCLP	Chrysene in TCLP
Trip Blank		✓																																		
Trip Spike		✓																																		
BH5-1.0											✓																									

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Sample ID	Benzo(bjk)fluoranthene in TCLP	Benzo(a)pyrene in TCLP	Indeno(1,2,3-c,d)pyrene - TCLP	Dibenzo(a,h)anthracene in TCLP	Benzo(g,h,i)perylene in TCLP	Total +vePAH's	Surrogate p-Terphenyl-d14	On Hold
Trip Blank								
Trip Spike								
BH5-1.0								

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

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CERTIFICATE OF ANALYSIS 201157

Client Details

Client	Douglas Partners Pty Ltd
Attention	Tom Graham
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86411.00, Carpark P6D**
Number of Samples	6 Water
Date samples received	19/09/2018
Date completed instructions received	19/09/2018

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.

Report Details

Date results requested by	26/09/2018
Date of Issue	26/09/2018

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Results Approved By
Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Nancy Zhang, Assistant Lab Manager
Nick Sarlamis, Inorganics Supervisor
Phalak Inthakesone, Organics Development Manager, Sydney

Authorised By



Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Water						
Our Reference		201157-1	201157-2	201157-3	201157-4	201157-5
Your Reference	UNITS	BH2	BH3	BH6	BD1/20180919	Trip Spike
Date Sampled		19/09/2018	19/09/2018	19/09/2018	19/09/2018	19/09/2018
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	20/09/2018	20/09/2018	20/09/2018	20/09/2018	20/09/2018
Date analysed	-	21/09/2018	21/09/2018	21/09/2018	21/09/2018	21/09/2018
TRH C_6 - C_9	µg/L	28	17	<10	<10	[NA]
TRH C_6 - C_{10}	µg/L	38	21	<10	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	33	18	<10	<10	[NA]
Benzene	µg/L	<1	<1	<1	<1	93%
Toluene	µg/L	2	<1	<1	<1	81%
Ethylbenzene	µg/L	<1	2	<1	<1	90%
m+p-xylene	µg/L	2	<2	<2	<2	94%
o-xylene	µg/L	1	1	<1	<1	97%
Naphthalene	µg/L	<1	<1	<1	<1	[NA]
Surrogate Dibromofluoromethane	%	77	91	91	87	89
Surrogate toluene-d8	%	98	94	120	102	96
Surrogate 4-BFB	%	91	99	95	101	111

vTRH(C6-C10)/BTEXN in Water		
Our Reference		201157-6
Your Reference	UNITS	Trip Blank
Date Sampled		19/09/2018
Type of sample		Water
Date extracted	-	20/09/2018
Date analysed	-	21/09/2018
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Surrogate Dibromofluoromethane	%	83
Surrogate toluene-d8	%	93
Surrogate 4-BFB	%	99

svTRH (C10-C40) in Water					
Our Reference		201157-1	201157-2	201157-3	201157-4
Your Reference	UNITS	BH2	BH3	BH6	BD1/20180919
Date Sampled		19/09/2018	19/09/2018	19/09/2018	19/09/2018
Type of sample		Water	Water	Water	Water
Date extracted	-	20/09/2018	20/09/2018	20/09/2018	20/09/2018
Date analysed	-	20/09/2018	20/09/2018	20/09/2018	20/09/2018
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Surrogate o-Terphenyl	%	108	104	99	86

PAHs in Water - Low Level				
Our Reference	UNITS	201157-1	201157-2	201157-3
Your Reference		BH2	BH3	BH6
Date Sampled		19/09/2018	19/09/2018	19/09/2018
Type of sample		Water	Water	Water
Date extracted	-	20/09/2018	20/09/2018	20/09/2018
Date analysed	-	21/09/2018	21/09/2018	21/09/2018
Naphthalene	µg/L	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	0.2	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	0.1	<0.1
Pyrene	µg/L	<0.1	0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	NIL (+)VE	0.61	NIL (+)VE
Surrogate p-Terphenyl-d14	%	91	91	88

OCP in water				
Our Reference	UNITS	201157-1	201157-2	201157-3
Your Reference		BH2	BH3	BH6
Date Sampled		19/09/2018	19/09/2018	19/09/2018
Type of sample		Water	Water	Water
Date extracted	-	20/09/2018	20/09/2018	20/09/2018
Date analysed	-	25/09/2018	25/09/2018	25/09/2018
HCB	µg/L	<0.2	<0.2	<0.2
alpha-BHC	µg/L	<0.2	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2	<0.2
Surrogate TCMX	%	101	95	91

OP Pesticides in water				
Our Reference		201157-1	201157-2	201157-3
Your Reference	UNITS	BH2	BH3	BH6
Date Sampled		19/09/2018	19/09/2018	19/09/2018
Type of sample		Water	Water	Water
Date extracted	-	20/09/2018	20/09/2018	20/09/2018
Date analysed	-	25/09/2018	25/09/2018	25/09/2018
Azinphos-methyl (Guthion)	µg/L	<0.2	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2
Chlorpyriphos	µg/L	<0.2	<0.2	<0.2
Chlorpyriphos-methyl	µg/L	<0.2	<0.2	<0.2
Diazinon	µg/L	<0.2	<0.2	<0.2
Dichlorovos	µg/L	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2
Malathion	µg/L	<0.2	<0.2	<0.2
Parathion	µg/L	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2
Surrogate TCMX	%	101	95	91

PCBs in Water				
Our Reference		201157-1	201157-2	201157-3
Your Reference	UNITS	BH2	BH3	BH6
Date Sampled		19/09/2018	19/09/2018	19/09/2018
Type of sample		Water	Water	Water
Date extracted	-	20/09/2018	20/09/2018	20/09/2018
Date analysed	-	25/09/2018	25/09/2018	25/09/2018
Aroclor 1016	µg/L	<2	<2	<2
Aroclor 1221	µg/L	<2	<2	<2
Aroclor 1232	µg/L	<2	<2	<2
Aroclor 1242	µg/L	<2	<2	<2
Aroclor 1248	µg/L	<2	<2	<2
Aroclor 1254	µg/L	<2	<2	<2
Aroclor 1260	µg/L	<2	<2	<2
Surrogate TCLMX	%	101	95	91

Total Phenolics in Water				
Our Reference		201157-1	201157-2	201157-3
Your Reference	UNITS	BH2	BH3	BH6
Date Sampled		19/09/2018	19/09/2018	19/09/2018
Type of sample		Water	Water	Water
Date extracted	-	24/09/2018	24/09/2018	24/09/2018
Date analysed	-	24/09/2018	24/09/2018	24/09/2018
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05	<0.05

HM in water - dissolved					
Our Reference	UNITS	201157-1	201157-2	201157-3	201157-4
Your Reference		BH2	BH3	BH6	BD1/20180919
Date Sampled		19/09/2018	19/09/2018	19/09/2018	19/09/2018
Type of sample		Water	Water	Water	Water
Date prepared	-	21/09/2018	21/09/2018	21/09/2018	21/09/2018
Date analysed	-	21/09/2018	21/09/2018	21/09/2018	21/09/2018
Arsenic-Dissolved	µg/L	<1	3	1	1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	3	2	<1	<1
Copper-Dissolved	µg/L	4	8	<1	<1
Lead-Dissolved	µg/L	2	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	27	13	4	4
Zinc-Dissolved	µg/L	26	17	10	10

PFAS in Waters Short				
Our Reference		201157-1	201157-2	201157-3
Your Reference	UNITS	BH2	BH3	BH6
Date Sampled		19/09/2018	19/09/2018	19/09/2018
Type of sample		Water	Water	Water
Date prepared	-	21/09/2018	21/09/2018	21/09/2018
Date analysed	-	21/09/2018	21/09/2018	21/09/2018
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	0.01	<0.01
8:2 FTS	µg/L	<0.01	<0.01	<0.01
Surrogate $^{13}C_8$ *PFOS*	%	103	103	106
Surrogate $^{13}C_2$ *PFOA*	%	92	95	107
Extracted ISTD $^{18}O_2$ *PFHxS*	%	98	100	106
Extracted ISTD $^{13}C_4$ *PFOS*	%	97	98	99
Extracted ISTD $^{13}C_4$ *PFOA*	%	107	105	97
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	121	117	123
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	79	77	82
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	0.01	<0.01

Method ID	Methodology Summary
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-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-005	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.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	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.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
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-035	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.1 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

Method ID	Methodology Summary
Org-035E	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.1 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.
Org-035E_2	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.1 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			20/09/2018	[NT]	[NT]	[NT]	[NT]	20/09/2018	[NT]
Date analysed	-			21/09/2018	[NT]	[NT]	[NT]	[NT]	21/09/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	86	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	85	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	84	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	76	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	104	[NT]	[NT]	[NT]	[NT]	87	[NT]
Surrogate toluene-d8	%		Org-016	106	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate 4-BFB	%		Org-016	97	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	201157-2
Date extracted	-			20/09/2018	1	20/09/2018	20/09/2018		20/09/2018	20/09/2018
Date analysed	-			20/09/2018	1	20/09/2018	20/09/2018		20/09/2018	20/09/2018
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	1	<50	<50	0	102	111
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	1	<100	<100	0	98	103
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	1	<100	<100	0	118	108
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	1	<50	<50	0	102	111
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	1	<100	<100	0	98	103
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	1	<100	<100	0	118	108
Surrogate o-Terphenyl	%		Org-003	92	1	108	86	23	98	108

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	201157-2
Date extracted	-			20/09/2018	1	20/09/2018	20/09/2018		20/09/2018	20/09/2018
Date analysed	-			21/09/2018	1	21/09/2018	21/09/2018		21/09/2018	21/09/2018
Naphthalene	µg/L	0.2	Org-012	<0.2	1	<0.2	<0.2	0	78	75
Acenaphthylene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	82	80
Phenanthrene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	88	82
Anthracene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	88	81
Pyrene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	82	76
Benzo(a)anthracene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	77	74
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	79	75
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	89	1	91	76	18	84	78

QUALITY CONTROL: OCP in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	201157-2
Date extracted	-			20/09/2018	1	20/09/2018	20/09/2018		20/09/2018	20/09/2018
Date analysed	-			25/09/2018	1	25/09/2018	25/09/2018		25/09/2018	25/09/2018
HCB	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
alpha-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	102	98
gamma-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	77	73
Heptachlor	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	101	95
delta-BHC	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Aldrin	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	95	87
Heptachlor Epoxide	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	93	87
gamma-Chlordane	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	91	84
Dieldrin	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	96	89
Endrin	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	101	94
pp-DDD	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	88	81
Endosulfan II	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endrin Aldehyde	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	84	80
Methoxychlor	µg/L	0.2	Org-005	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	92	1	101	84	18	85	95

QUALITY CONTROL: OP Pesticides in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	201157-3
Date extracted	-			20/09/2018	1	20/09/2018	20/09/2018		20/09/2018	20/09/2018
Date analysed	-			25/09/2018	1	25/09/2018	25/09/2018		25/09/2018	25/09/2018
Azinphos-methyl (Guthion)	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Bromophos ethyl	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Chlorpyriphos	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	74	94
Chlorpyriphos-methyl	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Diazinon	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Dichlorovos	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	90	112
Dimethoate	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Ethion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	77	102
Fenitrothion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	121	96
Malathion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	87	90
Parathion	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	103	118
Ronnel	µg/L	0.2	Org-008	<0.2	1	<0.2	<0.2	0	76	98
Surrogate TCMX	%		Org-008	92	1	101	84	18	86	106

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	201157-3
Date extracted	-			20/09/2018	1	20/09/2018	20/09/2018		20/09/2018	20/09/2018
Date analysed	-			25/09/2018	1	25/09/2018	25/09/2018		25/09/2018	25/09/2018
Aroclor 1016	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-006	<2	1	<2	<2	0	84	96
Aroclor 1260	µg/L	2	Org-006	<2	1	<2	<2	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	92	1	101	84	18	86	106

QUALITY CONTROL: Total Phenolics in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			24/09/2018	1	24/09/2018	24/09/2018		24/09/2018	[NT]
Date analysed	-			24/09/2018	1	24/09/2018	24/09/2018		24/09/2018	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	1	<0.05	<0.05	0	101	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			21/09/2018	1	21/09/2018	21/09/2018		21/09/2018	[NT]
Date analysed	-			21/09/2018	1	21/09/2018	21/09/2018		21/09/2018	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	98	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	101	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	3	4	29	94	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	4	4	0	97	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	2	2	0	100	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	[NT]		109	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	27	30	11	97	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	26	28	7	95	[NT]

QUALITY CONTROL: PFAS in Waters Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			21/09/2018	[NT]	[NT]	[NT]	[NT]	21/09/2018	[NT]
Date analysed	-			21/09/2018	[NT]	[NT]	[NT]	[NT]	21/09/2018	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
6:2 FTS	µg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
8:2 FTS	µg/L	0.01	Org-035E	<0.01	[NT]	[NT]	[NT]	[NT]	118	[NT]
Surrogate $^{13}C_8$ PFOS	%		Org-035E	103	[NT]	[NT]	[NT]	[NT]	103	[NT]
Surrogate $^{13}C_2$ PFOA	%		Org-035E_2	100	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD $^{18}O_2$ PFHxS	%		Org-035	107	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD $^{13}C_4$ PFOS	%		Org-035	90	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD $^{13}C_4$ PFOA	%		Org-035	100	[NT]	[NT]	[NT]	[NT]	97	[NT]
Extracted ISTD $^{13}C_2$ 6:2FTS	%		Org-035	106	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD $^{13}C_2$ 8:2FTS	%		Org-035	96	[NT]	[NT]	[NT]	[NT]	87	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

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: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics 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.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86411.00	**Suburb:** Olympic Park	**To:** ELS
Project Name:	Carpark P6D	**Order Number**	
Project Manager:	Tom Graham	**Sampler:** ~~CLN~~ TG	**Attn:** Aileen Hie
Emails:	tom.graham@douglaspartners.com.au		**Phone:**
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☒		**Email:**
Prior Storage:	☒ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM? Yes ☐ No ☒ (If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Combo 8L	PFAS Short Suite	Combo 1m	TRH/BTEX						Notes/preservation
BH2	1	19.9.18	W	G+P	X	X								
BH3	2	↓	W	G+P	X	X								
BH6	3	↓	W	G+P	X	X								
BD1/20180919	4	↓	W	G+P			X							
Trip spike/blank	5,6	↓	W	G				X						
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes ☐**

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 201157
Date Received: 19.09.18
Time Received: 14:50
Received By: JE
Temp: Cool/Ambient 4.5°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No:

Total number of samples in container: 6(36) **Relinquished by:** TG **Transported to laboratory by:** TG

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: **Received by:** ELS JEMBLEN **Date & Time:** 19.9.18 14:50

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Tom Graham

Sample Login Details

Your reference	86411.00, Carpark P6D
Envirolab Reference	201157
Date Sample Received	19/09/2018
Date Instructions Received	19/09/2018
Date Results Expected to be Reported	26/09/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	6 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	4.5
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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12 Ashley St Chatswood NSW 2067
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Sample ID	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	OCP in water - low level	OP Pesticides in water	PCBs in Water - Low Level	Total Phenolicsin Water	HM in water - dissolved	PFAS in Waters Short
BH2	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH3	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH6	✓	✓	✓	✓	✓	✓	✓	✓	✓
BD1/20180919	✓	✓						✓	
Trip Spike	✓								
Trip Blank	✓								

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.

Certificate of Analysis

Douglas Partners (Syd)
96 Hermitage Road
West Ryde
NSW 2114

NATA Accredited
Accreditation Number 1261
Site Number 18217

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

Attention: **Tom Graham**

Report **617424-S**
Project name CARPARK P6D
Project ID 86411.00
Received Date Sep 13, 2018

Client Sample ID			**BD1/20180904**
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S18-Se16791**
Date Sampled			**Sep 04, 2018**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	73
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
Heavy Metals			
Arsenic	2	mg/kg	9.0
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	10
Copper	5	mg/kg	51
Lead	5	mg/kg	29
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	53
Zinc	5	mg/kg	250
% Moisture	1	%	7.5

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Sep 15, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 15, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Sep 15, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
BTEX	Melbourne	Sep 15, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Melbourne	Sep 15, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	Sep 13, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Site # 1254 & 14271

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

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

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

Company Name:	Douglas Partners (Syd)	**Order No.:**		**Received:**	Sep 13, 2018 4:40 PM
Address:	96 Hermitage Road West Ryde NSW 2114	**Report #:**	617424	**Due:**	Sep 20, 2018
		Phone:	02 9809 0666	**Priority:**	5 Day
		Fax:		**Contact Name:**	Tom Graham
Project Name:	CARPARK P6D				
Project ID:	86411.00				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BD1/20180904	Sep 04, 2018		Soil	S18-Se16791	X	X	X	X
Test Counts						1	1	1	1

Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

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

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

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

Results <10 times the LOR : No Limit

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

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

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

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	74			70-130	Pass	
TRH C10-C14	%	71			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	86			70-130	Pass	
Toluene	%	87			70-130	Pass	
Ethylbenzene	%	91			70-130	Pass	
m&p-Xylenes	%	83			70-130	Pass	
Xylenes - Total	%	83			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	103			70-130	Pass	
TRH C6-C10	%	75			70-130	Pass	
TRH >C10-C16	%	72			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	107			80-120	Pass	
Cadmium	%	102			80-120	Pass	
Chromium	%	112			80-120	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Copper			%	112			80-120	Pass	
Lead			%	115			80-120	Pass	
Mercury			%	111			75-125	Pass	
Nickel			%	108			80-120	Pass	
Zinc			%	107			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Se17425	NCP	%	77			70-130	Pass	
TRH C10-C14	M18-Se19678	NCP	%	94			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-Se17615	NCP	%	74			70-130	Pass	
Toluene	M18-Se17615	NCP	%	72			70-130	Pass	
Ethylbenzene	M18-Se17615	NCP	%	73			70-130	Pass	
m&p-Xylenes	M18-Se17615	NCP	%	71			70-130	Pass	
o-Xylene	M18-Se17615	NCP	%	71			70-130	Pass	
Xylenes - Total	M18-Se17615	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Se17425	NCP	%	75			70-130	Pass	
TRH C6-C10	M18-Se17425	NCP	%	76			70-130	Pass	
TRH >C10-C16	M18-Se19678	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Se15420	NCP	%	105			75-125	Pass	
Cadmium	S18-Se15420	NCP	%	102			75-125	Pass	
Chromium	S18-Se15420	NCP	%	106			75-125	Pass	
Copper	S18-Se15420	NCP	%	103			75-125	Pass	
Lead	S18-Se15420	NCP	%	108			75-125	Pass	
Mercury	S18-Se15420	NCP	%	106			70-130	Pass	
Nickel	S18-Se15420	NCP	%	103			75-125	Pass	
Zinc	S18-Se15420	NCP	%	104			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Se18006	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-Se19677	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Se19677	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Se19677	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-Se17614	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M18-Se17614	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M18-Se17614	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M18-Se17614	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M18-Se17614	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M18-Se17614	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Se18006	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Se18006	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M18-Se19677	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Se19677	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Se19677	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S18-Se15419	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S18-Se15419	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S18-Se15419	NCP	mg/kg	9.7	6.9	33	30%	Fail	Q15
Copper	S18-Se15419	NCP	mg/kg	31	36	15	30%	Pass	
Lead	S18-Se15419	NCP	mg/kg	5.1	6.6	26	30%	Pass	
Mercury	S18-Se15419	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S18-Se15419	NCP	mg/kg	6.0	< 5	21	30%	Pass	
Zinc	S18-Se15419	NCP	mg/kg	24	21	13	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	A18-Se16629	NCP	%	15	15	<1	30%	Pass	

Comments

Sample Integrity

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

Qualifier Codes/Comments

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

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)



Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

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

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

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NATA # 1261 Site # 20794

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

Company Name:	Douglas Partners (Syd)	**Order No.:**		**Received:**	Sep 13, 2018 4:40 PM
Address:	96 Hermitage Road West Ryde NSW 2114	**Report #:**	617424	**Due:**	Sep 20, 2018
		Phone:	02 9809 0666	**Priority:**	5 Day
		Fax:		**Contact Name:**	Tom Graham
Project Name:	CARPARK P6D				
Project ID:	86411.00				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Metals M8	BTEX	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X
Sydney Laboratory - NATA Site # 18217									
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BD1/20180904	Sep 04, 2018		Soil	S18-Se16791	X	X	X	X
Test Counts						1	1	1	1

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

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

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

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

Sample Receipt Advice

Company name:	**Douglas Partners (Syd)**
Contact name:	Tom Graham
Project name:	CARPARK P6D
Project ID:	86411.00
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Sep 13, 2018 4:40 PM
Eurofins | mgt reference:	**617424**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

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

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

Results will be delivered electronically via e.mail to Tom Graham - Tom.Graham@douglaspartners.com.au.

Appendix E

Groundwater Field Sheets

Explanatory Notes

Borehole Logs (BH1 to BH6)

Douglas Partners
Geotechnics | Environment | Groundwater

Groundwater Field Sheet

Bore Volume = casing volume + filter pack volume
$= \pi h_1 d_2^2/4 + n(\pi h_1 d_1^2/4 - \pi h_2 d_2^2/4)$
Where: $\pi = 3.14$
n = porosity (0.3 for most filter pack material)
h_1 = height of water column
d_1 = diameter of annulus
h_2 = length of filter pack
d_2 = diameter of casing
Bore Vol Normally: 7.2*h

Project and Bore Installation Details	
Bore / Standpipe ID:	BH2
Project Name:	
Project Number:	86411.00
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Development Details	
Date/Time:	11.9.18
Purged By:	TG
GW Level (pre-purge):	10.58 m bgl
GW Level (post-purge):	16.73 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Observed Well Depth:	17.61 m bgl
Estimated Bore Volume:	50 L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) 20L, Dry
Equipment:	Geosub

Micropurge and Sampling Details	
Date/Time:	19.9.18
Sampled By:	TG
Weather Conditions:	Fine
GW Level (pre-purge):	10.64 m bgl
GW Level (post sample):	12.94 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	17.61 m bgl
Estimated Bore Volume:	L
Total Volume Purged:	10 L
Equipment:	Geosub pump with HDPE Tubing

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1°C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
09:04 (1L)	23.0	0.45ppm	7.24	6.51	299	-82
09:07 (2L)	23.0	0.07	7.98	6.53	722	-106
09:10 (3L)	23.2	0.01	8.11	6.51	96.1	-119
09:12 (4L)	23.5	0.01	8.05	6.48	208	-123
09:13 (5L)	23.8	0.04	7.88	6.48	985	-125
09:14 (6L)	24.0	0.05	7.67	6.47	434	-128
09:15 (7L)	24.0	0.13	7.45	6.46	962	-129
09:17 (8L)	23.9	0.31	7.29	6.39	256	-119
09:18 (9L)	23.8	0.33	7.22	6.39	2994	-116
09:21 (10L)	23.8	0.35	7.12	6.37	1368	-111
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	
Sample ID:	
QA/QC Samples:	
Sampling Containers and filtration:	
Comments / Observations:	

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Groundwater Field Sheet

Bore Volume = casing volume + filter pack volume
$= \pi h_1 d_1^2/4 + n(\pi h_1 d_1^2/4 - \pi h_2 d_2^2/4)$
Where: $\pi = 3.14$
n = porosity (0.3 for most filter pack material)
h_1 = height of water column
d_1 = diameter of annulus
h_2 = length of filter pack
d_2 = diameter of casing

Bore Vol Normally: 7.2*h

Project and Bore Installation Details

Bore / Standpipe ID:	BH3
Project Name:	
Project Number:	86411.00
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	19.15 m bgl
Screened Interval:	4.5 - 19.15 m bgl
Contaminants/Comments:	-

Bore Development Details

Date/Time:	11.9.18 / 08:00
Purged By:	TG
GW Level (pre-purge):	4.83 m bgl
GW Level (post-purge):	16.81 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	5.83 m bgl Suspected soil restriction. Nominal Depth 19.15
Estimated Bore Volume:	30 L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) Dry - Slow recharge
Equipment:	Geosub

Micropurge and Sampling Details

Date/Time:	19.9.18
Sampled By:	TG
Weather Conditions:	Fine
GW Level (pre-purge):	10.48 m bgl
GW Level (post sample):	15.76 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	18.59 m bgl
Estimated Bore Volume:	L
Total Volume Purged:	L
Equipment:	Geosub pump with HDPE Tubing. rpm

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
10:10 (1L)	24.7	0.54	10.02	6.55	—	-42
10:16 (2L)	25.1	0.34	10.12	6.53	819	-51
10:20 (3L)	25.2	0.32	10.07	6.54	903	-55
10:22 (4L)	25.0	0.14	9.54	6.53	916	-56
10:23 (5L)	25.0	0.07	8.874	6.55	975	-55
10:25 (6L)	25.1	0.09	7.66	6.56	999	-51
10:— (7L)						
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	
Sample ID:	
QA/QC Samples:	
Sampling Containers and filtration:	
Comments / Observations:	

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Geotechnics / Environment / Groundwater

Groundwater Field Sheet

Bore Volume = casing volume + filter pack volume
$= \pi h_1 d_2^2/4 + n(\pi h_1 d_1^2/4 - \pi h_2 d_2^2/4)$
Where: $\pi = 3.14$
n = porosity (0.3 for most filter pack material)
h_1 = height of water column
d_1 = diameter of annulus
h_2 = length of filter pack
d_2 = diameter of casing
Bore Vol Normally: 7.2*h

Project and Bore Installation Details	
Bore / Standpipe ID:	BH6
Project Name:	
Project Number:	86411.00
Site Location:	
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	- m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	-

Bore Development Details	
Date/Time:	11.9.18
Purged By:	TG
GW Level (pre-purge):	10.47 m bgl
GW Level (post-purge):	11.53 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Observed Well Depth:	19.30 m bgl
Estimated Bore Volume:	≈63 L
Total Volume Purged:	(target: no drill mud, min 3 well vol. or dry) 200, 3 vol
Equipment:	Geosub

Micropurge and Sampling Details	
Date/Time:	~~14.9.18~~ 19.9.18
Sampled By:	TG
Weather Conditions:	~~Rain~~
GW Level (pre-purge):	10.5 m bgl
GW Level (post sample):	10.65 m bgl
PSH observed:	Yes / No (interface / visual). Thickness if observed:
Observed Well Depth:	19.30 m bgl
Estimated Bore Volume:	L
Total Volume Purged:	10 L
Equipment:	

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
7:40 / 1	22.0	0.75	6.19	6.56	230	3/2
7:42 / 2	22.4	0.49	6.24	6.58	146	
7:44 / 3	22.5	0.45	6.28	6.54	176	-2
7:46 / 4	22.4	0.39	6.31	6.60	163	-8
7:48 / 5	22.6	0.38	6.29	6.60	164	-12
7:54 / 6	22.7	0.31	6.28	6.60	175	-13
7:57 / 7	22.8	0.29	6.39	6.61	169	-18
8:00 / 8	22.9	0.16	6.34	6.62	170	-24
8:03 / 9	22.9	0.11	6.34	662	171	-27
8:06 / 10	23.0	0.07	6.31	6.62	167	-29
Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			

Sample Details

Sampling Depth (rationale):	15.5 m bgl, Middle of water column
Sample Appearance (e.g. colour, siltiness, odour):	Slightly turbid, pale grey. No odour
Sample ID:	BH6
QA/QC Samples:	BD1/180919
Sampling Containers and filtration:	
Comments / Observations:	

Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Soil Descriptions

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Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726-1993, Geotechnical Site Investigations Code. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 2007. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $Is_{(50)}$ MPa	Approximate Unconfined Compressive Strength MPa*
Extremely low	EL	<0.03	<0.6
Very low	VL	0.03 - 0.1	0.6 - 2
Low	L	0.1 - 0.3	2 - 6
Medium	M	0.3 - 1.0	6 - 20
High	H	1 - 3	20 - 60
Very high	VH	3 - 10	60 - 200
Extremely high	EH	>10	>200

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$. It should be noted that the UCS to $Is_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and longer sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

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Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

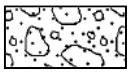
fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

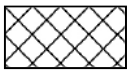
Graphic Symbols for Soil and Rock

General


Asphalt


Road base


Concrete

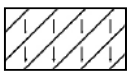

Filling

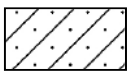
Soils


Topsoil

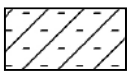

Peat

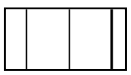

Clay

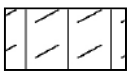

Silty clay

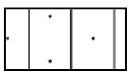

Sandy clay

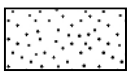

Gravelly clay

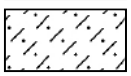

Shaly clay

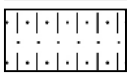

Silt


Clayey silt


Sandy silt

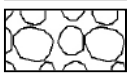

Sand

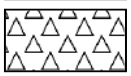

Clayey sand


Silty sand


Gravel


Sandy gravel


Cobbles, boulders

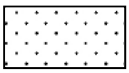

Talus

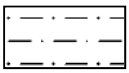
Sedimentary Rocks

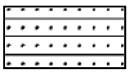

Boulder conglomerate

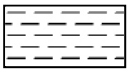

Conglomerate


Conglomeratic sandstone


Sandstone


Siltstone

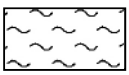

Laminite

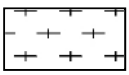

Mudstone, claystone, shale

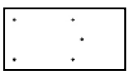

Coal


Limestone

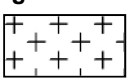
Metamorphic Rocks

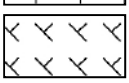

Slate, phyllite, schist

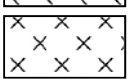

Gneiss

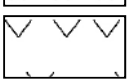

Quartzite

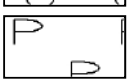
Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 13.5 AHD
EASTING: 321634.3
NORTHING: 6253297.4
DIP/AZIMUTH: 90°/--

BORE No: 1
PROJECT No: 86411.00
DATE: 28/8/2018
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
13	0.05	ASPHALTIC CONCRETE							A			
	0.2	ROADBASE: fine to medium, angular to sub angular roadbase gravel							A			
	0.6	FILLING: brown silty clay filling, with some ripped shale gravel							A			
12	1	CLAY: stiff, grey-brown clay with some ironstone gravel, moist							S			2,5,9 N = 14
	1.5	LAMINITE: extremely low strength, brown grey laminite						Unless otherwise stated rock is fractured along rough planar bedding dipping 0°-10°				
11	2								S			8,8/130 refusal Hammer bouncing
	2.7	LAMINITE: extremely low to very low strength, extremely to highly weathered, fragmented and slightly fractured, pale grey laminite						2.70-2.90m: fg, fe 2.90-3.40m: B (x5) 0°, cly	C	100	0	
10	3											PL(A) = 0.1
	4.0	LAMINITE: very low then low strength, highly weathered, slightly fractured, grey brown laminite with approximately 20% fine sandstone laminations						3.97-4.25m: B (x3) 0°-5°, fe 4.4m: J 45°, pl, ro, fe 4.60-5.22m: B (x5) 0°, fe, cly	C	100	33	PL(A) = 0.1
9	4											
	5.1	SHALE: medium strength, slightly weathered then fresh, unbroken, grey shale with a trace of fine sandstone laminations										PL(A) = 0.2 PL(A) = 0.5
8	5											
	6											
7	7							6.43-6.50m: fg, sz				PL(A) = 1
	7.0	SHALE: high strength, fresh unbroken, grey shale with approximately 10% fine sandstone laminations										PL(A) = 1.3
6	8								C	100	97	
5	9							>>				PL(A) = 1.9
	9.0	SHALE: medium strength, fresh, slightly fractured and unbroken grey shale with some high and very high strength siderite bands, and a trace of fine sandstone laminations										PL(A) = 0.7
4									C	100	97	

RIG: Scout 2 **DRILLER:** SS **LOGGED:** CE/SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 2.7m, NMLC-coring to 18.05m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: 10% water loss at 10.15m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 13.5 AHD
EASTING: 321634.3
NORTHING: 6253297.4
DIP/AZIMUTH: 90°/--

BORE No: 1
PROJECT No: 86411.00
DATE: 28/8/2018
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
		SHALE: medium strength, fresh, slightly fractured and unbroken grey shale with some high and very high strength siderite bands, and a trace of fine sandstone laminations *(continued)*						10.16m: J 45°, pl, sm, cln				PL(A) = 0.6
	11							11.02-11.15m: J 70°, pl, sm, cln 11.42m: J 45°, pl, sm, sz 30mm 11.77 & 12.43m: B 0°, fg, 5-10mm	C	100	97	PL(A) = 0.5
	12											PL(A) = 6.6 PL(A) = 0.6
	13											PL(A) = 0.3
	14								C	100	100	PL(A) = 0.6
	15											PL(A) = 0.6
	16											PL(A) = 0.4
	17							16.38m: B 0°, cly 10mm 16.44m: J sv, un, ro, cln 16.61m: J sv, pl, ro, cln	C	100	98	PL(A) = 0.7
	18 18.05	Bore discontinued at 18.05m										PL(A) = 0.5
	19											

RIG: Scout 2 **DRILLER:** SS **LOGGED:** CE/SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 2.7m, NMLC-coring to 18.05m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: 10% water loss at 10.15m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BORE: 1 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



2.7 – 6.0m

BORE: 1 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



6.0 = 11.0m

BORE: 1 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



11.0 – 16.0m

BORE: 1 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



16.0 – 18.05m

BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 13.5 AHD
EASTING: 321663.8
NORTHING: 6253316.7
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 86411.00
DATE: 30/8/2018
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
13	0.2	FILLING: grey, medium sand and roadbase gravel (sub-angular to angular) filling, moist							A			
	0.5	FILLING: grey silty clay filling with a trace of fine sand, moist							A			
12	1	CLAY: stiff to very stiff, mottled brownand light grey clay, slightly silty with a trace of ironstone gravel, moist							A			
									S			6,7,9 N = 16
11	2											
	2.2	LAMINITE: extremely low strength, light grey laminite						Unless otherwise stated rock is fractured along rough planar bedding dipping 0°-10°	S			15,20/50 refusal
10	3.0	LAMINITE: very low and low strength, highly wathered, fragmented to fractured, grey-brown laminite with approximately 20% fine sandstone laminations and some extremely low strength bands						3.00-3.10m: fg, fe 3.17m: J 60°, un, ro, cln 3.25m: J sv, pl, ro, fe 3.32-3.40m: Ds 3.46-3.49m: Ds 3.7m: B 0°, cly 15mm 3.80-4.15m: J 70°-80°, un, ro, fe 4.15-4.17m: Cs 4.32m: J 70°, un, ro, fe 4.5m: B 0°, fe, cly 10mm 4.55-4.60m: Ds	C	100	40	PL(A) = 1.2 PL(A) = 0.2
9	4											
	4.78											
8	5							4.6m: CORE LOSS: 180mm 4.85m: J 70°-90°, cu, ro, fe 5.00-5.20m: J 70°-90°, un, ro, fe 5.20-6.05m: B's 0°, fe, cly 5.9m: J 70°, pl, ro, fe	C	88	10	PL(A) = 0.9
	5.2	SHALE: medium strength, slightly weathered, fractured, grey-brown shale with some fine sandstone laminations										
	6											
	6.11											
7	6.22	SHALE: medium strength, fresh, slightly fratured grey shale						6.06m: CORE LOSS: 50mm 6.11-6.22m: fg, fe	C	98	92	PL(A) = 0.8
	7											
6	7.2	LAMINITE: high strength, fresh, slightly fractured then unbroken grey laminite with approximately 20% fine sandstone laminations						7.06m: B 0°, cly 7.15-7.20m: fg 7.35m: B 0°, cly, fg 10mm 7.76m: J 85°, pl, ro, cln				PL(A) = 1.2 PL(A) = 1.2
	8											
5	8.4	SHALE: medium strength, fresh, slightly fractured and unbroken grey shale with some very high strength siderite bands										
	9								C	100	92	PL(A) = 0.9
4								9.6m: J 60°, un, ro, cln 9.73-9.81m: J 80°, un, ro, cln				PL(A) = 0.5

RIG: Scout 2 **DRILLER:** SS **LOGGED:** SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 3.0m, NMLC-coring to 17.60m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Standpipe installed (screen 5.6-17.6m, gravel 1.0-17.6m, bentonite 0.5-1.0m, backfilled to GL with flush gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 13.5 AHD
EASTING: 321663.8
NORTHING: 6253316.7
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 86411.00
DATE: 30/8/2018
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
		SHALE: medium strength, fresh, slightly fractured and unbroken grey shale with some very high strength siderite bands *(continued)*						10.42m: J 70°, un, ro, cln				PL(A) = 0.5
	11								C	100	92	
								11.32m: J 60°, un, ro, cln 11.45m: J 80°, pl, ro, cln 11.55m: J 70°, un, ro, sz 20mm 11.73m: J 85°, un, ro, cln				PL(A) = 4.3 PL(A) = 0.8
	12											PL(A) = 4.3
												PL(A) = 0.6
	13											PL(A) = 0.6
	13.48							13.3m: J 90°, pl, sm, cln 13.4m: CORE LOSS: 80mm	C	97	88	
								13.52m: J 90°&45°, st, sm, fg 10mm 13.9m: J 45°, pl, sm, cln 14.1m: J 70°, un, ro, cln 14.25-14.35m: fg, cly, Sz 100mm 14.5m: J 70°-90°, cu, ro, cln 14.8m: J 90°, pl, ro, cln				PL(A) = 0.5 PL(A) = 1
	14											
	15											
												PL(A) = 0.9
	16								C	100	97	PL(A) = 6.8
								16.4m: B 0°, cly 10mm 16.5m: siderite band				PL(A) = 0.9
	17											
	17.6	Bore discontinued at 17.6m										PL(A) = 0.8
	18											
	19											

RIG: Scout 2 **DRILLER:** SS **LOGGED:** SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 3.0m, NMLC-coring to 17.60m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Standpipe installed (screen 5.6-17.6m, gravel 1.0-17.6m, bentonite 0.5-1.0m, backfilled to GL with flush gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BORE: 2 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



3.0 – 7.0m

BORE: 2 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



7.0 – 12.0m

BORE: 2 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



12.0 – 17.0m

BORE: 2 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



17.0 – 17.6m

BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 14.6 AHD
EASTING: 321625.4
NORTHING: 6253268.1
DIP/AZIMUTH: 90°/--

BORE No: 3
PROJECT No: 86411.00
DATE: 29/8/2018
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
14	0.05	ASPHALTIC CONCRETE							A			
	0.2	ROADBASE: pale grey to grey, fine to medium angular to sub-angular roadbase gravel							A			
1		FILLING: dark grey, silty clay filling with some fine sand and gravel, humid							A			
	1.1	CLAY: stiff, pale grey and orange-brown clay with a trace of ironstone gravel, moist							S			1,3,6 N = 9
13												
2												
	2.3	LAMINITE: very low strength, pale grey-brown laminite with iron-cemented bands						Unless otherwise stated rock is fractured along rough planar bedding dipping 0°-10°	S			13,25/100 refusal
12												
3								3m: CORE LOSS: 550mm				
	3.55	LAMINITE: medium then very low strength, highly weathered, fragmented to fractured, pale grey and red-brown laminite with some iron-cemented bands						3.55-3.80m: fg, fe	C	100	0	PL(A) = 0.6
11								4.02m: J 35°, un, ro, cly				
4								4.06m: B 0°, cly 10mm				
								4.17-4.23m: Cs				
								4.30-4.33m: Cs				
	4.58	LAMINITE: low strength, moderately weathered, fractured, grey-brown laminite with approximately 25% fine sandstone laminations						4.4m: J 70°, un, ro, cln	C	90	20	PL(A) = 0.2
10								4.45m: CORE LOSS: 130mm				
5								4.60-5.15m: B (x7) 0°, fe, cly vn				PL(A) = 0.3
								5.2m: J 60°, pl, ro, fe				
								5.30-6.00m: B (x12) 0°, fe				
9								5.4m: J 45°-80°, cu, ro, fe				
								5.9m: J 70°, pl, ro, fe, ti				
6	6.0	SHALE: medium strength, fresh, slightly fractured then unbroken, grey shale with some fine sandstone laminations						6.4m: J 30°, pl, ro, cln				PL(A) = 0.7
								6.6m: J 70°, pl, ro, cln				
8								6.73-6.92m: J 85°, pl, ro, cln				
7												PL(A) = 0.5
								7.68m: J 30°&85°, st, sm, cln	C	100	100	
								8m: J 90°, pl, ro, cln				PL(A) = 0.8
6												
	8.9	SHALE: medium and high strength, fresh, slightly fractured and unbroken, grey shale with a trace of fine sandstone laminations						9m: J 90°, pl, ro, cln				
5									C	100	100	PL(A) = 1 PL(A) = 2

RIG: Scout 2 **DRILLER:** SS **LOGGED:** SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 3.0m, NMLC-coring to 19.15m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Standpipe installed (screen: 4.5-19.15m, gravel: 1.0-19.15m, bentonite: 0.5-1.0m, backfill to GL with flush gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 14.6 AHD
EASTING: 321625.4
NORTHING: 6253268.1
DIP/AZIMUTH: 90°/--

BORE No: 3
PROJECT No: 86411.00
DATE: 29/8/2018
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
4	11	SHALE: medium and high strength, fresh, slightly fractured and unbroken, grey shale with a trace of fine sandstone laminations *(continued)*						10.4m: J 45°, pl, ro, cln 10.75m: J 60°, pl, ro, cln 11.24m: B 10°, ca 1mm	C	100	100	PL(A) = 0.8 PL(A) = 1
3	12 12.0	SHALE: medium strength, fresh, slightly fractured and unbroken, grey shale with some very high strength siderite bands										
2	13							12.70-12.90m: J 90°, pl, ro, cln	C	100	100	PL(A) = 0.4 PL(A) = 3.9
1	14							13.60-13.70m: siderite band 14.18-14.30m: J 80°, pl, ro, cln				PL(A) = 0.7 PL(A) = 3.9 PL(A) = 0.8
0	15							15.06m: J 45°-80° cu, he/ti	C	100	100	PL(A) = 0.7
-1	16											PL(A) = 0.7
-2	17											PL(A) = 0.6
-3	18							17.8m: J 45°, pl, ro, cln 18.28m: J 20°, pl, ro, cln, siderite 20mm	C	100	100	PL(A) = 9
-4	19											
-5	19.15	Bore discontinued at 19.15m										PL(A) = 0.8

RIG: Scout 2 **DRILLER:** SS **LOGGED:** SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 3.0m, NMLC-coring to 19.15m

WATER OBSERVATIONS: No free ground water observed whilst augering

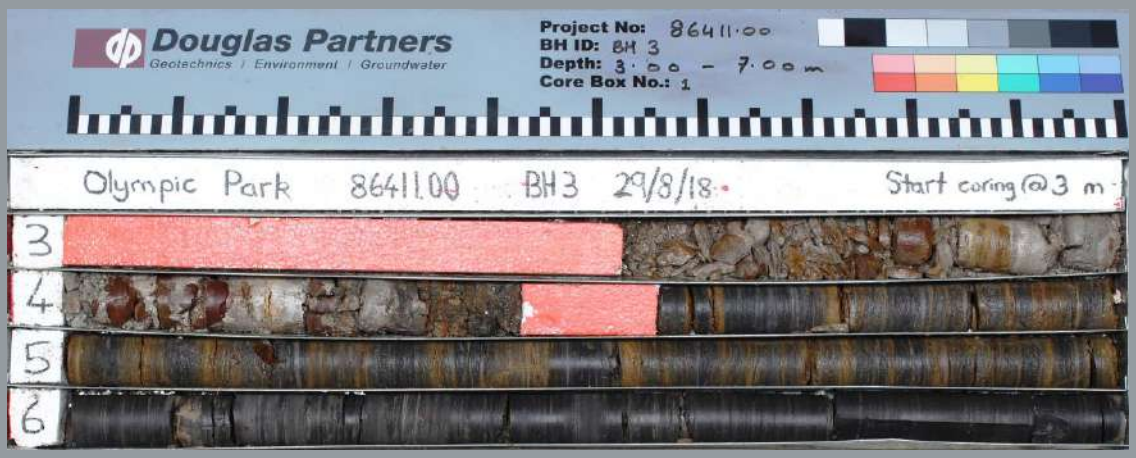
REMARKS: Standpipe installed (screen: 4.5-19.15m, gravel: 1.0-19.15m, bentonite: 0.5-1.0m, backfill to GL with flush gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BORE: 3 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



3.0 – 7.0m

BORE: 3 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



7.0 – 12.0m

BORE: 3 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



12.0 – 17.0m

BORE: 3 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



17.0 – 19.15m

BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 14.9 AHD
EASTING: 321682.4
NORTHING: 6253276.5
DIP/AZIMUTH: 90°/--

BORE No: 4
PROJECT No: 86411.00
DATE: 27/8/2018
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
14	0.01	ASPHALTIC CONCRETE							A			
	0.25	ROADBASE: grey, angular and sub-angular medum roadbase							A			
	0.65	FILLING: light grey-brown sandy clay filling, moist							A			
13	1	CLAY: very stiff, grey-brown clay with some ironstone gravel, moist							S			5,8,10 N = 18
	2.1	SHALE: extremely to very low strength, grey-brown shale						Unless otherwise stated rock is fractured along rough planar bedding dipping 0°-10°	S			25/130 refusal
12	2.8	SHALE: extremely low to very low strength, extremely to highly weathered, fragmented to fractured, pale grey-brown shale with some medium strength iron-cemented bands						2.80-3.00m: fg, fe, cly 3.00-4.15m: B's 0°-5°, fe, cly, 10-50mm 3.65m: J 80°, un, ro, fe, cly 3.92m: J sv, pl, ro, fe				PL(A) = 0.7
11	4.15	LAMINITE: low strength, highly to moderately weathered, fractured, grey-brown laminite with approximately 25% fine sandstone laminations						4.15-4.65m: B (x5) 0°, fe, cly co, 1-5mm 4.36m: J 80°, he/fe	C	100	56	PL(A) = 0.2
10	4.7	LAMINITE: medium strength, fresh stained, slightly fractured, grey-brown laminite with approximately 25% fine sandstone laminations						5.10-5.75m: B (x3) 0°, fe, cly				PL(A) = 0.7
9	6.41	SHALE: medium and high strength, fresh,slightly fractured and unbroken, dark grey shale with some very high strength siderite bands						6.42m: B 0°, fe, cly, 5mm 6.88m: J 45°-70°, cu, ro, cly				PL(A) = 2.6
8									C	100	99	PL(A) = 0.8
7												PL(A) = 1.2
6	9							9.20-9.35m: J 80°, pl, ro, cln 9.50-9.80m: J 80°, un, ro, cln	C	100	100	PL(A) = 1.3
5												

RIG: Scout 2 **DRILLER:** SS **LOGGED:** CE/SI **CASING:** HW to 2.8m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 2.8m, NMLC-coring to 19.20m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: 40% water loss from 4.9m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 14.9 AHD
EASTING: 321682.4
NORTHING: 6253276.5
DIP/AZIMUTH: 90°/--

BORE No: 4
PROJECT No: 86411.00
DATE: 27/8/2018
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
4	11	SHALE: medium and high strength, fresh,slightly fractured and unbroken, dark grey shale with some very high strength siderite bands *(continued)*							C	100	100	PL(A) = 0.7
												PL(A) = 0.7
3	12							12.36m: J 60°, pl, sm, cln, sz 40mm				PL(A) = 5.4
2	13											PL(A) = 0.5
								13.25-13.33m: siderite band	C	100	99	PL(A) = 4.4
1	14											PL(A) = 0.9
0	15							>>				
												PL(A) = 0.6
-1	16								C	95	95	PL(A) = 0.4
-2	17							16.95-17.12m: J 85°, pl, ro, cln				
	17.28							17.12m: CORE LOSS: 160mm				PL(A) = 1.2
								17.51m: J 35°, pl, ro, cln				PL(A) = 0.7
-3	18								C	100	100	PL(A) = 0.9
-4	19											PL(A) = 0.6
	19.2	Bore discontinued at 19.2m										
-5												

RIG: Scout 2 **DRILLER:** SS **LOGGED:** CE/SI **CASING:** HW to 2.8m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 2.8m, NMLC-coring to 19.20m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: 40% water loss from 4.9m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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2.8 – 6.0m

BORE: 4 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



6.0 -11.0m

BORE: 4 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



11.0 – 16.0m

BORE: 4 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



16.0 – 19.2m

BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 16.6 AHD
EASTING: 321644.5
NORTHING: 6253217.3
DIP/AZIMUTH: 90°/--

BORE No: 5
PROJECT No: 86411.00
DATE: 3/9/2018
SHEET 1 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
16	0.02	ASPHALTIC CONCRETE							A			
		FILLING: variably compacted grey and light grey-brown sand and ripped sandstone gravel filling, damp							A			
1									A			15,19,25/100 refusal
	1.5								S			
15		FILLING: variably compacted grey to grey-brown sandy clay and ripped shale fragments filling, damp to moist										
2												
14									S			13,18,18 N = 36
3												
13								Unless otherwise stated rock is fractured along rough planar bedding dipping 0°-10°				
4	4.0	FILLING: light grey and brown, ripped shale fragments filling with clay						4m: CORE LOSS: 1400mm				
12									C	33	0	
5												
11	5.4											
6								6.1m: CORE LOSS: 300mm				
	6.4											
10	6.5	LAMINITE: high strength, fresh, unbroken grey laminite with approximately 20% fine sandstone laminations										PL(A) = 1.8
7									C	90	87	PL(A) = 1.2
9												
8												PL(A) = 1.3
	9.1	SHALE: medium and high strength, fresh, unbroken grey shale with a trace of fine sandstone laminations						9.1m: J 45°, pl, sm, cln	C	100	100	PL(A) = 0.9
8												
7												

RIG: Scout 2 **DRILLER:** SS **LOGGED:** SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 4.0m, NMLC-coring to 20.85m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▽	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 16.6 AHD
EASTING: 321644.5
NORTHING: 6253217.3
DIP/AZIMUTH: 90°/--

BORE No: 5
PROJECT No: 86411.00
DATE: 3/9/2018
SHEET 2 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
			EW HW MW SW FS FR		Ex Low Very Low Low Medium High Very High Ex High		0.01 0.05 0.10 0.50 1.00	B - Bedding J - Joint S - Shear F - Fault				
11		SHALE: medium and high strength, fresh, unbroken grey shale with a trace of fine sandstone laminations *(continued)*							C	100	100	PL(A) = 1.5 PL(A) = 1.1
	11.5	SHALE: medium then medium to high strength, fresh, slightly fractured and unbroken grey shale with some very high strength siderite bands						11.63m: J 70°, pl, ro, cln				PL(A) = 0.9
12												
13									C	100	97	PL(A) = 0.9
14												PL(A) = 0.7
								14.68m: J 45°, pl, sm, si 14.72m: B 0°, cly 5mm 14.78m: J 80°, pl, ro, cln				PL(A) = 1.8
15												
16												PL(A) = 3.1 PL(A) = 0.6
17								>>	C	100	100	PL(A) = 0.7
18												PL(A) = 0.7
19									C	100	100	PL(A) = 1.1
								19.7m: B 0°, cly 5mm				PL(A) = 0.5

RIG: Scout 2 **DRILLER:** SS **LOGGED:** SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 4.0m, NMLC-coring to 20.85m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 16.6 AHD
EASTING: 321644.5
NORTHING: 6253217.3
DIP/AZIMUTH: 90°/--

BORE No: 5
PROJECT No: 86411.00
DATE: 3/9/2018
SHEET 3 OF 3

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
-4		SHALE: medium then medium to high strength, fresh, slightly fractured and unbroken grey shale with some very high strength siderite bands *(continued)*							C	100	100	PL(A) = 1.1
	20.85	Bore discontinued at 20.85m										
-5	21											
-6	22											
-7	23											
-8	24											
-9	25											
-10	26											
-11	27											
-12	28											
-13	29											

RIG: Scout 2 **DRILLER:** SS **LOGGED:** SI **CASING:** HW to 2.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 4.0m, NMLC-coring to 20.85m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BORE: 5 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



4.0 – 8.0m

BORE: 5 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



8.0 – 13.0m

BORE: 5 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



13.0 – 18.0m

BORE: 5 PROJECT: SYDNEY OLYMPIC PARK AUGUST 2018



18.0 – 20.85m

BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 14.9 AHD
EASTING: 321699.1
NORTHING: 6253240.6
DIP/AZIMUTH: 90°/--

BORE No: 6
PROJECT No: 86411.00
DATE: 5/9/2018
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
14	0.02	ASPHALTIC CONCRETE							A			
	0.4	FILLING: grey silty sand filling with ripped sandstone							A			
		FILLING: grey ripped shale filling										
1	1.0	FILLING: variably compacted, light grey to grey and grey-brown silty clay and ripped shale filling							A			
									S			6,18,23 N = 41
13	2											
									S			6,13,15 N = 28
12	3											
11	4								S			5,7,8 N = 15
10	5											
	5.5	SHALE: extremely to very low strength, extremely to highly weathered, fragmented, grey-brown shale with some medium strength bands						5.5m: CORE LOSS: 300mm				
9	5.8							5.80-6.20m: fg				
6	6.2	LAMINITE: high then medium strength, slightly weathered then fresh, slightly fractured, grey-brown laminite with approximately 20% fine sandstone laminations						6.2m: J 45°,pl, sm, fe 6.3m: J 45°,pl, sm, fe 6.5m: J 70°&80°, st, sm, cln 6.65-6.85m: B (x4) 0°, fe 6.85-6.94m: J 80°, pl, ro, fe	C	83	42	PL(A) = 1.1 PL(A) = 1.5
8	7							7.50m: siltstone clast				PL(A) = 0.9
7	8	SHALE: medium strength, fresh, slightly fractured and unbroken, grey shale with some fine grained sandstone laminations						7.95m: J 70°&85°, st, ro, cln				
6	8.0								C	100	98	PL(A) = 0.6
	9							8.9m: J 45°, un, ro, cln 8.95m: B 0°, cly co 2mm				
5								9.65-9.70m: J (x2) 80°, ti				PL(A) = 0.6

RIG: Scout 2 **DRILLER:** SS **LOGGED:** SI **CASING:** HW to 2.5m, HQ to 5.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 5.5m, NMLC-coring to 19.1m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Standpipe installed (screen: 6.0-19.1m, gravel: 5.0-19.1m, bentonite: 4.0-5.0m, backfill to GL with flush gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Ecove Pty Ltd
PROJECT: Carpark P6D
LOCATION: Olympic Park, Sydney

SURFACE LEVEL: 14.9 AHD
EASTING: 321699.1
NORTHING: 6253240.6
DIP/AZIMUTH: 90°/--

BORE No: 6
PROJECT No: 86411.00
DATE: 5/9/2018
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
		SHALE: medium strength, fresh, slightly fractured and unbroken, grey shale with some fine grained sandstone laminations *(continued)*							C	100	98	PL(A) = 0.8
												PL(A) = 0.6
	11							11.53m: J 70°, pl, ro, cln	C	100	94	
	12							12.25-12.50m: J (x4) 35°-45°, pl, sm, cln 12.50-12.55m: J (x4) 45°-65°, pl, sm, cln 12.65m: J 80°, to				PL(A) = 0.6
	13 13.0	SHALE: medium strength, fresh, fragmented to fractured grey shale with some very low strength bands						12.95m: J 85°, pl, sm, cln 13.05-13.18m: fg, cly, Sz 130mm 13.23m: J 70°, pl, ro, fg 5mm				
	13.8							13.28-13.55m: J (x3) 60°-70°, un, ro, cln 13.55-13.60m: fg, cly Sz 50mm 13.7m: CORE LOSS: 100mm 13.92m: J 45°&80°, st, sm, cln	C	95	20	PL(A) = 0.6
	14							14m: J 50°, pl, sm, cln				PL(A) = 0.3
	15 15.15	SHALE: medium strength, fresh, fractured and slightly fractured grey shale with a trace of fine sandstone laminations						14.12-14.20m: J (x4) 35°-45°, pl, sm, cln 14.33-14.63m: J (x4) 45°-50°, pl, ro, cln 14.65m: J 70°, pl, ro, cln 14.72-14.75m: J 45°, pl, ro, fg 5mm 14.90-15.05m: fg, cly, Sz 100mm	C	90	75	PL(A) = 0.5
	16							15.05m: CORE LOSS: 100mm 15.83m: J 45°-70°, cu, ro, cln 15.95m: J 60°, pl, sm, cln 16.12-16.20m: fg				PL(A) = 0.6
	17							16.85m: J (x2) 70°&80°, un, ro, cln 16.95m: J 45°, pl, sm, cln 17.15-17.25m: J 70°&80°, st, sm, cln 17.28-17.30m: J 45°, Sz 20mm	C	100	49	PL(A) = 0.5
	18							17.55m: J 30°, pl, sm, fg 50mm 17.70-17.76m: fg				
	19 19.1	Bore discontinued at 19.1m						17.76m: J 70°, un, ro, cln 17.9m: J 70°, pl, sm, fg 100mm 18.00-18.30m: J (x2) 85°, pl, ro, fg 18.35m: J 85°, pl, sm, cln 19.06m: J 45°, pl, sm, cln	C	100	90	PL(A) = 0.6

RIG: Scout 2 **DRILLER:** SS **LOGGED:** SI **CASING:** HW to 2.5m, HQ to 5.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m, Rotary (water) to 5.5m, NMLC-coring to 19.1m

WATER OBSERVATIONS: No free ground water observed whilst augering

REMARKS: Standpipe installed (screen: 6.0-19.1m, gravel: 5.0-19.1m, bentonite: 4.0-5.0m, backfill to GL with flush gatic cover)

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BORE: 6 PROJECT: SYDNEY OLYMPIC PARK SEP 2018



5.5 – 10.0m

BORE: 6 PROJECT: SYDNEY OLYMPIC PARK SEP 2018



10.0 – 15.0m

BORE: 6 PROJECT: SYDNEY OLYMPIC PARK SEP 2018



15.0 – 19.1m

Appendix F

Tables F1 and F2 (Summary of Laboratory Test Results)

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Table F1 - Summary of Laboratory Results

				Acid Extractable metals in soil								vTRH(C6-C10)/BTEXN in Soil										svTRH (C10-C40) in Soil								PAHs in Soil											
				Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Ethylbenzene	Naphthalene	Toluene	C6 - C9	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 less BTEX (F1)	C6-C10	C10-C16	C16-C34	C34-C40	F2-NAPHTHALENE	C10 - C14	C15 - C28	C29-C36	C10 - C40 (Sum of total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(g,h,i)perylene	Benzo(a)pyrene TEQ calc(PQL)	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				2/4	0.4	1/5	1/5	1/5	0.1	1/5	1/5	0.1/0.2	0.1/1	0.5/1	0.1/0.5	20/25	0.2/2	0.1/1	0.3/1	20/25	20/25	50	100	100	50	20/50	50/100	50/100	50	0.1	0.1	0.1	0.1	0.05	0.1	0.5	0.1	0.1	0.1	0.1	0.1
Direct Contact HSL-C/D												430	27000	11000	99000				81000		26000	20000	27000	38000																	
NEPM 2013 EILs Urban Res/POS Aged				100		410	130	1100		45	210			170																											
NEPM 2013 HILs Res B Soil				500	150	500	30,000	1200	120	1200	60,000																								4					
NEPM 2013 HILs Comm/Ind D Soil				3000	900	3600	240000	1500	730	6000	400000																								40					
NEPM Comm/Ind D Soil HSL for Vapour Intrusion, Sand 0-1m												4	1300	3	4800				840	680					500																
NEPM 2013 ESLs for Comm/Ind, Coarse Soil												75	165		135				180	215			1700	3300	170								1.4							
NEPM 2013 Management Limits Comm / Ind, Coarse Soil																					700	1000	3500	10000																	
Field_ID	**Depth**	**Sample Date**	**Soil Description**																																						
HLA 2002																																								
BH24	0.03-0.2	14/05/2002	Filling	3	<1	10	8	12	<0.1	8	25	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.4	-	-	-	-	-	-	<50	<100	<100	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH25	0.03-0.1	14/05/2002	Filling	2	<1	9	19	17	<0.1	25	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH26	0.03-0.1	14/05/2002	Filling	3	<1	6	7	15	<0.1	4	35	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.4	-	-	-	-	-	-	<50	<100	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUP06 - Duplicate of BH26_0.03-0.1				2	<1	5	6	11	<0.1	3	29	<0.2	<0.2	-	<0.2	<0.2	<0.2	<0.2	<0.4	-	-	-	-	-	-	<50	<100	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH27	0.03-0.1	14/05/2002	Filling	3	<1	30	11	13	<0.1	8	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH28	0.03-0.1	14/05/2002	Filling	6	<1	6	27	26	<0.1	19	42	-	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH29	0.03-0.1	14/05/2002	Filling	<1	<1	6	<1	7	<0.1	<1	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Duplicate of BH29_0.03-0.1				2	<0.5	6	1.5	9	<0.1	<0.5	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH30	1.5-1.7	14/05/2002	Filling	4	<1	8	30	14	<0.1	18	96	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.4	-	-	-	-	-	-	<50	<100	<100	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH31	0.8-1.0	14/05/2002	Filling	1	<1	8	5	10	<0.1	4	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH32	0.6-0.8	14/05/2002	Natural	9	<1	22	13	20	<0.1	<1	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH33	0-0.1	14/05/2002	Filling	7	<1	17	20	27	<0.1	26	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH34	0.7-0.8	14/05/2002	Filling	6	<1	29	12	15	<0.1	<1	6	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.4	-	-	-	-	-	-	<50	<100	<100	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH35	2.0-2.1	14/05/2002	Natural	4	<1	6	25	13	<0.1	<1	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH36	0.4-0.5	14/05/2002	Natural	5	<1	15	18	18	<0.1	14	80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH37	0.02	14/05/2002	Natural	4	<1	180	39	10	<0.1	163	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH38	0-0.1	14/05/2002	Filling	7	<1	23	12	13	<0.1	<1	21	<0.2	<0.2	<0.5	<0.2	<0.2	<0.2	<0.2	<0.4	-	-	-	-	-	-	<50	<100	<100	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5
BH39	0-0.1	14/05/2002	Filling	7	<1	23	12	13	<0.1	<1	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUP08 - Duplicate of BH39_0-0.1				8	<1	34	19	20	<0.1	2	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH40	0-0.1	14/05/2002	Filling	2	<1	6	71	7	<0.1	37	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH41	0.7-0.8	14/05/2002	Filling	9	<1	39	21	33	<0.1	8	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH42	0-0.2	14/05/2002	Natural	11	<1	25	20	25	<0.1	9	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DP 2018																																								
BH1	0.1	28/08/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1	0.5	28/08/2018	Filling	<4	<0.4	8	49	18	0.1	32	140	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.5	0.1	<0.1	<0.1	<0.1	<0.1
BD1/20180828 - Duplicate of BH1 - 0.5m				<4	0.4	11	100	18	<0.1	34	130	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	-	-	-	-	-	-	-	-	-	-	-	-
BH1	1.0	28/08/2018	Natural	6	<0.4	23	19	18	<0.1	3	8	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1
BH2	0.1	2/09/2018	Filling	<4	0.5	18	47	55	<0.1	15	100	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	130	<100	<50	<50	<100	<100	130	<0.1	<0.1	<0.1	0.3	0.3	0.2	0.5	0.3	<0.1	0.7	<0.1	0.1
BH2	2.5	2/09/2018	Natural	<4	<0.4	6	34	16	<0.1	11	33	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.1	0.08	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1
BD1/20180902 - Duplicate of BH2 - 2.5m				<4	<0.4	6	36	12	<0.1	6	39	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	-	-	-	-	-	-	-	-	-	-	-	-
BH3	0.5	29/08/2018	Filling	6	<0.4	16	20	19	<0.1	7	26	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	0.1	0.2	0.1	<0.5	0.1	<0.1	0.2	<0.1	<0.1
BH3	1.0	29/08/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	2.5	29/08/2018	Natural	<4	<0.4	4	19	12	<0.1	1	9	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1
BH4	0.5	27/08/2018	Filling	9	0.4	20	18	25	<0.1	5	21	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	0.6	0.88	0.6	1.3	0.6	0.1	0.8	<0.1	0.4
BH4	2.5	27/08/2018	Natural	<4	<0.4	9	30	12	<0.1	3	15	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1
BH5	0.5	3/09/2018	Filling	5	<0.4	7	25	14	<0.1	12	51	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1
BH5	1.0	3/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	2.5	3/09/2018	Filling	5	<0.4	7	35	18	<0.1	11	57	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	0.2	0.3	0.2	<0.5	0.2	<0.1	0.3	<0.1	0.2
BH6	0.1	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	0.5	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	1.0	4/09/2018	Filling	5	0.4	5	39	20	<0.1	35	150	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.5	0.1	<0.1	<0.1	<0.1	<0.1
BD1/20180904 - Duplicate of BH6 - 1.0m				9	<0.4	10	51	29	<0.1	53	250	<0.1	<0.1	<0.5	<0.1	<20	<0.2	<0.1	<0.3	<20	<20	<50	<100	<100	<50	<20	<50	<50	<50	-	-	-	-	-	-	-	-	-	-	-	-
BH6	1.5	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	2.5	4/09/2018	Filling	5	<0.4	4	22	13	<0.1	8	43	<0.2	<1	<1	<0.5	<25	<2	<1	<1	<25	<25	<50	<100	<100	<50	<50	<100	<100	<50	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1

Table F1 - Summary of Laboratory Results

					Moisture	Organochlorine Pesticides in soil																						Organophosphorus Pesticides												
	Naphthalene	Phenanthrene	Pyrene	Total +ive PAH	Moisture	4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Aldrin + Dieldrin	Azinophos methyl	Bromophos-ethyl	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Arochlor 1016
	mg/kg	mg/kg	mg/kg	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.1	0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Direct Contact HSL-C/D	11000																																						
NEPM 2013 EILs Urban Res/POS Aged	170													180																										
NEPM 2013 HILs Res B Soil				400											600					20			10		15	500	10			340										
NEPM 2013 HILs Comm/Ind D Soil				4000											3600					100			50		80	2500	45			2000										
NEPM Comm/Ind D Soil HSL for Vapour Intrusion, Sand 0-1m	3																																						
NEPM 2013 ESLs for Comm/Ind, Coarse Soil																																							
NEPM 2013 Management Limits Comm / Ind, Coarse Soil																																							

Field_ID	Depth	Sample Date	Soil Description																																						
		HLA 2002																																							
BH24	0.03-0.2	14/05/2002	Filling	<0.5	<0.5	<0.5	ND	-	-	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
BH25	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH26	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUP06 - Duplicate of BH26_0.03-0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH27	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH28	0.03-0.1	14/05/2002	Filling	<0.5	<0.5	<0.5	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH29	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Duplicate of BH29_0.03-0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH30	1.5-1.7	14/05/2002	Filling	<0.5	<0.5	<0.5	ND	-	-	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
BH31	0.8-1.0	14/05/2002	Filling	-	-	-	-	-	-	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
BH32	0.6-0.8	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH33	0-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH34	0.7-0.8	14/05/2002	Filling	<0.5	<0.5	<0.5	ND	-	-	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
BH35	2.0-2.1	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH36	0.4-0.5	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH37	0.02	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH38	0-0.1	14/05/2002	Filling	<0.5	<0.5	<0.5	ND	-	-	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.2	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.1	<0.05	<0.05	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-
BH39	0-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUP08 - Duplicate of BH39_0-0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH40	0-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH41	0.7-0.8	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH42	0-0.2	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		DP 2018																																						
BH1	0.1	28/08/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1	0.5	28/08/2018	Filling	<0.1	<0.1	<0.1	0.725	11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BD1/20180828 - Duplicate of BH1 - 0.5m				-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1	1.0	28/08/2018	Natural	<0.1	<0.1	<0.1	<1.35	25	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH2	0.1	2/09/2018	Filling	<0.1	0.4	0.7	3.3	13	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH2	2.5	2/09/2018	Natural	<0.1	<0.1	0.1	0.78	14	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BD1/20180902 - Duplicate of BH2 - 2.5m				-	-	-	-	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	0.5	29/08/2018	Filling	<0.1	<0.1	0.2	1.3	18	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH3	1.0	29/08/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	2.5	29/08/2018	Natural	<0.1	<0.1	<0.1	<1.35	11	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH4	0.5	27/08/2018	Filling	<0.1	0.2	1	5.43	13	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH4	2.5	27/08/2018	Natural	<0.1	<0.1	<0.1	<1.35	12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH5	0.5	3/09/2018	Filling	<0.1	<0.1	<0.1	<1.35	10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH5	1.0	3/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	2.5	3/09/2018	Filling	<0.1	<0.1	0.4	2.15	9.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH6	0.1	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	0.5	4/09/2018	Filling	-	-	-	-	6.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	1.0	4/09/2018	Filling	<0.1	0.1	<0.1	0.775	7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BD1/20180904 - Duplicate of BH6 - 1.0m				-	-	-	-	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	1.5	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	2.5	4/09/2018	Filling	<0.1	<0.1	<0.1	<1.35	9.8	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Table F1 - Summary of Laboratory Results

				PCBs in Soil							PFAs						Phenols	
				Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)	Perfluorohexanesulfonic acid - PFHxS	Perfluorooctanesulfonic acid - PFOS	Perfluorooctanoic acid - PFOA	Total Positive PFAS	Total Positive PFHxS & PFOS	Total Positive PFOS & PFOA	Phenolics Total
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	5
Direct Contact HSL-C/D											20	20	50				
NEPM 2013 EILs Urban Res/POS Aged												1	10				
NEPM 2013 HILs Res B Soil										1	2	2	20				130
NEPM 2013 HILs Comm/Ind D Soil										7	20	20	50				660
NEPM Comm/Ind D Soil HSL for Vapour Intrusion, Sand 0-1m																	
NEPM 2013 ESLs for Comm/Ind, Coarse Soil																	
NEPM 2013 Management Limits Comm / Ind, Coarse Soil																	
Field_ID	**Depth**	**Sample Date**	**Soil Description**														
HLA 2002																	
BH24	0.03-0.2	14/05/2002	Filling	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
BH25	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-		-	-	-	-	-	-	-
BH26	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-		-	-	-	-	-	-	-
DUP06 - Duplicate of BH26_0.03-0.1				-	-	-	-	-	-		-	-	-	-	-	-	-
BH27	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-		-	-	-	-	-	-	-
BH28	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-		-	-	-	-	-	-	-
BH29	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-		-	-	-	-	-	-	-
Laboratory Duplicate of BH29_0.03-0.1				-	-	-	-	-	-		-	-	-	-	-	-	-
BH30	1.5-1.7	14/05/2002	Filling	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
BH31	0.8-1.0	14/05/2002	Filling	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
BH32	0.6-0.8	14/05/2002	Natural	-	-	-	-	-	-		-	-	-	-	-	-	-
BH33	0-0.1	14/05/2002	Filling	-	-	-	-	-	-		-	-	-	-	-	-	-
BH34	0.7-0.8	14/05/2002	Filling	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
BH35	2.0-2.1	14/05/2002	Natural	-	-	-	-	-	-		-	-	-	-	-	-	-
BH36	0.4-0.5	14/05/2002	Natural	-	-	-	-	-	-		-	-	-	-	-	-	-
BH37	0.02	14/05/2002	Natural	-	-	-	-	-	-		-	-	-	-	-	-	-
BH38	0-0.1	14/05/2002	Filling	-	-	-	-	-	-	<0.1	-	-	-	-	-	-	-
BH39	0-0.1	14/05/2002	Filling	-	-	-	-	-	-		-	-	-	-	-	-	-
DUP08 - Duplicate of BH39_0-0.1				-	-	-	-	-	-		-	-	-	-	-	-	-
BH40	0-0.1	14/05/2002	Filling	-	-	-	-	-	-		-	-	-	-	-	-	-
BH41	0.7-0.8	14/05/2002	Filling	-	-	-	-	-	-		-	-	-	-	-	-	-
BH42	0-0.2	14/05/2002	Natural	-	-	-	-	-	-		-	-	-	-	-	-	-
DP 2018																	
BH1	0.1	28/08/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1	0.5	28/08/2018	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	<5
BD1/20180828 - Duplicate of BH1 - 0.5m				-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1	1.0	28/08/2018	Natural	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	<5
BH2	0.1	2/09/2018	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.0002	0.0012	0.0002	0.0016	0.0014	0.0014	<5
BH2	2.5	2/09/2018	Natural	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	<5
BD1/20180902 - Duplicate of BH2 - 2.5m				-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	0.5	29/08/2018	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	<5
BH3	1.0	29/08/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	2.5	29/08/2018	Natural	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	<5
BH4	0.5	27/08/2018	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	<5
BH4	2.5	27/08/2018	Natural	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<5
BH5	0.5	3/09/2018	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	<5
BH5	1.0	3/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	2.5	3/09/2018	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<5
BH6	0.1	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	0.5	4/09/2018	Filling	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-
BH6	1.0	4/09/2018	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	<5
BD1/20180904 - Duplicate of BH6 - 1.0m				-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	1.5	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	2.5	4/09/2018	Filling	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	<5

	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,1-dichloropropene	1,2,3-trichlorobenzene	1,2,3-trichloropropane	1,2,4-trichlorobenzene	1,2,4-trimethylbenzene	1,2-dibromo-3-chloropropane	1,2-dibromoethane	1,2-dichlorobenzene	1,2-dichloroethane	1,2-dichloropropane	1,3,5-trimethylbenzene	1,3-dichlorobenzene	1,3-dichloropropane	1,4-dichlorobenzene	2,2-dichloropropane	2-chlorotoluene	4-chlorotoluene	Benzene	Bromobenzene
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.2	1
Direct Contact HSL-C/D																								430	
NEPM 2013 EILs Urban Res/POS Aged																									
NEPM 2013 HILs Res B Soil																									
NEPM 2013 HILs Comm/Ind D Soil																									
NEPM Comm/Ind D Soil HSL for Vapour Intrusion, Sand 0-1m																								4	
NEPM 2013 ESLs for Comm/Ind, Coarse Soil																								75	
NEPM 2013 Management Limits Comm / Ind, Coarse Soil																									
HLA 2002																									
BH24	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<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
BH25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUP06 - Duplicate of BH26_0.03-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Laboratory Duplicate of BH29_0.03-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH36	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DUP08 - Duplicate of BH39_0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH41	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<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
BH42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DP 2018																									
BH1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<1
BD1/20180828 - Duplicate of BH1 - 0.5m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<1
BD1/20180902 - Duplicate of BH2 - 2.5m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<1
BH4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<1
BH6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<1
BD1/20180904 - Duplicate of BH6 - 1.0m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<0.2	<1

				VOCs in soil																														Asbestos ID	
				Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	Carbon tetrachloride	Chlorobenzene	Chlorodibromomethane	Chloroethane	Chloroform	Chloromethane	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Cyclohexane	Dibromomethane	Dichlorodifluoromethane	Ethylbenzene	Hexachlorobutadiene	Isopropylbenzene	n-butylbenzene	n-propylbenzene	p-isopropyltoluene	sec-butylbenzene	Styrene	Trichloroethene	tert-butylbenzene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichlorofluoromethane	Vinyl chloride	Xylene (m & p)	Xylene (o)	Asbestos Id	Asbestos Fibres
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	%(w/w)
EQL				1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1		0.001
Direct Contact HSL-C/D																			27000																	
NEPM 2013 EILs Urban Res/POS Aged																																				
NEPM 2013 HILs Res B Soil																																				
NEPM 2013 HILs Comm/Ind D Soil																																				
NEPM Comm/Ind D Soil HSL for Vapour Intrusion, Sand 0-1m																			1300																	
NEPM 2013 ESLs for Comm/Ind, Coarse Soil																			165																	
NEPM 2013 Management Limits Comm / Ind, Coarse Soil																																				
Field_ID	**Depth**	**Sample Date**	**Soil Description**																																	
		HLA 2002																																		
BH24	0.03-0.2	14/05/2002	Filling	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<0.5	<5	-	<1	-	<0.5	<5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<5	<5	<0.5	<0.5	-	
BH25	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH26	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DUP06 - Duplicate of BH26_0.03-0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH27	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH28	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH29	0.03-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Laboratory Duplicate of BH29_0.03-0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH30	1.5-1.7	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH31	0.8-1.0	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH32	0.6-0.8	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH33	0-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH34	0.7-0.8	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH35	2.0-2.1	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH36	0.4-0.5	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH37	0.02	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH38	0-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH39	0-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DUP08 - Duplicate of BH39_0-0.1				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH40	0-0.1	14/05/2002	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH41	0.7-0.8	14/05/2002	Filling	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<5	<0.5	<5	-	<1	-	<0.5	<5	<0.5	<0.5	-	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<5	<5	<0.5	<0.5	-	
BH42	0-0.2	14/05/2002	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
		DP 2018																																		
BH1	0.1	28/08/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH1	0.5	28/08/2018	Filling	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	NAD	-
BD1/20180828 - Duplicate of BH1 - 0.5m				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH1	1.0	28/08/2018	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH2	0.1	2/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH2	2.5	2/09/2018	Natural	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	-	-
BD1/20180902 - Duplicate of BH2 - 2.5m				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	0.5	29/08/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH3	1.0	29/08/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH3	2.5	29/08/2018	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH4	0.5	27/08/2018	Filling	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	NAD	<0.001
BH4	2.5	27/08/2018	Natural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH5	0.5	3/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH5	1.0	3/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH5	2.5	3/09/2018	Filling	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	-	-
BH6	0.1	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH6	0.5	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	1.0	4/09/2018	Filling	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<2	<1	NAD	-
BD1/20180904 - Duplicate of BH6 - 1.0m				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	1.5	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH6	2.5	4/09/2018	Filling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-

Table F2: Summary of Groundwater Laboratory Results

		HM in water - dissolved								vTRH(C6-C10)/BTEXN in Water									svTRH (C10-C40) in Water													
		Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Benzene	Ethylbenzene	Naphthalene	Toluene	C6 - C9	Xylene (m & p)	Xylene (o)	C6-C10 less BTEX (F1)	C6-C10	C10-C16	C16-C34	C34-C40	F2-NAPHTHALENE	C10 - C14	C15 - C28	C29-C36	4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane	d-BHC	DDD
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.001	0.0001	0.001	0.001	0.001	0.00005	0.001	0.001	0.001	0.001	0.001	0.001	0.01	0.002	0.001	0.01	0.01	0.05	0.1	0.1	0.05	0.05	0.1	0.1	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Comm/Ind HSL D GW for Vapour Intrusion PQL										0.001	0.001	0.001	0.001		0.002	0.001	0.01					0.05										
NEPM 2013 Table 1C GILs, Fresh Waters		0.013	0.0008	0.0044	0.0014	0.0094	0.00006	0.017	0.031	2		0.085			0.34	0.64														0.00027		
Sample Name	**Sampled Date**																															
BH2	19/09/2018	<0.001	<0.0001	0.003	0.004	0.002	<0.00005	0.027	0.026	<0.001	<0.001	<0.001	0.002	0.028	0.002	0.001	0.033	0.038	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.1	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
BH3	19/09/2018	0.003	<0.0001	0.002	0.008	<0.001	<0.00005	0.013	0.017	<0.001	0.002	<0.001	<0.001	0.017	<0.002	0.001	0.018	0.021	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.1	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
BH6	19/09/2018	0.001	<0.0001	<0.001	<0.001	<0.001	<0.00005	0.004	0.01	<0.001	<0.001	<0.001	<0.001	<0.01	<0.002	<0.001	<0.01	<0.01	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.1	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
BD1/20180919	19/09/2018	0.001	<0.0001	<0.001	<0.001	<0.001	<0.00005	0.004	0.01	<0.001	<0.001	<0.001	<0.001	<0.01	<0.002	<0.001	<0.01	<0.01	<0.05	<0.1	<0.1	<0.05	<0.05	<0.1	<0.1	-	-	-	-	-	-	-

Exceeds the NEPM GILs for Fresh water

Exceeds the PQL and adopted HSL screening level

Table F2: Summary of Groundwater Laboratory

		OCP in water												OP Pesticides in water																	
		DDT	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Azinophos methyl	Bromophos-ethyl	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion	Ronnel	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL		0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001
Comm/Ind HSL D GW for Vapour Intrusion PQL																														
NEPM 2013 Table 1C GILs, Fresh Waters		0.00004					0.00006		0.001	0.0007						0.0012		0.00008		0.0003		0.0004	0.0011	0.00004						
Sample Name	**Sampled Date**																													
BH2	19/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
BH3	19/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
BH6	19/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
BD1/20180919	19/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Exceeds the NEPM GILs for Fres
Exceeds the PQL and adopted H

Table F2: Summary of Groundwater Laboratory

		PAHs in Water - Low Level												PCBs in Water							PFAS								Phenolics
		Benzo(a)pyrene TEQ	Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Total +ve PAHs	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Perfluorohexanesulfonic acid - PFHxS	Perfluorooctanesulfonic acid - PFOS	Perfluorooctanoic acid - PFOA	6:2 Fluorotelomer Sulfonate - 6:2 FtS	8:2 FTS	Total Positive PFHxS & PFOS	Total Positive PFOA & PFOS	Total Positive PFAS	Phenolics Total
		µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L
EQL		0.5	0.2	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0001		0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
Comm/Ind HSL D GW for Vapour Intrusion PQL										0.0002																			
NEPM 2013 Table 1C GILs, Fresh Waters										0.085							0.0017		0.0002			31	1824						
Sample Name	**Sampled Date**																												
BH2	19/09/2018	<0.5	<0.2	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
BH3	19/09/2018	<0.5	<0.2	<0.0001	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0002	0.0002	0.0001	0.00061	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	0.01	<0.05
BH6	19/09/2018	<0.5	<0.2	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	0	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
BD1/20180919	19/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Exceeds the NEPM GILs for Fres
Exceeds the PQL and adopted H

Appendix G

QA/QC Procedures and Results

QA/QC PROCEDURES AND RESULTS

Q1. Data Quality Objectives

The Detailed Site Investigation (DSI) was prepared with reference to the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure* 1999 as amended 2013 (NEPC, 2013). The DQO process is outlined as follows:

- Stating the Problem;
- Identifying the Decision;
- Identifying Inputs to the Decision;
- Defining the Boundary of the Assessment;
- Developing a Decision Rule;
- Specifying Acceptable Limits on Decision Errors; and
- Optimising the Design for Obtaining Data.

The DQOs have been addressed within the report as shown in Table Q1.

Table Q1: Data Quality Objectives

Data Quality Objective	Report Section where Addressed
State the Problem	S1 Introduction
Identify the Decision	S12 Conclusions and Recommendations
Identify Inputs to the Decision	S1 Introduction S3 Site Information S5 Previous Reports S6 Site Walkover S7 Conceptual Site Model S9 Site Assessment Criteria S10 Field Work Results S11 Analytical Results
Define the Boundary of the Assessment	S3 Site Information Drawing 1 - Appendix B
Develop a Decision Rule	S9 Site Assessment Criteria
Specify Acceptable Limits on Decision Errors	S8 Fieldwork and Sampling Methodology QA/QC Procedures and Results - Appendix G
Optimise the Design for Obtaining Data	S2 Scope of Works S7 Conceptual Site Model QA/QC Procedures and Results - Appendix G

Q2. FIELD AND LABORATORY QUALITY CONTROL

The field and laboratory QC procedures and results are summarised in the following Table Q2. Reference should be made to the Fieldwork and Sampling Methodology procedures in Section 8 and the laboratory results certificates in Appendix D for further details.

Table Q2: Field and Laboratory QC

Item	Evaluation / Acceptance Criteria	Achievement
Analytical laboratories used	NATA accreditation	yes
Holding times	Various based on type of analysis	yes
Intra-laboratory replicates	5% of primary samples; <50% RPD (>5 x PQL)	yes[1]
Inter-laboratory replicates	5% of primary samples; <50% RPD (10-20 x PQL)	yes[1]
Trip Spikes	1 per sampling event; 60-140% recovery	yes
Trip Blanks	1 per sampling event; <PQL	yes
Laboratory / Reagent Blanks	1 per batch; <PQL	yes
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	yes
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	yes
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	yes

NOTE: 1 qualitative assessment of RPD results overall

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

Q2.1 Laboratory Replicates

Both inter- and intra-laboratory replicates were analysed as an internal check of the reproducibility within the laboratory and as a measure of consistency of sampling techniques. The comparative results of analysis between original and intra-laboratory replicate sample are summarised in Tables Q3 and Q4.

Note that, where both samples are below LOR/PQL the difference and RPD has been given as zero. Where one sample is reported below LOR/PQL, but a concentration is reported for the other, the LOR/PQL value has been used for calculation of the RPD for the less than LOR/PQL sample.

Table Q3: Relative Percentage Difference Results – Intra- and inter-laboratory Replicate Soil

Laboratory	Sample ID	Date Sampled	Media	Units	Metals								TRH				BTEX			
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	C6-C10	>C10-C16	>C16-C34	>C34-C40	Benzene	Toluene	Ethylbenzene	Xylene
ELS	BH1/0.5	28/08/2018	S	mg/kg	<4	<0.4	8	49	18	0.1	32	140	<25	<50	<100	<100	<0.2	<0.5	<1	<2
ELS	BD1/20180828	28/08/2018	S	mg/kg	<4	0.4	11	100	18	<0.1	34	130	<25	<50	<100	<100	<0.2	<0.5	<1	<2
Difference				mg/kg	0	0	3	51	0	0	2	10	0	0	0	0	0	0	0	0
RPD				%	0	0	**32**	**68**	0	0	6	7	0	0	0	0	0	0	0	0
ELS	BH2/2.5	02/09/2018	S	mg/kg	<4	<0.4	6	34	16	<0.1	11	33	<25	<50	<100	<100	<0.2	<0.5	<1	<2
ELS	BD1/20180902	02/09/2018	S	mg/kg	<4	<0.4	6	36	12	<0.1	6	39	<25	<50	<100	<100	<0.2	<0.5	<1	<2
Difference				mg/kg	0	0	0	2	4	0	5	6	0	0	0	0	0	0	0	0
RPD				%	0	0	0	6	29	0	**59**	17	0	0	0	0	0	0	0	0
ELS	BH6/1.0	04/09/2018	S	mg/kg	5	0.4	5	39	20	<0.1	35	150	<25	<50	<100	<100	<0.2	<0.5	<1	<2
Eurofins MGT	BD1/20180904	04/09/2018	S	mg/kg	9	<0.4	10	51	29	<0.1	53	250	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3
Difference				mg/kg	4	0	5	12	9	0	18	100	0	0	0	0	0	0	0	0
RPD				%	**57**	0	**67**	27	**37**	0	**41**	**50**	0	0	0	0	0	0	0	0

Table Q4: Relative Percentage Difference Results – Intra-laboratory Replicates Groundwater

Laboratory	Sample ID	Date Sampled	Media	Units	Metals								TRH				BTEX			
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	C6-C10	>C10-C16	>C16-C34	>C34-C40	Benzene	Toluene	Ethylbenzene	Xylene
ELS	BH6	19/09/2018	W	µg/L	<1	<0.1	<1	<1	<1	<0.05	4	10	<10	<50	<100	<100	<1	<1	<1	<1
ELS	BD1/250718	25/07/2018	S	µg/kg	<1	<0.1	<1	<1	<1	<0.05	4	10	<10	<50	<100	<100	<0.2	<0.5	<1	<2
Difference				mg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
RPD				%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

The calculated RPD values were within the acceptable range of +/-30% for inorganic analytes and +/-50% for organics, with the exception of those in bold. This is not considered significant because:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred. High RPD values reflect the small differences between two small numbers;
- The replicate pairs being collected from fill soils which were heterogeneous in nature;
- Soil replicates, rather than homogenised soil duplicates, were used to minimise the risk of possible volatile loss, hence greater variability can be expected;
- The majority of RPDs within a replicate pair being within the acceptable limits; and
- All other QA/QC parameters met the DQIs.

Overall, the intra-laboratory replicate comparisons indicate that the sampling techniques were generally consistent and repeatable.

Q3. Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs):

Precision:	A quantitative measure of the variability (reproducibility) of data;
Accuracy:	A quantitative measure of the closeness of reported data to the “true” value;
Representativeness:	The confidence (expressed qualitatively) that data are representative of each media present on the site;
Completeness:	A measure of the useable data from a data collection activity; and
Comparability:	The confidence (expressed qualitatively) that data can be considered equivalent for each sampling and analytical event.

The DQIs were assessed as outlined in the following Table Q5.

Table Q5: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Systematic and selected target locations sampled; Preparation of borehole logs, sample location plan and chain of custody records; Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody; Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM); Completion of chain of custody (COC) documentation; NATA accredited laboratory results certificates provided by the laboratory; Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section Q2.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project; Experienced sampler used; Use of NATA registered laboratories, with test methods the same or similar between laboratories; Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled; Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs; Samples were extracted and analysed within holding times; Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures; Acceptable RPD between original samples and replicates; Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures; Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been complied with. As such, it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.