

27 September 2010

Bursar
Sydney Church of England Grammar School
c/o Mr Dennis Zines
WSP Fitzwalter

WSP Environment & Energy

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Dear Bursar,

SOIL INVESTIGATION, 20 EDWARD STREET, NORTH SYDNEY NSW 2060

1.0 Introduction

WSP Environmental Pty Ltd, trading as WSP Environment & Energy (WSP) was engaged by WSP Fitzwalter on behalf of Sydney Church of England Grammar School (Shore) to conduct a limited soil investigation and a hazardous materials assessment (HMA) at the property located at 20 Edward Street, North Sydney (Refer to Figure 1, Attachment A). This letter pertains to the soil investigation works only. A separate letter report has been prepared for the HMA.

Previously a preliminary environmental assessment was undertaken on the site by HIBBS and Associates (June 2009). Because this study did not include any soil sampling, it was judged that further work (this report) was warranted.

The completed works outlined in this report have been conducted in response to a limited number of potential soil contamination issues outlined in the Conservation Management Plan by Tanners Architects, dated May 2010. The areas of potential concern at the site included:

- Potential soil contamination resulting from alleged historical dumping of building waste to the west of the Coach House;
- The presence of an abandoned above ground oil storage tank close to the eastern boundary of the property; and
- Location of a former orchard in the southern area of the property. The CMP also noted the inclusion of slit air raid trenches in this area in 1942.

This letter report outlines the findings of drilling and soil logging works undertaken on 9 September 2010 and details the results of soil chemistry analysis undertaken as part of those works.

2.0 Objectives

The objective of the soil investigation was to investigate potential contamination in soils in the vicinity of the Coach House, the above ground oil storage tank and to provide general site coverage including the area formerly occupied by an orchard.

3.0 Methodology

To meet the objectives of the proposed works, WSP performed the following works:

- Site inspection and site walkover;
- Underground service clearance of drilling locations by an approved underground service locator (DAGGs);
- A limited soil investigation comprising 10 boreholes in the following areas (see Figure 2, Attachment for bore locations):

- Area to the west of the Coach House (BH7, BH9 and BH10);
 - In vicinity of an abandoned above ground oil storage tank (BH1 and BH2);
 - Area to the south of the site to investigate the presence of any fill and potential contamination associated with a former orchard (BH3 and BH4);
 - BH8 was located to the west of the former Nursing Ward building in the east of the property to investigate the presence of fill and any contamination associated with the construction of and/or maintenance of this building;
 - BH5 and BH6 were located in the central area of the site in the vicinity of former tennis courts to investigate the potential presence of fill in this area and to provide general site coverage.
- The investigation works were completed using manual augering to minimise impact on the gardens and grounds of the site. Ten (10) shallow boreholes were progressed to a maximum depth of 1.5m or until refusal (whichever was shallower). Soil samples were collected close to the surface and then at approximately 0.5m intervals or at the base of the borehole where auger refusal occurred.
 - Each sample was collected from the auger and placed directly into a laboratory supplied glass sample jar using disposable nitrile gloves. The samples were then immediately placed into an Esky to keep cool. Upon returning to the WSP office, samples were refrigerated overnight below 4 degrees Celsius to ensure appropriate laboratory preservation and transported to the laboratory by courier the following morning (10 September 2010).
 - Detailed descriptions of the soil materials encountered were recorded during the site works, including the presence and type of any fill encountered, the depth at which natural soils were observed, soil type, any staining, odours or other observations of potential contamination.
 - A chain of custody was completed for the samples and dispatched to Envirolab (NATA certified), where chemical analysis was performed on the submitted soil samples;
 - One (1) sample from each bore location (total 10) was submitted for analysis by a NATA accredited laboratory (Envirolab). All samples were analysed for Total Petroleum Hydrocarbons (TPH), asbestos, and 8 Heavy Metals (arsenic, cadmium, chromium, copper lead, nickel, mercury and zinc). A selection of samples were also analysed for PAHs, BTEX and organochlorine pesticides (OCPs).
 - One duplicate and one triplicate soil sample were analysed for QA/QC purposes. The triplicate was submitted to Labmark (NATA certified) for analysis.

4.0 Site Description

A summary of the site location, current zoning and land use is outlined in Table 4.1.

Table 4.1 Site Location Details

Legal Description	Lot 2 in Deposited Plan 539853
Zoning Site:	Zoned Special Uses (North Sydney LEP 2001)
Gross Area-Site:	2.678ha
Geographic Co-ordinates	Latitude: 33°83'93.40"S Longitude: 151°20'31.89"E
Current Structures:	4 buildings surrounded by 2 bitumen surfaced car parks and gardens
Current Use:	Currently not being used. Site was previously used as a convalescent home and most recently as a nursing home.
Planned Use	School Uses.

5.0 Environmental Setting

5.1 Topography

The property is elevated approximately 70m above the Australian Height Datum (AHD) in the northern portion of the site and 50m AHD in the southern portion. The site generally slopes to the southwest.

5.2 Geology

According to the Sydney 1:100,000 Geological Series Sheet 9130 Edition 1 (1983) the site is situated on Hawkesbury Sandstone, consisting of medium to coarse-grained quartz sandstone, very minor shale and laminate lenses.

5.3 Acid Sulfate Soils (ASS)

According to the Acid Sulfate Risk Map provided by the Land and Water Conservation for this region, there is no known occurrence of acid sulphate soils (ASS) on the site or the immediate surrounding area.

5.4 Site Assessment Criteria

The applicable Australian soil assessment criteria comprised the following:

- The National Environment Protection (Assessment of Site Contamination) Measure (1999) Schedule B(1) (NEPM,1999) Health-based Investigation Level A – Residential with gardens/accessible soils as it is understood that the site will be used
- The National Environment Protection (Assessment of Site Contamination) Measure (1999) Schedule B(1) (NEPM,1999) Ecological Investigation Levels (EILs);
- The NSW EPA (1994) Service Station Guidelines criteria for petroleum hydrocarbons not stated in the NEPM guidelines.

Table 5.1: Soil Assessment Criteria

Analyte	HIL (mg/kg)	EIL (mg/kg)	Source
Arsenic	100	20	NEPM (1999;HIL-A)
Cadmium	20	3	NEPM (1999;HIL-A)
Copper	1000	100	NEPM (1999;HIL-A)
Lead	300	600	NEPM (1999;HIL-A)
Mercury	15	1	NEPM (1999;HIL-A)
Nickel	600	60	NEPM (1999;HIL-A)
Zinc	7000	200	NEPM (1999;HIL-A)
Chromium III	12%	400	NEPM (1999;HIL-A)
Benzene	1	NG	NSW EPA (1994)
Toluene	1.4	NG	NSW EPA (1994)
Ethylbenzene	3.1	NG	NSW EPA (1994)
Xylene	14	NG	
TPH		NG	
TPH C6-C9	65	NG	NSW EPA (1994)
TPH C10-C36	1000		NSW EPA (1994)
Total PAHs	20	NG	NEPM (1999;HIL-A)
Benzo(a) pyrene	1	NG	NEPM (1999;HIL-A)
Heptachlor	10	NG	NEPM (1999;HIL-A)
Asbestos	No asbestos present in soil	NG	EnHealth 2005

* Highlighted guideline values indicate exceeded guideline levels.

NG = No Guideline

6.0 Observations and Analytical Results

6.1 Field Observations

Fibrous sheeting was observed on the ground surface in the surrounds of BH9 and BH10 near the Coach House located in the north of the site. A sample was obtained and submitted to Envirolab for analyses for asbestos as a precautionary measure. The result indicated no asbestos fibres.

Soil descriptions can be found in field sheets provided in Attachment B. Based on the site inspection and soil sampling works conducted on 9 September 2010 the subsurface conditions encountered can be summarised below in Table 6.1.

Table 6.1: Subsurface Soil Descriptions

Location	Depth (m bgl)	Soil Description
BH1	0.00-0.40	Fill: Light brown, fine to coarse grained sand
	0.40-0.80	Fill: Light brown, fine to coarse grained sand with some gravel. Tree roots observed.
	0.8	Auger refusal in natural material.
BH2	0.00-0.20	Fill: Dark brown, fine to coarse grained sand with some gravel
	0.20-0.45	Fill: Dark brown and light orange, fine to coarse grained sand with some gravel.
	0.45-0.65	Natural: Light brown coarse gravel with fine to coarse grained sand.
	0.65	Auger refusal in natural material.
BH3	0.00-0.10	Fill: Dark grey, gravely, sandy and silty. Poorly sorted.
	0.10-0.30	Fill: Dark grey, gravely, sandy and silty. Poorly sorted. Glass and ash fragments.
	0.30-0.50	Fill: Grey/brown and white/yellow silty sand. Glass and ash fragments.
	0.5	Auger refusal in fill material
BH4	0.00-0.10	Fill: Dark grey sandy silt, fine to coarse grained, poorly sorted. Some gravel and rootlets. Approximately 10% ash inclusions.
	0.10-0.30	Fill: Grey/brown sandy silt, fine to coarse grained, poorly sorted. Some gravel and rootlets. Approximately 10% ash inclusions. Approximately 20% sandstone fragments.
	0.3	Auger refusal in fill material.
BH5	0.00-0.15	Fill: Dark brown fine to coarse grained sand.
	0.15-0.60	Fill: Light brown/orange sandy clay. Medium hardness. Slag fragments.
	0.60-0.80	Fill: Dark brown and light orange sandy clay. Slag fragments.
	0.80-1.00	Natural: Light brown/grey sandy clay with medium to coarse grained gravel. Loose, non-plastic.
	1	Auger refusal in natural.
BH6	0.00-0.30	Fill: Gravely silt, dark grey fine to coarse grained sand, poorly sorted with rootlets.
	0.30-0.50	Fill: Gravely silt, dark grey, fine to coarse grained sand, poorly sorted with rootlets. Slag fragments.

Location	Depth (m bgl)	Soil Description
	0.50-0.60	Natural: Yellow/brown clayey sand, poorly sorted.
	0.6	Auger refusal in natural material
BH7	0.00-0.50	Fill: Dark grey/brown silty sand, fine grained, poorly sorted, trace rootlets.
	0.50-0.60	Fill: Brown silty sand, medium grained, gravel inclusions, poorly sorted, glass fragments.
	0.6	Auger refusal in fill material
BH8	0.00-0.15	Fill: Dark brown fine to coarse grained sand.
	0.15-0.30	Fill: Light brown and orange sandy clay. Some gravel. Poorly sorted.
	0.30-0.70	Natural: Light brown and orange sandy clay. Uniform.
	0.7	Auger refusal in natural material.
BH9	0.00-0.20	Fill: Dark brown fine to coarse grained sand with some gravel inclusions and roots.
	0.20-0.40	Fill material: Grey fine to coarse grained sand with grave, silt and ash material.
	0.4	Auger refusal in fill material
BH10	0.00-0.10	Fill: Fine to coarse grained sand.
	0.10-0.45	Fill material: Grey sand and silt with ash.
	0.45	Auger refusal in fill material

From the above soil descriptions, it is shown that fill material was encountered to shallow depths (maximum 0.8m below ground level (bgl)) in BH2, BH5, BH6 and BH8. Auger refusal occurred in fill material in the remaining six (6) soil bores.

Fill was generally described as sandy silt with fragments of glass, ash, brick and slag in the western, southern and central areas of the site. In the eastern site area, fill was logged as coarse grained sand and gravel. Natural soils comprised yellow/brown to orange sandy clay.

No visual or olfactory signs of contamination were identified in any boreholes.

6.2 Soil Analytical Results

Soil analytical results are provided in Attachment C and laboratory certificates are included in Attachment D. The following provides a summary of the results for each analyte tested and whether it exceeded the adopted acceptance criteria outlined in Section 6.0 above.

Assessment against NEP (1999) HIL A – Residential with Gardens / Accessible Soils:

Heavy Metals

- Lead concentrations exceeded the adopted screening criteria (NEPM 1999 HIL-A) of 300mg/kg in boreholes BH2 (0-0.3m bgl – 440mg/kg) and BH8 (0-0.30 mbgl - 740mg/kg). Lead was detected at concentrations below the adopted guideline concentrations in all other boreholes.
- Arsenic was detected below adopted guideline concentrations (100mg/kg) in BH2, BH3, BH5 and BH8 with concentrations ranging between 4mg/kg and 11mg/kg. All other samples recorded values below laboratory detection limits;

- Cadmium was detected below laboratory detection limits in all boreholes with the exception of BH8 (1.4mg/kg). All recorded concentrations were below the adopted guideline value.
- Total chromium was detected in all boreholes, ranging between 11mg/kg (BH4 and BH9) and 25mg/kg (BH5). Chromium III was below the guideline value provided in the NEPM 1999 HIL-A.
- Copper was detected in all boreholes below adopted guideline value of 1000mg/kg at concentrations ranging between 3mg/kg (BH5) and 33mg/kg (BH8);
- Mercury concentrations in all boreholes were below the adopted guideline value of 15mg/kg. Recorded concentrations ranged between below laboratory detection limits and 0.5mg/kg (BH1);
- Nickel concentrations in all boreholes were below the adopted guideline value of 600mg/kg. Recorded concentrations ranged between below laboratory detection limit and 19mg/kg (BH10);
- Zinc concentrations in all boreholes were below the adopted guideline value of 7000mg/kg. Recorded concentrations ranged between 7mg/kg (BH5) and 780mg/kg (BH8).

PAHs

- Benzo(a) pyrene concentrations exceeded the adopted guideline value of 1mg/kg in BH2 (2.3mg/kg) and BH3 (2.8mg/kg);
- All other PAHs with the exception of acenaphthene and fluorine were reported above the limit of reporting (LOR) but below the adopted guideline values;
- Acenaphthene and Fluorine were below laboratory detection limits.

OCPs

- OCP concentrations were reported below laboratory detection limits in all samples analysed.

TPH

- TPH C10-C36 concentrations ranged between below laboratory detection limits and 490mg/kg (BH8 (0-0.30m bgl)). All results were below the adopted acceptance criteria.

BTEX

- BTEX concentrations were reported below laboratory detection limits in all samples analysed.

Asbestos

- Asbestos was not detected in any of the 10 soil samples analysed. Asbestos was also found below the limit of laboratory reporting (LOR) in a surface sample of fibrous material collected from an area to the west of the Coach House.

Assessment against Ecological Investigation Limits (EILs):

All contaminants were found below EILs with the exception of:

- Lead was found marginally above the EIL (600 mg/kg) in one (1) sample (BH8: 0-0.3m bgl – 740mg/kg); and
- Zinc was found above the EIL of 200mg/kg in two near surface (0 – 0.3m bgl) in (2) samples (BH2 – 350mg/kg and BH8 – 780mg/kg).

6.3 QA/QC Results

Based on the reported relative percentage differences (RPD's), which ranged from 0 - 67% (see Attachment E) and the reported internal laboratory QA/QC results, there were three

exceedances of the acceptable RPD values for copper and nickel. As the primary, duplicate and triplicate concentrations were below guideline values these slight exceedances are not considered to be significant.

The variation in original sample and field duplicate results is attributed to a combination of a number of possible factors relating to the sample composition, analyte behaviour and inherent uncertainties in the analytical methods. WSP consider that the sample integrity, container requirements and holding time compliances were documented as acceptable. Internal laboratory quality controls (QC) included Matrix Spikes, Laboratory Control Samples, Laboratory Duplicates, and Surrogates. The laboratory QC results are provided in detail within the laboratory reports from Envirolab (45722) and Labmark (50116)). All laboratory QC results were within acceptable limits.

7.0 Conclusions and Recommendations

Following the site inspection and soil sampling works conducted on 9 September 2010, WSP concludes the following:

Auger refusal was encountered earlier than anticipated in most boreholes. This can be attributed to reaching the underlying sandstone bedrock or large brick or concrete fragments in fill material. It is likely fill materials were imported to provide the foundation of the previous tennis courts, structural foundations near the Coach House and Headmaster's house, and to level the southern portion of the site. Fill generally comprised sandy silt with minor quantities of ash, glass, brick fragments and slag. Glass, brick and ash were absent in fill found in the eastern area of the site in BH1, BH2 and BH8. Fill in this area was described as coarse grained sand and gravel.

Asbestos was not detected in any of the 10 soil samples analysed. Furthermore, asbestos was not detected in the fibrous sheet fragment submitted for analyses.

Benzo(a)pyrene and lead are the only analytes tested found above the adopted criteria. Findings and recommendations are discussed below.

7.1 Benzo(a) pyrene

Benzo(a) pyrene concentrations exceeded the adopted guideline value of 1mg/kg in near surface (0 – 0.3m bgl) samples in BH2 (2.3mg/kg) and BH3 (2.8mg/kg). Lead concentrations exceeded the adopted screening criteria of 100mg/kg in boreholes BH2 (440mg/kg) and BH8 (740mg/kg) in near surface samples (0 – 0.3m bgl). All other analytes were found below the adopted criteria. It is likely that the slight exceedances of benzo(a)pyrene are attributable to ash materials found in BH3 and potentially due to the proximity of a former above ground heating oil tank to BH2.

It is **recommended** that the abandoned heating oil tank is removed off site and disposed of to an appropriately licensed facility. It is further recommended that an additional 3 shallow bores (maximum 0.5m) are drilled in the vicinity of the tank to delineate the lateral and vertical extent of PAH contamination. Two (2) soil sampled should be collected at each location and tested for lead and PAHs (including benzo(a)pyrene. Following delineation, impacted soils should be removed to an appropriately licensed facility. It is anticipated that surface scraping is likely to be sufficient to remove the area of impact. However, the method of removal should be determined following the results of the additional investigation.

It is **recommended** that an additional three (3) shallow bores to 0.5m be drilled to delineate the extent of benzo(a) pyrene contamination found in BH3 in the southern area of the site. Two samples should be collected from each borehole to define the vertical extent of contamination. Following delineation, impacted soils should be removed and disposed to an appropriately licensed facility.

Both of these recommendations could be carried out in conjunction with the future demolition of the Ward building.

7.2 Lead

Lead concentrations exceeded the adopted screening criteria for residential use (HIL A) of 100mg/kg in boreholes BH2 (440mg/kg) and BH8 (740mg/kg) in near surface samples (0 – 0.3m bgl). The BH sample also marginally exceeded the EIL. The exceedances of lead were found near the abandoned heating oil tank and the former Nursing Ward building. A report by Hibbs & Associates (2009) Hazardous Materials Survey, Graythwaite Nursing Home, June 2009 reported the presence of lead based paint on the heating oil tank. Paint tested in several area of the Nursing Ward building also tested positive for lead, including downpipes, external doors, and window frames. This indicates that the lead recorded in shallow soils above the adopted criteria may be derived from lead based paint.

Recommendations for further investigation of the area around the heating tank have been discussed above.

It is likely, given the findings of the Hibbs (2009) report that lead in near surface soils is derived from lead based paints used on the former Nursing Ward Building. The Hibbs report also reported positive results for lead based paints in the other buildings on external walls and window frames as well as internally. It is **recommended** that shallow bores (maximum 0.5m) are drilled under the eaves and curtilage of the buildings to capture any lead contamination fallout that may have occurred during construction and maintenance. A total of 12 shallow bores is recommended to target the Coach House (2), the Main House (4), the Nursing Ward (3) and the Tom O'Neill Building (3).

Following delineation of the extent of lead contamination, impacted soils should be removed and disposed of to an appropriately licensed facility.

This recommendation should be undertaken with the Stage 1 Project Application works.

7.3 Zinc

Zinc was found below the HIL A criteria for residential land use but was found above the EIL in 2 near surface (0 – 0.3m bgl) samples (BH2 and BH8). The recommended further works for lead contamination in the vicinity of BH2 and BH 8 should include a provision for further analysis of zinc.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Aaron Young'.

Aaron Young
Environmental Scientist
WSP Environmental Pty Ltd

A handwritten signature in black ink, appearing to read 'Rebecca Kelly'.

Rebecca Kelly
Project Manager
WSP Environmental Pty Ltd

Attachment A - Figures
Attachment B – Field Sheets
Attachment C – Summary Results Table
Attachment D – Laboratory Reports
Attachment E – RPD Analysis Table

Report Limitations

The findings of this report are based on the scope of work outlined in Section 1. WSP performed its services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties, express or implied are made.

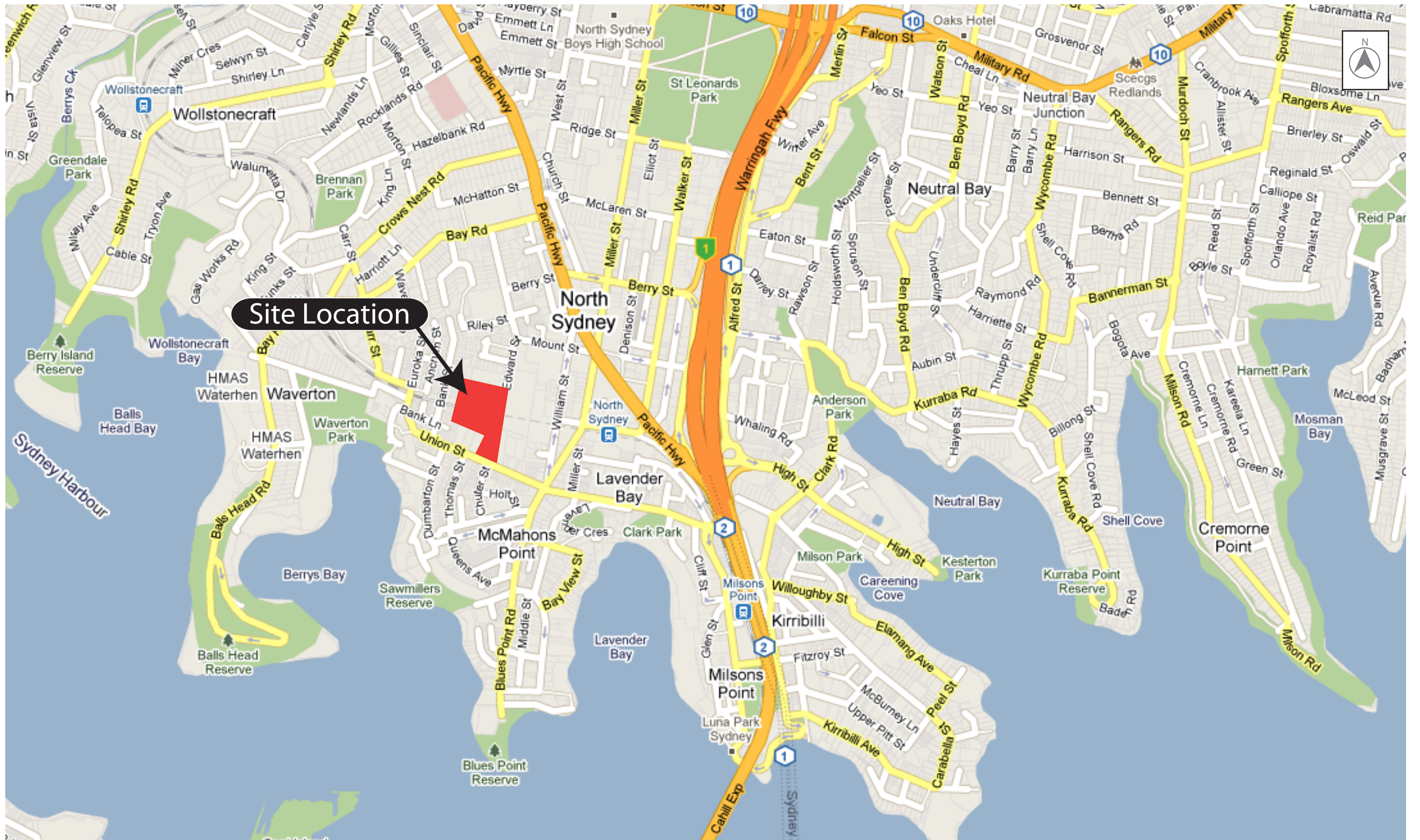
Subject to the scope of work, WSP's assessment was limited strictly to identifying the environmental conditions associated with the subject property and does not include evaluation of any other issues. The absence of any identified hazardous or toxic materials should not be interpreted as a guarantee that such materials do not exist on the subject property.

This report does not comment on any regulatory obligations based on the findings. This report relates only to the objectives stated and does not relate to any other work undertaken for the Client. It is a report based on the concentrations of contaminants observed in soil at the time of the sample collection. These conditions may change with time and space.

All conclusions and recommendations regarding the property are the professional opinions of the WSP personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, WSP assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements or sources outside of WSP, or developments resulting from situations outside the scope of this project.

WSP is not engaged in environmental assessment and reporting for the purpose of advertising sales promoting, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes. The client acknowledges that this report is for the exclusive use of the client.

ATTACHMENT A – Figures



Approximate Scale

0 400

Metres

Site Location

20 Edward Street, North Sydney, NSW

FIGURE 1



KEY



Site Boundary



BH1

Borehole Location

0 Approximate Scale 50
Metres

Photo Courtesy of Google Maps 2010

Borehole Locations

20 Edward Street, North Sydney, NSW

FIGURE 2

ATTACHMENT B – Field Sheets

Job Information	
Date: 09/09/10	Time: arrive 8.00am depart
Project Name:	Project Number: 3000
Site Location: 14 Edward St North Sydney	Operator: AH

Purpose of Visit
<p>Soil Investigation</p> <p>Hermet Investigation.</p>

Description of Works and People Met
<p>10 Boreholes 1-1.5m depth</p> <p>Antony Critche (DACAS) → service location,</p>

Sampling Details			
Sampling Conducted:	<input checked="" type="radio"/> Y	<input type="radio"/> N	<input type="radio"/> NA
Matrix:	<input checked="" type="radio"/> S	<input type="radio"/> W	<input type="radio"/> O
COC Form Submitted:	<input checked="" type="radio"/> Y	<input type="radio"/> N	<input type="radio"/> NA
COC Number:			
Primary Lab:	Envirolab.		
Secondary Lab:			

Field Equipment Used						
PID:	Y	<input checked="" type="radio"/> N	Calibrated / tested:	Y	<input type="radio"/> N	<input type="radio"/> NA
FID:	Y	<input checked="" type="radio"/> N	Calibrated / tested:	Y	<input type="radio"/> N	<input type="radio"/> NA
IP:	Y	<input checked="" type="radio"/> N	Calibrated / tested:	Y	<input type="radio"/> N	<input type="radio"/> NA
Water Quality Metre:	Y	<input checked="" type="radio"/> N	Calibrated / tested:	Y	<input type="radio"/> N	<input type="radio"/> NA
Pump:	Y	<input checked="" type="radio"/> N	Calibrated / tested:	Y	<input type="radio"/> N	<input type="radio"/> NA
Other:	Y	<input type="radio"/> N	Calibrated / tested:	Y	<input type="radio"/> N	<input type="radio"/> NA
Other:	Y	<input type="radio"/> N	Calibrated / tested:	Y	<input type="radio"/> N	<input type="radio"/> NA

Other Outstanding Action Items
<p>BH9 & BH10 - Area asbestos affected = ~6x5m. Bounded by fence line to N & west. It is full material.</p> <p>F1 = BH9 F2 = BH10 DUL1 = BH6 0.3</p> <p>Trip 1 = BH6 0.3</p>

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Testpit No. BH1

TESTPIT LOG

Sheet 1 of 10

Project No: 3000

Contractor:

Project: Cranehire

Method: Hand Auger

Site: 20 Edward St North Sydney.

Depth:

Date: 09/09/2010

Logged By: AT

Checked By:

Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
0			BH1/0.1		F-C grained sand, light brown, uniform, no odour. Natural Fill angular organic matter (roots)	
0.4			BH1/0.5		F-C grain sand with some gravel, light brown angular, odourless, natural, organic matter (roots)	
0.8			BH1/0.8		Auger refused at 0.8m,	

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Testpit No. BH2

TESTPIT LOG

Sheet 1 of 1

Project No: 3000

Contractor: _____

Project: _____

Method: Hand Auger

Site: _____

Depth: _____

Date: 09/09/10

Logged By: AT

Checked By: _____

Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
0					Moist. Dark brown F-C gran sand with some gravel. angular. Natural Fill	Cereal waste Present.
0.2					Moist. Dark Brown sandy clay. with some gravel. angular. Natural Fill	
0.3		BH2/0.3			Moist. Dark Brown sandy clay. with some gravel. angular. Natural Fill	
0.45		BH2/0.5			Light Brown. Moist. Dark angular. Natural. (Coarse gravel.	
0.65		BH2/0.65			Auger refused at 0.65m	

TESTPIT LOG

Testpit No.

Sheet of

Project No:

Project:

Site:

Date:

Contractor:

Method:

Depth:

Logged By:

Checked By:

Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
				BH3/0.1	Gravelly sandy silt, dark grey, poorly sorted, fine grained, moist, wetlands	Fill: Top soil
				BH3/0.3	Fill: (11) with glass fragments, ash fragments	RM 10%
				BH3/0.5	Fill: silty sand, grey/brown / white yellow, with some ash / glass fragments, becoming more silty with sandstone fragments	moist, Poorly sorted
					End @ 0.5	
					Refused	

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Testpit No. _____ Sheet of BH4		TESTPIT LOG	
Project No: _____ Project: _____ Site: _____ Date: _____		Contractor: _____ Method: _____ Depth: _____ Logged By: _____ Checked By: _____	

Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
				BH4/0.1	Sandy silt, dark grey, poorly sorted, fine - coarse grained, moist with wetlets, gravels, some (10% ash inclusions).	
				BH4/0.3 : Fill As BH4/0.1, but with	with grey/brown sand, with 10% ash inclusions, & 20% sandstone fragments.	
					Auger Refusal @ 0.35m. EOH @ 0.3m	

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TESTPIT LOG

Testpit No. BHS
Sheet (of 1

Project No: _____ Contractor: _____
Project: _____ Method: _____
Site: _____ Depth: _____
Date: _____ Logged By: _____
Checked By: _____

Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
					Loosy	
0					Dark brown F-C sand moist, angular.	Natural F.C.
0.15		BHS/0.3 BHS/0.5			light Dark brown & orange sandy clay, moist. with some gravel.	Natural. F.C.
0.60					Dark brown & light orange sandy clay, moist medium stagnant.	F.C.
0.8 ↓ 1.0		BHS/1.0			sandy clay, med-coarse grained, moist, grey/light brown, loose, non-plastic.	Natural
					GOT @ 1.0m	

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Testpit No.		TESTPIT LOG	
Sheet	of		
Project No:		Contractor:	
Project:		Method:	
Site:		Depth:	
Date:		Logged By:	
		Checked By:	

Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
				BHG/0.1	BHG/0.1: Full Gravelly silt, dark grey, fine - coarse grained, poorly sorted, moist, with inclusions	
				BHG/0.3	BHG/0.3: (11), with ash/slag, gravels, poorly sorted, moist.	= Day 1 = Trip 1
				0.4	becoming natural	
				BHG/0.5	BHG/0.5: sand clayey sand, yellow/brown, moist, poorly sorted	(Natural)
					CUH @ 0.6 m Refused sandstone?	

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Testpit No.		TESTPIT LOG				
Sheet	of	BH7				
Project No:	AS BH6		Contractor:			
Project:			Method:			
Site:			Depth:	AS BH6		
Date:			Logged By:			
			Checked By:			
Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
			BH7/0.1		1 - BH/0.1: sandy silty sand, dark grey/brown, poorly sorted, fine grained, moist, trace rootlets - F.M	
			BH7/0.3		As BH/0.1, all fragments of glass. F.M	F.M.
			BH7/0.5		As BH/0.1, with fragments of glass 10%	F.M
			BH7/0.6		As BH/0.1. silty sand, brown, poorly sorted, med-grained, moist, with gravel inclusions.	F.M
					COH @ 0.6m Auger Refused	

WSP Environmental Pty Ltd



Testpit No. BH8
Sheet 1 of 1

TESTPIT LOG

Project No: 3000

Contractor: _____

Project: _____

Method: Hand Auger

Site: _____

Depth: _____

Date: 09/09/10

Logged By: AT

Checked By: _____

Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
0					<p>Woods</p> <p>Natural - Moist Dark Brown F-C grained sand, angular, organic matter (roots)</p>	
0.15					<p>Moist, light brown and orange sandy clay. Some gravel.</p>	
0.40			BH8/0.3		<p>light brown & orange & red sandy clay, moist.</p>	
0.70			BH8/0.5			
			BH8/0.7		Auger refusal at 0.7m	

WSP Environmental Pty Ltd



Testpit No. BH9

TESTPIT LOG

Sheet of

Project No: 3000

Contractor:

Project:

Method: Hard Auger

Site:

Depth:

Date: 09/09/10 AS BH1

Logged By: AT

Checked By:

Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
0					Loess Dark brown, F-C grain sand, moist. some gravel & roots angular. F.U.	
0.20			BH9/0.3		Grey with white clumps (fine, silty, sandy), F-C grained. F.U. Crumbly & silty & ash.	
0.40			BH9/0.4		Auger refusal at 0.4m	

WSP Environmental Pty Ltd



Testpit No. BH10
Sheet 1 of 1

TESTPIT LOG

Project No: 3000

Contractor: _____

Project: _____

Method: _____

Site: _____

Depth: _____

Date: 09/09/10

Logged By: AA

Checked By: _____

Depth (m)	GW Level (m)	Sample		Graphic Log	Soil Description	Observations / Comments
		PID	ID No.			
0			F-1		Grass Dark moist F-C grained sand, angular. Fill	
0.10			BH10/0.07		Dark grey with white possible ash layers. Fill, grey with ash & silt & sand.	
0.45			BH10/0.45		Auger refusal at 0.45m	

ATTACHMENT C – Summary Results Tables

Page 1

ATTACHMENT D – Laboratory Reports

CHAIN OF CUSTODY - Client



ENVIROLAB SERVICES

Client: WSP Environmental Pty Ltd	Client Project Name and Number:	Envirolab Services 12 Ashley St, Chatswood, NSW, 2067 Phone: 02 9910 6200 Fax: 02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Project Mgr: Rebecca Kelly	PO No.: 3000 (b)	
Sampler: Aaron Young	Envirolab Services Quote No.:	
Address: Lev 1, 41 McLaren St North Sydney Rebecca.Kelly@wspgroup.com	Date results required:	
Email: Aaron.Young@wspgroup.com	Or choose: <u>standard</u>	
Phone: 89256700 Fax: 89256799	Note: Inform lab in advance if urgent turnaround is required - surcharge applies	

Sample information				Tests Required										Comments
Envirolab Sample ID	Client Sample ID	Date sampled	Type of sample	TPH 10-36	BTEX, TPH > 36	8 Metals	OCPS	Asbestos	PAHs					Provide as much information about the sample as you can
1	BH1/0.3	9/9/10	Soil	/	/	/	/	/	/					
2	BH1/0.5													
3	BH1/0.8													
4	BH2/0.3			/	/	/	/	/	/					
5	BH2/0.5													
6	BH2/0.65													
7	BH3/0.1													
8	BH3/0.3			/	/	/	/	/	/					
9	BH3/0.5													
10	BH4/0.1			/	/	/	/	/	/					
11	BH4/0.3			/	/	/	/	/	/					
12	BH5/0.3			/	/	/	/	/	/					
13	BH5/0.5			/	/	/	/	/	/					
14	BH5/1.0													
15	BH6/0.1													

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: 9910 6200

Job No: 45722

Date received: 10/9/10

Time received: 1:00

Received by: JHie

Temp: Cool/Ambient

Cooling/ice/icepack

Security/Intact/Broken/None

Relinquished by (company): WSP	Received by (company): ELS	Samples Received: Cool or Ambient (circle one)
Print Name: Aaron Ly	Print Name: JHie	Temperature Received at: (if applicable)
Date & Time: 9/9/10	Date & Time: 10/9/10 1:00	Transported by: Hand delivered / courier
Signature: [Signature]	Signature: [Signature]	Page No:

CHAIN OF CUSTODY - Client



ENVIROLAB SERVICES

Client: WSP Environmental Pty Ltd		Client Project Name and Number:		EnviroLab Services	
Project Mgr:		PO No.: 3050 (b)		12 Ashley St, Chatswood, NSW, 2067	
Sampler:		EnviroLab Services Quote No.:		Phone: 02 9910 6200	
Address: Lev 1, 41 McLaren St North Sydney		Date results required:		Fax: 02 9910 6201	
Email:		Or choose <u>standard</u>		E-mail: ahie@envirolabservices.com.au	
Phone: 89256700		Note: Inform lab in advance if urgent turnaround is required - surcharge applies		Contact: Aileen Hie	
Fax: 89256799					

Sample information				Tests Required										Comments
EnviroLab Sample ID	Client Sample ID	Date sampled	Type of sample	TPH	BTEX	8 Metals	OCs	Asbestos	DAAs					Provide as much information about the sample as you can
16	BH6/0-3	9/9/10	Soil	/	/	/	/	/	/					
17	BH6/0-5													
18	BH7/0-1													
19	BH7/0-3													
20	BH7/0-5			/	/	/	/	/	/					
21	BH7/0-6													
22	BH8/0-3			/	/	/	/	/	/					
23	BH8/0-5													
24	BH8/0-7													
25	BH9/0-3			/	/	/	/	/	/					
26	BH9/0-4													
27	BH10/0-3			/	/	/	/	/	/					
28	BH10/0-45													
29	Dup 1			/	/	/	/	/	/					
30	Trip 1			/	/	/	/	/	/					

Relinquished by (company):		Received by (company): ELS		Samples Received: Cool or Ambient (circle one)	
Print Name:		Print Name: JHP		Temperature Received at: (if applicable)	
Date & Time:		Date & Time: 10/9/10 1:00		Transported by: Hand delivered / courier	
Signature:		Signature: [Signature]		Page No:	


CHAIN OF CUSTODY - Client



ENVIROLAB SERVICES

Client: WSP Environmental Pty Ltd	Client Project Name and Number:	Envirolab Services 12 Ashley St, Chatswood, NSW, 2067 Phone: 02 9910 6200 Fax: 02 9910 6201 E-mail: ahie@envirolabservices.com.au Contact: Aileen Hie
Project Mgr:		
Sampler:	PO No.: 3100 (b)	
Address: Lev 1, 41 McLaren St North Sydney	Envirolab Services Quote No. :	
Email:	Date results required:	
	Or choose: standard	
Phone: 89256700 Fax: 89256799	<i>Note: Inform lab in advance if urgent turnaround is required - surcharge applies</i>	

[illegible]

Relinquished by (company):	Received by (company): ELS	Samples Received: Cool or Ambient (circle one)
Print Name:	Print Name: JHie.	Temperature Recieved at: (if applicable)
Date & Time:	Date & Time: 10/9/10 1:00	Transported by: Hand delivered / courier
Signature:	Signature: 	Page No:



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

CERTIFICATE OF ANALYSIS 45722

Client:

WSP Environmental
Level 1, 41 McLaren St
North Sydney
NSW 2060

Attention: Rebecca Kelly / Aaron Young

Sample log in details:

Your Reference:	3000(b)
No. of samples:	29 Soils, 1 Material
Date samples received:	10/09/10
Date completed instructions received:	10/09/10

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:	17/09/10
Date of Preliminary Report:	Not issued
Issue Date:	17/09/10

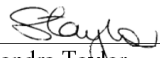
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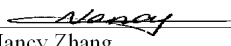
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Tests not covered by NATA are denoted with *.

Results Approved By:


Sandra Taylor
Assistant Lab Manager


Nancy Zhang
Chemist


Matt Mansfield
Approved Signatory

Envirolab Reference: 45722
Revision No: R 00



vTPH & BTEX in Soil				
Our Reference:	UNITS	45722-1	45722-4	45722-25
Your Reference:	-----	BH1	BH2	BH9
Depth	-----	0.3	0.3	0.3
Date Sampled		9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil
Date extracted	-	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	13/09/2010	13/09/2010	13/09/2010
vTPH C ₆ - C ₉	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.5	<0.5	<0.5
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1.0	<1.0	<1.0
m+p-xylene	mg/kg	<2.0	<2.0	<2.0
o-Xylene	mg/kg	<1.0	<1.0	<1.0
Surrogate aaa-Trifluorotoluene	%	89	85	82

sTPH in Soil (C10-C36)						
Our Reference:	UNITS	45722-1	45722-4	45722-8	45722-11	45722-13
Your Reference	-----	BH1	BH2	BH3	BH4	BH5
Depth	-----	0.3	0.3	0.3	0.3	0.5
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
TPH C10 - C14	mg/kg	<50	<50	<50	<50	<50
TPH C15 - C28	mg/kg	200	<100	130	<100	<100
TPH C29 - C36	mg/kg	160	<100	<100	<100	<100
Surrogate o-Terphenyl	%	#	135	139	137	125

sTPH in Soil (C10-C36)						
Our Reference:	UNITS	45722-16	45722-20	45722-22	45722-25	45722-27
Your Reference	-----	BH6	BH7	BH8	BH9	BH10
Depth	-----	0.3	0.5	0.3	0.3	0.3
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
TPH C10 - C14	mg/kg	<50	<50	<50	<50	<50
TPH C15 - C28	mg/kg	<100	<100	230	<100	<100
TPH C29 - C36	mg/kg	<100	<100	260	<100	<100
Surrogate o-Terphenyl	%	123	135	#	123	118

sTPH in Soil (C10-C36)		
Our Reference:	UNITS	45722-29
Your Reference	-----	Dup 1
Depth	-----	-
Date Sampled		9/09/2010
Type of sample		Soil
Date extracted	-	13/09/2010
Date analysed	-	13/09/2010
TPH C10 - C14	mg/kg	<50
TPH C15 - C28	mg/kg	<100
TPH C29 - C36	mg/kg	<100
Surrogate o-Terphenyl	%	126

PAHs in Soil Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS ----- -----	45722-1 BH1 0.3 9/09/2010 Soil	45722-4 BH2 0.3 9/09/2010 Soil	45722-8 BH3 0.3 9/09/2010 Soil	45722-13 BH5 0.5 9/09/2010 Soil	45722-16 BH6 0.3 9/09/2010 Soil
Date extracted	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	14/09/2010	14/09/2010	14/09/2010	14/09/2010	14/09/2010
Naphthalene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	0.3	0.3	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.3	1.8	1.9	<0.1	0.1
Anthracene	mg/kg	0.1	0.4	0.5	<0.1	<0.1
Fluoranthene	mg/kg	0.8	3.7	4.1	<0.1	0.3
Pyrene	mg/kg	0.9	3.6	4.4	<0.1	0.3
Benzo(a)anthracene	mg/kg	0.5	1.8	2.5	<0.1	0.2
Chrysene	mg/kg	0.5	1.7	2.2	<0.1	0.2
Benzo(b+k)fluoranthene	mg/kg	1	3.1	3.6	<0.2	0.3
Benzo(a)pyrene	mg/kg	0.7	2.3	2.8	<0.05	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.4	1.2	1.3	<0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	0.1	0.3	0.4	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.5	1.3	1.3	<0.1	0.1
Surrogate p-Terphenyl-d ₁₄	%	103	101	102	103	102

PAHs in Soil			
Our Reference:	UNITS	45722-20	45722-27
Your Reference	-----	BH7	BH10
Depth	-----	0.5	0.3
Date Sampled		9/09/2010	9/09/2010
Type of sample		Soil	Soil
Date extracted	-	13/09/2010	13/09/2010
Date analysed	-	14/09/2010	14/09/2010
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	0.8
Anthracene	mg/kg	<0.1	0.2
Fluoranthene	mg/kg	0.4	1.6
Pyrene	mg/kg	0.4	1.5
Benzo(a)anthracene	mg/kg	0.2	0.7
Chrysene	mg/kg	0.3	0.7
Benzo(b+k)fluoranthene	mg/kg	0.6	1.2
Benzo(a)pyrene	mg/kg	0.4	0.8
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	0.4
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.1
Benzo(g,h,i)perylene	mg/kg	0.3	0.4
Surrogate p-Terphenyl-d ₁₄	%	101	98

Organochlorine Pesticides in soil						
Our Reference:	UNITS	45722-1	45722-4	45722-8	45722-11	45722-13
Your Reference	-----	BH1	BH2	BH3	BH4	BH5
Depth	-----	0.3	0.3	0.3	0.3	0.5
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	14/09/2010	14/09/2010	14/09/2010	14/09/2010	14/09/2010
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	90	89	93	91	90

Organochlorine Pesticides in soil					
Our Reference:	UNITS	45722-16	45722-20	45722-25	45722-27
Your Reference	-----	BH6	BH7	BH9	BH10
Depth	-----	0.3	0.5	0.3	0.3
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	14/09/2010	14/09/2010	14/09/2010	14/09/2010
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	89	87	90	90

Acid Extractable metals in soil						
Our Reference:	UNITS	45722-1	45722-4	45722-8	45722-11	45722-13
Your Reference	-----	BH1	BH2	BH3	BH4	BH5
Depth	-----	0.3	0.3	0.3	0.3	0.5
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	14/09/2010	14/09/2010	14/09/2010	14/09/2010	14/09/2010
Arsenic	mg/kg	<4	4	4	<4	11
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium	mg/kg	11	17	12	20	25
Copper	mg/kg	21	21	31	11	3
Lead	mg/kg	120	440	130	39	15
Mercury	mg/kg	0.5	0.4	0.4	0.1	0.1
Nickel	mg/kg	3	3	4	2	<1
Zinc	mg/kg	190	350	180	38	7

Acid Extractable metals in soil						
Our Reference:	UNITS	45722-16	45722-20	45722-22	45722-25	45722-27
Your Reference	-----	BH6	BH7	BH8	BH9	BH10
Depth	-----	0.3	0.5	0.3	0.3	0.3
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date digested	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	14/09/2010	14/09/2010	14/09/2010	14/09/2010	14/09/2010
Arsenic	mg/kg	<4	<4	7	<4	<4
Cadmium	mg/kg	<0.5	<0.5	1.4	<0.5	<0.5
Chromium	mg/kg	12	13	20	17	16
Copper	mg/kg	27	6	33	11	21
Lead	mg/kg	80	67	740	69	130
Mercury	mg/kg	<0.1	0.2	0.3	<0.1	<0.1
Nickel	mg/kg	12	1	5	15	19
Zinc	mg/kg	98	30	780	71	120

Acid Extractable metals in soil		
Our Reference:	UNITS	45722-29
Your Reference	-----	Dup 1
Depth	-----	-
Date Sampled		9/09/2010
Type of sample		Soil
Date digested	-	13/09/2010
Date analysed	-	14/09/2010
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.5
Chromium	mg/kg	12
Copper	mg/kg	19
Lead	mg/kg	71
Mercury	mg/kg	0.1
Nickel	mg/kg	7
Zinc	mg/kg	75

Moisture						
Our Reference:	UNITS	45722-1	45722-4	45722-8	45722-11	45722-13
Your Reference	-----	BH1	BH2	BH3	BH4	BH5
Depth	-----	0.3	0.3	0.3	0.3	0.5
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Moisture	%	7.2	11	11	16	12

Moisture						
Our Reference:	UNITS	45722-16	45722-20	45722-22	45722-25	45722-27
Your Reference	-----	BH6	BH7	BH8	BH9	BH10
Depth	-----	0.3	0.5	0.3	0.3	0.3
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Date analysed	-	13/09/2010	13/09/2010	13/09/2010	13/09/2010	13/09/2010
Moisture	%	15	9.1	17	9.2	14

Moisture		
Our Reference:	UNITS	45722-29
Your Reference	-----	Dup 1
Depth	-----	-
Date Sampled		9/09/2010
Type of sample		Soil
Date prepared	-	13/09/2010
Date analysed	-	13/09/2010
Moisture	%	14

Asbestos ID - soils						
Our Reference:	UNITS	45722-1	45722-4	45722-8	45722-10	45722-12
Your Reference	-----	BH1	BH2	BH3	BH4	BH5
Depth	-----	0.3	0.3	0.3	0.1	0.3
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	14/9/2010	14/9/2010	14/9/2010	14/9/2010	14/9/2010
Sample Description	-	Approx 40g Soil	Approx 40g Soil	Approx 40g Soil	Approx 40g Soil	Approx 40g Soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected

Asbestos ID - soils						
Our Reference:	UNITS	45722-16	45722-20	45722-22	45722-25	45722-27
Your Reference	-----	BH6	BH7	BH8	BH9	BH10
Depth	-----	0.3	0.5	0.3	0.3	0.3
Date Sampled		9/09/2010	9/09/2010	9/09/2010	9/09/2010	9/09/2010
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	14/9/2010	14/9/2010	14/9/2010	14/9/2010	14/9/2010
Sample Description	-	Approx 40g Soil	Approx 40g Soil	Approx 40g Soil	Approx 40g Soil	Approx 40g Soil
Asbestos ID in soil	-	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg	No asbestos found at reporting limit of 0.1g/kg
Trace Analysis	-	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected	Respirable fibres not detected

Asbestos ID - materials		
Our Reference:	UNITS	45722-31
Your Reference	-----	F1
Depth	-----	-
Date Sampled		9/09/2010
Type of sample		Material
Date analysed	-	13/9/2010
Sample Description	-	47g Fibre board fragments
Asbestos ID in materials	-	No asbestos detected

Method ID	Methodology Summary
GC.16	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.
GC.3	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
GC.12 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
GC-5	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Metals.20 ICP-AES	Determination of various metals by ICP-AES.
Metals.21 CV-AAS	Determination of Mercury by Cold Vapour AAS.
LAB.8	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB.1	Asbestos ID - Qualitative identification of asbestos type fibres in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques.
AS4964-2004	Asbestos ID - Qualitative identification of asbestos type fibres in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques.

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTPH & BTEX in Soil						Base II Duplicate II %RPD		
Date extracted	-			13/09/2010	45722-1	13/09/2010 13/09/2010	LCS-5	13/09/2010
Date analysed	-			13/09/2010	45722-1	13/09/2010 13/09/2010	LCS-5	13/09/2010
vTPH C ₆ - C ₉	mg/kg	25	GC.16	<25	45722-1	<25 <25	LCS-5	69%
Benzene	mg/kg	0.5	GC.16	<0.5	45722-1	<0.5 <0.5	LCS-5	60%
Toluene	mg/kg	0.5	GC.16	<0.5	45722-1	<0.5 <0.5	LCS-5	67%
Ethylbenzene	mg/kg	1	GC.16	<1.0	45722-1	<1.0 <1.0	LCS-5	73%
m+p-xylene	mg/kg	2	GC.16	<2.0	45722-1	<2.0 <2.0	LCS-5	73%
o-Xylene	mg/kg	1	GC.16	<1.0	45722-1	<1.0 <1.0	LCS-5	75%
Surrogate aaa-Trifluorotoluene	%		GC.16	86	45722-1	89 84 RPD: 6	LCS-5	90%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
sTPH in Soil (C ₁₀ -C ₃₆)						Base II Duplicate II %RPD		
Date extracted	-			13/09/2010	45722-1	13/09/2010 13/09/2010	LCS-5	13/09/2010
Date analysed	-			13/09/2010	45722-1	13/09/2010 13/09/2010	LCS-5	13/09/2010
TPH C ₁₀ - C ₁₄	mg/kg	50	GC.3	<50	45722-1	<50 <50	LCS-5	107%
TPH C ₁₅ - C ₂₈	mg/kg	100	GC.3	<100	45722-1	200 270 RPD: 30	LCS-5	112%
TPH C ₂₉ - C ₃₆	mg/kg	100	GC.3	<100	45722-1	160 180 RPD: 12	LCS-5	120%
Surrogate o-Terphenyl	%		GC.3	125	45722-1	# #	LCS-5	116%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			13/09/2010	45722-1	13/09/2010 13/09/2010	LCS-5	13/09/2010
Date analysed	-			13/09/2010	45722-1	14/09/2010 14/09/2010	LCS-5	13/09/2010
Naphthalene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	<0.1 <0.1	LCS-5	113%
Acenaphthylene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.1 0.2 RPD: 67	[NR]	[NR]
Acenaphthene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	<0.1 <0.1	LCS-5	118%
Phenanthrene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.3 0.7 RPD: 80	LCS-5	121%
Anthracene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.1 0.2 RPD: 67	[NR]	[NR]
Fluoranthene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.8 1.7 RPD: 72	LCS-5	112%
Pyrene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.9 1.9 RPD: 71	LCS-5	114%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Benzo(a)anthracene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.5 1.0 RPD: 67	[NR]	[NR]
Chrysene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.5 1.0 RPD: 67	LCS-5	126%
Benzo(b+k)fluoranthene	mg/kg	0.2	GC.12 subset	<0.2	45722-1	1 1.8 RPD: 57	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	GC.12 subset	<0.05	45722-1	0.7 1.4 RPD: 67	LCS-5	117%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.4 0.8 RPD: 67	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.1 0.2 RPD: 67	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	GC.12 subset	<0.1	45722-1	0.5 0.9 RPD: 57	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		GC.12 subset	96	45722-1	103 100 RPD: 3	LCS-5	79%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			13/09/2010	45722-1	13/09/2010 13/09/2010	LCS-5	13/09/2010
Date analysed	-			14/09/2010	45722-1	14/09/2010 14/09/2010	LCS-5	14/09/2010
HCB	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	111%
gamma-BHC	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	104%
Heptachlor	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	100%
delta-BHC	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	97%
Heptachlor Epoxide	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	108%
gamma-Chlordane	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	106%
Dieldrin	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	115%
Endrin	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	119%
pp-DDD	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	111%
Endosulfan II	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	LCS-5	110%
Methoxychlor	mg/kg	0.1	GC-5	<0.1	45722-1	<0.1 <0.1	[NR]	[NR]
Surrogate TCLMX	%		GC-5	94	45722-1	90 89 RPD: 1	LCS-5	69%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date digested	-			13/09/2010	45722-1	13/09/2010 13/09/2010	LCS-1	13/09/2010
Date analysed	-			14/09/2010	45722-1	14/09/2010 14/09/2010	LCS-1	14/09/2010
Arsenic	mg/kg	4	Metals.20 ICP-AES	<4	45722-1	<4 <4	LCS-1	111%
Cadmium	mg/kg	0.5	Metals.20 ICP-AES	<0.5	45722-1	<0.5 <0.5	LCS-1	112%
Chromium	mg/kg	1	Metals.20 ICP-AES	<1	45722-1	11 12 RPD: 9	LCS-1	113%
Copper	mg/kg	1	Metals.20 ICP-AES	<1	45722-1	21 27 RPD: 25	LCS-1	113%
Lead	mg/kg	1	Metals.20 ICP-AES	<1	45722-1	120 160 RPD: 29	LCS-1	110%
Mercury	mg/kg	0.1	Metals.21 CV-AAS	<0.1	45722-1	0.5 0.4 RPD: 22	LCS-1	114%
Nickel	mg/kg	1	Metals.20 ICP-AES	<1	45722-1	3 4 RPD: 29	LCS-1	113%
Zinc	mg/kg	1	Metals.20 ICP-AES	<1	45722-1	190 250 RPD: 27	LCS-1	110%

QUALITY CONTROL	UNITS	PQL	METHOD	Blank
Moisture				
Date prepared	-			13/09/2010
Date analysed	-			13/09/2010
Moisture	%	0.1	LAB.8	<0.10

QUALITY CONTROL	UNITS	PQL	METHOD	Blank
Asbestos ID - soils				
Date analysed	-			[NT]

QUALITY CONTROL	UNITS	PQL	METHOD	Blank
Asbestos ID - materials				
Date analysed	-			[NT]

Report Comments:

Total Petroleum Hydrocarbons in soil (semivol):# Percent recovery is not possible to report as the high concentration of analytes in the sample/s have caused interference.

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

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 30-40g of sample in it's own container.

Asbestos ID was analysed by Approved Identifier:	Paul Ching
Asbestos ID was authorised by Approved Signatory:	Matt Mansfield
Asbestos counting was analysed by Approved Counter:	@ERROR
Asbestos counting was authorised by Approved Signatory:	@ERROR

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

Quality Control Definitions

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

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

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

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

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

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batched of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No: E050116	Cover Page 1 of 3
Client Name: WSP Environmental Pty Ltd	plus Sample Results
Client Reference: 3000 (b)	
Contact Name: Rod Harwood	
Chain of Custody No: na	Date Received: 13/09/2010
Sample Matrix: SOIL	Date Reported: 23/09/2010

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occurred within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy: matrix spike: 1 in first 5-20, then 1 every 20 samples
lcs, crm, method: 1 per analytical batch
surrogate spike: addition per target organic method

Precision: laboratory duplicate: 1 in first 5-10, then 1 every 10 samples

laboratory triplicate: re-extracted & reported when duplicate RPD values exceed acceptance criteria

Holding Times: soils, waters: Refer to LabMark Preservation & THT table
VOC's 14 days water / soil
VAC's 7 days water or 14 days acidified
VAC's 14 days soil
SVOC's 7 days water, 14 days soil
Pesticides 7 days water, 14 days soil
Metals 6 months general elements
Mercury 28 days

Confirmation: target organic analysis: GC/MS, or confirmatory column

Sensitivity: EQL: Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL

GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy: spike, lcs, crm general analytes 70% - 130% recovery
surrogate: phenol analytes 50% - 130% recovery
organophosphorous pesticide analytes 60% - 130% recovery
phenoxy acid herbicides, organotin 50% - 130% recovery

anion/cation bal: +/- 10% (0-3 meq/l),
+/- 5% (>3 meq/l)

Precision: method blank: not detected >95% of the reported EQL
duplicate lab 0-30% (>10xEQL), 0-75% (5-10xEQL)
RPD (metals): 0-100% (<5xEQL)
duplicate lab 0-50% (>10xEQL), 0-75% (5-10xEQL)
RPD: 0-100% (<5xEQL)

QUALITY CONTROL

ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy: spike, lcs, crm analyte specific recovery data
surrogate: <3xsd of historical mean

Uncertainty: spike, lcs: measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

Data Quality Objective	s: matrix spike recovery	p: pending	bcs: batch specific lcs
Data Quality Indicator	d: laboratory duplicate	lcs: laboratory control sample	bmb: batch specific mb
Estimated Quantitation Limit	t: laboratory triplicate	crm: certified reference material	
not applicable	r: RPD relative % difference	mb: method blank	



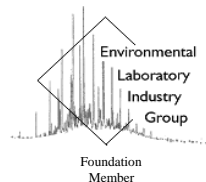
Laura Schofield
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Laboratory Report: E050116

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NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

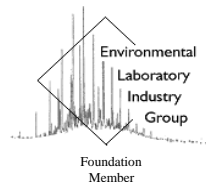
- A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.
- B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.
- C. Laboratory QA/QC samples are specific to this project.
- D. Inter-laboratory proficiency results are available upon request. NATA accreditation 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 GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.
- G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomalous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.
- H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.
- I. LabMark shall maintain an official copy of this Certificate of Analysis for all traceable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

- A. SRN issued to client upon sample receipt & login verification.
- B. Preservation & sampling date details specified on COC and SRN, unless noted.
- C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

- A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).
- B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 1645.
- C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.



Laboratory Report: E050116

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4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	Volatile TPH by P&T (vTPH)	1	0	0%	0	0	0%
2	Petroleum Hydrocarbons (TPH)	1	0	0%	0	0	0%
3	Acid extractable metals - mercury	1	0	0%	0	0	0%
4	Acid extractable metals	1	0	0%	0	0	0%
5	Moisture	1	--	--	--	--	--

GLOSSARY:

- #d number of discrete duplicate extractions/analyses performed.
- %d-ratio NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
- #t number of triplicate extractions/analyses performed.
- #s number of spiked samples analysed.
- %s-ratio USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

Laboratory Report No: E050116
Client Name: WSP Environmental Pty Ltd
Contact Name: Rod Harwood
Client Reference: 3000 (b)

Page: 1 of 5
 plus cover page
Date: 23/09/10

Final
Certificate
 of Analysis

This report supercedes reports issued on: N/A

Laboratory Identification		277941	lcs	mb							
Sample Identification		Trip1	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		9/9/10	--	--							
Laboratory Extraction (Preparation) Date		15/9/10	15/9/10	15/9/10							
Laboratory Analysis Date		16/9/10	15/9/10	15/9/10							
Method : E029.2/E016.2											
Volatile TPH by P&T (vTPH)		EQL									
C6 - C9 Fraction		10	<10	107%	<10						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E029.2/E016.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID/MSD.

Laboratory Report No: E050116
Client Name: WSP Environmental Pty Ltd
Contact Name: Rod Harwood
Client Reference: 3000 (b)

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Final
Certificate
 of Analysis

This report supercedes reports issued on: N/A

Laboratory Identification		277941	lcs	mb							
Sample Identification		Trip1	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		9/9/10	--	--							
Laboratory Extraction (Preparation) Date		15/9/10	15/9/10	15/9/10							
Laboratory Analysis Date		16/9/10	14/9/10	14/9/10							
Method : E006.2											
Petroleum Hydrocarbons (TPH)		EQL									
C10 - C14 Fraction	50	<50	--	<50							
C15 - C28 Fraction	100	<100	100%	<100							
C29 - C36 Fraction	100	<100	--	<100							
Sum of TPH C10 - C36	--	--	--	--							

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

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Client Name: WSP Environmental Pty Ltd
Contact Name: Rod Harwood
Client Reference: 3000 (b)

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Final
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This report supercedes reports issued on: N/A

Laboratory Identification		277941	crm	lcs	mb						
Sample Identification		Trip1	QC	QC	QC						
Depth (m)		--	--	--	--						
Sampling Date recorded on COC		9/9/10	--	--	--						
Laboratory Extraction (Preparation) Date		15/9/10	15/9/10	15/9/10	15/9/10						
Laboratory Analysis Date		16/9/10	16/9/10	15/9/10	15/9/10						
Method : E026.2											
Acid extractable metals - mercury		EQL									
Mercury	0.05	0.20	101%	92%	<0.05						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.

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Contact Name: Rod Harwood
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This report supercedes reports issued on: N/A

Laboratory Identification		277941	lcs	mb							
Sample Identification		Trip1	QC	QC							
Depth (m)		--	--	--							
Sampling Date recorded on COC		9/9/10	--	--							
Laboratory Extraction (Preparation) Date		15/9/10	15/9/10	15/9/10							
Laboratory Analysis Date		22/9/10	21/9/10	21/9/10							
Method : E020.2/E030.2											
Acid extractable metals		EQL									
Arsenic	1	7	108%	<1							
Cadmium	0.1	0.7	104%	<0.1							
Chromium	1	9	107%	<1							
Copper	2	15	97%	<2							
Lead	2	75	114%	<2							
Nickel	1	9	103%	<1							
Zinc	5	104	120%	<5							

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E020.2/E030.2: 0.5g digested with nitric/hydrochloric acid . Analysis by AAS and/or ICP-OES.

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Client Name: WSP Environmental Pty Ltd
Contact Name: Rod Harwood
Client Reference: 3000 (b)

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This report supercedes reports issued on: N/A


Laboratory Identification		277941									
Sample Identification		Trip1									
Depth (m)		--									
Sampling Date recorded on COC		9/9/10									
Laboratory Extraction (Preparation) Date		15/9/10									
Laboratory Analysis Date		16/9/10									
Method : E005.2											
Moisture		EQL									
Moisture		--	13								

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Sample Receipt Notice (SRN) for E050116



Quality, Service, Support

Client Details

Client Name: WSP Environmental Pty Ltd
Client Phone: 02 8925 6700
Client Fax: 02 8925 6799
Contact Name: Rod Harwood
Contact Email: rod.harwood@wspgroup.com.au
Client Address: Level 1, 250 Victoria Parade
East Melbourne Victoria 3002

Project Name: 3000 (b)
Project Number: - Not provided -
CoC Serial Number: - Not provided -
Purchase Order: - Not provided -
Surcharge: No surcharge applied (results by 6:30pm on due date)
Sample Matrix: SOIL

Date Sampled (earliest date): 09/09/2010
Date Samples Received: 13/09/2010
Date Sample Receipt Notice issued: 13/09/2010
Date Preliminary Report Due: 22/09/2010
Client TAT Request Date: 22/09/2010

Laboratory Reference Information

Please have this information ready when contacting MGT Labmark.

Laboratory Report: E050116
Quotation Number: - Not provided, standard prices apply
Laboratory Address: Unit 1, 8 Leighton Pl.
Asquith NSW 2077
Phone: 61 2 9476 6533
Fax: 61 2 9476 8219
Sample Receipt Contact: Leanne Knowles
Email: leanne.knowles@labmark.com.au
Reporting Contact: Leanne Knowles
Email: leanne.knowles@labmark.com.au

NATA Accreditation: 13542

Reporting Requirements: Electronic Data Download required: Yes

Invoice Number: 10EA11446

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals not used .
Sample container & chemical preservation suitable .

Comments:

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:

MGT LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of \$1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur \$5.00/ sample/ 3 months. Additional refrigerated storage shall incur \$30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from MGT LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Thank you for choosing MGT Labmark to analyse your project samples.
Additional information on www.mgtlabmark.com.au

Sample Receipt Notice (SRN) for E050116



Quality, Service, Support

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE				Requested Analysis															
No.	Date	Depth	Client Sample ID	Acid extractable metals - mercury	Acid extractable metals	Moisture	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (vTPH)										
277941	09/09		Trip1	●	●	●	●	●	●										
Totals:				1	1	1	1	1	1										

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing MGT Labmark to analyse your project samples.
Additional information on www.mgtlabmark.com.au

**Sample
Receipt
Notice (SRN) for E050116**



Quality, Service, Support

				Requested Analysis															
No.	Date	Depth	Client Sample ID	M7 - MET-AAS_S	HG-T_S Mercury														
277941	09/09		Trip1	●	●														
Totals:				1	1														

Thank you for choosing MGT Labmark to analyse your project samples.
Additional information on www.mgtlabmark.com.au



Attachment E – RPD Analysis Table

SDG	45722	45722		45722	Interlab_D	
Field_ID	BH6	Dup 1	RPD	BH6	Trip1	RPD
Sampled_Date-Time	9/09/2010	9/09/2010		9/09/2010	9/09/2010	

Method_Type	ChemName	Units	EQL						
8 metals in soil	Arsenic	mg/kg	4 (Primary): 1 (Interlab)	<4.0	<4.0	0	<4.0	7.0	55
	Cadmium	mg/kg	0.5 (Primary): 0.1 (Interlab)	<0.5	<0.5	0	<0.5	0.7	33
	Chromium (III+VI)	mg/kg	1	12.0	12.0	0	12.0	9.0	29
	Copper	mg/kg	1 (Primary): 2 (Interlab)	27.0	19.0	35	27.0	15.0	57
	Lead	mg/kg	1 (Primary): 2 (Interlab)	80.0	71.0	12	80.0	75.0	6
	Mercury	mg/kg	0.1 (Primary): 0.05 (Interlab)	<0.1	0.1	0	<0.1	0.2	67
	Nickel	mg/kg	1	12.0	7.0	53	12.0	9.0	29
	Zinc	mg/kg	1 (Primary): 5 (Interlab)	98.0	75.0	27	98.0	104.0	6
Moisture	Moisture	%	0.1	15.0	14.0	7	15.0	13.0	14
sTPH in Soil (C10-C36)	TPH C10 - C14	mg/kg	50	<50.0	<50.0	0	<50.0	<50.0	0
	TPH C15 - C28	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0
	TPH C29-C36	mg/kg	100	<100.0	<100.0	0	<100.0	<100.0	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 100 (0-5 x EQL); 75 (5-10 x EQL); 30 (> 10 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory