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# SOIL CONTAMINATION INVESTIGATION

NSW Department of Education c/o  
Conrad Gargett Pty Ltd

## SMALLS ROAD PUBLIC SCHOOL



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## Soil Contamination Investigation

NSW Department of Education c/o Conrad Gargett Pty Ltd

Smalls Road Public School, Smalls Rd North Ryde, NSW 2113

### 1 EXECUTIVE SUMMARY

Greencap-NAA (Greencap) was engaged by the NSW Department of Education c/o Conrad Garnett Pty Ltd to undertake a Soil Contamination Investigation at Smalls Road Public School, Smalls Rd North Ryde, NSW 2113. The objectives of this Soil Contamination Investigation are to assess the contamination present on a portion of the site as a result of past and present land use activities and to provide recommendations on further contamination assessment, management or remediation works (if required). The portion of the site investigated is illustrated on Figure 1 attached.

In particular, this investigation provides preliminary conclusions regarding the suitability of the land for future land use as a primary school consistent with the Health Investigation Levels derived for developed open space land. This includes parks, playgrounds, playing fields, secondary schools and footpaths and this set of investigation criteria is known as HIL - C in the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) ('NEPM', NEPC, 2013). This is also known as the "Recreational C" landuse exposure setting (refer NEPM 2013 amendment Table 1A(1): Health investigation levels for soil contaminants).

Based upon the desktop and field investigations, the principal potential contamination sources are associated with historical filling practices used to establish current site levels. The site is situated predominantly on a layer of fill material overlying Red/Brown mottled firm clays, derived from the underlying shale bedrock. Fill was observed to depths of up to 1.7 m. Source of fill material is unknown, however, was possibly derived from localised cut and fill operations. Available information indicates that the site has been operated as a school since 1965, though the exact age of the existing structures on-site was unable to be clearly defined.

No visible evidence of spills or discoloured in soil was identified during the field investigations and site inspection. No foreign materials, asbestos or odours were noted during the drilling of the boreholes. Analytical results indicate that there are no impacts to surface fill material and shallow natural soils associated with heavy metals, TPH, OCP, PCB, PAHs, metals and Asbestos. All results were found to be less than the assessment criteria. From a contamination perspective, no significant or widespread soil contamination was identified during the contamination investigation which would restrict use of the site for use as a secondary school in a Recreational C - developed public open space setting.

Note: This report is issued in draft form pending the receipt of the dangerous goods search. The report will be reissued in final form upon receipt of the dangerous good search.

### Statement of Limitations

This report has been prepared in accordance with the agreement between NSW Department of Education c/o Conrad Gargett Pty Ltd and Grencap.

Within the limitations of the agreed upon scope of services, this work has been undertaken and performed in a professional manner, in accordance with generally accepted practices, using a degree of skill and care ordinarily exercised by members of its profession and consulting practice. No other warranty, expressed or implied, is made.

This report is solely for the use of NSW Department of Education c/o Conrad Gargett Pty Ltd and any reliance on this report by third parties shall be at such party's sole risk and may not contain sufficient information for purposes of other parties or for other uses. This report shall only be presented in full and may not be used to support any other objective than those set out in the report, except where written approval with comments are provided by Grencap.

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# Soil Contamination Investigation

NSW Department of Education c/o Conrad Gargett Pty Ltd

Smalls Road Public School, Smalls Rd North Ryde, NSW 2113

## Table of Contents

1	Executive Summary .....	ii
1	Introduction .....	1
1.1	Background .....	1
1.2	Project Objectives.....	1
1.3	Scope of works .....	1
2	Site information.....	2
2.1	Boundaries and surrounding Land uses.....	2
2.2	Site Geology and Soils.....	2
2.3	Site Topography and Drainage .....	3
2.4	Acid Sulfate soils.....	3
3	Development Controls and Regulatory Records.....	3
3.1	Section 149.....	3
3.2	Workcover dangerous good search.....	3
3.3	Contaminated Land record search .....	3
3.4	POEO Act search .....	4
4	Site History.....	4
4.1	Aerial Photograph Review.....	4
4.2	Heritage / Archaeological items.....	5
5	Site Inspection.....	5
6	Regulatory compliance .....	5
7	Sampling and analysis quality plan.....	6
7.1	Sampling pattern .....	6
7.2	Sample collection.....	6
7.3	Analytical Strategy.....	7
7.4	Adopted site criteria .....	8
7.5	Aesthetic considerations.....	9
8	Sampling Program And Field Observations.....	9
9	Results.....	10
9.1	Monocyclic Aromatic Hydrocarbons, Volatile Total Recoverable Hydrocarbons and Semi Volatile Total Recoverable Hydrocarbons.....	10
9.2	Polycyclic Aromatic Hydrocarbons .....	10
9.3	Pesticides and Polychlorinated Biphenyls.....	10
9.4	Heavy Metals.....	10
9.5	Asbestos.....	11
9.6	Discussion of Results.....	11
9.7	Waste Classification.....	11
10	Quality Control and Assurance.....	11

11	Conceptual Site Model.....	12
12	Conclusions.....	12
	Appendix A: Borehole logs.....	i
	Appendix B Section 149 Certificate.....	II
	Appendix C: Dangerous Goods Search.....	III
	Appendix D: PID Calibration Certificate.....	IV
	Appendix E: Summary Data Table.....	V
	Appendix F: NATA-accredited laboratories Results.....	VI
	Appendix G: Data validation sheets.....	VII

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## 1 INTRODUCTION

### 1.1 Background

Greencap-NAA (Greencap) was engaged by the NSW Department of Education c/o Conrad Garnett Pty Ltd to undertake a Soil Contamination Investigation at Smalls Road Public School, Smalls Rd North Ryde, NSW 2113. The property is legally defined as Lot 1 in Deposited Plan (DP) 830420 and is hereafter referred to as "the site". Refer to Figure 1 for site location.

This work has been conducted in accordance with the scope of works and limitations set out in Greencap's proposal J146932-02 v3 (December 2016) and approval to undertake the works received from NSW Department of Education c/o Conrad Gargett Pty Ltd in January 2017.

### 1.2 Project Objectives

The project objectives of this Soil Contamination Investigation are to assess the contamination present on a portion of the site as a result of past and present land use activities and to provide recommendations on further contamination assessment, management or remediation works (if required). The portion of the site investigated is illustrated on Figure 1 attached.

In particular, this investigation provides preliminary conclusions regarding the suitability of the land for future land use as a secondary school consistent with the Health Investigation Levels derived for developed open space land. This includes parks, playgrounds, playing fields, secondary schools and footpaths and this set of investigation criteria is known as HIL - C in the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No.1) ('NEPM', NEPC, 2013). This is also known as the "Recreational C" landuse exposure setting (refer NEPM 2013 amendment Table 1A(1): Health investigation levels for soil contaminants).

### 1.3 Scope of works

To achieve this objective, Greencap carried out the following works:

- Desktop review of site plans, historical records and aerial photography;
- Reviewing the environmental conditions of the site including geology;
- Comprehensive inspection of the site;
- Providing an overview of the site's past and current land uses, potential contamination issues and potential Areas of Environmental Concern (AEC);
- Undertake soil sampling from a series of boreholes located across the site investigation area to assess the soils for potential contaminants, using a tracked geoprobe drill rig;
- A field log at each location to record a detailed description of the soil texture, odours and any notable inclusions or other evidence of contamination. Refer to Appendix A for borehole logs;
- A photoionisation detector (PID) used at each location to screen the soil for the presence of volatile organic compounds (VOCs). The results were also used to select samples for laboratory analysis;
- Laboratory testing of selected soil samples (including QA/QC samples) for a range of potential organic and inorganic contaminants to enable assessment of data quality;
- Interpretation of the results of laboratory testing in the context of field observations, local geology, history of the site and proposed future landuse; and,
- Provide a preliminary assessment of site contamination (if any) and discuss the need for further assessment, management or remediation works.

The site consisted of a two distinct areas, the playing field on the northeast portion and a number of large two story structures used for educational purposes on the southwest portion, which are visible

on Figure 1 attached. Due to the limited sampling scope and the proposed new development limited to the southwest area, the playing fields were not subject to this Soil Contamination Investigation. Refer to Figure 1 - site location, Figure 2 –sample locations and Figure 3 – Site development plan, attached

## 2 SITE INFORMATION

The Site identification details are summarised in Table 1 below:

Site Locality Summary	
Site Name	Smalls Road Public School
Address	3 Smalls Rd, Ryde NSW 2112
Local Government Authority	Ryde City Council
Lot and Deposited Plan	Lot 1 in Deposited Plan (DP) 830420
Site Zoning	SP2 Educational Establishment
Current Use	Educational Centre
Proposed Use	Educational Centre
Site Investigation Area	Approximately 0.2790 hectares
Site Location	Refer to Figure 1 – site location

The proposed new redevelopment consists of the demolition of the existing structures with the construction of a new two story semicircular structure with new carparks and playground areas. Refer to Figure 3 – Site Development Plan.

### 2.1 Boundaries and surrounding Land uses

The boundary and surrounding landscape features of the Site are shown on Figure 1 and summarised in Table 2 below:

Direction	Details
North	Smalls Road with Low density residential housing beyond
East	Low density residential housing
South	Low density residential housing
West	Low density residential housing

### 2.2 Site Geology and Soils

The soil landscape unit for the site is described in the *Soil Landscapes of The Sydney 1:100,000 Sheet (9130)* (C.L. Murphy *et al.*) as Red Podzolic Soil being derived from the Wianamatta group geological unit shales. The soil landscape mapping unit comprises shallow to moderately deep (30-100cm) red and brown podzolic soils on the crests grading towards yellow podzolic soils on lower areas and drainage lines.

Based upon the geological mapping for the site and observations during fieldwork it is considered that the above description of the natural soil profile is accurate. However, it should be noted that soil bores on the site identified that a clay fill overlies this natural soil.

A review of the 1:100,000 *Sydney Geology Series Sheet (9130)* indicates that the site is underlain by Bringelly Shale (of the Wianamatta group) which typically comprises beds of dark grey to black

siltstone, claystone, finely interlaminated siltstone and sandstone (laminite), shale and fine grained sandstone. Hawkesbury Sandstone underlies this which comprises of medium to coarse-grained quartz sandstone with claystone and laminite lenses.

### 2.3 Site Topography and Drainage

The general topography of the site appeared generally consistent with the surrounding landscape. A review of the *Sydney Sheet 9130 (Edition 1) National Topographic Map Series* indicates that the site elevation is approximately 60 metres above Australian Height Datum (AHD). The site slightly slopes in a northwest direction towards Shrimptons Creek. Shrimptons Creek is the closest natural water body to the site located 370 metres northwest. The site consisted of a two distinct areas, the playing field on the northeast portion and a number of large two story structures used for educational purposes on the southeast portion. The southeast portion of the site is slightly elevated relative to the adjacent playing fields.

### 2.4 Acid Sulfate soils

Review of the Ryde Local Environmental Plan 2014 and the NSW eSpade Acid Sulfate Soil Risk Mapping indicated that there are no known occurrences of acid sulfate soils in the area.

## 3 DEVELOPMENT CONTROLS AND REGULATORY RECORDS

### 3.1 Section 149

A Planning Certificate from Ryde City Council under Section 149 of the Environmental Planning and Assessment Act 1979 (NSW) was obtained for all lots at the Site, stating:

- The zoning and land use provisions of Zone SP2 Infrastructure - Educational Establishment under the Ryde Local Environmental Plan 2014 apply to this land;
- The land does not include or comprise critical habitat and is not located in a Conservation Area;
- The Site does not contain Aboriginal archaeological sites under the protection of the National Parks and Wildlife Service Act 1974 (NSW);
- The Site is not affected by Local Road Widening;
- No matters apply to this property under the Contaminated Land Management Act 1997 (NSW);
- The land is not affected by the operation Sections 38 or 39 of the Coastal Protection Act 1979 (NSW).
- The land has not been proclaimed to be within a mine subsidence district; and,
- The land is not located within an area that is bush fire prone land as defined by the Environmental Planning and Assessment Act 1979 (NSW).

No indicators of potential contamination were identified. Refer to Appendix B – Section 149 Certificate.

### 3.2 Workcover dangerous good search

Documentation pending. This report is issued in draft form. The report will be reissued in final form upon receipt of the dangerous good search.

Refer to Appendix C – Dangerous Goods Search (Documentation pending).

### 3.3 Contaminated Land record search

A search was conducted of all records pertaining to section 58 of the Contaminated Land Management Act 1997 (NSW) and revealed that the Site is not encumbered by any notices from the

NSW EPA with regard to contaminated land. No sites in the vicinity of the site were encumbered by any notices according to the search record.

### 3.4 POEO Act search

A search of the NSW EPA Protection of the Environment Operations Act 1997 (NSW) public register did not locate any records of licences, applications, notices, audits, or pollution studies/reduction programs for the site.

## 4 SITE HISTORY

### 4.1 Aerial Photograph Review

Table 3: Historical land use from aerials

Photo I.D.	Comments	
Six Maps -1943 imagery Date: 1 May 1943 SKM Sydney	Site	The site is being used for agricultural purposes with 3 buildings located on site, with no buildings located on site. There is limited natural vegetation on site with some trees. The site appears to be bounded by some kind of fencing which can also be found throughout the site. The site is bounded to the north west by a dirt road (Smalls road) and by agricultural fields in on all other sides.
	Surroundings	Directly to the west, north and east is more agricultural land with scattered buildings. To the south, there is low density residential, which expands further to the west and south. There is some heavily vegetated areas to the east past the agricultural fields.
Date: January 1956 Ident: no. 210 233_18_205	Site	The site is still being used for agricultural purposes, the two buildings in the centre of north west boundary from the previous aerial have now been replaced or built on and are one large building.
	Surroundings	The areas to the south and west, have seen an increase in low density housing. The northern agricultural areas have changed in places to low density residential.
Date: 29 August 1965 Ident: NSW 1404 1405_18_165	Site	In the southern half of the property, a series of interconnected buildings with a central courtyard have been built. There are three free standings buildings in the south east corner, another in the central part of the south west boundary and another on the central part of the north west boundary. The rest of the site has been cleared and there is little to no vegetation on site. The site is bounded on by fencing on the north east, south east and south west boundaries. Some interior roads and paths have been constructed on the site.
	Surrounding	The site is surrounded by low density residential housing which appears to have replaced all the agricultural land use in the area. There is a large park to the north east of the site and another to the southwest. New roads have been added to the surrounding suburbs.
Date: 6 August 1975 Ident: NSW 2327_05_074	Site	A new building has been added just north east of the interconnected buildings and a car park has been added to the south west corner of the site and by the south east corner of the interconnected building. There is fencing separating sections of the site and the entire site has been fenced along the boundary. There is a sealed sports field just off the new building to the north east of the interconnected building.
	Surrounding	The surrounding area has seen an increase in low density residential housing.
Date: 3 August 1986 Ident: NSW 3528_19_205	Site	The car park on the south east corner of the interconnected building has been removed and one of the buildings east of the interconnected building has been extended. There has been significant increase in trees on site with most buildings and visible fence lines having tree bounding them.
	Surrounding	There has been no visible significant change to the surrounding area that can be seen on the aerial.

Photo I.D.	Comments	
Run 8 Date: 4 October 1994 233-247	Site	A new building has been built along centre of the south west boundary.
	Surroundings	There has been no visible significant change to the surrounding area that can be seen on the aerial.
Google Earth Date: 8/8/2005	Site	Car parks have been added west of the building located on the centre of the south west boundary, where the sealed sports field was north east of the interconnected building and in the central courtyard of the interconnected building.
	Surroundings	The park to the south-east of the site has had significant redevelopment.
Nearmap Date: 04/11/2016	Site	There is a new path leading to a small building located on the central portion of the north west boundary.
	Surroundings	There has been no visible significant change to the surrounding area that can be seen on the aerial.

## 4.2 Heritage / Archaeological items

A review of the Heritage Map Sheet HER\_005 provided in the Ryde Local Environmental Plan 2014, did not identify archaeological or aboriginal heritage items on site.

## 5 SITE INSPECTION

A site walkover was undertaken on Wednesday 1<sup>st</sup> of February 2017. The purpose of the inspection was to make observations of the site and adjacent site land uses relevant to the assessment of land contamination. The site consisted of a number of large two story structures used for educational purposes. The footprint (concrete slab) of the structures entail approximately 40% of the investigation area. The remaining grounds consisted of footpaths, carpark and vegetation areas. The site inspection made the following observations:

- There was no visual evidence of wastes being dumped on the site. The storage of chemical and visible spillages were also not observed during the site walkover;
- There was no visual evidence of underground storage tanks (e.g. fill points, dip points, breather lines) or above ground storage tanks observed during the site walkover;
- There was no visual evidence of potential asbestos containing materials (ACM) observed on the surface of the site;
- There was no visual evidence of phytotoxic impact (i.e. plant stress or dieback) observed on the site;
- There was no olfactory evidence of odours detected on the site;
- There was no visual evidence of surface staining observed on the site; and,
- There was visual evidence to suggest the presence of potential filling material on the site, based on the elevated position of investigation area relative to the adjacent playing fields. Additionally evidence of filling was present in the central internal carpark due to its raised position and retaining walls. The potential for localised or minor filling elsewhere on the site cannot be precluded.

## 6 REGULATORY COMPLIANCE

The regulatory framework within which this Contamination Investigation has been undertaken comprises the following:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM 2013 amendment);

- NSW OEH (2011), *Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites*;
- NSW EPA (2014), *Waste Classification Guidelines – Part 1: Classifying Waste*;
- NSW EPA (1995), *Sampling Design Guidelines*;
- *Contaminated Land Management Act 1997*; and
- *Protection of the Environment Operations Act 1997*.

## 7 SAMPLING AND ANALYSIS QUALITY PLAN

### 7.1 Sampling pattern

A judgmental sampling pattern was adopted for the assessment of the site on the basis of the positioning of the proposed new development and observed potential for filling onsite. A total of 9 boreholes were drilled at the locations shown on Figure 2 (BH1 to BH9) and 12 primary soil samples were collected from various depth of the strata and analysed. The justification of the sampling point regime for the assessment was based on the investigator's knowledge, operational requirements, experience and history of the site. All historical information / investigations and anecdotal evidence supported the sampling approach adopted and provided for samples to be collected in a representative and unbiased manner.

### 7.2 Sample collection

During the assessment of contaminated sites, the integrity of data collected is considered paramount. Soil samples for chemical analyses were generally collected in accordance with the Sampling Design Guidelines (NSW EPA, 1995), NEPM (NEPC, 2013) and AS4482.1-2005. Soil samples collected during the investigation were placed immediately into laboratory prepared glass jars with Teflon lid inserts. Standard identification labels were adhered to each individual container and labelled according to depth, date, sampling team and media collected. All equipment used in the sampling program which includes an auger, spades and mixing bowl was decontaminated prior to use and between samples to prevent cross contamination. Samples were taken from the auger by using nitrile disposal gloves and immediately transferred to sample containers of appropriate composition, fresh gloves were used for every sample taken to prevent cross contamination.

Bulk samples (10 litre) were taken from the fill layer for screening of asbestos containing materials. All samples were forwarded to Envirolab Services and Australian Safer Environment & Technology Pty Ltd under recognised chain of custodies with clear identification outlining the date, location, sampler and sample ID. All samples were packed into an esky with ice from the time of collection. During the project, the laboratory reported that all the samples arrived intact and were analysed within holding times for the respective analytes. Samples were kept below 4°C at all times.

Sampling for asbestos was carried out in accordance with the NEPM (NEPC, 2013). Soils were inspected and any visible potential ACM was collected and sent for laboratory analysis. A minimum of 10 litres of subsurface soils were collected from the sample location and manually screened on-site through a 7mm mesh sieve. Material remaining on the sieve was examined for bonded ACM or suspect material. Any ACM or suspect material was collected and laboratory analysed for asbestos content and weight. Following field screening, a 500mL sample was collected from the fines for laboratory analysis for any potential AF/FA. Asbestos concentration calculations were based on the amount of asbestos equivalent in a measured amount of soil expressed as a % weight for weight (w/w) and estimated using the formula:

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

Percentage weight for weight (%w/w) concentrations of ACM in soil were determined by a gravimetric approach outlined in NEPM (NEPC, 2013).

### 7.3 Analytical Strategy

Samples were analysed for listed chemicals based on representativeness of potential contamination and to allow confident assessment. Most samples analysed were from the fill layer. Samples were analysed for the following parameters:

Table 4 – Analytical Plan

Borehole	Sample Depth (mbgl)	Analyte
BH-1	0.0-0.2 Chemical 0.0-0.5 Asbestos	vTRH/BTEX, TRH, PAH, Heavy Metals, OCP, OPP, PCB, Asbestos.
BH-2	0.3-0.4 Chemical 0.0-0.3 Asbestos	vTRH/BTEX, TRH, PAH, Heavy Metals, OCP, OPP, PCB, Asbestos.
BH-3	0.1-0.2 Chemical 0.0-0.3 Asbestos 0.9-1.0 Chemical	vTRH/BTEX, TRH, PAH, Heavy Metals, OCP, OPP, PCB, Asbestos.
BH-4	0.1-0.2 Chemical 0.1-0.3 Asbestos	vTRH/BTEX, TRH, PAH, Heavy Metals, OCP, OPP, PCB, Asbestos.
BH-5	0.1-0.3 Chemical 0.0-0.3 Asbestos	vTRH/BTEX, TRH, PAH, Heavy Metals, OCP, OPP, PCB, Asbestos.
BH-6	0.2-0.3 Chemical 0.0-0.3 Asbestos	vTRH/BTEX, TRH, PAH, Heavy Metals, OCP, OPP, PCB, Asbestos.
BH-7	0.2-0.4 Chemical 0.0-0.3 Asbestos	vTRH/BTEX, TRH, PAH, Heavy Metals, OCP, OPP, PCB, Asbestos.
BH-8	0.3-0.4 Chemical 0.0-0.5 Asbestos 1.3 Chemical	vTRH/BTEX, TRH, PAH, Heavy Metals, OCP, OPP, PCB, Asbestos.
BH-9	0.3-0.4 Chemical 0.0-0.5 Asbestos 1.4 Chemical	vTRH/BTEX, TRH, PAH, Heavy Metals, OCP, OPP, PCB, Asbestos.

vTRH: Volatile Total Recoverable Hydrocarbons  
 BTEX: Benzene, Toluene, Ethyl-Benzene, Xylenes  
 TRH: Total Recoverable Hydrocarbons  
 PAH: Polycyclic Aromatic Hydrocarbons

Heavy Metals: Arsenic (As), Chromium (Cr), Cadmium (Cd), Copper, (Cu), Lead (Pb), Mercury (Hg), Nickel (Ni), Zinc (Zn)  
 OCP: Organochlorine Pesticides  
 OPP: Organophosphorus Pesticides, PCB: Polychlorinated Biphenyls

Photo Ionisation Detection (PID) was undertaken using a PhoCheck Tiger PID Metre as a screening guide in the field to enable sampling. In addition, all samples were analysed for volatile (BTEX+N) and TRH compounds. PID screening was undertaken through the collection of a portion of soil into a plastic snap lock bag that was then sealed with air inside. The bag was then left for up to one minute then the tip of the PID probe was pushed through the bag into the bag headspace and a reading was taken.

#### 7.4 Adopted site criteria

The HIL-C criteria selected as trigger levels for site suitability assessment are adopted from *Schedule B1: Guideline on Investigation Levels for Soil and Groundwater* contained within the National Environment Protection Council (1999) *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (NEPM 2013 amendment).

This schedule provides a framework for the use of investigation and screening levels and is based on a matrix of human health and ecological soil investigation and screening levels.

Note that these criteria are identified by NSW EPA as investigation criteria only and have not been devised specifically as clean-up criteria. They are intended as levels which trigger further site-specific derivation of clean-up criteria.

The adopted criteria for this site are based on its future intended land-use as a Secondary School (Health Investigation Level, HIL-C or "Recreational C" (developed public open space land) setting in Table 1A(1): Health investigation levels for soil contaminants and Health Screening Levels HSL-C for VOCs. CRC hydrocarbons have also been adopted for the assessment of Risk Characterisation of non volatile TRH compound concentrations if detected.

Table 4 summarises the soil assessment criteria applied for this investigation.

Asbestos containing material found within the site was based on criteria of AF/FA 0.001% and ACM criteria of 0.02% from the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (NEPM 2013 amendment).

Table 5: Soil Assessment Criteria – NEPM 1999 (2013 Amendment)

Table 2A - Site Assessment Criteria - SOILS (TRH, BTEX, PAH)		Total Recoverable Hydrocarbons				BTEX				PAH			
		C <sub>6</sub> -C <sub>10</sub> (F1) (mg/kg)	C <sub>10</sub> -C <sub>16</sub> (F2) (mg/kg)	>C <sub>16</sub> -C <sub>34</sub> (F3) (mg/kg)	>C <sub>34</sub> -C <sub>40</sub> (F4) (mg/kg)	Benzene (mg/kg)	Toluene (mg/kg)	Ethyl- benzene (mg/kg)	Xylene (total) (mg/kg)	Naphthalene (mg/kg)	BaP (MG/KG)	BaP (TEQ) (mg/kg)	Total (mg/kg)
CRC CARE Direct Contact HSL-C Residential ( Density) (2011)		5,100	3,800	5,300	7,400	120	18,000	5300	15,000	1,900	-	-	-
NEPM 1999 (2013 amendment) - CLAY Soil HSL for Vapour Intrusion - HSL-C, Recreational Land Use in Clay (Table 1A(3)) (mg/kg)	0- <1m	NL	NL			NL	NL	NL	NL	NL	-		
Ecological Screening Levels (ESLs) for TRH fractions (F1- F4), BTEX and BaP in Soil - Urban Residential and Public Open Space ((Table 1B(6)) (mg/kg)**		180	120	1,300	5,600	65	105	125	145	-	0.7	-	
NEPM 1999 (2013 amendment) - Recreational C (HIL-C) Criteria (Table 1A(1)) (mg/kg)		-	-	-	-	-	-	-	-	-	-	3	300
NEPM 1999 (2013 amendment) - Management Limits for TPH (F1-F4) in Soil - Residential, parkland and public open space (Table 1B(7)) (mg/kg)		700	1,000	2,500	10,000	-	-	-	-	-	-	-	-

\*Urban residential/public open space is broadly equivalent to the HIL C land use scenarios

Table 5 continued: Soil Assessment Criteria – NEPM 1999 (2013 Amendment)

Table 2B - Site Assessment Criteria - SOILS (OCPs , PCBs and OPPs)	Organochlorine Pesticides								Polychlorinated Biphenyls
	DDT + DDE + DDD	Aldrin and Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor	
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	
NEPM 1999 (2013 amendment) - Recreational HIL-C Criteria (Table 1A(1)) (mg/kg)	400	10	70	340	20	10	10	400	1

\*\* criteria for DDT only

Table 2C - Site Assessment Criteria - SOILS (Heavy Metals)	Metals							
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
NEPM 1999 (2013 amendment) - Recreational C (HIL-C) Criteria (Table 1A(1)) (mg/kg)	300	90	300*	17,000	600	80	1,200	30,000

\* note that criteria is for CrVI and not Total Cr

According to NEPM (NEPC, 2013), Schedule B (5a) – Guideline on Ecological Risk Assessment, factors that may influence a Risk Management Decision (and therefore determine Ecological Risk Assessment outcomes) are generally based on economic, ecological or societal considerations.

Examples include:

- The size of the site, land value, cost of remediation (economic);
- The type of contaminants present, current and potential site land use, surrounding land use (societal); and,
- The ecological significance (e.g. a rare and endangered species or a species that supports a valued ecological process or a sensitive introduced species of low ecological significance) of the values identified in the Receptor Identification component of Ecological Risk Assessment (ERA) to be protected.

EILs have been implemented to environmentally manage the effect of contaminants on terrestrial ecosystems and species sensitivity. The EILs referenced in this report have been developed for the generic land use setting of urban residential areas and public open space. It is important to note that the contamination is assumed to be aged (>2 years), as fresh contamination associated with current industrial / agricultural activity and chemical spills are not likely present on-site. EILs have been derived for: Arsenic (As), Copper (Cu), Chromium (CrIII), DDT, naphthalene, Nickel (Ni), Lead (Pb) and Zinc (Zn).

#### Ambient Background Concentration (ABC)

For Ni, CrIII, Zn and Pb (aged contamination), the EILs are the sum of Added Contaminant Limits (ACLs) and Ambient Background Concentrations (ABCs). To establish the ABC of a contaminant, the recommended method is to measure the ABC at an appropriate unpolluted reference site. Sample BH-3 (0.9-1.0) was determined to be the most appropriate unpolluted reference location for the purposes of ABCs. The sample was collected from dry clay at a depth of 0.9-1.0mbgl and the soils at this location are therefore considered characteristic of natural clays in the region.

For As, DDT and Naphthalene (aged contamination), the EILs are generically obtained (i.e. not dependent on soil type).

#### Added Contaminant Limit (ACL)

The Added Contaminant Limit (ACL) is the added contamination (in excess of the ABC). ACLs are applicable to Cr III, Cu, Ni and Zn and are based on soils properties of pH, Cation Exchange Capacity (CEC) and the clay content. Refer to the table below for soil properties to be measured for site-specific derivation of ACLs. Refer to the table below for soil properties to be measured during site-specific derivation of ACLs.

Table 6 – Soil Properties to be measured for site-specific derivation of ACLs

Property	Cr III	Cu	Ni	Zn
pH	--	Yes	--	Yes
CEC	--	Yes	Yes	Yes
% Clay	Yes	--	--	--

The soil type at BH8 03-04mbgl was identified to be clay, allowing for a clay content percentage in excess of 90%. From the analytical results a pH of 7.3 and CEC of 25cmolc/kg have been adopted in the determination of the ACLs below. The respective soil EILs are provided in the following table:

Table 7 – EILs for Soils (mg/kg)

Analytes	ABC	ACL	EIL
Arsenic	--	--	100 <sup>1</sup>
Chromium (III)	11	400 <sup>2</sup>	411
Copper	10	215 <sup>3</sup>	225
Lead	20	1,100 <sup>4</sup>	1,120
Nickel	<1	310 <sup>5</sup>	310
Zinc	3	150 <sup>6</sup>	153
DDT	--	--	180 <sup>7</sup>
Naphthalene	--	--	170 <sup>8</sup>

1 NEPM (NEPC, 2013) Schedule B1 Table 1B(5).

2 NEPM (NEPC, 2013) Schedule B1 Table 1B(3).

3 NEPM (NEPC, 2013) Schedule B1 Table 1B(2). CEC has been used for this calculation.

4 NEPM (NEPC, 2013) Schedule B1 Table 1B(4).

5 NEPM (NEPC, 2013) Schedule B1 Table 1B(3).

6 NEPM (NEPC, 2013) Schedule B1 Table 1B(1). pH and CEC has been used for this calculation.

7 NEPM (NEPC, 2013) Schedule B1 Table 1B(5).

8 NEPM (NEPC, 2013) Schedule B1 Table 1B(5).

## 7.5 Aesthetic considerations

An assessment of the aesthetic quality of soils requires consideration of the natural state of soil on any given site, and a comparison between it and the soil encountered during investigation works. In particular, soils on site should not excessively exhibit the following:

- Discolouration (i.e. staining);
- A malodorous nature (i.e. odours); or
- Abnormal consistency (i.e. presence of excessive amounts demolition wastes, etc.).

Where discolouration or odours were observed during field works, notes were taken on the field logging sheets and analytical results analysed to determine the possible cause of the abnormality. Where abnormal consistency was observed this was also noted to enable the extent of objectionable materials to be determined.

## 8 SAMPLING PROGRAM AND FIELD OBSERVATIONS

The investigation area targeted the fill soils around the structures onsite. A total of nine boreholes were drilled across the site (excepting areas where existing buildings were present) and locations are shown on Figure 2. All borehole locations extended into natural materials. Borehole logs are presented in Appendix A. The in-situ materials encountered within the boreholes consisted of the following:

- Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density and rounded angularity;
- Natural - Red/Brown mottled clays, dry, firm consistency, high plasticity and dense; and,
- Natural - Grey extremely weathered shale and dry.

No foreign materials, asbestos or odours were noted during the drilling of the boreholes. PID readings between 0.8 ppm and 0.1 ppm were obtained, suggesting that there is no residual impact from volatile hydrocarbons. Refer to Appendix D PID Calibration Certificate.

Fill was identified at all locations and ranged in depth from 0.15 m at BH6 to 1.7 m at BH9. Excluding deep fill at BH9, the depth of fill at BH1 to BH8 was 0.15 to 0.90m. The fill layer was targeted for sampling for asbestos analyses and the majority of the chemical analysis samples.

## 9 RESULTS

Twelve primary soil samples were submitted to Envirolab Services Pty Ltd and Australian Safer Environment & Technology Pty Ltd for analysis of a range of potential contaminants. The results of the soil sampling are summarised below:

### 9.1 Monocyclic Aromatic Hydrocarbons, Volatile Total Recoverable Hydrocarbons and Semi Volatile Total Recoverable Hydrocarbons

All samples collected were analysed for Volatile Total Recoverable Hydrocarbons (vTRH) and Benzene, Toluene, Ethyl benzene, Xylene and Naphthalene (BTEX). There were no concentrations of vTRH, BTEX or Naphthalene recorded above the Laboratory Limit of Reporting (LOR).

All samples were also analysed for semi-volatile Total Recoverable Hydrocarbon (TRH) compounds. Trace detections of the F2 (C10-C16) and F3 (C16-C34) hydrocarbon fraction was detected in Sample BH1-0.0-0.2. All concentrations of TRH in the samples were within the thresholds prescribed by the NEPM (NEPC, 2013).

### 9.2 Polycyclic Aromatic Hydrocarbons

All samples were analysed for Polycyclic Aromatic Hydrocarbons (PAH) compounds. There were no recorded detections of BaP TEQ. Total PAH concentrations were detected above the laboratory LOR in two samples – sample BH1-0.0-0.2 (0.2mg/kg) and sample BH9-1.4 (0.3mg/kg). All concentrations were below the adopted assessment criteria of 300mg/kg.

### 9.3 Pesticides and Polychlorinated Biphenyls

All samples were analysed for Organochlorine (OC), Organophosphate (OP) pesticides and Polychlorinated Biphenyls (PCBs). DDE was detected above the laboratory LOR in one sample BH9-1.4 (0.3mg/kg). The concentration is below the adopted assessment criteria of 400mg/kg.

### 9.4 Heavy Metals

All samples were analysed for eight heavy metals as recommended by the NSW EPA. Detections were observed for all heavy metals with the exception of Cadmium. All samples were compliant with the HILs and EILs for each respective analyte.

Table 8 – Heavy Metals in Soil (mg/kg)

Sample	Depth (mbgl)	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
BH-1	0.0-0.2	8	nd	47	17	47	0.5	6	42
BH-2	0.3-0.4	4	nd	21	16	18	nd	7	9
BH-3	0.1-0.2	6	nd	21	15	23	nd	4	13
BH-3	0.9-1.0	5	nd	11	10	20	nd	nd	3

Sample	Depth (mbgl)	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn
BH-4	0.1-0.2	9	nd	41	21	33	0.2	5	29
BH-5	0.1-0.3	4	nd	16	22	20	nd	16	52
BH-6	0.2-0.3	nd	nd	11	9	23	nd	nd	4
BH-7	0.2-0.4	5	nd	28	21	26	nd	4	14
BH-8	0.3-0.4	11	nd	56	19	40	0.7	8	27
BH-8	1.3	5	nd	5	17	15	nd	nd	3
BH-9	0.3-0.4	6	nd	39	11	26	0.3	5	20
BH-9	1.4	9	nd	60	20	31	0.7	3	20
Residential C, NEPM (NEPC, 2013)		300	90	300*	17,000	600	80	1,200	30,000
EILs for Soils (mg/kg)		100	--	411	225	1120	--	310	153
No. of Exceedances		0	0	0	0	0	0	0	0

nd = Not detected above the NATA Accredited Laboratory levels of detection | nt = not tested | \* note that criteria is for CrVI and not Total Cr

## 9.5 Asbestos

Analysis of asbestos in soils was undertaken in all borehole locations. No samples reported the presence of asbestos fines/fibrous asbestos (AF/FA). No visible fragments of asbestos were observed during the site inspection or during sampling.

## 9.6 Discussion of results

A summary of results compared against the adopted criteria is presented in Appendix D. The laboratory certificates provided by NATA-accredited laboratories are presented in Appendix E.

All results for all analytes (TPH, BTEX, OCP, PCB, PAHs, metals and Asbestos) were found to be less than the human health based assessment criteria and environmental criteria and are consistent with field observations.

## 9.7 Waste Classification

The results of the investigation indicate that:

- Excavated materials can be classified as General Solid Waste-non putrescible, subject to a final waste classification in accordance with the NSW EPA's *Waste Classification Guidelines* during excavation, if disposed of offsite.
- The fill may also be classifiable as Excavated Natural Material (ENM) if further assessed in accordance with the NSW EPA's Excavated Natural Material Order 2014;
- The natural soils are likely classifiable as virgin excavated natural material (VENM) for unrestricted beneficial re-use as fill.

## 10 QUALITY CONTROL AND ASSURANCE

The laboratory QA/QC report is presented in Appendix E and data validation sheets can be found in Appendix F. Extraction and analysis of samples was all undertaken within the relevant prescribed

holding times. The relative percentage difference (RPD) for BH6 (0.2-0.3) and QC2 were within the applicable acceptance criteria of 30% for inorganics and 50% for organics.

The RPD for BH2 (0.3-0.4) and QC1 exceeded the applicable acceptance criteria of 30% for both Cu and Ni. The differences in concentrations for BH2 (0.3-0.4) and QC1 were for reported concentrations of less than 5% of the relevant HIL concentration. Considering that the majority of the analytes of the duplicate pairs were within the adopted limits and the effects of confidence intervals with low concentrations, the heterogeneity observed in the duplicate sample is not significant enough to diminish the confidence in sampling technique or laboratory results.

The internal laboratory control results (blanks, surrogates, matrix spikes and duplicates) are all within acceptable limits indicating good data quality.

## 11 CONCEPTUAL SITE MODEL

Based upon the desktop and field investigations, the principal potential contamination sources are associated with historical filling practices used to establish current site levels. The site is situated predominantly on a layer of fill material overlying Red/Brown mottled firm clays, derived from the underlying shale bedrock. Fill was observed to depths of up to 1.7 m. Source of fill material is unknown, however, was possibly derived from localised cut and fill operations. Available information indicates that the site has been operated as a school since 1965, though the exact age of the existing structures on-site was unable to be clearly defined.

No visible evidence of spills or discoloured in soil was identified during the field investigations and site inspection. No foreign materials, asbestos or odours were noted during the drilling of the boreholes. Analytical results indicate that there are no impacts to surface fill material and shallow natural soils associated with heavy metals, TPH, OCP, PCB, PAHs, metals and Asbestos. All results were found to be less than the assessment criteria. From a contamination perspective, no significant or widespread soil contamination was identified during the contamination investigation which would restrict use of the site for use as a secondary school in a Recreational C - developed public open space setting.

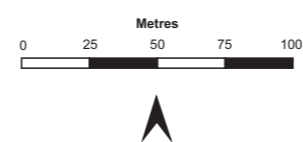
## 12 CONCLUSIONS

The sampling regime and subsequent assessment and reporting of the site are considered to be adequate for assessment purposes to assess the likelihood of contamination on the site as a result of past and present land use activities in accordance with the general requirements of State Environmental Planning Policy No.55 (SEPP 55). All reporting has been undertaken in accordance with the Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (NSW EPA, 2011) and the Guidelines for the NSW Site Auditor Scheme (NSW EPA, 2nd ed., 2006).

Based on a review of the available desktop search data, observations made during the site walkover and the soil sampling. Greencap consider the site to be suitable is for the intended land use consistent with NEPM (NEPC, 2013) Recreational C - Developed Open Space Land Use. It is noted, that no soil samples have been collected from under the structures onsite, from which the potential remains for contamination to be present. It is recommended an Unexpected Findings Protocol (UFP) be developed as part of the construction planning for implementation during Site activities primarily associated with demolition, excavation and civil activities. Its preparation of an UFP is to ensure appropriate management of natural soils / fill which may contain undefined levels of chemical or asbestos contamination should they be encountered during site works.



- Legend:**
- Site Boundary
  - + Site Location
  - Area subject to soil sampling



**GREENCAP**

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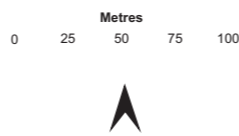
Client Name:		NSW Department of Education c/o Conrad Gargett Pty Ltd			
Client Number:		C120920		Project Number: J146932-01	
Project Description: Preliminary Site Investigation					
Address:		Small roads Public school, Small road, North Ryde, NSW			
Prepared:	ND	Reviewed:	JB	Date:	17/02/2017
Figure 1	Site Location and Regional Context				

Disclaimer: Greencap Pty Ltd has produced this map for the purpose of presenting a summary of relevant spatial information and gives no warranty in relation to the data (including accuracy, reliability, completeness or suitability) and accepts no liability (including without limitation, liability in negligence) for any loss, damage or costs (including consequential damage) relating to any use or reliance upon the data. Data must not be used for direct marketing or be used in breach of privacy laws. Service Layer Credits © 2016 NSW Land and Property Information (Six Maps)



**Legend:**

- Site Boundary
- Sampling locations



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Client Name:		NSW Department of Education c/o Conrad Gargett Pty Ltd			
Client Number:		C120920		Project Number: J146932-01	
Project Description: Preliminary Site Investigation					
Address:		Small roads Public school, Small road, North Ryde, NSW			
Prepared:	ND	Reviewed:	JB	Date:	17/02/2017
Figure 2		Sampling locations			

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Figure 3 - Site Development Plan



## Soil Contamination Investigation

NSW Department of Education c/o Conrad Gargett Pty Ltd

Smalls Road Public School, Smalls Rd North Ryde, NSW 2113

Appendix A: Borehole logs



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**Log of Borehole: J146932-01:BH 1**

**Project Name:** Smalls Road Public School  
**Project No:** J146932-01  
**Client:** Department of Education  
**Location:** Smalls Road Public School  
**Project Manager:** John Browne  
**Type:** Borehole

**Date:** 15/02/2017  
**Total Depth:** 1.5  
**Groundwater:** None  
**Logged by:** JB  
**Approved by:** JH

SUBSURFACE PROFILE			SAMPLE					Comments
Depth (m)	Symbol	Description	Sample name	Duplicate	PID	Field pH	Moisture	
0.0 - 0.5		Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density rounded angularity, (Top soil)	BH1 (0.0-0.2)		0.6	6		No foreign materials or odour noted.  10L sieve, 500ml sample taken at 0.0-0.5 for Asbestos. Visually no asbestos identified.
0.5 - 1.0		Natural - Red/Brown mottled clays, dry, firm consistency, high plasticity, dense	BH 1 (0.5-0.6)		0.5	6.5		
1.0 - 1.5		Grey extremely weathered shale, dry						
1.5		End of borehole						
2.0								
2.5								
3.0								
3.5								
4.0								

**Note:** This log is for environmental purposes only it is not intended for geotechnical use.

**Drill Method:** Auger  
**Drilled by:** Tarratest  
**Sheet:** 1 of 1



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**Log of Borehole: J146932-01:BH 2**

**Project Name:** Smalls Road Public School  
**Project No:** J146932-01  
**Client:** Department of Education  
**Location:** Smalls Road Public School  
**Project Manager:** John Browne  
**Type:** Borehole

**Date:** 15/02/2017  
**Total Depth:** 1.4  
**Groundwater:** None  
**Logged by:** JB  
**Approved by:** JH

SUBSURFACE PROFILE			SAMPLE					Comments
Depth (m)	Symbol	Description	Sample name	Duplicate	PID	Field pH	Moisture	
0.0 - 0.3		Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density rounded angularity, (Top soil)						No foreign materials or odour noted.  10L sieve, 500ml sample taken at 0.0-0.3 for Asbestos. Visually no asbestos identified.
0.3 - 0.4			BH 2 (0.3-0.4)		0.1	6		
0.4 - 1.0		Natural - Red/Brown mottled clays, dry, firm consistency, high plasticity, dense						
1.0 - 1.5		Grey extremely weathered shale, dry						
1.5		End of borehole						
2.0								
2.5								
3.0								
3.5								
4.0								

**Note:** This log is for environmental purposes only it is not intended for geotechnical use.

**Drill Method:** Auger  
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**Log of Borehole: J146932-01:BH3**

**Project Name:** Smalls Road Public School  
**Project No:** J146932-01  
**Client:** Department of Education  
**Location:** Smalls Road Public School  
**Project Manager:** John Browne  
**Type:** Borehole

**Date:** 15/02/2017  
**Total Depth:** 1.6  
**Groundwater:** None  
**Logged by:** JB  
**Approved by:** JH

SUBSURFACE PROFILE			SAMPLE					Comments
Depth (m)	Symbol	Description	Sample name	Duplicate	PID	Field pH	Moisture	
0.0 - 0.1	[Cross-hatched symbol]	Bituchem						No foreign materials or odour noted.  10L sieve, 500ml sample taken at 0.1-0.3 for Asbestos. Visually no asbestos identified.
0.1 - 0.3	[Cross-hatched symbol]	Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density rounded angularity, (Top soil)	BH 3 (0.1-0.2)		0.1	5.5		
0.3 - 0.9	[Dotted symbol]	Natural - Red/Brown mottled clays, dry, firm consistency, high plasticity, dense	BH 3 (0.9-1.0)		0.1	5.5		
0.9 - 1.5	[Dotted symbol]	Grey extremely weathered shale, dry						
1.5 - 1.6	[Dotted symbol]	End of borehole						
1.6 - 4.0	[Blank symbol]							

**Note:** This log is for environmental purposes only it is not intended for geotechnical use.


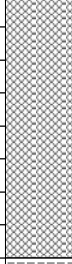


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## Log of Borehole: J146932-01:BH 4

**Project Name:** Smalls Road Public School  
**Project No:** J146932-01  
**Client:** Department of Education  
**Location:** Smalls Road Public School  
**Project Manager:** John Browne  
**Type:** Borehole

**Date:** 15/02/2017  
**Total Depth:** 1.6  
**Groundwater:** None  
**Logged by:** JB  
**Approved by:** JH

SUBSURFACE PROFILE			SAMPLE					Comments
Depth (m)	Symbol	Description	Sample name	Duplicate	PID	Field pH	Moisture	
0.0 - 0.1		Bituchem						No foreign materials or odour noted.  10L sieve, 500ml sample taken at 0.1-0.3 for Asbestos. Visually no asbestos identified.
0.1 - 0.8		Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density rounded angularity, (Top soil)	BH 4 (0.1-0.2)		0.1	5.5		
0.8 - 1.5		Natural - Red/Brown mottled clays, dry, firm consistency, high plasticity, dense						
1.5 - 1.6		Grey extremely weathered shale, dry	BH 4 (1.5)		0.1	5.5		
1.6 - 4.0		End of borehole						

**Note:** This log is for environmental purposes only it is not intended for geotechnical use.


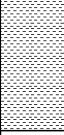
**Drill Method:** Auger  
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## Log of Borehole: J146932-01:BH 5

**Project Name:** Smalls Road Public School  
**Project No:** J146932-01  
**Client:** Department of Education  
**Location:** Smalls Road Public School  
**Project Manager:** John Browne  
**Type:** Borehole

**Date:** 15/02/2017  
**Total Depth:** 1.5  
**Groundwater:** None  
**Logged by:** JB  
**Approved by:** JH

SUBSURFACE PROFILE			SAMPLE					Comments
Depth (m)	Symbol	Description	Sample name	Duplicate	PID	Field pH	Moisture	
0.5		Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density rounded angularity, (Top soil)	BH 5 (0.1-0.3)		0.1	5.5		No foreign materials or odour noted.  10L sieve, 500ml sample taken at 0.0-0.3 for Asbestos. Visually no asbestos identified.
		Natural - Red moderately weathered Ironstone, dry	BH 5 (0.6-0.7)		0.1	5		
		Grey extremely weathered shale, dry						
		End of borehole						
1.5								
2.0								
2.5								
3.0								
3.5								
4.0								

**Note:** This log is for environmental purposes only it is not intended for geotechnical use.

**Drill Method:** Auger  
**Drilled by:** Tarratest  
**Sheet:** 1 of 1



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**Log of Borehole: J146932-01:BH 6**

**Project Name:** Smalls Road Public School  
**Project No:** J146932-01  
**Client:** Department of Education  
**Location:** Smalls Road Public School  
**Project Manager:** John Browne  
**Type:** Borehole

**Date:** 15/02/2017  
**Total Depth:** 1.4  
**Groundwater:** None  
**Logged by:** JB  
**Approved by:** JH

SUBSURFACE PROFILE			SAMPLE					Comments
Depth (m)	Symbol	Description	Sample name	Duplicate	PID	Field pH	Moisture	
0.0 - 0.3		Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density rounded angularity, (Top soil)	BH 6 (0.2-0.3)		0.2	5.5		No foreign materials or odour noted.  10L sieve, 500ml sample taken at 0.0-0.3 for Asbestos. Visually no asbestos identified.
0.3 - 1.0		Natural - Red/Brown mottled clays, dry, firm consistency, high plasticity, dense						
1.0 - 1.5		Grey extremely weathered shale, dry						
1.5		End of borehole						
2.0								
2.5								
3.0								
3.5								
4.0								

**Note:** This log is for environmental purposes only it is not intended for geotechnical use.

**Drill Method:** Auger  
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**Log of Borehole: J146932-01:BH7**

**Project Name:** Smalls Road Public School  
**Project No:** J146932-01  
**Client:** Department of Education  
**Location:** Smalls Road Public School  
**Project Manager:** John Browne  
**Type:** Borehole

**Date:** 15/02/2017  
**Total Depth:** 1.6  
**Groundwater:** None  
**Logged by:** JB  
**Approved by:** JH

SUBSURFACE PROFILE			SAMPLE					Comments
Depth (m)	Symbol	Description	Sample name	Duplicate	PID	Field pH	Moisture	
0.5	[Symbol]	Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density rounded angularity, (Top soil)	BH 7 (0.2-0.40)		0.3	5.5		No foreign materials or odour noted.  10L sieve, 500ml sample taken at 0.0-0.3 for Asbestos. Visually no asbestos identified.
		Natural - Red/Brown mottled clays, dry, firm consistency, high plasticity, dense						
		Natural - Red moderately weathered Ironstone, dry	BH 7 (0.9-1.0)		0.1	5		
		Grey extremely weathered shale, dry						
1.5		End of borehole						
2.0								
2.5								
3.0								
3.5								
4.0								

**Note:** This log is for environmental purposes only it is not intended for geotechnical use.

**Drill Method:** Auger  
**Drilled by:** Tarratest  
**Sheet:** 1 of 1



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**Log of Borehole: J146932-01:BH 8**

**Project Name:** Smalls Road Public School  
**Project No:** J146932-01  
**Client:** Department of Education  
**Location:** Smalls Road Public School  
**Project Manager:** John Browne  
**Type:** Borehole

**Date:** 15/02/2017  
**Total Depth:** 1.6  
**Groundwater:** None  
**Logged by:** JB  
**Approved by:** JH

SUBSURFACE PROFILE			SAMPLE					Comments
Depth (m)	Symbol	Description	Sample name	Duplicate	PID	Field pH	Moisture	
0.5		Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density, rounded angularity, (Top soil). Minor presence of medium gravel at 0.4-0.5m.	BH 8 (0.3-0.40)		0.1	5.5		No foreign materials or odour noted.  10L sieve, 500ml sample taken at 0.0-0.5 for Asbestos. Visually no asbestos identified.
1.0		Natural - Red/Brown mottled clays, dry, firm consistency, high plasticity, dense						
1.5		Grey extremely weathered shale, dry	BH 8 (1.3)		0.1	4.5		
2.0		End of borehole						
2.5								
3.0								
3.5								
4.0								

**Note:** This log is for environmental purposes only it is not intended for geotechnical use.

**Drill Method:** Auger  
**Drilled by:** Tarratest  
**Sheet:** 1 of 1



Greencap  
 2/11 Khartoum Road  
 North Ryde, NSW 2113  
 T: 02 9889 1800  
 F: 02 9889 1811

**Log of Borehole: J146932-01:BH 9**

**Project Name:** Smalls Road Public School  
**Project No:** J146932-01  
**Client:** Department of Education  
**Location:** Smalls Road Public School  
**Project Manager:** John Browne  
**Type:** Borehole

**Date:** 15/02/2017  
**Total Depth:** 2.8  
**Groundwater:** None  
**Logged by:** JB  
**Approved by:** JH

SUBSURFACE PROFILE			SAMPLE					Comments	
Depth (m)	Symbol	Description	Sample name	Duplicate	PID	Field pH	Moisture		
0.5	[Cross-hatched symbol]	Fill - Brown silty clays, dry, soft consistency, low plasticity, loose density, rounded angularity (Top soil)						No foreign materials or odour noted.  10L sieve, 500ml sample taken at 0.0-0.3 for Asbestos. Visually no asbestos identified.	
			BH 9 (0.3-0.40)		0.8	5.5			
			BH 9 (1.4)		0.2	5.5			
2.0	[Horizontal dashed symbol]	Natural - Red/Brown mottled clays, dry, firm consistency, high plasticity, dense	BH 9 (1.8)		0.2	5			
2.5	[Dotted symbol]	Grey extremely weathered shale, dry							
3.0		End of borehole							
3.5									
4.0									

**Note:** This log is for environmental purposes only it is not intended for geotechnical use.

**Drill Method:** Auger  
**Drilled by:** Tarratest  
**Sheet:** 1 of 1

## Soil Contamination Investigation

NSW Department of Education c/o Conrad Gargett Pty Ltd

Smalls Road Public School, Smalls Rd North Ryde, NSW 2113

Appendix B Section 149 Certificate.

**PLANNING CERTIFICATE UNDER  
SECTION 149 ENVIRONMENTAL PLANNING  
AND ASSESSMENT ACT, 1979**

**Cert No:** PLN2017/0743  
**Date:** Thursday, 9 March 2017  
**Your Ref:** 144361

**Applicant:** Mr John Browne (Greencap)  
Level 2/ 11  
Khartoum Road  
Macquarie Park NSW 2113

**Property Address:** 3B Small's Rd RYDE  
**Description:** Lot 1 DP 830420

**Property Reference:** 535594  
**Land Reference:** 26673

**INFORMATION PROVIDED PURSUANT TO SECTION 149(2) OF THE ACT.**

**1. NAMES OF RELEVANT ENVIRONMENTAL PLANNING INSTRUMENTS, DRAFT INSTRUMENTS AND DEVELOPMENT CONTROL PLANS THAT APPLY TO THE CARRYING OUT OF DEVELOPMENT ON THE LAND**

**a) LOCAL ENVIRONMENTAL PLAN AND DEEMED ENVIRONMENTAL PLANNING INSTRUMENTS**  
Ryde Local Environmental Plan 2014

**b) DRAFT LOCAL ENVIRONMENTAL PLANS**  
Nil

**c) DEVELOPMENT CONTROL PLANS**  
City of Ryde Development Control Plan 2014

**d) STATE ENVIRONMENTAL PLANNING POLICIES AND INSTRUMENTS (includes Draft Policies)**  
The Minister for Planning has notified Council that the following State Environmental Planning Policies and Deemed State Environmental Plans apply to the land and should be specified in this certificate:

**State Environmental Planning Policies**

State Environmental Planning Policy No 19 - Bushland in Urban Areas.  
State Environmental Planning Policy No 21 - Caravan Parks.  
State Environmental Planning Policy No 30 - Intensive Agriculture.  
State Environmental Planning Policy No 33 - Hazardous and Offensive Development.  
State Environmental Planning Policy No 50 - Canal Estate Development.  
State Environmental Planning Policy No 55 - Remediation of Land.  
State Environmental Planning Policy No 62 - Sustainable Aquaculture.  
State Environmental Planning Policy No 64 - Advertising and Signage.  
State Environmental Planning Policy No 65 - Design Quality of Residential Apartment Development.  
State Environmental Planning Policy (Affordable Rental Housing) 2009  
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004  
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008  
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004

State Environmental Planning Policy (Infrastructure) 2007  
State Environmental Planning Policy (Major Development) 2005  
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007  
State Environmental Planning Policy (State and Regional Development) 2011  
State Environmental Planning Policy (Temporary Structures) 2007

#### **Deemed State Environmental Planning Policies**

Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005

#### **Draft State Environmental Planning Policies**

State Environmental Planning Policy No 66 - Integration of Land Use and Transport 2001  
State Environmental Planning Policy (Competition) 2010  
State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017

*Note: Specific constraints and zoning of the land may affect the applicability of certain provisions within the Policies listed above.*

## **2. ZONING AND LAND USE UNDER RELEVANT LOCAL ENVIRONMENTAL PLANS**

### **(a) ZONING and ZONING TABLE**

#### **Ryde Local Environmental Plan 2014 - Zone SP2 Infrastructure - Educational Establishment**

##### **1 Objectives of zone**

- To provide for infrastructure and related uses.
- To prevent development that is not compatible with or that may detract from the provision of infrastructure.
- To ensure the orderly development of land so as to minimise any adverse effect of development on other land uses.

##### **2 Permitted without consent**

Nil

##### **3 Permitted with consent**

Roads; The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose

##### **4 Prohibited**

Any development not specified in item 2 or 3

### **(b) DEVELOPMENT STANDARDS FOR THE ERECTION OF A DWELLING HOUSE**

No development standards under the Local Environmental Plan apply to the land that fix minimum land dimensions for the erection of a dwelling house on the land.

### **(c) CRITICAL HABITAT**

No. The land does not include or comprise critical habitat under the Local Environmental Plan.

### **(d) CONSERVATION AREA (however described)**

No. The land has not been identified as being within a heritage conservation area under the Local Environmental Plan.

### **(e) ITEMS OF ENVIRONMENTAL HERITAGE (however described)**

No. An item of environmental heritage is not situated on the land under the Local Environmental Plan.

## **2A. ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006**

This land **is not** subject to:

- (a) Part 3 of the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* (the 2006 SEPP); or
- (b) a Precinct Plan (within the meaning of the 2006 SEPP); or
- (c) a proposed Precinct Plan (within the meaning of the 2006 SEPP) that is or has been the subject of community consultation or on public exhibition.

### **OTHER PRESCRIBED INFORMATION**

#### **3. COMPLYING DEVELOPMENT**

**Whether or not the land is land on which complying development may be carried out under each of the codes for complying development in *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*. If complying development may not be carried out on that land because of one of the requirements under that Policy, the reason why it may not be carried out.**

##### **General Housing Code and Rural Housing Code**

Complying Development under the General Housing Code and Rural Housing Code may be carried out on this land.

##### **Housing Alterations Code and General Development Code**

Complying Development under the Housing Alterations Code and General Development Code may be carried out on the land.

##### **Commercial and Industrial (New Buildings and Additions) Code**

Complying development under the Commercial and Industrial (New Buildings and Additions) Code may be carried out on the land.

##### **Subdivisions Code, Commercial and Industrial Alterations Code, Demolition Code and Fire Safety Code**

Complying development under the Subdivisions Code, Commercial and Industrial Alterations Code, Demolition Code, and Fire Safety Code may be carried out on the land.

*Note : It is necessary for the zoning, size of land and other criteria such as risk level of flood prone land and bushfire prone land to be in accordance with that specified in *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008* for certain types of development to occur under the Policy.*

#### **4. COASTAL PROTECTION**

**Whether or not the land is affected by the operation of section 38 or 39 of the *Coastal Protection Act 1979*, but only to the extent that the council has been so notified by the Department of Services, Technology and Administration.**

The land is not affected by the operation of section 38 or 39 of the Coastal Protection Act 1979.

##### **4A Information relating to a coastal council**

(1) Whether an order has been made under Part 4D of the *Coastal Protection Act 1979* in relation to temporary coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

NO

- (2)(a) Whether the council has been notified under section 55X of the *Coastal Protection Act 1979* that temporary coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land), and
- (b) If works have been so placed—whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

NO notification received

#### **4B Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works**

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the *Local Government Act 1993* for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

NO

Note. “Existing coastal protection works” are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of Section 553B of the *Local Government Act 1993*.

#### **5. MINE SUBSIDENCE**

**Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the *Mine Subsidence Compensation Act 1961*.**

No. The land has not been proclaimed to be a mine subsidence district.

#### **6. ROAD WIDENING AND ROAD REALIGNMENT**

**Whether or not the land is affected by any road widening or road realignment.**

The land is not affected by any road widening or road realignment under:

- (a) Division 2 of Part 3 of the Roads Act 1993;
- (b) any Environmental Planning Instrument.
- (c) any resolution of Council.

#### **7. COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS**

**Whether or not the land is affected by a policy adopted by the council, or adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by council, that restricts the development of the land because of the likelihood of:**

- (i) landslip — NO.
- (ii) bush fire — NO.
- (iii) tidal inundation — NO.
- (iv) subsidence — NO.
- (v) acid sulphate soil — NO.
- (vi) any other risk (other than flooding) — NO.

*Note: The fact that land has not been identified as being affected by a policy to restrict development because of the risks referred to does not mean that the risk is non-existent.*

#### **7A. FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION**

(1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors) living is subject to flood related development controls — NO

(2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls — NO

(3) Words and expressions in this clause have the same meanings as in the instrument set out in the schedule to the Standard Instrument (Local Environmental Plans) Order 2006.

#### **8. LAND RESERVED FOR ACQUISITION**

**Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in Clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.**

No Environmental Planning Instrument applying to the land provides for the acquisition of the land by a public authority pursuant to Section 27 of the Act.

#### **9. CONTRIBUTIONS PLANS**

**The name of each contributions plan applying to the land:**

City of Ryde Section 94 Development Contributions Plan 2007 – Interim Update (2014)

#### **9A BIODIVERSITY CERTIFIED LAND**

This land is not biodiversity certified land within the meaning of Part 7AA of the Threatened Species Conservation Act 1995.

#### **10 BIOBANKING AGREEMENTS**

The land is not the subject of a biobanking agreement under Part 7A of the Threatened Species Conservation Act 1995.

#### **11. BUSH FIRE PRONE LAND**

The land described in this certificate is not bush fire prone land (as defined in the Act).

#### **12. PROPERTY VEGETATION PLANS**

The land is not subject to a property vegetation plan under the Native Vegetation Act 2003.

#### **13. ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006**

There has not been an order made under the Trees (Disputes between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

#### **14. DIRECTIONS UNDER PART 3A**

There is no direction in force under section 75P (2)(c1) of the Environmental Planning and Assessment Act 1979.

#### **15. SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR SENIORS HOUSING**

Part A: There has been no Site Compatibility Certificate issued (of which Council is aware) under Clause 25 of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004.

Part B: There has not been any development consent granted since 11 October 2007 for development to which State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 applies.

## 16. SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

There is no valid Site Compatibility Certificate (Infrastructure) of which the Council is aware in respect of proposed development on the land.

## 17. SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

There is no current Site Compatibility Certificate (Affordable Rental Housing) that Council is aware in respect of proposed development on the land.

There are no terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 that have been imposed as a condition of consent to a development application in respect of the land.

## 18. PAPER SUBDIVISION INFORMATION

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot. NIL

(2) The date of any subdivision order that applies to the land. NIL

(3) Words and expressions used in this clause have the same meaning as they have in Part 16C of this Regulation.

**Note:** *City of Ryde does not hold any paper subdivision within the meaning of this clause.*

## 19. SITE VERIFICATION CERTIFICATES

There is no current site verification certificate of which the Council is aware in respect of the land.

**Note.** *The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate:*

(a) The land to which this certificate relates IS NOT significantly contaminated land.

(b) The land to which this certificate relates IS NOT subject to a management order.

(c) The land to which this certificate relates IS NOT the subject of an approved voluntary management proposal.

(d) The land to which this certificate relates IS NOT subject to an ongoing maintenance order .

(e) The land to which this certificate relates IS NOT subject to a site audit statement.

## ADDITIONAL INFORMATION PROVIDED UNDER SECTION 149(5) OF THE ACT

Environmental planning instruments or development control plans may place restrictions on matters such as:

- i) the purpose for which buildings, works or land may be erected, carried out or used;
- ii) the extent of development permitted;
- iii) minimum site requirements; and/or
- iv) the means of vehicular access to the land.

The instruments and the plans should be examined in relation to the specific restrictions which may apply to any development which may be proposed.

Registers of Consents may be examined at Council's Customer Service Centre for particulars relating to development consents which may have been issued for the use or development of the land.

Enquiries regarding areas reserved for Classified Road and Regional Open Space should be directed to the Roads and Maritime Services and Department of Planning and Environment respectively.

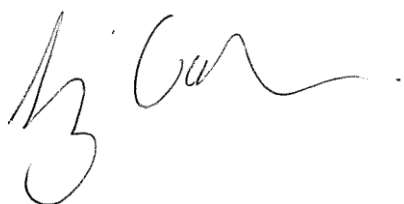
The information provided concerning the Coastal Protection Act, 1979 is only to the extent that the Council has been notified by the Office of Environment and Heritage.

Council has adopted by resolution a policy concerning the management of contaminated land. This policy applies to all land in the City of Ryde and will restrict development of the land if the circumstances set out in the policy prevail. Copies of the policy are available on Council's Website at [www.ryde.nsw.gov.au](http://www.ryde.nsw.gov.au).

#### **FURTHER ADDITIONAL INFORMATION UNDER SECTION 149(5) OF THE ACT**

No further additional information is available under this Section with respect to this property.

**Note:** *The information in this certificate is current as of the date of the certificate.*

A handwritten signature in black ink, appearing to read 'Liz Coad', with a large, stylized 'L' and 'C'.

Liz Coad  
Acting Director City Planning and Development

## Soil Contamination Investigation

NSW Department of Education c/o Conrad Gargett Pty Ltd

Smalls Road Public School, Smalls Rd North Ryde, NSW 2113

Appendix C: Dangerous Goods Search

## Soil Contamination Investigation

NSW Department of Education c/o Conrad Gargett Pty Ltd

Smalls Road Public School, Smalls Rd North Ryde, NSW 2113

Appendix D: PID Calibration Certificate

# RENTALS

## Equipment Report - MiniRAE 3000 PID

This Gas Meter has been performance checked and calibrated as follows:

Lamp	Compound	Concentration	Zero	Span	Traceability Lot #	Pass?
10.6 eV	Isobutylene	100 ppm	0.0 ppm	100.0 ppm	Lot 389261 Cyl 3	<input checked="" type="checkbox"/>

### Alarm Limits

High	100 ppm
Low	50 ppm

### Bump Test

Date	Target Gas	Reading	Pass?
10/02/2017	100 ppm	99.8 ppm	<input checked="" type="checkbox"/>

- Battery Status 100%
- 10 minutes test complete
- Spare battery status (Min 5.5 volts)
- Electrical Safety Tag attached (AS/NZS 3760)

- Performance check (pump, lamp, sensor)
- Data cleared
- Filters checked

Tag No: 000683  
Valid to: 30/04/2017

Date: 10/02/2017  
Signed: [Signature]

Please check that the following items are received and that all items are cleaned and decontaminated before return. A minimum \$30 cleaning / service / repair charge may be applied to any unclean or damaged items. Items not returned will be billed for at the full replacement cost.

Sent	Returned	Item
<input checked="" type="checkbox"/>	<input type="checkbox"/>	MiniRAE 2000 PID / Operational Check / Battery Status <u>100%</u>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Lamp 10.6 eV, Compound Set to: Isobutylene C/factor: 1
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Protective yellow rubber boot
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Inlet probe (attached to PID)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Spare water trap filter(s) Qty <u>1</u>
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Charger 240V to 12V1250mA
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cradle and Travel Charger
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Instruction Manual behind foam on the lid of case "
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Quick Guide Sheet behind foam on the lid of case "
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Spare Alkaline Battery Compartment with batteries
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Inline Moisture trap Filter Guide Laminated
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Calibration regulator & tubing (optional)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Data cable and Software CD (optional)
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Carry Case
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Check to confirm electrical safety (tag must be valid)

Date: 13/02/2017  
Signed: [Signature]

TFS Reference	<u>CS006291</u>	Return Date:	<u> / /</u>
Customer Reference		Return Time:	
Equipment ID	<u>PID3000-55</u>	Condition on return:	
Equipment Serial No.	<u>592916982</u>		

"We do more than give you great equipment... We give you great solutions!"

Phone: (Free Call) 1300 735 295		Fax: (Free Call) 1800 675 123		Email: RentalsAU@ThermoFisher.com	
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## Soil Contamination Investigation

NSW Department of Education c/o Conrad Gargett Pty Ltd

Smalls Road Public School, Smalls Rd North Ryde, NSW 2113

Appendix E: Summary Data Table



Report Name:	Soil Contamination Investigation		
Site Address:	Smalls Road Public School, Smalls Rd North Ryde, NSW 2113		
Client Name:	DOE/Conrad Garnett Pty Ltd		
Client Number:	C120920	Job Number:	J146932

Adopted Site Criteria	Total Recoverable Hydrocarbons				BTEX				PAH			
	C <sub>6</sub> -C <sub>10</sub> (F1)	C <sub>10</sub> -C <sub>16</sub> (F2)	>C <sub>16</sub> -C <sub>34</sub> (F3)	>C <sub>34</sub> -C <sub>40</sub> (F4)	Benzene	Toluene	Ethyl-benzene	Xylene (total)	Naphthalene	BaP	BaP (TEQ)	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)
CRC CARE Direct Contact HSL-A Residential (Density) (2011)	4,400	3,300	4,500	6,300	100	14,000	4,500	12,000	1,400	-	-	-
NEPM 1999 (2013 amendment) - Soil HSL for Vapour Intrusion - HSL-C, 0- <1m	NL	NL			NL	NL	NL	NL	NL	-	-	-
Environmental Investigation Levels (EILs) in Soils for Urban Residential/Public Space Land Use ((Table 1B(1-5)) (mg/kg)*	-	-	-	-	-	-	-	-	170	-	-	-
Ecological Screening Levels (ESLs) for TRH fractions (F1-F4), BTEX and BaP in Soil - Urban Residential and Public Open Space ((Table 1B(6)) (mg/kg)**	180	120	1,300	5,600	65	105	125	45	-	0.7	-	-
NEPM 1999 (2013 amendment) - Residential A Criteria (Table 1A(1)) (mg/kg)	-	-	-	-	-	-	-	-	-	-	3	300
NEPM 1999 (2013 amendment) - Management Limits for TPH (F1-F4) in Soil - Residential, parkland and public open space (Table 1B(7)) (mg/kg)	700	1,000	2,500	10,000	-	-	-	-	-	-	-	-
Soil Sample ID												
BH-1 (0.0-0.2)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.05	<0.5	0.2
BH-2 (0.3-0.4)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-3 (0.1-0.2)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-3 (0.9-1.0)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-4 (0.1-0.2)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-5 (0.1-0.3)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-6 (0.2-0.3)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-7 (0.2-0.4)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-8 (0.3-0.4)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-8 (1.2-1.3)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-9 (0.3-0.4)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05
BH-9 (1.4)	<50	<100	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.06	<0.5	0.3

Adopted Site Criteria	Organochlorine Pesticides							
	DDT + DDE + DDD	Aldrin and Dieldrin	Chlordane	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Environmental Investigation Levels (EILs) in Soils for Urban Residential/Public Space Land Use*	180**	-	-	-	-	-	-	-
NEPM 1999 (2013 amendment) - Residential A Criteria (Table 1A(1)) (mg/kg)	240	6	50	270	10	6	10	300
Soil Sample ID								
BH-1 (0.0-0.2)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-1 (0.0-0.2)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-2 (0.3-0.4)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-3 (0.1-0.2)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-3 (0.9-1.0)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-4 (0.1-0.2)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-5 (0.1-0.3)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-6 (0.2-0.3)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-7 (0.2-0.4)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-8 (0.3-0.4)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-8 (1.2-1.3)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-9 (0.3-0.4)	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
BH-9 (1.4)	0.3	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Adopted Site Criteria	Metals							
	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
NEPM 1999 (2013 amendment) - Residential A Criteria (Table 1A(1)) (mg/kg)	100	20	100	6,000	300	40	400	7,400
EILs for Soils (mg/kg)	100		411	225	1,120		310	153
Soil Sample ID								
BH-1 (0.0-0.2)	8	<0.4	47	17	47	0.5	6	42
BH-2 (0.3-0.4)	4	<0.4	21	16	18	<0.1	7	9
BH-3 (0.1-0.2)	6	<0.4	21	15	23	<0.1	4	13
BH-3 (0.9-1.0)	5	<0.4	11	10	20	<0.1	<1	3
BH-4 (0.1-0.2)	9	<0.4	41	21	33	0.2	5	29
BH-5 (0.1-0.3)	4	<0.4	16	22	20	<0.1	16	52
BH-6 (0.2-0.3)	<4	<0.4	11	9	23	<0.1	<1	4
BH-7 (0.2-0.4)	5	<0.4	28	21	26	<0.1	4	14
BH-8 (0.3-0.4)	11	<0.4	56	19	40	0.7	8	27
BH-8 (1.2-1.3)	5	<0.4	5	17	15	<0.1	<1	3
BH-9 (0.3-0.4)	6	<0.4	39	11	26	0.3	5	20
BH-9 (1.4)	9	<0.4	60	20	31	0.7	3	20

## Soil Contamination Investigation

NSW Department of Education c/o Conrad Gargett Pty Ltd

Smalls Road Public School, Smalls Rd North Ryde, NSW 2113

Appendix F: NATA-accredited laboratories Results.



**CERTIFICATE OF ANALYSIS**

**162090**

**Client:**

**Greencap - NAA Pty Ltd**  
Level 2, 11 Khartoum Rd  
North Ryde  
NSW 2113

**Attention:** John Browne

**Sample log in details:**

Your Reference:	<b>J146932-01, Smalls Rd/ DOE</b>		
No. of samples:	19 soils		
Date samples received / completed instructions received	17/02/17	/	17/02/17

**Analysis Details:**

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

***Please refer to the last page of this report for any comments relating to the results.***

**Report Details:**

Date results requested by: / Issue Date:	24/02/17	/	24/02/17
Date of Preliminary Report:	Not Issued		

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 \*.**

**Results Approved By:**

David Springer  
General Manager



vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	162090-1 BH-1	162090-3 BH-2	162090-4 BH-3	162090-5 BH-3	162090-6 BH-4
Depth	-----	0.0-0.2	0.3-0.4	0.1-0.2	0.9-1.0	0.1-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	21/02/2017
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPHC <sub>6</sub> - C <sub>10</sub> 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
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	93	94	85	90	93

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS ----- -	162090-8 BH-5	162090-10 BH-6	162090-11 BH-7	162090-13 BH-8	162090-14 BH-8
Depth	-----	0.1-0.3	0.2-0.3	0.2-0.4	0.3-0.4	1.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	21/02/2017
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25	<25
vTPHC <sub>6</sub> - C <sub>10</sub> 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
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	93	86	99	85	96

vTRH(C6-C10)/BTEXN in Soil	UNITS	162090-15	162090-16	162090-18	162090-19
Our Reference:	-----	BH-9	BH-9	QC1	QC2
Your Reference	-				
Depth	-----	0.3-0.4	1.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	<25	<25	<25	<25
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	<25	<25	<25	<25
vTPHC <sub>6</sub> - C <sub>10</sub> less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	97	97	97

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	162090-1 BH-1	162090-3 BH-2	162090-4 BH-3	162090-5 BH-3	162090-6 BH-4
Depth	-----	0.0-0.2	0.3-0.4	0.1-0.2	0.9-1.0	0.1-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	21/02/2017
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	53	<50	<50	<50	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	53	<50	<50	<50	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	<100	<100	<100	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	160	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	89	83	82	86

svTRH (C10-C40) in Soil Our Reference: Your Reference	UNITS ----- -	162090-8 BH-5	162090-10 BH-6	162090-11 BH-7	162090-13 BH-8	162090-14 BH-8
Depth	-----	0.1-0.3	0.2-0.3	0.2-0.4	0.3-0.4	1.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	21/02/2017
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	<100	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	82	83	85	82	83

svTRH (C10-C40) in Soil					
Our Reference:	UNITS	162090-15	162090-16	162090-18	162090-19
Your Reference	-----	BH-9	BH-9	QC1	QC2
Depth	-				
Type of sample	-----	0.3-0.4	1.4	-	-
		Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	<50	<50	<50	<50
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	<100	<100	<100	<100
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	<100	<100	<100	<100
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	<50	<50	<50	<50
TRH>C <sub>10</sub> - C <sub>16</sub> less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	<100	<100	<100	<100
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C <sub>10</sub> -C <sub>40</sub> )	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	83	83	83	82

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	162090-1 BH-1	162090-3 BH-2	162090-4 BH-3	162090-5 BH-3	162090-6 BH-4
Depth	-----	0.0-0.2	0.3-0.4	0.1-0.2	0.9-1.0	0.1-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	21/02/2017
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	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	0.2	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	94	96	82	84	88

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	162090-8 BH-5	162090-10 BH-6	162090-11 BH-7	162090-13 BH-8	162090-14 BH-8
Depth Type of sample	----- -----	0.1-0.3 Soil	0.2-0.3 Soil	0.2-0.4 Soil	0.3-0.4 Soil	1.3 Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	21/02/2017
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	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Surrogate p-Terphenyl-d14	%	96	105	90	89	102

PAHs in Soil Our Reference: Your Reference	UNITS ----- -	162090-15 BH-9	162090-16 BH-9	162090-18 QC1	162090-19 QC2
Depth	-----	0.3-0.4	1.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.06	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	mg/kg	<0.05	0.3	<0.05	<0.05
Surrogate <i>p</i> -Terphenyl-d14	%	108	93	91	96

Organochlorine Pesticides in soil		162090-1	162090-3	162090-4	162090-5	162090-6
Our Reference:	UNITS	BH-1	BH-2	BH-3	BH-3	BH-4
Your Reference	-----					
	-					
Depth	-----	0.0-0.2	0.3-0.4	0.1-0.2	0.9-1.0	0.1-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
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	92	101	92	101

Organochlorine Pesticides in soil		162090-8	162090-10	162090-11	162090-13	162090-14
Our Reference:	UNITS	BH-5	BH-6	BH-7	BH-8	BH-8
Your Reference	-----					
	-					
Depth	-----	0.1-0.3	0.2-0.3	0.2-0.4	0.3-0.4	1.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
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	%	89	85	99	91	90

Organochlorine Pesticides in soil	UNITS	162090-15	162090-16	162090-18	162090-19
Our Reference:	-----	BH-9	BH-9	QC1	QC2
Your Reference	-				
Depth	-----	0.3-0.4	1.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
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	0.3	<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
Total+ve DDT+DDD+DDE	mg/kg	<0.1	0.3	<0.1	<0.1
Surrogate TCMX	%	91	101	88	86

Organophosphorus Pesticides	UNITS	162090-1	162090-3	162090-4	162090-5	162090-6
Our Reference:	-----	BH-1	BH-2	BH-3	BH-3	BH-4
Your Reference	-					
Depth	-----	0.0-0.2	0.3-0.4	0.1-0.2	0.9-1.0	0.1-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
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	92	101	92	101

Organophosphorus Pesticides	UNITS	162090-8	162090-10	162090-11	162090-13	162090-14
Our Reference:	-----	BH-5	BH-6	BH-7	BH-8	BH-8
Your Reference	-					
Depth	-----	0.1-0.3	0.2-0.3	0.2-0.4	0.3-0.4	1.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
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	%	89	85	99	91	90

Organophosphorus Pesticides		162090-15	162090-16	162090-18	162090-19
Our Reference:	UNITS	BH-9	BH-9	QC1	QC2
Your Reference	-----				
	-				
Depth	-----	0.3-0.4	1.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	91	101	88	86

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	162090-1 BH-1	162090-3 BH-2	162090-4 BH-3	162090-5 BH-3	162090-6 BH-4
Depth	-----	0.0-0.2	0.3-0.4	0.1-0.2	0.9-1.0	0.1-0.2
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
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	92	101	92	101

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	162090-8 BH-5	162090-10 BH-6	162090-11 BH-7	162090-13 BH-8	162090-14 BH-8
Depth	-----	0.1-0.3	0.2-0.3	0.2-0.4	0.3-0.4	1.3
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
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	%	89	85	99	91	90

**Client Reference: J146932-01, Smalls Rd/ DOE**

PCBs in Soil Our Reference: Your Reference	UNITS ----- -	162090-15 BH-9	162090-16 BH-9	162090-18 QC1	162090-19 QC2
Depth	-----	0.3-0.4	1.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	91	101	88	86

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	162090-1 BH-1	162090-3 BH-2	162090-4 BH-3	162090-5 BH-3	162090-6 BH-4
Depth	-----	0.0-0.2	0.3-0.4	0.1-0.2	0.9-1.0	0.1-0.2
Type of sample	-----	Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Arsenic	mg/kg	8	4	6	5	9
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	47	21	21	11	41
Copper	mg/kg	17	16	15	10	21
Lead	mg/kg	47	18	23	20	33
Mercury	mg/kg	0.5	<0.1	<0.1	<0.1	0.2
Nickel	mg/kg	6	7	4	<1	5
Zinc	mg/kg	42	9	13	3	29

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	162090-8 BH-5	162090-10 BH-6	162090-11 BH-7	162090-13 BH-8	162090-14 BH-8
Depth	-----	0.1-0.3	0.2-0.3	0.2-0.4	0.3-0.4	1.3
Type of sample	-----	Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Arsenic	mg/kg	4	<4	5	11	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	11	28	56	5
Copper	mg/kg	22	9	21	19	17
Lead	mg/kg	20	23	26	40	15
Mercury	mg/kg	<0.1	<0.1	<0.1	0.7	<0.1
Nickel	mg/kg	16	<1	4	8	<1
Zinc	mg/kg	52	4	14	27	3

Acid Extractable metals in soil Our Reference: Your Reference	UNITS ----- -	162090-15 BH-9	162090-16 BH-9	162090-18 QC1	162090-19 QC2
Depth	-----	0.3-0.4	1.4	-	-
Type of sample	-----	Soil	Soil	Soil	Soil
Date prepared	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Arsenic	mg/kg	6	9	4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	39	60	23	14
Copper	mg/kg	11	20	7	10
Lead	mg/kg	26	31	19	23
Mercury	mg/kg	0.3	0.7	<0.1	<0.1
Nickel	mg/kg	5	3	3	<1
Zinc	mg/kg	20	20	8	3

**Client Reference: J146932-01, Smalls Rd/ DOE**

Moisture Our Reference: Your Reference	UNITS ----- -	162090-1 BH-1	162090-3 BH-2	162090-4 BH-3	162090-5 BH-3	162090-6 BH-4
Depth Type of sample	----- -	0.0-0.2 Soil	0.3-0.4 Soil	0.1-0.2 Soil	0.9-1.0 Soil	0.1-0.2 Soil
Date prepared	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	21/02/2017
Moisture	%	16	18	24	22	20

Moisture Our Reference: Your Reference	UNITS ----- -	162090-8 BH-5	162090-10 BH-6	162090-11 BH-7	162090-13 BH-8	162090-14 BH-8
Depth Type of sample	----- -	0.1-0.3 Soil	0.2-0.3 Soil	0.2-0.4 Soil	0.3-0.4 Soil	1.3 Soil
Date prepared	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017	21/02/2017
Moisture	%	14	19	19	17	13

Moisture Our Reference: Your Reference	UNITS ----- -	162090-15 BH-9	162090-16 BH-9	162090-18 QC1	162090-19 QC2
Depth Type of sample	----- -	0.3-0.4 Soil	1.4 Soil	- Soil	- Soil
Date prepared	-	20/02/2017	20/02/2017	20/02/2017	20/02/2017
Date analysed	-	21/02/2017	21/02/2017	21/02/2017	21/02/2017
Moisture	%	15	18	13	19

Misc Inorg - Soil			
Our Reference:	UNITS	162090-3	162090-13
Your Reference	-----	BH-2	BH-8
	-		
Depth	-----	0.3-0.4	0.3-0.4
Type of sample		Soil	Soil
Date prepared	-	22/07/2017	22/07/2017
Date analysed	-	22/07/2017	22/07/2017
pH 1:5 soil:water	pH Units	5.6	7.3
Chloride, Cl 1:5 soil:water	mg/kg	10	36
Sulphate, SO4 1:5 soil:water	mg/kg	70	36

Texture and Salinity			
Our Reference:	UNITS	162090-3	162090-13
Your Reference	-----	BH-2	BH-8
	-		
Depth	-----	0.3-0.4	0.3-0.4
Type of sample		Soil	Soil
Date prepared	-	22/02/2017	22/02/2017
Date analysed	-	22/02/2017	22/02/2017
Electrical Conductivity 1:5 soil:water	µS/cm	67	96
Texture Value	-	8.5	8.5
TEXTURE	-	Light Clay	Light Clay
ECe	dS/m	<2	<2
Class	-	NONSALINE	NONSALINE

CEC			
Our Reference:	UNITS	162090-3	162090-13
Your Reference	-----	BH-2	BH-8
	-		
Depth	-----	0.3-0.4	0.3-0.4
Type of sample		Soil	Soil
Date prepared	-	21/02/2017	21/02/2017
Date analysed	-	21/02/2017	21/02/2017
Exchangeable Ca	meq/100g	5.6	23
Exchangeable K	meq/100g	0.1	0.3
Exchangeable Mg	meq/100g	3.3	1.5
Exchangeable Na	meq/100g	0.32	0.13
Cation Exchange Capacity	meq/100g	9.3	25

MethodID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-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-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-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-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. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore " Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-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-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
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.

MethodID	Methodology Summary
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
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-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.

**Client Reference: J146932-01, Smalls Rd/ DOE**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II %RPD		
Date extracted	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Date analysed	-			21/02/2017	162090-1	21/02/2017    21/02/2017	LCS-1	21/02/2017
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	25	Org-016	<25	162090-1	<25    <25	LCS-1	111%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	25	Org-016	<25	162090-1	<25    <25	LCS-1	111%
Benzene	mg/kg	0.2	Org-016	<0.2	162090-1	<0.2    <0.2	LCS-1	97%
Toluene	mg/kg	0.5	Org-016	<0.5	162090-1	<0.5    <0.5	LCS-1	108%
Ethylbenzene	mg/kg	1	Org-016	<1	162090-1	<1    <1	LCS-1	112%
m+p-xylene	mg/kg	2	Org-016	<2	162090-1	<2    <2	LCS-1	118%
o-Xylene	mg/kg	1	Org-016	<1	162090-1	<1    <1	LCS-1	118%
naphthalene	mg/kg	1	Org-014	<1	162090-1	<1    <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	100	162090-1	93    92    RPD: 1	LCS-1	104%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
svTRH(C10-C40) in Soil						Base II Duplicate II %RPD		
Date extracted	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Date analysed	-			21/02/2017	162090-1	21/02/2017    21/02/2017	LCS-1	21/02/2017
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	50	Org-003	<50	162090-1	<50    <50	LCS-1	103%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	100	Org-003	<100	162090-1	<100    <100	LCS-1	100%
TRHC <sub>28</sub> - C <sub>36</sub>	mg/kg	100	Org-003	<100	162090-1	<100    <100	LCS-1	91%
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	50	Org-003	<50	162090-1	53    <50	LCS-1	103%
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	100	Org-003	<100	162090-1	100    <100	LCS-1	100%
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	100	Org-003	<100	162090-1	<100    <100	LCS-1	91%
Surrogate o-Terphenyl	%		Org-003	85	162090-1	88    85    RPD: 3	LCS-1	97%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Date extracted	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Date analysed	-			21/02/2017	162090-1	21/02/2017    21/02/2017	LCS-1	21/02/2017
Naphthalene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	LCS-1	88%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	LCS-1	98%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	LCS-1	100%
Anthracene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	LCS-1	108%
Pyrene	mg/kg	0.1	Org-012	<0.1	162090-1	0.1    0.1    RPD: 0	LCS-1	110%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	LCS-1	93%
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	162090-1	<0.2    <0.2	[NR]	[NR]

**Client Reference: J146932-01, Smalls Rd/ DOE**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PAHs in Soil						Base II Duplicate II %RPD		
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	162090-1	0.05    0.05    RPD: 0	LCS-1	79%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	93	162090-1	94    94    RPD: 0	LCS-1	122%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organochlorine Pesticides in soil						Base II Duplicate II %RPD		
Date extracted	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Date analysed	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
HCB	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	80%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	92%
Heptachlor	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	84%
delta-BHC	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	80%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	85%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	90%
Dieldrin	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	91%
Endrin	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	109%
pp-DDD	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	93%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	LCS-1	110%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	91	162090-1	97    103    RPD: 6	LCS-1	121%

**Client Reference: J146932-01, Smalls Rd/ DOE**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base II Duplicate II %RPD		
Date extracted	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Date analysed	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	LCS-1	90%
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	LCS-1	90%
Dimethoate	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	LCS-1	98%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	LCS-1	97%
Malathion	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	LCS-1	85%
Parathion	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	LCS-1	102%
Ronnel	mg/kg	0.1	Org-008	<0.1	162090-1	<0.1    <0.1	LCS-1	85%
Surrogate TCMX	%		Org-008	91	162090-1	97    103    RPD: 6	LCS-1	91%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
PCBs in Soil						Base II Duplicate II %RPD		
Date extracted	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Date analysed	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	162090-1	<0.1    <0.1	LCS-1	105%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	162090-1	<0.1    <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	91	162090-1	97    103    RPD: 6	LCS-1	91%

**Client Reference: J146932-01, Smalls Rd/ DOE**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II %RPD		
Date prepared	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Date analysed	-			20/02/2017	162090-1	20/02/2017    20/02/2017	LCS-1	20/02/2017
Arsenic	mg/kg	4	Metals-020	<4	162090-1	8    9    RPD: 12	LCS-1	113%
Cadmium	mg/kg	0.4	Metals-020	<0.4	162090-1	<0.4    <0.4	LCS-1	99%
Chromium	mg/kg	1	Metals-020	<1	162090-1	47    54    RPD: 14	LCS-1	111%
Copper	mg/kg	1	Metals-020	<1	162090-1	17    16    RPD: 6	LCS-1	113%
Lead	mg/kg	1	Metals-020	<1	162090-1	47    49    RPD: 4	LCS-1	109%
Mercury	mg/kg	0.1	Metals-021	<0.1	162090-1	0.5    0.6    RPD: 18	LCS-1	93%
Nickel	mg/kg	1	Metals-020	<1	162090-1	6    4    RPD: 40	LCS-1	102%
Zinc	mg/kg	1	Metals-020	<1	162090-1	42    46    RPD: 9	LCS-1	108%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Misc Inorg - Soil						Base II Duplicate II %RPD		
Date prepared	-			22/02/2017	[NT]	[NT]	LCS-1	22/02/2017
Date analysed	-			22/02/2017	[NT]	[NT]	LCS-1	22/02/2017
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	LCS-1	101%
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	LCS-1	101%
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	LCS-1	111%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Texture and Salinity						Base II Duplicate II %RPD		
Date prepared	-			22/02/2017	[NT]	[NT]	LCS-1	22/02/2017
Date analysed	-			22/02/2017	[NT]	[NT]	LCS-1	22/02/2017
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	LCS-1	100%
Texture Value	-		Inorg-002	[NT]	[NT]	[NT]	[NR]	[NR]
Class	-			[NT]	[NT]	[NT]	[NR]	[NR]
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
CEC						Base II Duplicate II %RPD		
Date prepared	-			21/02/2017	[NT]	[NT]	LCS-1	21/02/2017
Date analysed	-			21/02/2017	[NT]	[NT]	LCS-1	21/02/2017
Exchangeable Ca	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	104%
Exchangeable K	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	99%
Exchangeable Mg	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	103%

**Client Reference: J146932-01, Smalls Rd/ DOE**

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
CEC						Base II Duplicate II %RPD		
Exchangeable Na	meq/100 g	0.1	Metals-009	<0.1	[NT]	[NT]	LCS-1	95%
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate Base + Duplicate + %RPD				
vTRH(C6-C10)/BTEXN in Soil								
Date extracted	-	162090-15		20/02/2017    20/02/2017				
Date analysed	-	162090-15		21/02/2017    21/02/2017				
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	162090-15		<25    <25				
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	162090-15		<25    <25				
Benzene	mg/kg	162090-15		<0.2    <0.2				
Toluene	mg/kg	162090-15		<0.5    <0.5				
Ethylbenzene	mg/kg	162090-15		<1    <1				
m+p-xylene	mg/kg	162090-15		<2    <2				
o-Xylene	mg/kg	162090-15		<1    <1				
naphthalene	mg/kg	162090-15		<1    <1				
Surrogate aaa-Trifluorotoluene	%	162090-15		100    95    RPD: 5				
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate Base + Duplicate + %RPD				
svTRH (C10-C40) in Soil								
Date extracted	-	162090-15		20/02/2017    20/02/2017				
Date analysed	-	162090-15		21/02/2017    21/02/2017				
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	162090-15		<50    <50				
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	162090-15		<100    <100				
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	162090-15		<100    <100				
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	162090-15		<50    <50				
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	162090-15		<100    <100				
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	162090-15		<100    <100				
Surrogate o-Terphenyl	%	162090-15		83    83    RPD: 0				
QUALITYCONTROL	UNITS	Dup. Sm#		Duplicate Base + Duplicate + %RPD				
PAHs in Soil								
Date extracted	-	162090-15		20/02/2017    20/02/2017				
Date analysed	-	162090-15		21/02/2017    21/02/2017				
Naphthalene	mg/kg	162090-15		<0.1    <0.1				
Acenaphthylene	mg/kg	162090-15		<0.1    <0.1				
Acenaphthene	mg/kg	162090-15		<0.1    <0.1				
Fluorene	mg/kg	162090-15		<0.1    <0.1				
Phenanthrene	mg/kg	162090-15		<0.1    <0.1				
Anthracene	mg/kg	162090-15		<0.1    <0.1				
Fluoranthene	mg/kg	162090-15		<0.1    <0.1				
Pyrene	mg/kg	162090-15		<0.1    <0.1				
Benzo(a)anthracene	mg/kg	162090-15		<0.1    <0.1				
Chrysene	mg/kg	162090-15		<0.1    <0.1				

QUALITYCONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Benzo(b,j+k)fluoranthene	mg/kg	162090-15	<0.2    <0.2
Benzo(a)pyrene	mg/kg	162090-15	<0.05    <0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	162090-15	<0.1    <0.1
Dibenzo(a,h)anthracene	mg/kg	162090-15	<0.1    <0.1
Benzo(g,h,i)perylene	mg/kg	162090-15	<0.1    <0.1
Surrogate p-Terphenyl-d14	%	162090-15	108    85    RPD: 24
QUALITYCONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	162090-15	20/02/2017    20/02/2017
Date analysed	-	162090-15	20/02/2017    20/02/2017
HCB	mg/kg	162090-15	<0.1    <0.1
alpha-BHC	mg/kg	162090-15	<0.1    <0.1
gamma-BHC	mg/kg	162090-15	<0.1    <0.1
beta-BHC	mg/kg	162090-15	<0.1    <0.1
Heptachlor	mg/kg	162090-15	<0.1    <0.1
delta-BHC	mg/kg	162090-15	<0.1    <0.1
Aldrin	mg/kg	162090-15	<0.1    <0.1
Heptachlor Epoxide	mg/kg	162090-15	<0.1    <0.1
gamma-Chlordane	mg/kg	162090-15	<0.1    <0.1
alpha-chlordane	mg/kg	162090-15	<0.1    <0.1
Endosulfan I	mg/kg	162090-15	<0.1    <0.1
pp-DDE	mg/kg	162090-15	<0.1    <0.1
Dieldrin	mg/kg	162090-15	<0.1    <0.1
Endrin	mg/kg	162090-15	<0.1    <0.1
pp-DDD	mg/kg	162090-15	<0.1    <0.1
Endosulfan II	mg/kg	162090-15	<0.1    <0.1
pp-DDT	mg/kg	162090-15	<0.1    <0.1
Endrin Aldehyde	mg/kg	162090-15	<0.1    <0.1
Endosulfan Sulphate	mg/kg	162090-15	<0.1    <0.1
Methoxychlor	mg/kg	162090-15	<0.1    <0.1
Surrogate TCMX	%	162090-15	91    90    RPD: 1

QUALITYCONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD		
Date extracted	-	162090-15	20/02/2017    20/02/2017		
Date analysed	-	162090-15	20/02/2017    20/02/2017		
Azinphos-methyl (Guthion)	mg/kg	162090-15	<0.1    <0.1		
Bromophos-ethyl	mg/kg	162090-15	<0.1    <0.1		
Chlorpyriphos	mg/kg	162090-15	<0.1    <0.1		
Chlorpyriphos-methyl	mg/kg	162090-15	<0.1    <0.1		
Diazinon	mg/kg	162090-15	<0.1    <0.1		
Dichlorvos	mg/kg	162090-15	<0.1    <0.1		
Dimethoate	mg/kg	162090-15	<0.1    <0.1		
Ethion	mg/kg	162090-15	<0.1    <0.1		
Fenitrothion	mg/kg	162090-15	<0.1    <0.1		
Malathion	mg/kg	162090-15	<0.1    <0.1		
Parathion	mg/kg	162090-15	<0.1    <0.1		
Ronnel	mg/kg	162090-15	<0.1    <0.1		
Surrogate TCMX	%	162090-15	91    90    RPD: 1		
QUALITYCONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD		
Date extracted	-	162090-15	20/02/2017    20/02/2017		
Date analysed	-	162090-15	20/02/2017    20/02/2017		
Aroclor 1016	mg/kg	162090-15	<0.1    <0.1		
Aroclor 1221	mg/kg	162090-15	<0.1    <0.1		
Aroclor 1232	mg/kg	162090-15	<0.1    <0.1		
Aroclor 1242	mg/kg	162090-15	<0.1    <0.1		
Aroclor 1248	mg/kg	162090-15	<0.1    <0.1		
Aroclor 1254	mg/kg	162090-15	<0.1    <0.1		
Aroclor 1260	mg/kg	162090-15	<0.1    <0.1		
Surrogate TCLMX	%	162090-15	91    90    RPD: 1		
QUALITYCONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	162090-15	20/02/2017    20/02/2017	LCS-2	20/02/2017
Date analysed	-	162090-15	20/02/2017    20/02/2017	LCS-2	20/02/2017
Arsenic	mg/kg	162090-15	6    5    RPD: 18	LCS-2	109%
Cadmium	mg/kg	162090-15	<0.4    <0.4	LCS-2	97%
Chromium	mg/kg	162090-15	39    37    RPD: 5	LCS-2	107%
Copper	mg/kg	162090-15	11    12    RPD: 9	LCS-2	108%
Lead	mg/kg	162090-15	26    24    RPD: 8	LCS-2	105%
Mercury	mg/kg	162090-15	0.3    0.2    RPD: 40	LCS-2	90%
Nickel	mg/kg	162090-15	5    4    RPD: 22	LCS-2	100%
Zinc	mg/kg	162090-15	20    21    RPD: 5	LCS-2	100%

**Client Reference: J146932-01, Smalls Rd/ DOE**

QUALITYCONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162090-3	20/02/2017
Date analysed	-	[NT]	[NT]	162090-3	21/02/2017
TRHC <sub>6</sub> - C <sub>9</sub>	mg/kg	[NT]	[NT]	162090-3	107%
TRHC <sub>6</sub> - C <sub>10</sub>	mg/kg	[NT]	[NT]	162090-3	107%
Benzene	mg/kg	[NT]	[NT]	162090-3	93%
Toluene	mg/kg	[NT]	[NT]	162090-3	103%
Ethylbenzene	mg/kg	[NT]	[NT]	162090-3	108%
m+p-xylene	mg/kg	[NT]	[NT]	162090-3	115%
o-Xylene	mg/kg	[NT]	[NT]	162090-3	117%
naphthalene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate aaa- Trifluorotoluene	%	[NT]	[NT]	162090-3	97%
QUALITYCONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162090-3	20/02/2017
Date analysed	-	[NT]	[NT]	162090-3	21/02/2017
TRHC <sub>10</sub> - C <sub>14</sub>	mg/kg	[NT]	[NT]	162090-3	92%
TRHC <sub>15</sub> - C <sub>28</sub>	mg/kg	[NT]	[NT]	162090-3	88%
TRHC <sub>29</sub> - C <sub>36</sub>	mg/kg	[NT]	[NT]	162090-3	80%
TRH>C <sub>10</sub> -C <sub>16</sub>	mg/kg	[NT]	[NT]	162090-3	92%
TRH>C <sub>16</sub> -C <sub>34</sub>	mg/kg	[NT]	[NT]	162090-3	88%
TRH>C <sub>34</sub> -C <sub>40</sub>	mg/kg	[NT]	[NT]	162090-3	80%
Surrogate o-Terphenyl	%	[NT]	[NT]	162090-3	89%
QUALITYCONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162090-3	20/02/2017
Date analysed	-	[NT]	[NT]	162090-3	21/02/2017
Naphthalene	mg/kg	[NT]	[NT]	162090-3	89%
Acenaphthylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	[NT]	[NT]	162090-3	96%
Phenanthrene	mg/kg	[NT]	[NT]	162090-3	90%
Anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	[NT]	[NT]	162090-3	99%
Pyrene	mg/kg	[NT]	[NT]	162090-3	107%
Benzo(a)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	[NT]	[NT]	162090-3	86%
Benzo(b,j+k)fluoranthene	mg/kg	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	[NT]	[NT]	162090-3	82%
Indeno(1,2,3-c,d)pyrene	mg/kg	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	[NT]	[NT]	[NR]	[NR]

**Client Reference: J146932-01, Smalls Rd/ DOE**

QUALITYCONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	[NT]	[NT]	162090-3	122%
QUALITYCONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162090-3	20/02/2017
Date analysed	-	[NT]	[NT]	162090-3	20/02/2017
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	162090-3	76%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	162090-3	85%
Heptachlor	mg/kg	[NT]	[NT]	162090-3	77%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	162090-3	75%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	162090-3	80%
gamma-Chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	[NT]	[NT]	162090-3	83%
Dieldrin	mg/kg	[NT]	[NT]	162090-3	86%
Endrin	mg/kg	[NT]	[NT]	162090-3	102%
pp-DDD	mg/kg	[NT]	[NT]	162090-3	93%
Endosulfan II	mg/kg	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	[NT]	[NT]	162090-3	93%
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	162090-3	112%

**Client Reference: J146932-01, Smalls Rd/ DOE**

QUALITYCONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162090-3	20/02/2017
Date analysed	-	[NT]	[NT]	162090-3	20/02/2017
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	[NR]	[NR]
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	162090-3	104%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	162090-3	88%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	162090-3	105%
Fenitrothion	mg/kg	[NT]	[NT]	162090-3	96%
Malathion	mg/kg	[NT]	[NT]	162090-3	79%
Parathion	mg/kg	[NT]	[NT]	162090-3	86%
Ronnel	mg/kg	[NT]	[NT]	162090-3	96%
Surrogate TCMX	%	[NT]	[NT]	162090-3	99%
QUALITYCONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	162090-3	20/02/2017
Date analysed	-	[NT]	[NT]	162090-3	20/02/2017
Aroclor 1016	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	[NT]	[NT]	162090-3	112%
Aroclor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	162090-3	99%
QUALITYCONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	162090-3	20/02/2017
Date analysed	-	[NT]	[NT]	162090-3	20/02/2017
Arsenic	mg/kg	[NT]	[NT]	162090-3	83%
Cadmium	mg/kg	[NT]	[NT]	162090-3	82%
Chromium	mg/kg	[NT]	[NT]	162090-3	96%
Copper	mg/kg	[NT]	[NT]	162090-3	105%
Lead	mg/kg	[NT]	[NT]	162090-3	82%
Mercury	mg/kg	[NT]	[NT]	162090-3	93%
Nickel	mg/kg	[NT]	[NT]	162090-3	85%
Zinc	mg/kg	[NT]	[NT]	162090-3	86%

**Report Comments:**

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

INS: Insufficient sample for this test

PQL: Practical Quantitation Limit

NT: Not tested

NR: Test not required

RPD: Relative Percent Difference

NA: Test not required

<: Less than

>: Greater than

LCS: Laboratory Control Sample

### Quality Control Definitions

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

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

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

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

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

### Laboratory Acceptance Criteria

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

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

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

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.

**NA**  
Noel Arnold & Associates Pty Ltd  
**Chain of Custody**  
**Record**

2 Mayneview St Milton QLD 4066  
 Level 2, 11 Kharthour Rd North Ryde NSW 2113  
 Level 3, 818 Whitehorse Rd Box Hill VIC 3128

Phone: (07) 3514 9222    Fax (07) 3514 9220  
 Phone: (02) 9889 1800    Fax (02) 9889 1811  
 Phone: (03) 9890 8811    Fax (03) 9890 8911

<b>NAA Project Details:</b> Client No.: Job No: <u>5146932-01</u> NAA Contact Name: <u>John Browne</u> NAA Contact Email: <u>john.browne@greenup.com.au</u>		Requested Analyses: All analyses to be conducted to NATA methods, unless agreed										<b>Receiving Laboratory:</b> Please complete sample receipt details below & then email COC to NAA contact					
Receiving Lab Name: <b>Envirolab Services Pty Ltd</b> Attention To: <b>Aileen Hie / Jacinta Hurst</b> Address: <b>12 Ashley Street</b> <b>Chatswood NSW 2067 (Ph 02 9910 6200)</b>		Received By: (Name) <u>Elen Nh.</u> Day, Date and Time: <u>170217 1130.</u> COC Emailed to NAA (tick)										Signature: 					
Relinquished By: 		Day, Date & Time: <u>17/2/17 7:00 am</u>		(Signature) <u>[Signature]</u>		Sample Storage Requirements: All samples are to be stored for a period of 3 months unless otherwise agreed.										Date Received: <u>170217</u> Time Received: <u>11:30.</u> Received by: <u>EM</u> Temp: <u>Cool/Ambient</u> Cooling: <u>Ice/icepack</u> Security: <u>Intact/Broken/None</u>	
Results Required By (Day, Date & Time): <u>Standard turnaround</u>		Soil Filter Tube Bag										Job No: <u>162090</u>					
Sample ID & Type		CEC / pH / SD / LL Slime / texture Field										Envirolab Services 12 Ashley St Chatswood NSW 2067 Ph: (02) 9910 6200					
01. BH-1 - 0.0-0.2		X										Date Received: <u>170217</u>					
02. BH-1 - 0.5-0.6		X										Time Received: <u>11:30.</u>					
03. BH-2 - 0.3-0.4		X										Received by: <u>EM</u>					
04. BH-3 - 0.1-0.2		X										Temp: <u>Cool/Ambient</u>					
05. BH-3 - 0.9-1.0		X										Cooling: <u>Ice/icepack</u>					
06. BH-4 - 0.1-0.2		X										Security: <u>Intact/Broken/None</u>					
07. BH-4 - 1.5		X										Job No: <u>162090</u>					
08. BH-5 - 0.1-0.3		X										Date Received: <u>170217</u>					
09. BH-5 - 0.6-0.7		X										Time Received: <u>11:30.</u>					
10. BH-6 - 0.2-0.3		X										Received by: <u>EM</u>					
11. BH-7 - 0.2-0.4		X										Temp: <u>Cool/Ambient</u>					
12. BH-7 - 0.9-1.0		X										Cooling: <u>Ice/icepack</u>					
13. BH-8 - 0.3-0.4		X										Security: <u>Intact/Broken/None</u>					
14. BH-8 - 1.3		X										Job No: <u>162090</u>					

## Chain of Custody Record

(Formerly Noel Arnold & Associates Pty Ltd)

2 Mayneview St Milton QLD 4066  
 Level 2, 11 Kharitourm Rd North Ryde NSW 2113  
 Level 3, 818 Whitehorse Rd Box Hill VIC 3128

Phone: (07) 3514 9222    Fax (07) 3514 9220  
 Phone: (02) 9889 1800    Fax (02) 9889 1811  
 Phone: (03) 9890 8811    Fax (03) 9890 8911

GreencapNAA Project Details:		Requested Analyses: All analyses to be conducted to NATA methods, unless agreed												Receiving Laboratory:		
Client No. Job No:	Smalls Rd / DOE													Please complete sample receipt details below & then email COC to NAA contact		
NAA Contact Name:	5146932-01													Received By: (Name)		
NAA Contact Email:														<i>Ellen Wg</i>		
Receiving Lab Name:														Day, Date and Time:		
Attention To:														<i>170217 11:30</i>		
Address:														COC Emailed to NAA (tick)		
Relinquished By:														Signature:		
Results Required By (Day, Date & Time):														<i>[Signature]</i>		
Sample ID		Soil	Jar	Tube	Bag								Sample Storage Requirements: All samples are to be stored for a period of 3 months unless otherwise agreed.			
<i>15 BH-9-0.3-0.4</i>																
<i>16 BH-9-1.4</i>																
<i>17 BH-9-1.8</i>																
<i>18 QCU</i>																
<i>19 QCU</i>																

*Flow*

*6*

*XX*

*XX*

*XX*

*2082*



Our ref : ASET55147/ 58327 / 1 - 9  
Your ref : J146932-02- Smalls Rd / DOE  
**NATA Accreditation No: 14484**

20 February 2017

GreenCap| NAA  
Level 2, 11 Khartoum Road  
North Ryde NSW 2113



Accredited for compliance with ISO/IEC 17025.

**Attn: Mr John Browne**

Dear John

**Asbestos Identification**

This report presents the results of nine samples, forwarded by GreenCap| NAA on 11 February 2017, for analysis for asbestos.

**1.Introduction:**Nine samples forwarded were examined and analysed for the presence of asbestos.

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

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

**3. Results :** **Sample No. 1. ASET55147/ 58327 / 1. BH1 0.0-0.5.**  
Approx dimensions 10.0 cm x 10.0 cm x 8.0 cm  
Approx total dry weight of soil = 810.0g  
The sample consisted of a mixture of clayish soil, stones, plant matter and fragments of plaster.  
**No asbestos detected.**

**Sample No. 2. ASET55147/ 58327 / 2. BH2 0.0-0.3.**  
Approx dimensions 10.0 cm x 10.0 cm x 7.0 cm  
Approx total dry weight of soil = 715.0g  
The sample consisted of a mixture of clayish sandy soil, stones, sandstone and plant matter.  
**No asbestos detected.**

**Sample No. 3. ASET55147/ 58327 / 3. BH3 0.1-0.3.**  
Approx dimensions 10.0 cm x 10.0 cm x 6.4 cm  
Approx total dry weight of soil = 650.0g  
The sample consisted of a mixture of clayish soil, stones, plant matter and fragments of plaster.  
**No asbestos detected.**

**Sample No. 4. ASET55147/ 58327 / 4. BH4 0.1-0.3.**  
Approx dimensions 10.0 cm x 10.0 cm x 7.0 cm  
Approx total dry weight of soil = 720.0g  
The sample consisted of a mixture of clayish soil, stones, plant matter and fragments of plaster.  
**No asbestos detected.**



**Sample No. 5. ASET55147 / 58327 / 5. BH5 0.0-0.3.**

Approx dimensions 11.0 cm x 10.0 cm x 9.7 cm

Approx total dry weight of soil = 1010.0g

The sample consisted of a mixture of clayish sandy soil, stones, sandstone, plant matter and fragments of brick.

**No asbestos detected.**

**Sample No. 6. ASET55147 / 58327 / 6. BH6 0.0-0.3.**

Approx dimensions 10.0 cm x 10.0 cm x 8.2 cm

Approx total dry weight of soil = 833.0g

The sample consisted of a mixture of clayish soil, stones, plant matter, fragments of plaster and corroded metal.

**No asbestos detected.**

**Sample No. 7. ASET55147 / 58327 / 7. BH7 0.0-0.3.**

Approx dimensions 10.0 cm x 10.0 cm x 7.9 cm

Approx total dry weight of soil = 805.0g

The sample consisted of a mixture of clayish sandy soil, stones, plant matter and fragments of brick.

**No asbestos detected.**

**Sample No. 8. ASET55147 / 58327 / 8. BH8 0.0-0.8.**

Approx dimensions 10.0 cm x 10.0 cm x 8.1 cm

Approx total dry weight of soil = 820.0g

The sample consisted of a mixture of clayish sandy soil, stones, sandstone and plant matter.

**No asbestos detected.**

**Sample No. 9. ASET55147 / 58327 / 9. BH9 0.0-0.2.**

Approx dimensions 10.0 cm x 10.0 cm x 8.4 cm

Approx total dry weight of soil = 855.0g

The sample consisted of a mixture of sandy soil, stones, sandstone, plant matter, fragments of cement.

**No asbestos detected.**

Analysed and reported by,

A handwritten signature in black ink, appearing to read "Chamath".

**Chamath Annakkage. BSc**  
**Analyst / Approved Identifier**

A handwritten signature in black ink, appearing to read "Mahen De Silva".

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



**Accredited for compliance with ISO/IEC 17025.**

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

**Disclaimers;**

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

*The results contained in this report relate only to the sample/s submitted for testing. Australian Safer Environment & Technology accepts no responsibility for whether or not the submitted sample/s is/are representative. Results indicating "No asbestos detected" indicates a reporting limit specified in AS4964 -2004 which is 0.1g/ Kg (0.01%). Any amounts detected at assumed lower level than that would be reported, however those assumed lower levels may be treated as "No asbestos detected" as specified and recommended by AS4964-2004. Trace / respirable level asbestos will be reported only when detected.*

*Estimation of asbestos weights involves the use of following assumptions;  
Volume of each kind of Asbestos present in broken edges have been visually estimated and its been assumed that volumes remain similar throughout the binding matrix and those volumes are only approximate and not exact. Material densities have been assumed to be similar to commonly found similar materials and may not be exact.*

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

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

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

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

**\* denotes asbestos detected in ACM in bonded form.**

**# denotes FA.**

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



## Soil Contamination Investigation

NSW Department of Education c/o Conrad Gargett Pty Ltd

Smalls Road Public School, Smalls Rd North Ryde, NSW 2113

Appendix G: Data validation sheets

SAMPLE BATCH DATA QA SUMMARY SHEET			
<b>Project Name:</b>	Soil Contamination Investigation Smalls Road	<b>Project Number:</b>	J146932-01
<b>Primary Laboratory:</b>	Envirolab	<b>Certificate Number:</b>	162090
<b>Secondary Laboratory:</b>	N/A	<b>Certificate Number:</b>	N/A
<b>Date Sampled:</b>	15/02/2017	<b>Sample Medium:</b>	Soil
Sample Information			
<b>Number of Primary Samples:</b>	12	<b>Number of Triplicate Samples:</b>	
<b>Number of Duplicate Samples:</b>	2	<b>Number of Other Field QAQC Samples:</b>	
Documentation and Sample Handling Information			
	Y/N	Comments	
COC completed properly?	Y	Signed by both field scientist and labs personnel.	
All requested analysis completed?	Y		
Samples received intact and chilled?	Y	Samples received chilled and intact at Laboratory	
Samples analysed within appropriate holding times?	Y		
Sample volumes sufficient for QC analysis?	Y		
Are there non-NATA accredited methods used?	N		
Chromatograms supplied as appropriate?	N/A	Not required	
Laboratory reports signed by authorised personnel?	Y		
Laboratory Control Spike (LCS) Analyses			
<b>Analyte Group</b>			<b>Comments</b>
	All Envirolab results were within the laboratory control limit.		
Matrix Spike (MS) Analyses			
<b>Analyte Group</b>			<b>Comments</b>
	All Envirolab results were within the laboratory control limit.		
Laboratory Duplicates (LD) Analyses			
<b>Analyte Group</b>	<b>Analyte(s)</b>	<b>Sample ID</b>	<b>Comments</b>
			All Envirolab results were within the laboratory control limit.
Field Duplicates (FD) Analyses			
<b>Analyte Group</b>	<b>Primary ID</b>	<b>Duplicate ID</b>	<b>Comments</b>
Metals	BH2 (0.3-0.4)	QC1	All field duplicate results are within acceptable RPD criteria with the exception of Cu and Ni. The differences in concentrations for BH2 (0.3-0.4) and QC1 were for reported concentrations of less than 5% of the relevant HIL concentration
	BH6 (0.2-0.3)	QC2	All field duplicate results are within acceptable RPD criteria
Field Triplicates (FT) Analyses (inter-laboratory Duplicate)			
<b>Analyte Group</b>	<b>Primary ID</b>	<b>Triplicate ID</b>	<b>Comments</b>
			N/A
Surrogate Compound Monitoring Analyses			
<b>Analyte Group</b>	<b>Analyte(s)</b>	<b>Sample ID</b>	<b>Comments</b>
			All surrogate recoveries were within acceptance limits
Overall Comments			
<p>The laboratory control samples and surrogate recoveries indicate appropriate sensitivity of analytical methods and accuracy and precision meeting acceptance limits.</p> <p>Lead exceeded the acceptable RPD range in the field duplicate sample. This can be attribute to the heterogeneity of the fill material which was sampled.</p> <p>This batch has been validated and is considered suitable for site contamination assessment.</p> <p>Note: Data validation assesses each analyte in terms of all the data validation variables and only the exceedances and outliers are reported in this form.</p> <p>*When concentrations are less than the LOR for both primary and duplicate/triplicate results, no RPDs are calculated</p>			
<b>Performed By:</b>	John Browne	<b>Checked By:</b>	Ian McLennan
<b>Date:</b>	8/03/2017	<b>Date:</b>	8/03/2017

Project J146932  
Field Duplicate

Location : Smalls Road Public School,
Sample Date : 15/02/17

BH2 (0.3-0.4)	OC1
15/02/2017	15/02/2017
PS	FD

BH6 (0.2-0.3)	OC2
15/02/2017	15/02/2017
PS	FD

Analyte	Units	LOR			RPD Primary vs Duplicate			RPD Primary vs Duplicate
Arsenic	mg/kg	4	4	4	0%	<4	<4	0%
Cadmium	mg/kg	0.4	<0.4	<0.4	0%	<0.4	<0.4	0%
Chromium	mg/kg	1	21	23	9%	11	14	9%
Copper	mg/kg	1	16	7	78%	9	10	24%
Lead	mg/kg	1	18	19	5%	23	23	11%
Mercury	mg/kg	0.1	<0.1	<0.1	0%	<0.1	<0.1	0%
Nickel	mg/kg	1	7	3	80%	<1	<1	0%
Zinc	mg/kg	1	9	8	12%	4	3	29%
Naphthalene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Acenaphthylene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Acenaphthene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Fluorene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Phenanthrene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Anthracene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Fluoranthene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Pyrene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Chrysene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Benzo(b+j)fluoranthene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Indeno(1,2,3-cd)pyrene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Sum of polycyclic aromatic hydrocarbons	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
Benzo(a)pyrene TEQ (zero)	mg/kg	0.5	<0.5	<0.5	ND	<0.5	<0.5	ND
C6 - C9 Fraction	mg/kg	10	<10	<10	ND	<10	<10	ND
C10 - C14 Fraction	mg/kg	50	<50	<50	ND	<50	<50	ND
C15 - C28 Fraction	mg/kg	100	<100	<100	ND	<100	<100	ND
C29 - C36 Fraction	mg/kg	100	<100	<100	ND	<100	<100	ND
C10 - C36 Fraction (sum)		50	<50	<50	ND	<50	<50	ND
C6 - C10 Fraction	mg/kg	10	<10	<10	ND	<10	<10	ND
C6 - C10 Fraction minus BTEX (F1)	mg/kg	10	<10	<10	ND	<10	<10	ND
>C10 - C16 Fraction	mg/kg	50	<50	<50	ND	<50	<50	ND
>C16 - C34 Fraction	mg/kg	100	<100	<100	ND	<100	<100	ND
>C34 - C40 Fraction	mg/kg	100	<100	<100	ND	<100	<100	ND
>C10 - C40 Fraction (sum)	mg/kg	50	<50	<50	ND	<50	<50	ND
>C10 - C16 Fraction minus Naphthalene (F2)		50	<50	<50	ND	<50	<50	ND
Benzene	mg/kg	0	<0.2	<0.2	ND	<0.2	<0.2	ND
Toluene	mg/kg	1	<0.5	<0.5	ND	<0.5	<0.5	ND
Ethylbenzene	mg/kg	1	<0.5	<0.5	ND	<0.5	<0.5	ND
meta- & para-Xylene	mg/kg	1	<0.5	<0.5	ND	<0.5	<0.5	ND
ortho-Xylene	mg/kg	1	<0.5	<0.5	ND	<0.5	<0.5	ND
Total Xylenes	mg/kg	1	<0.5	<0.5	ND	<0.5	<0.5	ND
Sum of BTEX		0	<0.2	<0.2	ND	<0.2	<0.2	ND
Naphthalene		1	<1	<1	ND	<1	<1	ND

Notes  
-: Not analysed  
ND: Not Detected  
PS: Primary Sample  
FD: Field Duplicate

Acceptable RPDs: RPD <= 30%  
RPD > 30%, Analysis result < 10 times LOR  
RPD >= 50%, Analysis result > 10 times LOR and < 20 times LOR

Exceeds Acceptable RPD limits