Universal Property Group Pty Ltd

Detailed Site Investigation: South Werrington Urban Village Precinct, Lot 102 DP1140594, 16 Chapman Street, Werrington NSW

ENVIRONMENTAL

WATER

WASTEWATER

GEOTECHNICAL

CIVIL

PROJECT MANAGEMENT

P1504996JR01V01
October 2015

Limitations Statement

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Martens & Associates Pty Ltd derived the data in this report primarily from a number of sources which may include for example site inspections, correspondence regarding the proposal, examination of records in the public domain, interviews with individuals with information about the site or the project, and field explorations conducted on the dates indicated. The passage of time, manifestation of latent conditions or impacts of future events may require further examination / exploration of the site and subsequent data analyses, together with a re-evaluation of the findings, observations and conclusions expressed in this report.

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All enquiries regarding this project are to be directed to the Project Manager.

Contents

1 Introduction

1.1 Overview

This report prepared by Martens and Associates (MA), for Universal Property Group Pty Ltd documents a Detailed Site Investigation (DSI) completed for 16 Chapman Street, Werrington, NSW (the site).

A Preliminary Environmental Site Assessment (PESA) was previously completed by Douglas Partners (DP, 2014a) and should be read in conjunction with this report.

1.2 Objectives

The objective of this report is to assess the potential sources of site contamination identified in the PESA (DP, 2014) and determine site suitability for redevelopment which includes residential land use.

1.3 Scope of Works

The scope of works includes:

- Intrusive soil investigation and soil sampling for laboratory analysis of potential areas of environmental concern as identified by DP (2014a).
- Preparation of a report in general accordance with the relevant sections of ASC NEPM (1999, amended 2013), NSW OEH (2011) and DEC (2006).

1.4 Reference Guidelines

This assessment is prepared in general accordance with the following guidelines:

- NSW OEH (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.
- NSW DEC (2006) 2nd Ed. Contaminated Sites: Guidelines for the NSW Site Auditor Scheme.
- ASC NEPC (1999, amended 2013) National Environmental Protection Measure, (NEPM 1999, amended 2013).

1.5 Abbreviations

ASC NEPM – Assessment of site contamination (National Environmental Protection Measure)

AEC – Area of environmental concern

ACM – Asbestos containing material

BTEX – Benzene, toluene, ethyl benzene, xylene

BGL – Below ground level

COPC – Chemical of primary concern

CMP – Construction management plan

CSM – Conceptual site model

DEC – NSW Department of Environment and Conservation

DP – Deposited Plan / Douglas Partners

EIL – Ecological investigation level

ESL – Ecological screening level

EPA – NSW Environmental Protection Authority

ESA – Environmental site assessment

HM – Heavy metals

LOR – Limit of reporting

LGA – Local government area

MA – Martens and Associates Pty Ltd

NATA – National Association of Testing Authorities

OCP – Organochloride pesticides

OEH – NSW Office of Environment and Heritage

OPP – Organophosphate pesticides

PAH – Polycyclic aromatic hydrocarbons

PCB – Polychlorinated biphenyl

RPD – Relative percentage difference – difference between two values divided by the average

SAC – Site acceptance criteria

SOP – Standard operating procedure

TPH – Total petroleum hydrocarbons

UST – Underground storage tank

2 Site Background Information

2.1 Location and Setting

Site information is summarised in Table 1.

Table 1: Site background information.

Item	Description/Detail
Site address	16 Chapman Street, Werrington NSW.
Lot/DP	Lot 102 DP 114059.
Site area	Approximately 28 ha.
Existing site development	No major existing structures. A small corrugated iron shed is located towards the centre of the site which appears to have been used as an amenities building (with a composting toilet).
Aspect	Site generally slopes towards the south east with the eastern portion of the site sloes to the north / north east.
Typical slopes	Generally slopes between 0 – 15%.
Existing vegetation	Generally cleared with low lying grasses and mature bushes. Scattered mature trees located near the centre of the site.
Neighbouring environments	The surrounding land use includes: o North: Western railway line and low density residential land use. o East: Low density residential development and vacant former commercial site. o South: Cobham Junvenile Justice Centre. o West: University of Western Sydney (Kingswood Campus).
Local Government Area (LGA)	Penrith City Council.
Drainage	Site drainage The site generally drains via overland flow to the south east / east portions to a large concrete pipe / culvert which leaves the site under to the north under Landers Street and eventually discharges in to South Creek.

Item	Description/Detail
Geology and soil landscapes	The Penrith 1:100,000 Geological Series Sheet 9030 (1991) indicates that the site is underlain by Wianamatta Group of Bringelly Shale consisting of carbonaceous claystone. The Reference to the Penrith 1:100,000 Soil Landscapes Sheet indicates that the northern part of the site is located within the erosional Luddenham soil landscape. This landscape is characterised by shallow (<100 cm) dark podzolic soils or massive earthy clays on crests; moderately deep (70-150 cm) red podzolic soils on upper slopes.
Environmental receptors	South Creek (350 m to the east).
Human receptors	Existing surrounding residential developments. Future residents and site workers/ builders.

2.2 Hydrogeology

Review of NSW Natural Resources Atlas indicated three groundwater bores (with available information) within approximately 1 km of the site. All three bores were recorded as monitoring bores and were all located up gradient of the site. Limited information regarding standing water level was available at the time of preparing this report. Further assessment would be required to characterise site hydrogeology.

3 Preliminary Conceptual Site Model

3.1 Overview

The preliminary conceptual site model (CSM) has been developed based on information documented in the PESA (DP, 2014a) and the Geotechnical Assessment (DP, 2014b) which included subsurface investigation.

3.2 Summary of Previous Investigations.

- Historic aerials indicate the site has remained generally undeveloped since 1943. There is some evidence of broad acre farming with evidence of ploughing and or crop lines evident along the eastern and western boundaries in the 1961 aerial. No evidence of large onsite development was found on any reviewed aerial.

- A search of the NSW EPA Record of Notices for Contaminated Land was conducted which found no notice for the site.

- A site walkover conducted on 17 December 2013 by Douglas Partners confirmed a generally vacant site with only a small corrugated iron shed located towards the centre of the site which appears to have been used as an amenities building (with a composting toilet).

- The geotechnical assessment (DP, 2014b) undertook subsurface site testing via 50 test pits excavated across the site. Fill material was identified in several testing locations, predominantly in the eastern portion of the site.

The PESA (DP, 2014a) identified two areas of environmental concern (AEC) and associated chemicals of primary concern (COPC) which are summarised in Table 2.

Table 2: AEC and COPC 16 Chapman Street, Werrington, NSW

AEC	Potential for Contamination	COPC	Contamination Likelihood
A - Areas of filling	Fill from unknown origins.	TPH / BTEX, PAH, HM, OCP/OPP, phenols and asbestos	Medium - high
B – Composting toilet	Unknown historical use. Unknown construction methodology of toilet.	Faecal coliforms, E.coli and salmonella	Low

3.3 Sensitive Receptors and Exposure Pathways

Table 3 provides a summary of identified sensitive receptors and potential exposure pathways connecting receptors to identified AEC / COPC outlined in Table 2 as presented in the PESA (DP, 2014a).

Table 3: Summary of receptors and potential pathways.

Receptor	Pathway
Human Receptors: o Future site occupants. o Site visitors. o Site workers during any future construction works. o Surrounding offsite occupants.	o Dermal contact. o Ingestion of potentially contaminated soil. o Inhalation of airborne contaminants. o Migration of pollutants via site surface and groundwater.
Environmental Receptors o South Creek . o Existing vegetated areas across the site. o Vegetated or landscaped areas of any future site design plans.	o Migration of pollutants via site surface and groundwater. o Direct contact with site flora.

3.4 PESA Recommendation

The PESA recommended a targeted intrusive soil investigation to quantify and characters potential contamination risk identified in the CSM.

Testing was recommended in areas of potential site filling and, following removal of the existing site shed, near the former composting toilet. It is noted that the current investigation was not able to target the compost

toilet area as the shed and toilet have not yet been removed. It is proposed that, following site clearing works and removal of waste from the pit, subsurface sampling be completed in this area and the results provided as an addendum to this report.

Additional testing was recommended outside of the AEC to confirm the low risk status of the site.

4 Field and Laboratory Investigations

4.1 Field Programme overview

Referencing the preliminary CSM (Section 3), a soil investigation program was planned to investigate the areas of potential site filling. Information from previous subsurface investigation in the geotechnical assessment (DP, 2014b) was used to target site areas associated with filling. Based on test pit logs (DP 2014b), subsurface testing was primarily focused in the eastern portion of the site.

While not directly addressed as an AEC in the PESA, there was some evidence, based on the historic aerials, to suggest previous agricultural land use. To address this concern, shallow (0.1 mBGL) surface samples were collected from across the site in a grid pattern and assessed for heavy metal and pesticide contaminants.

4.2 Investigation Constraints

As noted in Section 3.4, the existing site shed and composting toilet were intact during the investigation and testing could not be completed. To fully address data gaps in the CSM, further soil investigation is required following demolition of the shed.

4.3 Intrusive Investigation Methodology

An overview of site investigation methodology is provided in Table 4.

Table 4: Investigation methodology.

Investigation dates	7 October 2015.
Number of sampling points	36 surface samples in grid pattern across the site. 12 test pits.
Investigation method	Testpits were excavated using a 5 tonne excavator. Surface samples collected using a small hand spade.

4.4 Sampling Methodology and Quality Assurance / Quality Control

Soil sampling methodology (Table 5) was completed to meet data quality objectives.

Table 5: Soil sampling methodology.

Activity	Detail / Comments
Soil Sampling	Soil sampling was completed by an experienced MA environmental engineer. Each sample was placed into a laboratory-supplied, acid-rinsed 250mL glass jar, labelled with a unique identification number and no headspace to limit volatile loss. A clean pair of disposable gloves was used when handling each sample.
Sample Compositing	Surface samples collected from across the site were combined to form 12 triple composite samples. Sample compositing was completed by Envirolab Pty Ltd a NATA accredited laboratory at the direction of MA.
QA / QC Sampling	Duplicate samples were collected at a rate of approximately 1 in 10 samples for intra-laboratory analysis.
Sample handling and transportation	Sample collection, storage and transport were conducted according to Martens and Associates SOP. Collected samples were placed into an ice chilled cooler-box. Samples were dispatched to NATA-accredited laboratory under chain of custody documentation within holding times.
Decontamination of sampling equipment	Surface sampling equipment (hand spade) was decontaminated between sampling locations by pressurised water spray with a solution of Decon-90™, a phosphate-free detergent, followed by rinsing with potable water. Test pit samples were collected directly from the centre of the excavator bucket and a clean pair of disposable gloves were used between each sample collected.

A review of QA/QC procedure has been completed and is presented in the data validation report (Attachment D). The report concludes that data is suitable for the purposes of the assessment.

4.5 Data Quality Objectives (DQO)

Data quality objectives (DQO) have been prepared as statements specifying qualitative and quantitative data required to support project decisions. Data quality indicators (DQI) are presented in the following sections, outlining procedures to achieve DQO for site works. DQO have been prepared in general accordance with NSW DEC (2006) and US EPA (1994) guidelines and are presented in Table 6.

Table 6: Data quality objectives for the assessment of soil investigations.

Step 1 **Stating the Problem**	The proposed site development will include residential land use. Therefore the site must be deemed suitable to accommodate residential use (residential with minimal soil access). This DSI is required to assess risk posed by potentially contaminated soil to onsite and offsite sensitive receptors.
Step 2 **Identifying the Decision(s)**	Previous suite investigation have identified AECs which may be the source of potential contamination. To assess the suitability of the site for future residential use, decisions are to be made based on the following questions: o Is site soil quality suitable for the intended residential land use? o Do site soils require remediation or management to prior to onsite residential land use?
Step 3 **Identification of Inputs to the Decision**	The inputs to the assessment of site soil quality will include: o Soil sampling at nominated locations (where access is available) across the site. o Laboratory analytical results for relevant COPC. o Assessment of the suitability of the data obtained from sampling an analyses as measured against DQIs. o Assessment of analytical results against site suitable human health criteria.
Step 4 **Study Boundary Definitions**	Study boundaries are as follows: o Lateral – Lateral boundary of the assessment is defined by the site boundary as indicated in Figure 1 (Attachment A). o Vertical – Vertical boundary will be governed by the maximum depth reached during subsurface investigations. It is noted that assessment of site groundwater and soil vapours is outside of the scope of this assessment.
Step 5 **Development of Decision Rules**	The decision rule for this for this investigation area as follows: If the concentration of contaminants in the soils exceeds the adopted assessment criteria; an assessment of the need to further investigate, remediate and or manage the onsite impacts in relation to the proposed development will be undertaken.
Specification of Limits on Decision Errors	Guidance found in ASC NEPM (1999 amended 2013) Schedule B2 regarding 95% upper confidence limit (UCL) states that the 95% UCL of the arithmetic mean provides a 95% confidence level that the true population mean will be less than or equal to this value. Therefore a decision can be made based on a probability that 95% of the data collected will satisfy the site acceptance criteria. A limit on decision error will be 5% that a conclusive statement may be incorrect.
Step 7 **Optimisation of Sampling Design**	Proposed sampling locations are based on completed Stage 1 investigations at the subject site to ensure that critical locations are assessed, sampled, and analysed for appropriate contaminants of concern. The above will be achieved by utilisation of MA SOP to achieve DQO.

4.6 Laboratory Analytical Suite

Laboratory analysis was carried out by Envirolab Pty Ltd a NATA accredited laboratory. Laboratory analytical documentation is presented in Attachment C.

Table 7: Summary of primary soil laboratory analyses.

COC	Number of Samples Analysed
BTEX	8
TRH	8
PAH	8
PCB	8
Asbestos in soil	8
Heavy metals[1]	36 in 12 triple composites 8 discrete
OCP/OPP	36 in 12 triple composites 8 discrete

Notes:
[1] Heavy metals – arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc.

5 Assessment Criteria

5.1 Overview

The site assessment criteria (SAC) adopted for this DSI has been derived from the following sources:

- ASC NEPM (1999, amended 2013) National Environmental Protection (Assessment of Site Contamination) Measure (NEPM).

Guideline values for individual contaminants are presented in laboratory tables in Attachment B.

Table 7 summarises the applicability of the SAC adopted for this investigation.

Table 8: Summary of SAC.

SAC	Applicability
Health investigation levels (HIL)	Based on the proposed residential site use, HIL – A Residential with soil access (ASC NEPM 1999, amended 2013) have been adopted.
Health screening levels (HSL) for petroleum hydrocarbons	HSLs A – low density residential for clay (ASC NEPM 1999, amended 2013) have been adopted. Clay has been selected based on encountered lithology at the site. Soil HSL provide a preliminary assessment of human risk via inhalation of vapours from potential contamination. For this purpose HSL A criteria are considered appropriate.
TPH Management Limits	Residential land use TPH Management limits have been adopted from ASC NEPM (1999, amended 2013).

SAC	Applicability
Ecological assessment criteria (EAS)	A preliminary assessment of ecological risk has been undertaken with reference to ecological screening levels (ESL) and ecological investigation levels (EILs). Ecological assessment criteria applies principally to the top 2m of soil. **ESLs** ESLs for fine grained soils in urban residential and open spaces (ASC NEPM 1999, amended 2013) have been adopted based on site lithology. **EILs** EILS have been calculated using methodology outlined in ASC NEPM (1999, amended 2013(. The most conservative added contaminant levels have been used to develop site EILs as no physiochemical properties of site soils have been measured. Ambient background concentrations (ABC) have been taken from Olszowy et al (1995) for aged contamination in low traffic areas in NSW.
Asbestos in soil / material	Based on the preliminary nature of this assessment the 'presence/absence' of asbestos in soil / material has been adopted as the SAC.

6 Results

6.1 Field Observations

6.1.1 Lithology

A summary of lithology observations compiled during intrusive investigation is presented in Table 9. Detailed test pit logs are presented in Attachment E.

Table 9: Summary of site lithology.

Lithology [1]	Depth Range (mBGL) [2]
FILL - Generally consisting of silty clays and clay. Anthropogenic inclusions observed included: pieces of tile, glass, concrete and plastics.	0.0 – 1.1 (variable)
SILTY CLAY / CLAY – Low to medium plasticity, light brown/ brown / grey.	0.0 – 1.4 (variable)
SHALE – Assumed low strength, grey / light brown.	>1.4 (variable)

Notes:
[1] See test pit logs for detailed material description.
[2] Indicative depth range. Material depth may vary across a site depending on site and local geological conditions, and degree of filling.

6.1.2 Visual and Olfactory Evidence of Contamination

Visual or olfactory evidence of gross contamination was not identified during intrusive investigations.

6.2 Laboratory Analytical Results

6.2.1 Test Pit Samples

Comparison of test pit sample results with the relevant SAC is available in the laboratory tables in Attachment B. A summary of results is presented in Table 9.

Table 10: Summary of soil laboratory results.

Analyte	Results Compared to SAC
Heavy Metals	HILs All results below SAC. EIL All results below SAC.
TPH/BTEX	HSL All results below SAC. ESL All results below SAC.
OCP/OPP	HILs All results below SAC.
PCB	HILs All results below SAC.
PAH	HILs All results below SAC. ESL All results below SAC.
Asbestos in soil	All soil samples reported negative for asbestos in soil detection.

6.2.2 Soil Analytical Results for Broad Site Grid Samples

All triple composite samples from broader site grid sampling, reported values below the adopted SAC for OC/OP pesticides and heavy metals.

7 Discussion, Recommendations and Conclusion

7.1 Site Contamination

A subsurface investigation has been completed by MA targeting areas of site filling identified in the PESA (DP, 2014a). Additional surface samples were collected from across the site to address potential historic agricultural land use. Results of soil sampling found no contaminant level above SAC.

7.2 Recommendation

Based on the large site area, there remains a risk that as yet uncovered fill material, which contains contaminant levels above the adopted SAC, shall be discovered during site works. It is therefore recommended that an unexpected finds protocol be developed for the site and implemented as part of a construction management plan (CMP). The unexpected finds protocol should outline all procedures associated with the discovery of any new potentially contaminated material.

As noted in Section 3.4, access beneath the existing site shed and composting toilet was not available during this investigation. It is recommended that following the removal of the shed and waste material within the pit, validation testing be conducted which shall include sampling for pathogens as per DP (2014a).

7.3 Conclusion

Based on site testing to date, site contamination which would impact the proposed development has not been identified. Therefore following the completion of the above recommendations the site shall be deemed fit for the proposed residential development.

8 Limitations

This Stage 2 contamination assessment was undertaken in accordance with current industry standards.

It is important to note that no land contamination study can be considered to be a complete and exhaustive characterisation of a site nor can it be guaranteed that any assessment shall identify and characterise all areas of potential contamination or all past potentially contaminating land-uses. This is particularly the case where site filling has been identified. Therefore, this report should not be read as a guarantee that no contamination shall be found on the site. Should material be exposed in future which appears to be contaminated, additional testing may be required to determine the implications for the site.

Martens & Associates Pty Ltd has undertaken this assessment for the purposes of assessing potential site contamination. No reliance on this report should be made for any other investigation or proposal. Martens & Associates accepts no responsibility, and provides no guarantee regarding the characteristics of areas of the site not specifically studied in this investigation.

9 References

Chapman and Murphy (1983) Penrith 1:100 000 Soil Landscapes Sheet 9131.

Department of Mineral Resources (1983) Penrith 1:100,000 Geological Sheet 9131.

Douglas Partners (2014a) *Preliminary Environmental Site Assessment : South Werrington Urban Village Precinct, Lot 102 DP1140594 , 16 Chapman Street, Werrington, NSW*, ref: 73741.02

Douglas Partners (2014b) *Geotechnical Assessment : South Werrington Urban Village Precinct, Lot 102 DP1140594 , 16 Chapman Street, Werrington, NSW*, ref: 73741.01

NEPC (1999, amended 2013) *National Environmental Protection (Assessment of Site Contamination) Measure* – Referred to as ASC NEPM (1999, amended 2013).

NSW DEC (2006) 2nd Ed. Contaminated Sites: Guidelines for the NSW Site Auditor Scheme.

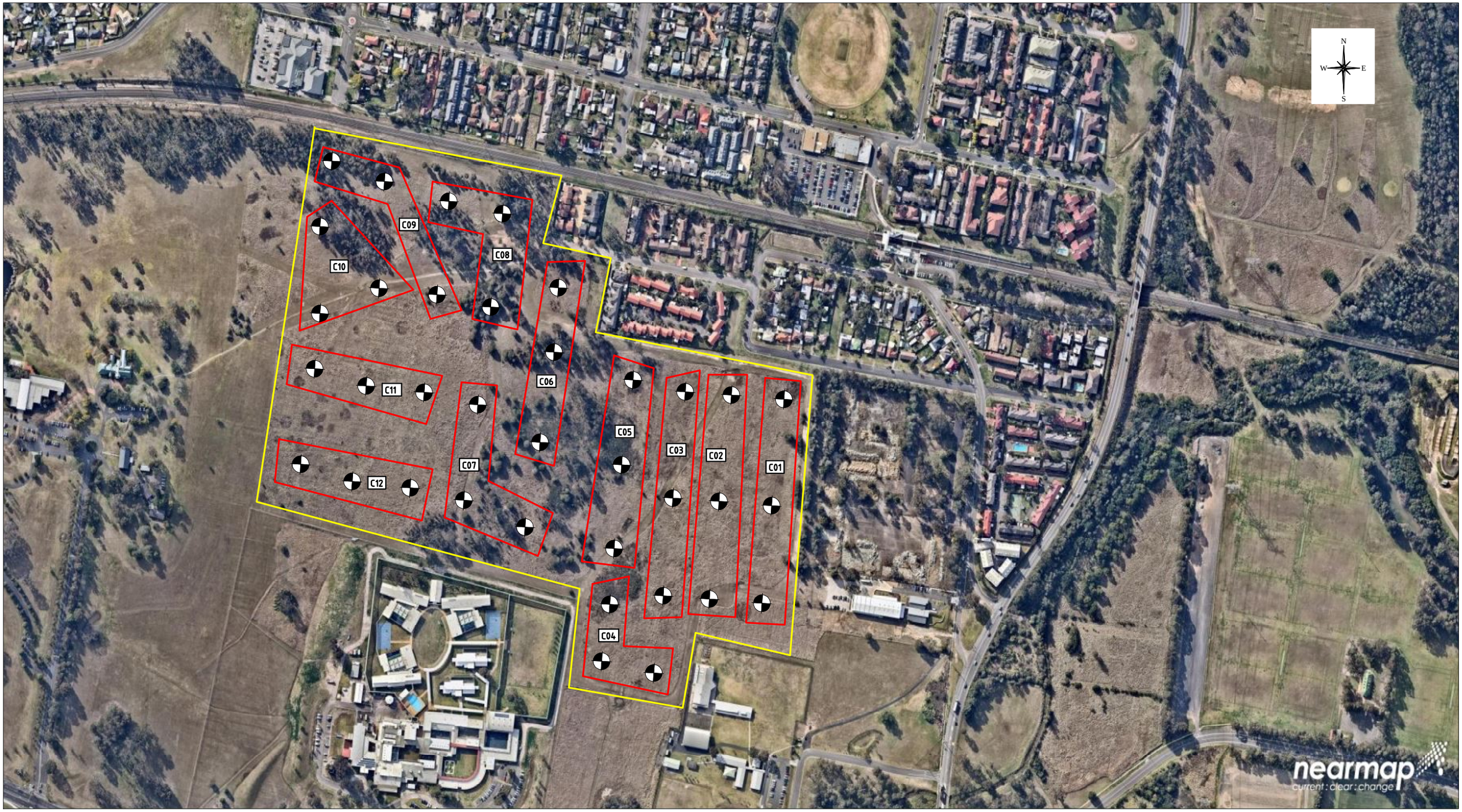
NSW EPA (2005) Contaminated Sites: Guidelines for Assessing Former Orchards and Market Gardens

NSW EPA (1995) *Sampling Design Guidelines.*

NSW OEH (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*.

SEPP *55 Remediation of Land.*

10 Attachment A – Site Plans



KEY

C04 SURFACE SAMPLING LOCATION
COMPOSITE SAMPLE IDENTIFER

APPROXIMATE SITE BOUNDARY

Martens & Associates Pty Ltd ABN 85 070 240 890		**Environment | Water | Wastewater | Geotechnical | Civil | Management**	
Drawn:	BM	**Composite Testing Locations** **South Werrington Urban Village** **16 Chapman Street, Werrington, NSW**	Drawing No./ID: **Figure 1**
Approved:	JF		
Date:	27.10.2015		
Scale @A3:	NA	Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 Email: mail@martens.com.au Internet: http://www.martens.com.au	Project: P1504996 | File: JD01V01 | Revision: A

KEY

TP201 APPROXIMATE TESTPIT LOCATION

APPROXIMATE SITE BOUNDARY

Martens & Associates Pty Ltd ABN 85 070 240 890		**Environment | Water | Wastewater | Geotechnical | Civil | Management**			
Drawn:	BM	**Testpit Locations** **South Werrington Urban Village** **16 Chapman Street, Werrington, NSW**	Drawing No./ID: **Figure 2**		
Approved:	JF				
Date:	27.10.2015				
Scale @A3:	NA	Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 Email: mail@martens.com.au Internet: http://www.martens.com.au	Project: P1504996	File: JD01V01	Revision: A

11 Attachment B – Laboratory Summary Tables

	Lead	Metals						
	Lead	Arsenic	Cadmium	Chromium (III+VI)	Copper	Mercury	Nickel	Zinc
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	1	4	0.4	1	1	0.1	1	1
NEPM 2013 Table 1A(1) HILs Res A Soil	300	100	20	-	6000	40	400	7400
NEPM 2013 Table 1A(1) HILs Res A Soil (Composite Values)	100	33	6	-	2000	13	133	2467
NEPM 2013 EIL	1100	100	-	-	100	-	60	210
NEPM 2013 EIL (Composite Values)	366	33	-	-	33	-	20	70

Field_ID	LocCode	Sample_Depth_Range	Sampled_Date-Time	Matrix_Description								
4996/TP201	4996/TP201	0.5	7/10/2015		10	4	<0.4	20	12	<0.1	5	10
4996/TP202	4996/TP202	0.15	7/10/2015		29	6	<0.4	20	11	<0.1	5	53
4996/TP203	4996/TP203	0.15	7/10/2015		31	7	<0.4	20	14	<0.1	7	43
4996/TP204	4996/TP204	0.15	7/10/2015		28	11	<0.4	24	25	<0.1	6	34
4996/TP207	4996/TP207	0.15	7/10/2015		29	7	<0.4	20	14	<0.1	7	32
4996/TP208	4996/TP208	0.15	7/10/2015		15	5	<0.4	18	10	<0.1	7	15
4996/TP210	4996/TP210	0.15	7/10/2015		24	7	<0.4	23	8	<0.1	5	22
4996/TP212	4996/TP212	0.15	7/10/2015		25	10	<0.4	35	13	<0.1	8	19
C1	C1	0.1	7/10/2015		33	6	<0.4	19	11	<0.1	5	44
C10	C10	0.1	7/10/2015		21	7	<0.4	15	26	<0.1	12	49
C11	C11	0.1	7/10/2015		22	8	<0.4	16	24	<0.1	16	45
C12	C12	0.1	7/10/2015		24	8	<0.4	19	14	<0.1	10	27
C2	C2	0.1	7/10/2015		24	8	<0.4	32	9	<0.1	6	30
C3	C3	0.1	7/10/2015		22	9	<0.4	18	22	<0.1	12	54
C4	C4	0.1	7/10/2015		18	<4	<0.4	16	8	<0.1	5	19
C5	C5	0.1	7/10/2015		19	5	<0.4	16	14	<0.1	7	33
C6	C6	0.1	7/10/2015		29	9	<0.4	36	10	<0.1	7	25
C7	C7	0.1	7/10/2015		25	8	<0.4	23	14	<0.1	8	28
C8	C8	0.1	7/10/2015		33	16	<0.4	21	32	<0.1	8	43
C9	C9	0.1	7/10/2015		24	8	<0.4	19	20	<0.1	11	38

Statistical Summary

Number of Results	20	20	20	20	20	20	20	20
Number of Detects	20	19	0	20	20	0	20	20
Minimum Concentration	10	<4	<0.4	15	8	<0.1	5	10
Minimum Detect	10	4	ND	15	8	ND	5	10
Maximum Concentration	33	16	<0.4	36	32	<0.1	16	54
Maximum Detect	33	16	ND	36	32	ND	16	54
Average Concentration	24	7.6	0.2	22	16	0.05	7.9	33
Median Concentration	24	7.5	0.2	20	14	0.05	7	32.5
Standard Deviation	5.9	2.9	0	6.1	6.9	0	3	13
Number of Guideline Exceedances	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0

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	BTEX						PAH/Phenols															Polychlorinated Biphenyls							TPH						
	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	C6-C10 less BTEX (F1)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Carcinogenic PAHs (as B(a)P TPE)	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	C10-C16	C16-C34	C34-C40	F2-NAPHTHALENE	C6 - C9	C10 - C14	C15 - C28
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.2	1	0.5	2	1	25	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	50	100	100	50	25	50	100
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Clay																																				
0-1m	0.7	NL	480			50														5												280			
1-2m	1	NL	NL			90														NL												NL			
2-4m	2	NL	NL			150														NL												NL			
>4m	3	NL	NL			290														NL												NL			
NEPM 2013 Table 1B(6) ESLs for Urban Res, Fine Soil	65		105			180																								1300	5600	120			
0-2m		125									0.7																								
NEPM 2013 Table 1B(7) Management Limits Comm / Ind, Coarse Soil																														1000	5000	10000				

Field_ID	LocCode	Sample_Depth_Range	Sampled_Date-Time	Matrix_Description																																	
4996/TP201	4996/TP201	0.5	7/10/2015		<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100
4996/TP202	4996/TP202	0.15	7/10/2015		<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100
4996/TP203	4996/TP203	0.15	7/10/2015		<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100
4996/TP204	4996/TP204	0.15	7/10/2015		<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100
4996/TP207	4996/TP207	0.15	7/10/2015		<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100
4996/TP208	4996/TP208	0.15	7/10/2015		<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100
4996/TP210	4996/TP210	0.15	7/10/2015		<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100
4996/TP212	4996/TP212	0.15	7/10/2015		<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100

Statistical Summary

Number of Results	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.2	<1	<0.5	<2	<1	<25	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<50	<100	<100	<50	<25	<50	<100
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.1	0.5	0.25	1	0.5	13	0.05	0.05	0.05	0.05	0.025	0.1	0.05	0.05	0.05	0.25	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	25	50	50	25	13	25	50
Median Concentration	0.1	0.5	0.25	1	0.5	12.5	0.05	0.05	0.05	0.05	0.025	0.1	0.05	0.05	0.05	0.25	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	25	50	50	25	12.5	25	50
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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				Organochlorine Pesticides																						Organophosphorous Pesticides													
				4,4-DDE	a-BHC	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Azinophos methyl	Bromophos-ethyl	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Ronnel
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.1	0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.1		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HILs Res A Soil							6							240					10			6		300			160											
NEPM 2013 Table 1A(1) HILs Res A Soil (Composite Values)							2							80					3			2		100			53											
Field_ID	**LocCode**	**Sample_Depth_Range**	**Sampled_Date-Time**	**Matrix_Description**																																			
4996/TP201	4996/TP201	0.5	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4996/TP202	4996/TP202	0.15	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4996/TP203	4996/TP203	0.15	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4996/TP204	4996/TP204	0.15	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4996/TP207	4996/TP207	0.15	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4996/TP208	4996/TP208	0.15	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4996/TP210	4996/TP210	0.15	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4996/TP212	4996/TP212	0.15	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C1	C1	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C10	C10	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C11	C11	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C12	C12	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C2	C2	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C3	C3	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C4	C4	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C5	C5	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C6	C6	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C7	C7	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C8	C8	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
C9	C9	0.1	7/10/2015		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Statistical Summary																																							
Number of Results				20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Number of Detects				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration				<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Minimum Detect				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration				<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Maximum Detect				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration				0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Median Concentration				0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Standard Deviation				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

12 Attachment C – Laboratory Analytical Certificates and Chain of Custody Documentation

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CERTIFICATE OF ANALYSIS 135605

Client:

Martens & Associates Pty Ltd
Suite 201, 20 George St
Hornsby
NSW 2077

Attention: Ben McGiffin

Sample log in details:

Your Reference:	**P1504996COC01V01, South Werrington**
No. of samples:	82 Soils
Date samples received / completed instructions received	08/10/2015 / 08/10/2015

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:	15/10/15 / 13/10/15
Date of Preliminary Report:	Not Issued

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

Results Approved By:

Jacinta Hurst
Laboratory Manager

ACCREDITED FOR TECHNICAL COMPETENCE

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	135605-52	135605-56	135605-59	135605-61	135605-63
Your Reference	----------	4996/TP201	4996/TP202	4996/TP203	4996/TP204	4996/TP207
Depth	----------	0.5	0.15	0.15	0.15	0.15
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	96	99	94	98	100

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	135605-65	135605-69	135605-74	135605-77	135605-78
Your Reference	----------	4996/TP208	4996/TP210	4996/TP212	TS	TS
Depth	----------	0.15	0.15	0.15	-	-
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
TRHC6 - C9	mg/kg	<25	<25	<25	[NA]	[NA]
TRHC6 - C10	mg/kg	<25	<25	<25	[NA]	[NA]
vTPHC6 - C10 less BTEX (F1)	mg/kg	<25	<25	<25	[NA]	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	99%	97%
Toluene	mg/kg	<0.5	<0.5	<0.5	98%	97%
Ethylbenzene	mg/kg	<1	<1	<1	97%	97%
m+p-xylene	mg/kg	<2	<2	<2	99%	96%
o-Xylene	mg/kg	<1	<1	<1	98%	98%
naphthalene	mg/kg	<1	<1	<1	[NA]	[NA]
Surrogate aaa-Trifluorotoluene	%	98	97	99	101	106

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	135605-52	135605-56	135605-59	135605-61	135605-63
Your Reference	----------	4996/TP201	4996/TP202	4996/TP203	4996/TP204	4996/TP207
Depth	----------	0.5	0.15	0.15	0.15	0.15
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	90	91	91	91	92

svTRH (C10-C40) in Soil				
Our Reference:	UNITS	135605-65	135605-69	135605-74
Your Reference	----------	4996/TP208	4996/TP210	4996/TP212
Depth	----------	0.15	0.15	0.15
Composite Reference		-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	09/10/2015	09/10/2015	10/10/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100
Surrogate o-Terphenyl	%	95	92	93

PAHs in Soil						
Our Reference:	UNITS	135605-52	135605-56	135605-59	135605-61	135605-63
Your Reference	----------	4996/TP201	4996/TP202	4996/TP203	4996/TP204	4996/TP207
Depth	----------	0.5	0.15	0.15	0.15	0.15
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<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 Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	93	95	95	99	99

PAHs in Soil				
Our Reference:	UNITS	135605-65	135605-69	135605-74
Your Reference	----------	4996/TP208	4996/TP210	4996/TP212
Depth	----------	0.15	0.15	0.15
Composite Reference		-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	09/10/2015	09/10/2015	09/10/2015
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	94	96	86

Organochlorine Pesticides in soil						
Our Reference:	UNITS	135605-37	135605-38	135605-39	135605-40	135605-41
Your Reference	----------	C1	C2	C3	C4	C5
Depth	----------	0.1	0.1	0.1	0.1	0.1
Composite Reference		1+2+3	4+5+6	7+8+9	10+11+12	13+14+15
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	92	94	97	98

Organochlorine Pesticides in soil						
Our Reference:	UNITS	135605-42	135605-43	135605-44	135605-45	135605-46
Your Reference	----------	C6	C7	C8	C9	C10
Depth	----------	0.1	0.1	0.1	0.1	0.1
Composite Reference		16+17+18	19+20+21	22+23+24	25+26+27	28+29+30
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	97	94	96	93

Organochlorine Pesticides in soil						
Our Reference:	UNITS	135605-47	135605-48	135605-52	135605-56	135605-59
Your Reference	----------	C11	C12	4996/TP201	4996/TP202	4996/TP203
Depth	----------	0.1	0.1	0.5	0.15	0.15
Composite Reference		31+32+33	34+35+36	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	95	95	95	94

Organochlorine Pesticides in soil						
Our Reference:	UNITS	135605-61	135605-63	135605-65	135605-69	135605-74
Your Reference	----------	4996/TP204	4996/TP207	4996/TP208	4996/TP210	4996/TP212
Depth	----------	0.15	0.15	0.15	0.15	0.15
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	94	94	96	94	96

Organophosphorus Pesticides						
Our Reference:	UNITS	135605-37	135605-38	135605-39	135605-40	135605-41
Your Reference	----------	C1	C2	C3	C4	C5
Depth	----------	0.1	0.1	0.1	0.1	0.1
Composite Reference		1+2+3	4+5+6	7+8+9	10+11+12	13+14+15
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	92	94	97	98

Organophosphorus Pesticides						
Our Reference:	UNITS	135605-42	135605-43	135605-44	135605-45	135605-46
Your Reference	----------	C6	C7	C8	C9	C10
Depth	----------	0.1	0.1	0.1	0.1	0.1
Composite Reference		16+17+18	19+20+21	22+23+24	25+26+27	28+29+30
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	97	94	96	93

Organophosphorus Pesticides						
Our Reference:	UNITS	135605-47	135605-48	135605-52	135605-56	135605-59
Your Reference	----------	C11	C12	4996/TP201	4996/TP202	4996/TP203
Depth	----------	0.1	0.1	0.5	0.15	0.15
Composite Reference		31+32+33	34+35+36	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	93	95	95	95	94

Organophosphorus Pesticides						
Our Reference:	UNITS	135605-61	135605-63	135605-65	135605-69	135605-74
Your Reference	----------	4996/TP204	4996/TP207	4996/TP208	4996/TP210	4996/TP212
Depth	----------	0.15	0.15	0.15	0.15	0.15
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	94	94	96	94	96

PCBs in Soil						
Our Reference:	UNITS	135605-52	135605-56	135605-59	135605-61	135605-63
Your Reference	----------	4996/TP201	4996/TP202	4996/TP203	4996/TP204	4996/TP207
Depth	----------	0.5	0.15	0.15	0.15	0.15
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015	10/10/2015	10/10/2015
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
Surrogate TCLMX	%	95	95	94	94	94

PCBs in Soil				
Our Reference:	UNITS	135605-65	135605-69	135605-74
Your Reference	----------	4996/TP208	4996/TP210	4996/TP212
Depth	----------	0.15	0.15	0.15
Composite Reference		-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	10/10/2015	10/10/2015	10/10/2015
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Surrogate TCLMX	%	96	94	96

Acid Extractable metals in soil						
Our Reference:	UNITS	135605-37	135605-38	135605-39	135605-40	135605-41
Your Reference	----------	C1	C2	C3	C4	C5
Depth	----------	0.1	0.1	0.1	0.1	0.1
Composite Reference		1+2+3	4+5+6	7+8+9	10+11+12	13+14+15
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Arsenic	mg/kg	6	8	9	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	19	32	18	16	16
Copper	mg/kg	11	9	22	8	14
Lead	mg/kg	33	24	22	18	19
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	6	12	5	7
Zinc	mg/kg	44	30	54	19	33

Acid Extractable metals in soil						
Our Reference:	UNITS	135605-42	135605-43	135605-44	135605-45	135605-46
Your Reference	----------	C6	C7	C8	C9	C10
Depth	----------	0.1	0.1	0.1	0.1	0.1
Composite Reference		16+17+18	19+20+21	22+23+24	25+26+27	28+29+30
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Arsenic	mg/kg	9	8	16	8	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	36	23	21	19	15
Copper	mg/kg	10	14	32	20	26
Lead	mg/kg	29	25	33	24	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	8	8	11	12
Zinc	mg/kg	25	28	43	38	49

Acid Extractable metals in soil						
Our Reference:	UNITS	135605-47	135605-48	135605-52	135605-56	135605-59
Your Reference	----------	C11	C12	4996/TP201	4996/TP202	4996/TP203
Depth	----------	0.1	0.1	0.5	0.15	0.15
Composite Reference		31+32+33	34+35+36	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Arsenic	mg/kg	8	8	4	6	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	19	20	20	20
Copper	mg/kg	24	14	12	11	14
Lead	mg/kg	22	24	10	29	31
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	16	10	5	5	7
Zinc	mg/kg	45	27	10	53	43

Acid Extractable metals in soil						
Our Reference:	UNITS	135605-61	135605-63	135605-65	135605-69	135605-74
Your Reference	----------	4996/TP204	4996/TP207	4996/TP208	4996/TP210	4996/TP212
Depth	----------	0.15	0.15	0.15	0.15	0.15
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Date analysed	-	09/10/2015	09/10/2015	09/10/2015	09/10/2015	09/10/2015
Arsenic	mg/kg	11	7	5	7	10
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	24	20	18	23	35
Copper	mg/kg	25	14	10	8	13
Lead	mg/kg	28	29	15	24	25
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	7	7	5	8
Zinc	mg/kg	34	32	15	22	19

Acid Extractable metals in soil			
Our Reference:	UNITS	135605-79	135605-82
Your Reference	----------	4996/DUP101	4996/DUP104
Depth	----------	-	-
Composite Reference		-	-
Date Sampled		7/10/2015	7/10/2015
Type of sample		Soil	Soil
Date prepared	-	09/10/2015	09/10/2015
Date analysed	-	09/10/2015	09/10/2015
Arsenic	mg/kg	5	6
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	19	22
Copper	mg/kg	11	14
Lead	mg/kg	19	16
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	6	7
Zinc	mg/kg	26	20

Moisture						
Our Reference:	UNITS	135605-37	135605-38	135605-39	135605-40	135605-41
Your Reference	----------	C1	C2	C3	C4	C5
Depth	----------	0.1	0.1	0.1	0.1	0.1
Composite Reference		1+2+3	4+5+6	7+8+9	10+11+12	13+14+15
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015
Date analysed	-	12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015
Moisture	%	13	14	17	19	26

Moisture						
Our Reference:	UNITS	135605-42	135605-43	135605-44	135605-45	135605-46
Your Reference	----------	C6	C7	C8	C9	C10
Depth	----------	0.1	0.1	0.1	0.1	0.1
Composite Reference		16+17+18	19+20+21	22+23+24	25+26+27	28+29+30
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015
Date analysed	-	12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015
Moisture	%	13	12	10	9.8	21

Moisture						
Our Reference:	UNITS	135605-47	135605-48	135605-52	135605-56	135605-59
Your Reference	----------	C11	C12	4996/TP201	4996/TP202	4996/TP203
Depth	----------	0.1	0.1	0.5	0.15	0.15
Composite Reference		31+32+33	34+35+36	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015
Date analysed	-	12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015
Moisture	%	18	24	19	12	16

Moisture						
Our Reference:	UNITS	135605-61	135605-63	135605-65	135605-69	135605-74
Your Reference	----------	4996/TP204	4996/TP207	4996/TP208	4996/TP210	4996/TP212
Depth	----------	0.15	0.15	0.15	0.15	0.15
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	9/10/2015	9/10/2015	9/10/2015	9/10/2015	9/10/2015
Date analysed	-	12/10/2015	12/10/2015	12/10/2015	12/10/2015	12/10/2015
Moisture	%	15	19	19	16	12

Moisture			
Our Reference:	UNITS	135605-79	135605-82
Your Reference	----------	4996/DUP101	4996/DUP104
Depth	----------	-	-
Composite Reference		-	-
Date Sampled		7/10/2015	7/10/2015
Type of sample		Soil	Soil
Date prepared	-	9/10/2015	9/10/2015
Date analysed	-	12/10/2015	12/10/2015
Moisture	%	11	21

Asbestos ID - soils						
Our Reference:	UNITS	135605-52	135605-56	135605-59	135605-61	135605-63
Your Reference	----------	4996/TP201	4996/TP202	4996/TP203	4996/TP204	4996/TP207
Depth	----------	0.5	0.15	0.15	0.15	0.15
Composite Reference		-	-	-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	13/10/2015	13/10/2015	13/10/2015	13/10/2015	13/10/2015
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 45g	Approx. 35g
Sample Description	-	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils				
Our Reference:	UNITS	135605-65	135605-69	135605-74
Your Reference	----------	4996/TP208	4996/TP210	4996/TP212
Depth	----------	0.15	0.15	0.15
Composite Reference		-	-	-
Date Sampled		7/10/2015	7/10/2015	7/10/2015
Type of sample		Soil	Soil	Soil
Date analysed	-	13/10/2015	13/10/2015	13/10/2015
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 35g
Sample Description	-	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks	Brown coarse grain soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'TEQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'TEQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-1	09/10/2015
Date analysed	-			10/10/2015	135605-52	10/10/2015 || 10/10/2015	LCS-1	10/10/2015
TRHC6 - C9	mg/kg	25	Org-016	<25	135605-52	<25 || <25	LCS-1	103%
TRHC6 - C10	mg/kg	25	Org-016	<25	135605-52	<25 || <25	LCS-1	103%
Benzene	mg/kg	0.2	Org-016	<0.2	135605-52	<0.2 || <0.2	LCS-1	97%
Toluene	mg/kg	0.5	Org-016	<0.5	135605-52	<0.5 || <0.5	LCS-1	104%
Ethylbenzene	mg/kg	1	Org-016	<1	135605-52	<1 || <1	LCS-1	103%
m+p-xylene	mg/kg	2	Org-016	<2	135605-52	<2 || <2	LCS-1	106%
o-Xylene	mg/kg	1	Org-016	<1	135605-52	<1 || <1	LCS-1	106%
naphthalene	mg/kg	1	Org-014	<1	135605-52	<1 || <1	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	91	135605-52	96 || 97 || RPD: 1	LCS-1	105%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-1	09/10/2015
Date analysed	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-1	09/10/2015
TRHC10 - C14	mg/kg	50	Org-003	<50	135605-52	<50 || <50	LCS-1	130%
TRHC15 - C28	mg/kg	100	Org-003	<100	135605-52	<100 || <100	LCS-1	114%
TRHC29 - C36	mg/kg	100	Org-003	<100	135605-52	<100 || <100	LCS-1	116%
TRH>C10-C16	mg/kg	50	Org-003	<50	135605-52	<50 || <50	LCS-1	130%
TRH>C16-C34	mg/kg	100	Org-003	<100	135605-52	<100 || <100	LCS-1	114%
TRH>C34-C40	mg/kg	100	Org-003	<100	135605-52	<100 || <100	LCS-1	116%
Surrogate o-Terphenyl	%		Org-003	100	135605-52	90 || 90 || RPD: 0	LCS-1	115%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-1	09/10/2015
Date analysed	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-1	09/10/2015
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	LCS-1	102%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	LCS-1	108%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	LCS-1	105%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	LCS-1	92%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	LCS-1	94%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	LCS-1	92%
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	135605-52	<0.2 || <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	135605-52	<0.05 || <0.05	LCS-1	116%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012 subset	94	135605-52	93 || 100 || RPD: 7	LCS-1	110%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-1	09/10/2015
Date analysed	-			10/10/2015	135605-52	10/10/2015 || 10/10/2015	LCS-1	10/10/2015
HCB	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	101%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	88%
Heptachlor	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	90%
delta-BHC	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	92%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	90%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	87%
Dieldrin	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	119%
Endrin	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	105%
pp-DDD	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	97%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	LCS-1	102%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-005	99	135605-52	95 || 95 || RPD: 0	LCS-1	118%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-1	09/10/2015
Date analysed	-			10/10/2015	135605-52	10/10/2015 || 10/10/2015	LCS-1	10/10/2015
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	LCS-1	96%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	LCS-1	98%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	LCS-1	107%
Dimethoate	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	LCS-1	101%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	LCS-1	120%
Malathion	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	LCS-1	129%
Parathion	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	LCS-1	72%
Ronnel	mg/kg	0.1	Org-008	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-008	99	135605-52	95 || 95 || RPD: 0	LCS-1	118%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-1	09/10/2015
Date analysed	-			10/10/2015	135605-52	10/10/2015 || 10/10/2015	LCS-1	10/10/2015
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	135605-52	<0.1 || <0.1	LCS-1	108%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	135605-52	<0.1 || <0.1	[NR]	[NR]
Surrogate TCLMX	%		Org-006	99	135605-52	95 || 95 || RPD: 0	LCS-1	118%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-4	09/10/2015
Date analysed	-			09/10/2015	135605-52	09/10/2015 || 09/10/2015	LCS-4	09/10/2015
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	135605-52	4 || 5 || RPD: 22	LCS-4	105%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	135605-52	<0.4 || <0.4	LCS-4	98%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	135605-52	20 || 22 || RPD: 10	LCS-4	102%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	135605-52	12 || 12 || RPD: 0	LCS-4	106%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	135605-52	10 || 11 || RPD: 10	LCS-4	103%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	135605-52	<0.1 || <0.1	LCS-4	91%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	135605-52	5 || 6 || RPD: 18	LCS-4	99%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	135605-52	10 || 10 || RPD: 0	LCS-4	100%

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	135605-74	09/10/2015 || 09/10/2015
Date analysed	-	135605-74	10/10/2015 || 10/10/2015
TRHC$_6$ - C$_9$	mg/kg	135605-74	<25 || <25
TRHC$_6$ - C$_{10}$	mg/kg	135605-74	<25 || <25
Benzene	mg/kg	135605-74	<0.2 || <0.2
Toluene	mg/kg	135605-74	<0.5 || <0.5
Ethylbenzene	mg/kg	135605-74	<1 || <1
m+p-xylene	mg/kg	135605-74	<2 || <2
o-Xylene	mg/kg	135605-74	<1 || <1
naphthalene	mg/kg	135605-74	<1 || <1
Surrogate aaa-Trifluorotoluene	%	135605-74	99 || 95 || RPD: 4

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	135605-74	09/10/2015 || 09/10/2015
Date analysed	-	135605-74	10/10/2015 || 10/10/2015
TRHC$_{10}$ - C$_{14}$	mg/kg	135605-74	<50 || <50
TRHC$_{15}$ - C$_{28}$	mg/kg	135605-74	<100 || <100
TRHC$_{29}$ - C$_{36}$	mg/kg	135605-74	<100 || <100
TRH>C$_{10}$-C$_{16}$	mg/kg	135605-74	<50 || <50
TRH>C$_{16}$-C$_{34}$	mg/kg	135605-74	<100 || <100
TRH>C$_{34}$-C$_{40}$	mg/kg	135605-74	<100 || <100
Surrogate o-Terphenyl	%	135605-74	93 || 94 || RPD: 1

QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	135605-74	09/10/2015 || 09/10/2015
Date analysed	-	135605-74	09/10/2015 || 09/10/2015
Naphthalene	mg/kg	135605-74	<0.1 || <0.1
Acenaphthylene	mg/kg	135605-74	<0.1 || <0.1
Acenaphthene	mg/kg	135605-74	<0.1 || <0.1
Fluorene	mg/kg	135605-74	<0.1 || <0.1
Phenanthrene	mg/kg	135605-74	<0.1 || <0.1
Anthracene	mg/kg	135605-74	<0.1 || <0.1
Fluoranthene	mg/kg	135605-74	<0.1 || <0.1
Pyrene	mg/kg	135605-74	<0.1 || <0.1
Benzo(a)anthracene	mg/kg	135605-74	<0.1 || <0.1
Chrysene	mg/kg	135605-74	<0.1 || <0.1
Benzo(b,j+k)fluoranthene	mg/kg	135605-74	<0.2 || <0.2
Benzo(a)pyrene	mg/kg	135605-74	<0.05 || <0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	135605-74	<0.1 || <0.1
Dibenzo(a,h)anthracene	mg/kg	135605-74	<0.1 || <0.1
Benzo(g,h,i)perylene	mg/kg	135605-74	<0.1 || <0.1
Surrogate p-Terphenyl-d14	%	135605-74	86 || 84 || RPD: 2

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	135605-74	09/10/2015 || 09/10/2015
Date analysed	-	135605-74	10/10/2015 || 10/10/2015
HCB	mg/kg	135605-74	<0.1 || <0.1
alpha-BHC	mg/kg	135605-74	<0.1 || <0.1
gamma-BHC	mg/kg	135605-74	<0.1 || <0.1
beta-BHC	mg/kg	135605-74	<0.1 || <0.1
Heptachlor	mg/kg	135605-74	<0.1 || <0.1
delta-BHC	mg/kg	135605-74	<0.1 || <0.1
Aldrin	mg/kg	135605-74	<0.1 || <0.1
Heptachlor Epoxide	mg/kg	135605-74	<0.1 || <0.1
gamma-Chlordane	mg/kg	135605-74	<0.1 || <0.1
alpha-chlordane	mg/kg	135605-74	<0.1 || <0.1
Endosulfan I	mg/kg	135605-74	<0.1 || <0.1
pp-DDE	mg/kg	135605-74	<0.1 || <0.1
Dieldrin	mg/kg	135605-74	<0.1 || <0.1
Endrin	mg/kg	135605-74	<0.1 || <0.1
pp-DDD	mg/kg	135605-74	<0.1 || <0.1
Endosulfan II	mg/kg	135605-74	<0.1 || <0.1
pp-DDT	mg/kg	135605-74	<0.1 || <0.1
Endrin Aldehyde	mg/kg	135605-74	<0.1 || <0.1
Endosulfan Sulphate	mg/kg	135605-74	<0.1 || <0.1
Methoxychlor	mg/kg	135605-74	<0.1 || <0.1
Surrogate TCMX	%	135605-74	96 || 96 || RPD: 0

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	135605-74	09/10/2015 || 09/10/2015
Date analysed	-	135605-74	10/10/2015 || 10/10/2015
Azinphos-methyl (Guthion)	mg/kg	135605-74	<0.1 || <0.1
Bromophos-ethyl	mg/kg	135605-74	<0.1 || <0.1
Chlorpyriphos	mg/kg	135605-74	<0.1 || <0.1
Chlorpyriphos-methyl	mg/kg	135605-74	<0.1 || <0.1
Diazinon	mg/kg	135605-74	<0.1 || <0.1
Dichlorvos	mg/kg	135605-74	<0.1 || <0.1
Dimethoate	mg/kg	135605-74	<0.1 || <0.1
Ethion	mg/kg	135605-74	<0.1 || <0.1
Fenitrothion	mg/kg	135605-74	<0.1 || <0.1
Malathion	mg/kg	135605-74	<0.1 || <0.1
Parathion	mg/kg	135605-74	<0.1 || <0.1
Ronnel	mg/kg	135605-74	<0.1 || <0.1
Surrogate TCMX	%	135605-74	96 || 96 || RPD: 0

QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date extracted	-	135605-74	09/10/2015 || 09/10/2015
Date analysed	-	135605-74	10/10/2015 || 10/10/2015
Aroclor 1016	mg/kg	135605-74	<0.1 || <0.1
Aroclor 1221	mg/kg	135605-74	<0.1 || <0.1
Aroclor 1232	mg/kg	135605-74	<0.1 || <0.1
Aroclor 1242	mg/kg	135605-74	<0.1 || <0.1
Aroclor 1248	mg/kg	135605-74	<0.1 || <0.1
Aroclor 1254	mg/kg	135605-74	<0.1 || <0.1
Aroclor 1260	mg/kg	135605-74	<0.1 || <0.1
Surrogate TCLMX	%	135605-74	96 || 96 || RPD: 0

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	135605-74	09/10/2015 || 09/10/2015	LCS-5	09/10/2015
Date analysed	-	135605-74	09/10/2015 || 09/10/2015	LCS-5	09/10/2015
Arsenic	mg/kg	135605-74	10 || 11 || RPD: 10	LCS-5	106%
Cadmium	mg/kg	135605-74	<0.4 || <0.4	LCS-5	100%
Chromium	mg/kg	135605-74	35 || 45 || RPD: 25	LCS-5	102%
Copper	mg/kg	135605-74	13 || 13 || RPD: 0	LCS-5	106%
Lead	mg/kg	135605-74	25 || 27 || RPD: 8	LCS-5	100%
Mercury	mg/kg	135605-74	<0.1 || <0.1	LCS-5	89%
Nickel	mg/kg	135605-74	8 || 9 || RPD: 12	LCS-5	98%
Zinc	mg/kg	135605-74	19 || 20 || RPD: 5	LCS-5	99%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	LCS-6	09/10/2015
Date analysed	-	[NT]	[NT]	LCS-6	09/10/2015
Arsenic	mg/kg	[NT]	[NT]	LCS-6	104%
Cadmium	mg/kg	[NT]	[NT]	LCS-6	98%
Chromium	mg/kg	[NT]	[NT]	LCS-6	100%
Copper	mg/kg	[NT]	[NT]	LCS-6	105%
Lead	mg/kg	[NT]	[NT]	LCS-6	99%
Mercury	mg/kg	[NT]	[NT]	LCS-6	94%
Nickel	mg/kg	[NT]	[NT]	LCS-6	98%
Zinc	mg/kg	[NT]	[NT]	LCS-6	100%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	135605-56	09/10/2015
Date analysed	-	[NT]	[NT]	135605-56	10/10/2015
HCB	mg/kg	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	[NT]	[NT]	135605-56	98%
gamma-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	[NT]	[NT]	135605-56	84%
Heptachlor	mg/kg	[NT]	[NT]	135605-56	84%
delta-BHC	mg/kg	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	[NT]	[NT]	135605-56	89%
Heptachlor Epoxide	mg/kg	[NT]	[NT]	135605-56	86%
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]	135605-56	85%
Dieldrin	mg/kg	[NT]	[NT]	135605-56	116%
Endrin	mg/kg	[NT]	[NT]	135605-56	100%
pp-DDD	mg/kg	[NT]	[NT]	135605-56	94%
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]	135605-56	87%
Methoxychlor	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	135605-56	94%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	135605-56	09/10/2015
Date analysed	-	[NT]	[NT]	135605-56	10/10/2015
Azinphos-methyl (Guthion)	mg/kg	[NT]	[NT]	135605-56	70%
Bromophos-ethyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	[NT]	[NT]	135605-56	91%
Chlorpyriphos-methyl	mg/kg	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	[NT]	[NT]	135605-56	96%
Dimethoate	mg/kg	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	[NT]	[NT]	135605-56	91%
Fenitrothion	mg/kg	[NT]	[NT]	135605-56	105%
Malathion	mg/kg	[NT]	[NT]	135605-56	80%
Parathion	mg/kg	[NT]	[NT]	135605-56	69%
Ronnel	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%	[NT]	[NT]	135605-56	94%
QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	135605-56	09/10/2015
Date analysed	-	[NT]	[NT]	135605-56	10/10/2015
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]	135605-56	101%
Aroclor 1260	mg/kg	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%	[NT]	[NT]	135605-56	94%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	135605-56	09/10/2015
Date analysed	-	[NT]	[NT]	135605-56	09/10/2015
Arsenic	mg/kg	[NT]	[NT]	135605-56	92%
Cadmium	mg/kg	[NT]	[NT]	135605-56	87%
Chromium	mg/kg	[NT]	[NT]	135605-56	95%
Copper	mg/kg	[NT]	[NT]	135605-56	109%
Lead	mg/kg	[NT]	[NT]	135605-56	##
Mercury	mg/kg	[NT]	[NT]	135605-56	92%
Nickel	mg/kg	[NT]	[NT]	135605-56	86%
Zinc	mg/kg	[NT]	[NT]	135605-56	109%

Report Comments:

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

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 135605-52, 56, 59, 61, 63, 65, 69, 74 were sub-sampled from jars provided by the client.

Asbestos ID was analysed by Approved Identifier: Paul Ching
Asbestos ID was authorised by Approved Signatory: Paul Ching

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
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.

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consulting engineers since 1989

SOIL ANALYSIS CHAIN OF CUSTODY FORM

Additional Testing													
Name	P1504996 – Detailed Site Assessment – South Werrington Urban Village												
Martens Contact Officer	Ben McGiffin					**Contact Email**	bmcgiffin@martens.com.au						
Sampling and Shipping	**Sample Date**	7.10.2015		**Dispatch Date**	8.10.2015		**Turnaround Time**		standard				
	Our Reference	P1504996COC01V01				**Shipping Method (X)**	**Hand**		**Post**		**Courier**	X	
	On Ice (X)		**No Ice (X)**	x	**Other (X)**								
Laboratory													
Name	EnviroLab												
Sample Delivery Address	12 Ashley Street, Chatswood												
Delivery Contact	**Name**	Aileen		**Phone**	9910 6200	**Fax**		**Email**	ahie@envirolabservices.com.au				
Please Send Report By (X)	**Post**		**Fax**		**Email**	X	**Reporting Email Address**	bmcgiffin@martens.com.au jfulton@martens.com.au					

	Sample ID	Composite		Sample ID	Composite
1	4996/SS01/0.1	C1	19	4996/SS19/0.1	C7
2	4996/SS02/0.1		20	4996/SS20/0.1	
3	4996/SS03/0.1		21	4996/SS21/0.1	
4	4996/SS04/0.1	C2	22	4996/SS22/0.1	C8
5	4996/SS05/0.1		23	4996/SS23/0.1	
6	4996/SS06/0.1		24	4996/SS24/0.1	
7	4996/SS07/0.1	C3	25	4996/SS25/0.1	C9
8	4996/SS08/0.1		26	4996/SS26/0.1	
9	4996/SS09/0.1		27	4996/SS27/0.1	
10	4996/SS10/0.1	C4	28	4996/SS28/0.1	C10
11	4996/SS11/0.1		29	4996/SS29/0.1	
12	4996/SS12/0.1		30	4996/SS30/0.1	
13	4996/SS13/0.1	C5	31	4996/SS31/0.1	C11
14	4996/SS14/0.1		32	4996/SS32/0.1	
15	4996/SS15/0.1		33	4996/SS33/0.1	
16	4996/SS16/0.1	C6	34	4996/SS34/0.1	C12
17	4996/SS17/0.1		35	4996/SS35/0.1	
18	4996/SS18/0.1		36	4996/SS36/0.1	

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 135605

Date Received: 8/10/15
Time Received: 17:30
Received by: DF
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Head Office
Suite 201, 20 George St
Hornsby NSW 2077, Australia
Ph 02 9476 9999 **Fax** 02 9476 8767

> mail@martens.com.au
> www.martens.com.au
MARTENS & ASSOCIATES P/L
ABN 85 070 240 890 ACN 070 240 890

SOIL ANALYSIS CHAIN OF CUSTODY

	Sample ID	Depth	OCP/OPP	8 HM	Combo 6A	Hold	
37	C1	0.1	x	x			
38	C2	0.1	x	X			
39	C3	0.1	X	X			
40	C4	0.1	X	X			
41	C5	0.1	X	X			
42	C6	0.1	X	X			
43	C7	0.1	X	X			
44	C8	0.1	X	X			
45	C9	0.1	X	X			
46	C10	0.1	X	X			
47	C11	0.1	X	X			
48	C12	0.1	x	X			
49	4996/SS37/0.1	0.1				x	
50	4996/SS38/0.1	0.1				x	
51	4996/TP201/0.15	0.15					
52	4996/TP201/0.5	0.5			x		
53	4996/TP201/1.0	1.0					
54	4996/TP201/1.5	1.5					
55	4996/TP201/2.0	2.0					
56	4996/TP202/0.15	0.15			x		
57	4996/TP202/0.5	0.5					
58	4996/TP202/1.0	1.0					
59	4996/TP203/0.15	0.15			x		
60	4996/TP203/0.5	0.5					
61	4996/TP204/0.15	0.15			x		
62	4996/TP204/0.5	0.5					
63	4996/TP207/0.15	0.15			x		
64	4996/TP207/0.75	0.75					
65	4996/TP208/0.15	0.15			x		
66	4996/TP208/0.65	0.65					
67	4996/TP209/0.15	0.15					
68	4996/TP209/0.5	0.5					
69	4996/TP210/0.15	0.15			x		
70	4996/TP210/0.65 (110 on ppt)	0.65					
71	4996/TP210/1.5 (110 on ppt)	1.5					
72	4996/TP211/0.2	0.2					
73	4996/TP211/1.0	1.0					
74	4996/TP212/0.15	0.15			x		
75	4996/TP212/0.65	0.65					
76	4996/TP212/1.0	1.0					
77	TS D.F						
78	TB D.F.						

SOIL ANALYSIS CHAIN OF CUSTODY

4996/DUP101			x			
4996/DUP102					x	
4996/DUP103					x	
4996/DUP104			x			

79
80
81
82

NOTE : SOME SAMPLES JARS HAVE BEEN LABELED AS 4946/## PLEASE REPORT ALL AS 4996

13 Attachment D – Data Validation Report

DATA VALIDATION REPORT: South Werrington Urban Village :16 Chapman Steet, Werrington NSW

1. Sample Handling

	Yes	No (Comments below)
a. Were sample holding times met?	✓	
b. Were samples in proper custody between the field and reaching the laboratory?	✓	
c. Were the samples properly and adequately preserved?	✓	
d. Were the samples received by the laboratory in good condition?	✓	

COMMENTS

Sample handling is:

- ✓ **Satisfactory**
- **Partially Satisfactory**
- **Unsatisfactory**

DATA VALIDATION REPORT: South Werrington Urban Village :16 Chapman Steet, Werrington NSW

2. Precision / Accuracy Statement

	Yes	No (Comments below)
a. Was a NATA registered laboratory used?	✓	
b. Did the laboratory perform the requested tests?	✓	
c. Were laboratory methods adopted NATA endorsed?	✓	
d. Were appropriate test procedures followed?	✓	
e. Were reporting limits satisfactory?	✓	
f. Was the NATA Seal on the reports?	✓	
g. Were reports signed by an authorised person?	✓	

COMMENTS

Precision / Accuracy of the Laboratory Report:

✓ **Satisfactory**

Partially Satisfactory

Unsatisfactory

DATA VALIDATION REPORT: South Werrington Urban Village :16 Chapman Steet, Werrington NSW

3. Field Quality Assurance / Quality Control (QA/QC)

Media	Number
Soil:	20
Water:	-
Material	-

a. Number of Primary Samples analysed
(does not include duplicates)

b. Number of days of sampling: 1

c. Number and Type of QA/QC Samples analysed

	Soil	Water
Intra-Laboratory Field Duplicates	2	
Inter-Laboratory Field triplicates		
Trip Blanks	1	
Wash Blanks		
Other (Field Blanks, Spikes,Trip Blanks, etc.)	1	

Field Duplicates

	Yes	No (Comments below)
Adequate Numbers of intra-laboratory field duplicates analysed?	✓	
Adequate Numbers of inter-laboratory field duplicates analysed?	✓	
Were RPDs within Control Limits?		
i. Organics (+ 30%)	✓	
ii. Metals / Inorganics (+ 30%)		✓
iii. Nutrients (+ 50%)	N/A	

COMMENTS

RPD for metals is above ASC NEPM criteria for the following samples:

4996/TP208 and DUP101 – Zinc 53%

4996/TP204 and DUP104 – Lead 55 %

4996/TP204 and DUP 104 – Arsenic 59%

4996/TP204 and DUP 104 Copper 54%

4996/TP204 and DUP 101 Zinc 52%

These results are all below the adopted SAC and considered 'natural'variations in the fill material. These results do not impact the usability of the data set.

Summary of Quality Assurance / Quality Control (QA/QC)

QA/QC Type	Satisfactory	Partially Satisfactory	Unsatisfactory
Sample handling	✓		
Precision / Accuracy of the Laboratory Report	✓		
Field QA / QC	✓		
Laboratory Internal QA / QC	✓		

Data Usability

1. Data directly usable ✓

2. Data usable with the following corrections/modifications
   (see comment below)

3. Data not usable.

COMMENTS

14 Attachment E – Test Pit Logs

CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP201**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 2.3m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS	
E	Nil	N	M	1.0 1.1		XX		Fill: Silty CLAY - Low to medium plasticity, grey/ orange and brown, fine grained sand and gravels (5 - 10 mm, 10-20%).			E E E	0.15 0.5 1.0	- Fill 4996/TP201/0.15 - brick and tile inclusions from 0.2 m. 4996/TP201/0.5 4996/TP201/1.0	1.0
E	Nil	N	D	2.0 2.3			CL	CLAY - low to medium plasticity, grey / white, trace fine gravels.	S-F		E	1.5	- Residual 4996/TP201/1.5	2.0
				3.0 4.0 4.5				Testpit terminated at 2.3 m on clay / low strength shale.						3.0 4.0 4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
Y USCS
N Agricultural

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

martens
MARTENS & ASSOCIATES PTY LTD
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Hornsby, NSW 2077 Australia
Phone: (02) 9476 9999 Fax: (02) 9476 8767
mail@martens.com.au WEB: http://www.martens.com.au

Engineering Log - Excavation

Quality Sheet No. 4

CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP202**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.4 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS	
E	Nil	N	M	0.3		XX		Fill: Silty CLAY - Low to medium plasticity, dark brown/brown, with fine grained sand and gravels (5-10 mm, 10-20%).			E	0.15	- Fill 4996/TP202/0.15 - Brick and tile inclusions.	
E	Nil	N	D	0.5 1.0 1.4		CL		CLAY - low to medium plasticity, grey / white, trace fine gravels.	S-F		E E	0.5 1.0	- Residual 4996/TP202/0.5 4996/TP202/1.0	1.0
				2.0 2.5 3.0 4.0 4.5				Testpit terminated at 1.4m on clay/low strength shale.						2.0 3.0 4.0 4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
Y USCS
N Agricultural

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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Engineering Log - Excavation

CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP203**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.0 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS	
E	Nil	N	M	0.3			XX	Fill: Silty CLAY - Low to medium plasticity, dark brown/brown, with fine grained sand and gravels (5-10 mm, 10-20%).			E	0.15	- Fill 4996/TP203 /0.15 - Brick and tile inclusions.	
E	Nil	N	D	1.0			CL	CLAY - low to medium plasticity, grey / white, trace fine gravels.	S-F		E	0.5	- Residual 4996/TP203 /0.5	1.0
				2.0				Testpit terminated at 1.0m on clay.						2.0
				3.0										3.0
				4.0										4.0
				4.5										4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
Y USCS
N Agricultural

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

Quality Sheet No. 4

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Engineering Log - Excavation

CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP204**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.1 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS	
E	Nil	N	M	0.3			XX	Fill: Silty CLAY - Low to medium plasticity, dark brown/brown, with fine grained sand and gravels (5-10 mm, 10-20%).			E	0.15	- Fill 4996/TP204 /0.15 - Brick and tile inclusions.	
E	Nil	N	D	1.0 1.1			CL	CLAY - low to medium plasticity, grey / white, trace fine gravels.	S-F		E	0.5	- Residual 4996/TP204 /0.5	1.0
				2.0				Testpit terminated at 1.1m on clay.						2.0
				3.0										3.0
				4.0										4.0
				4.5										4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
Y USCS
N Agricultural

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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Engineering Log - Excavation

CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP205**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.1 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS
E	Nil	N	M	0.2			OL	Silty SAND - Fine grained, light brown/brown.					- Topsoil
E	Nil	N	M	0.4			CL	Silty CLAY - Low to medium plasticity, light brown.	S-F				- Residual
E	Nil	N	D	1.0 1.1			CL	CLAY - Low to medium plasticity, grey/white, trace fine gravels.	S-F				- Residual 1.0
				2.0				Testpit terminated at 1.1m on clay.					2.0
				3.0									3.0
				4.0									4.0
				4.5									4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
Y USCS
N Agricultural

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP206**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.0 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS
E	Nil	N	M	0.2			OL	Silty SAND - Fine grained, light brown/brown.					- Topsoil
E	Nil	N	M	0.4			CL	Silty CLAY - Low to medium plasticity, light brown.	S-F				- Residual
E	Nil	N	D	0.5 1.0			CL	CLAY - Low to medium plasticity, grey/white, trace fine gravels.	S-F				- Residual 1.0
				2.0				Testpit terminated at 1.0 m on clay.					2.0
				3.0									3.0
				4.0									4.0
				4.5									4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
Y USCS
N Agricultural

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP207**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.0 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS	
E	Nil	N	M	0.5			XX	Fill: Silty CLAY - Low to medium plasticity, dark brown/brown, with fine grained sand and gravels (5-10 mm, 10-20%).			E	0.15	- Fill 4996/TP207/0.15 - Brick and tile inclusions.	
E	Nil	N	D	1.0 1.2			CL	CLAY - low to medium plasticity, grey / white, trace fine gravels.	S-F		E	0.75	- Residual 4996/TP207/0.75	1.0
				2.0				Testpit terminated at 1.2m on clay.						2.0
				3.0										3.0
				4.0										4.0
				4.5										4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
Y USCS
N Agricultural

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CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP208**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.7 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS	
E	Nil	N	M	0.5		XX		Fill: Silty CLAY - Low to medium plasticity, dark brown/brown, with fine grained sand and gravels (5-10 mm, 10-20%).			E	0.15	- Fill 4996/TP208/0.15 - Brick and tile inclusions.	
E	Nil	N	D	1.0 1.2		CL		CLAY - low to medium plasticity, grey / white, trace fine gravels.	S-F		E	0.65	- Residual 4996/TP208/0.65	1.0
E	Nil	N	D	1.7				SHALE - very low strength, light brown/ grey.					- Residual	
				2.0 3.0 4.0 4.5				Testpit terminated at 1.7m on very low strength shale.						2.0 3.0 4.0 4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
Y USCS
N Agricultural

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

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Engineering Log - Excavation

CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP209**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.1 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING		
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS
E	Nil	N	M	0.2			OL	Silty SAND - Fine grained, light brown/brown.			E	0.15	4996/TP209/0.15 - Topsoil
E	Nil	N	D	0.5 0.6			CL	Silty CLAY - Low to medium plasticity, light brown.	S-F		E	0.5	4996/TP209/0.5 - Residual
E	Nil	N	D	1.0 1.1			CL	CLAY - Low to medium plasticity, grey / white, trace fine gravels.	S-F				- Residual 1.0
				2.0				Testpit terminated at 1.1m on clay.					2.0
				3.0									3.0
				4.0									4.0
				4.5									4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
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Engineering Log - Excavation

CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP210**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 2.3 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS	
E	Nil	N	M	0.5			XX	Fill: Silty CLAY - Low to medium plasticity, dark brown/brown, with fine grained sand and gravels (5-10 mm, 10-20%).			E	0.15	- Fill 4996/TP210 /0.15 - Brick and tile inclusions.	
E	Nil	N	D	1.0 1.1			CL	CLAY - low to medium plasticity, grey /brown.	S-F		E	0.65	- Residual 4996/TP210/0.65	1.0
E	Nil	N	D	2.0 2.3				SHALE - very low strength, light brown/ grey.			E	1.5	- Weathered rock 4996/TP210/1.5	2.0
				3.0 4.0 4.5				Testpit terminated at 2.3 m on very low strength shale.						3.0 4.0 4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

pp Pocket penetrometer
S Standard penetration test
VS Vane shear
DCP Dynamic cone penetrometer
FD Field density
WS Water sample

CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION
Y USCS
N Agricultural

EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS

Quality Sheet No. 4

martens
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CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP211**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.1 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS	
E	Nil	N	M	0.5			XX	Fill: Silty CLAY - Low to medium plasticity, dark brown/brown, with fine grained sand and gravels (5-10 mm, 10-20%).			E	0.15	- Fill 4996/TP211 /0.15 - Brick and tile inclusions.	
E	Nil	N	D	1.0 1.1			CL	CLAY - low to medium plasticity, grey /brown.	S-F		E	1.0	- Residual 4996/TP211/1.0	1.0
				2.0				Testpit terminated at 1.1m on Clay.						2.0
				3.0										3.0
				4.0										4.0
				4.5										4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
VL Very Loose
L Loose
MD Medium Dense
D Dense
VD Very Dense

SAMPLING & TESTING
A Auger sample
B Bulk sample
U Undisturbed sample
D Disturbed sample
M Moisture content
Ux Tube sample (x mm)
E Environmental sample

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Engineering Log - Excavation

CLIENT	**Universal Property Group Pty Ltd**	**COMMENCED**	7.10.15	**COMPLETED**	7.10.15	**REF**	**TP212**
PROJECT	**Detailed SIte Investigation**	**LOGGED**	BM	**CHECKED**	JF	**Sheet**	**1 of 1**
SITE	**South Werrington Urban Village**	**GEOLOGY**	Bringelly Shale	**VEGETATION**	Grass	**PROJECT NO.**	P1504996
EQUIPMENT	5 Tonne excavator	**EASTING**	-	**RL SURFACE**	-		
EXCAVATION DIMENSIONS	600mm X 1.5 m depth	**NORTHING**	-	**ASPECT**	East	**SLOPE**	<5%

EXCAVATION DATA						MATERIAL DATA					SAMPLING & TESTING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	DRILLING RESISTANCE (L M H R)	GRAPHIC LOG	CLASSIFICATION	MATERIAL DESCRIPTION SOIL NAME, plasticity or particle characteristics, colour, secondary and minor components, moisture condition, consistency/relative density, ROCK NAME, grain size, texture/fabric, colour, strength, weathering.	CONSISTENCY	DENSITY INDEX	TYPE	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS	
E	Nil	N	M	0.5			XX	Fill: Silty CLAY - Low to medium plasticity, dark brown/brown, with fine grained sand and gravels (5-10 mm, 10-20%).			E	0.15	- Fill 4996/TP212 /0.15 - Brick and tile inclusions.	
E	Nil	N	D	1.0 1.5			CL	CLAY - low to medium plasticity, grey /brown.	S-F		E E	0.65 1.0	- Residual 4996/TP212/0.65 4996/TP212/1.0	1.0
				2.0 3.0 4.0 4.5				Testpit terminated at 1.5m on clay.						2.0 3.0 4.0 4.5

EQUIPMENT / METHOD
N Natural exposure
X Existing excavation
HA Hand auger
S Spade
CC Concrete Corer
V V-Bit
TC Tungsten Carbide Bit
E Excavator backhoe bucket

SUPPORT
SH Shoring
SC Shotcrete
RB Rock Bolts
Nil No support

WATER
N None observed
X Not measured
Water level
Water outflow
Water inflow

MOISTURE
D Dry
M Moist
W Wet
Wp Plastic limit
Wl Liquid limit

PENETRATION
L Low
M Moderate
H High
R Refusal

CONSISTENCY
VS Very Soft
S Soft
F Firm
St Stiff
VSt Very Stiff
H Hard
F Friable

DENSITY
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Engineering Log - Excavation