Precise Planning

# Detailed Site Investigation: 45 Noongah Street and 25 Gwynn Hughes Road, Bargo, NSW.



ENVIRONMENTAL



WATER



WASTEWATER



GEOTECHNICAL



CIVIL



PROJECT MANAGEMENT



P1504816JR06V01 January 2017

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## 1 Introduction

### 1.1 Overview

This report prepared by Martens and Associates (MA), for Precise Planning documents a Detailed Site Investigation (DSI) completed for 45 Noongah Street and 25 Gwynn Hughes Road, Bargo, NSW (the site).

A Preliminary Site Investigation (PSI) was completed by MA (MA, 2015) and should be read in conjunction with this report.

#### 1.2 Objectives

The objectives of the DSI is to investigate data gaps noted in PSI, assess site contamination status and determine suitability for site redevelopment for residential land use.

#### 1.3 Scope of Works

The scope of works includes:

- Assessment of historic information data gaps outlined in MA (2015).
- Intrusive soil investigation and soil sampling for laboratory analysis, targeting areas of environmental concern (AEC) as outlined in MA (2015).
- 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 (2005) Guidelines for Assessing Former Orchards and Market Gardens.
- NSW DEC (2006) 2<sup>nd</sup> Ed. Contaminated Sites: Guidelines for the NSW Site Auditor Scheme.



• NEPC (1999, amended 2013) National Environmental Protection Measure, (NEPM 1999, amended 2013).

#### 1.5 Abbreviations

ABC – Ambient background concentrations

ACM – Asbestos containing material

AEC – Area of environmental concern

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

BTEX – Benzene, toluene, ethyl benzene, xylene

BGL – Below ground level

CEC - Cation exchange capacity

COPC – Chemical of primary concern

CSM – Conceptual site model

DEC – NSW Department of Environment and Conservation

DQO - Data quality objectives

DP – Deposited Plan

DSI – Detailed Site Investigation

EAC - Ecological assessment criteria

EPA – NSW Environmental Protection Authority

ESA – Environmental site assessment

ESL - Ecological screening levels

HIL - Health investigation levels

HM – Heavy metals

HSL – Health screening levels

LOR – Limit of reporting

LGA – Local government area



- MA Martens and Associates Pty Ltd
- mBGL Metres below ground level
- NATA National Association of Testing Authorities
- NEPM National Environmental Protection Measure
- OCP Organochloride pesticides
- OEH NSW Office of Environment and Heritage
- OPP Organophosphate pesticides
- PACM Potential asbestos containing material
- PAH Polycyclic aromatic hydrocarbons
- PCB Polychlorinated biphenyl
- PSI Preliminary site investigation
- RAP Remediation action plan
- RPD Relative percentage difference difference between two values divided by the average
- SAC Site acceptance criteria
- SOP Standard operating procedure
- TB Trip blank
- TRH Total recoverable hydrocarbons
- TS Trip spike



# 2 Site Background Information

## 2.1 Location and Setting

Site information is summarised in Table 1.

 Table 1: Site background information.

ltem	Description/Detail
Site address	45 Noongah Street and 25 Gwynn Hughes Street, Bargo, NSW
Lot/DP	Lot 22 DP 619150 and Lot 95 DP 13116
Site area	Approximately 20.7 ha
Investigation area	Entire site
Existing site development	Both lots are rural residential properties with no existing site infrastructure
Aspect	Generally east
Typical slopes	<5 %
Existing vegetation	Lot 22 is vegetated along the watercourse corridor in the south western portion of the lot, with the remainder of the lot grassed paddock. Lot 95 is mainly vegetated
Neighbouring environments	The site is surrounded by rural residential allotments to the north and residential lots to the east. Bushland to the west and south
Local Government Area (LGA)	Wollondilly Shire Council
Drainage	Hornes Creek, which forms a major tributary of the Bargo River, bisects the site and flows in a northerly direction
	An east west orientated drainage depression, located in the eastern portion of the site, flows into Hornes Creek



Item	Description/Detail
Geology and soil landscapes	The Wollongong Port Hacking 1:100,000 Geological Series Sheet (1985) describes the geology being at the boundary of Wianamatta Group and Hawkesbury Sandstone. Wianamatta Group consisting of laminate and dark-grey siltstone. Hawkesbury Sandstone consisting of medium to coarse-grained quartz sandstone, very minor shale and laminate lenses
	The NSW Environment and Heritage eSPADE website identifies the north eastern portion of the site as having soils of the Blacktown soil landscapes consisting of shallow to moderately deep hardsetting mottled texture contrast soils, red and brown podzolic soils on crests grading to yellow podzic soils on lower slopes and in drainage lines. The remainder of the site is identified as having Lucus Heights soil landscapes consisting of moderately deep hardsetting yellow podzolic soils and yellow soloths on ridges and plateau surfaces and earthy sands in valley flats
Environmental receptors	Hornes Creek and drainage depression located in the eastern portion of the site
Human receptors	Existing surrounding residential and rural residential developments Future residents and site workers / builders

#### 2.2 Hydrogeology

Review of NSW Office of Water's Real Time groundwater database indicated one groundwater bore located within approximately 1 km of the site (Table 2).

 Table 2: Available hydrogeological information.

Groundwater Bore Identification	Distance/ Orientation From Site	Depth To Groundwater (mBGL)	Intended Use	Water Bearing Zone Substrates
GW112473	0.65km south	42.0	Irrigation	Sandstone

From review of the information in Table 2, groundwater well in the vicinity is used for irrigation purposes with groundwater levels approximately 42.0 m below ground level (mbgl). Groundwater levels are likely to be indicative of the site as site elevation and topographic units are similar; however, further investigation would be required to characterise site hydrogeology.

Groundwater was encountered in TP310 to TP315 in the western portion of the site, with measured groundwater levels ranging from 0.7 to 1.1 mbgl.



## 3 Preliminary Conceptual Site Model

### 3.1 Overview

The summary of the PSI MA (2015) has been used as the preliminary conceptual site model (CSM). Historical data gaps noted in Chapter 5 of that report are to be assessed as part of this DSI.

#### 3.2 Summary of PSI Findings

The following summarises the PSI (MA, 2015) general findings.

- Both lots are vacant with no existing site infrastructure. Sheds and dwellings on Lot 22 have recently been demolished and cleared, in accordance with DA 010.2015.00000095.001 (March 2015).
- Remains of metal and timber shed in north western portion of Lot 95.
- Development applications were approved for free range chicken farming (1987) and a chicken processing plant (1988) on Lot 22. These operations have been terminated, with all infrastructure removed sometime after February 2010.
- Former dwelling and shed construction and maintenance on both lots have the potential to have introduced contaminants in the form of asbestos (as a construction material or possible floor insulation for chicken sheds), pesticides (pest control) and heavy metals (paints, pest control). Former sheds may previously have stored fuel, oils or other chemicals, leading to hydrocarbon, OCP/OPP and heavy metal contamination.
- Localised fill importation may also have occurred during the long history of rural land use and may have introduced site contaminants. Potential fill was observed near the location of the former chicken processing plant near the western boundary of Lot 22.
- Past agricultural use, possible use of Lot 22 for irrigation of liquid waste from the chicken processing plant have potential to have caused widespread contamination with heavy metals and pesticides.
- Possible burial of solid waste for chicken processing plant.



- Coal wash with blue metal gravel (likely used as fill) near location of former chicken processing plant near the western boundary of Lot 22.
- Lot 95 is heavily vegetated. Lot 22 is primarily vegetated near the Homes Creek corridor and in the south western portion of the site. The remainder of Lot 22 is grassed.

The PSI recommended that further searches of Council and EPA (successor of SPCC) records be undertaken to determine if chicken processing plant utilised onsite waste (liquid or solid) disposal. In addition, a review of all available aerial photographs between 1987 and 1998 was recommended to be undertaken to identify any evidence of waste irrigation or burial pits.

#### 3.3 Supplementary Historical Investigation

3.3.1 Detailed Aerial Photograph Interpretation

An additional 3 aerial photographs taken of the site during 1990, 1994 and 1998 were reviewed to identify any evidence of waste irrigation or burial pits. Copies of aerial photographs are provided in Attachment C.

Photos indicate no evidence of site waste (liquid or solid) disposal.

#### 3.3.2 EPA/Council Records Search

A letter from the SPCC regarding the development application for the chicken processing plant was identified during the EPA and Council records search. The letter stated the applicant would require formal approval from the Commission under Section 17R of the State Pollution Control Commission Act for the "installation and disposal of waste water" (SPCC ref. 150.649 GD:TG) arising from the chicken processing plant. A copy of the letter is provided in Attachment D.

Investigations and requests made to NSW EPA by MA resulted in no finding of formal approval for onsite waste disposal arising from the chicken processing plant.

#### 3.4 Areas of Environmental Concern (AEC) and Contaminants of Primary Concern (COPC) Assessed During DSI Works

The PSI findings and supplementary historical investigations have identified AECs and associated COPC summarised in Table 3.



#### Table 3: Site AEC and COPC.

AEC <sup>1</sup>	Potential for Contamination	COPC	Contamination Likelihood
A – Former dwellings/ sheds	Pesticides and heavy metals may have been used underneath dwellings and/or sheds for pest control. Dwelling and/or shed construction may have included ACM and/or lead based paints. Sheds may have previously stored fuel, oils, asbestos sheeting (PACM) or pesticides.	HM, TPH, BTEX, PAH, OCP/OPP and asbestos.	Medium - high
B – Potential site filling	Fill material of unknown origin and quality.	HM, TRH, BTEX, PAH, OCP/OPP and asbestos.	Medium
C – Cleared site areas	Past agricultural use, most likely grazing.	HM and OCP/OPP.	Low
D – Lot 22	Processing plant approval notes the irrigation of liquid waste on to land is approved subject to SPCC license. No detail is available regarding this operation. Waste irrigation may have led to contamination with agricultural chemicals (primarily HM) and nutrients (which are not "contaminants" considered in a PSI).	HM.	Low (based on updated historical investigations)
E – Buried pits	DA 63/88 notes burial of solid waste may occur with written Council approval. If this occurred, there is a risk of localised contamination depending on the nature of burial waste. The scale of any such buried pits are likely to be small and shall be difficult to identify without further site evidence of location.	HM, OCP/OPP, TRH, BTEX and PAH.	Low (based on updated historical investigations)

#### 3.5 Sensitive Receptors and Exposure Pathways

Table 4 provides a summary of identified sensitive receptors and potential exposure pathways connecting receptors to identified AEC/COPC outlined in Table 3.



Recepto	br	Pathway	1
<u>Human</u>	Receptors:		
0	Future site occupants.	0	Dermal contact.
0	Site visitors.	0	Ingestion of potentially contaminated
0	Site workers during any future		soil.
	construction works.	0	Inhalation of airborne contaminants.
0	Surrounding offsite occupants.	0	Migration of pollutants via site surface
			and groundwaters.
Environr	nental Receptors		
0	Homes Creek	0	Migration of contaminated runoff.
0	Existing vegetated areas across the	0	Direct contact of soil with site flora.
	site.		
0	Vegetated or landscaped areas of		
	any future site design plans.		

 Table 4: Summary of receptors and potential pathways.

#### 3.6 Data Gaps

The PSI (MA, 2015) recommended reviewing aerial photographs between 1987 and 1998 and further searches of Council and EPA records to determine if the chicken processing plant utilised onsite waste (liquid or solid) disposal. The Council/EPA records search and aerial photograph interpretation did not find any evidence of onsite waste (liquid or solid) disposal.

Based on identified AECs, COPC and potential pathways to receptors, a soil sampling regime is recommended in potential filled areas, under all dwelling and shed footprints (plus 1 m curtilage) and possibly across other site areas to characterise potential adverse human and environmental risks which may impact the proposed development. These investigations are documented in the next chapter of this report.



# 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 contamination status of areas associated with previous structures (being chicken processing plant, dwellings and sheds).
- Investigate identified potential hotspot areas of contamination from filling, stockpiles and possible burial of solid waste.

## 4.2 Intrusive Investigation Methodology

An overview of site investigation methodology is provided in Table 5.

 Table 5: Investigation methodology.

Investigation date	10 September 2015.
Number of sampling points	20 test pits (18 test pit samples / 3 material samples / 16 asbestos in soil samples).
Investigation method	Excavator / hand spade.

Site sampling locations are presented in Figure 1, Attachment A with test pit logs provided in Attachment B.



## 4.3 Data Quality Objectives (DQO)

Data quality objectives (DQO) have been prepared as statements specifying qualitative and quantitative data required to support project decisions. DQO have been prepared in general accordance with NSW DEC (2006) and US EPA (2006) 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 with garden/accessible soil as well as open space land use. Therefore the site must be deemed suitable to accommodate proposed uses. This DSI is required to assess risk posed by potentially contaminated soil to onsite sensitive receptors.
Step 2 Identifying the Decision(s)	<ul> <li>Historical investigations have identified AECs which may be the source of contamination including site filling, stockpiles, previous structures and possible burial of solid waste. To assess the suitability of the site for future residential and open space use, decisions are to be made based on the following questions:</li> <li>Is site soil quality suitable for the intended residential and open space land use?</li> <li>Do site soils require remediation or management to prior to onsite residential land use?</li> </ul>
Step 3 Identification of Inputs to the Decision	<ul> <li>The inputs to the assessment of site soil quality will include:</li> <li>Soil sampling at nominated locations (where access is available) across the site.</li> <li>Laboratory analytical results for relevant COPC for soil.</li> <li>Assessment of analytical results against site suitable human health and ecological risk criteria.</li> </ul>
Step 4 Study Boundary Definitions	<ul> <li>Study boundaries are as follows:</li> <li>Lateral – Lateral boundary of the assessment is defined by the site boundary as indicated in Figure 1 (Attachment A).</li> <li>Vertical – Vertical boundary will be governed by the maximum depth reached during subsurface investigations.</li> </ul>
Step 5 Development of Decision Rules	The decision rule for this investigation area as follows: If the concentration of contaminants in the soils data 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.
Step 6 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 shall provide even coverage across the site (with consideration to the existing development constraints). Sampling shall attempt to ensure that critical locations are assessed, sampled, and analysed for appropriate contaminants of concern. Soil sampling locations were set using judgement across the site (access permitting).



## 4.4 Sampling Methodology and Quality Assurance / Quality Control

Test pit samples were collected from the middle of a clod of soil removed with the excavator bucket or hand spade.

Soil sampling methodology (Table 7) was completed to meet data quality objectives.

|--|

Activity	Detail / Comments
Soil logging	Test pits were logged by an experienced environmental engineer in accordance with Martens and Associates SOP.
Soil sampling	Soil sampling was completed by the supervising environmental engineer from MA. Soil samples were collected from the centre of excavator bucket or hand spade.
	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.
Soil screening	An assessment of VOC compounds with a PID was outside the scope of works
QA / QC sampling	Three duplicate samples were collected for intra-laboratory analysis. One trip blank (TB) and one trip spike (TS) sample was placed with soil samples in cooler boxes and tested by the analytical laboratory to assess potential cross contamination between samples (TB) and the loss of volatile contamination from samples (TS) during transportation.
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 laboratories under chain of custody documentation within holding times.
Decontamination of sampling equipment	Hand sampling equipment was decontaminated between sampling locations by pressurised water spray with a solution of Decon-90 <sup>TM</sup> , a phosphate-free detergent, followed by rinsing with potable water.

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

## 4.5 Laboratory Analytical Suite

The analytical suite for laboratory analysis (Table 8) was selected to address site AECs and potential COPC identified in the updated CSM (Chapter 3). Laboratory analysis was carried out by Envirolab Pty Ltd a NATA accredited laboratory. Laboratory analytical documentation is presented in Attachment F.



#### Table 8: Summary of primary laboratory analyses.

COC	Number of Samples Analysed
BTEX	15
TRH	15
РАН	15
Asbestos in soil	16
Heavy metals <sup>1</sup>	15
OCP/OPP	18

#### Note:

<sup>1</sup> 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).
- Friebel & Nadebaum (2011) HSL for petroleum hydrocarbons in soil and groundwater, part 1 technical development document.

Guideline values for individual contaminants analysed for this assessment are presented in laboratory tables in Attachment E.

Table 9 summarises the applicability of the SAC adopted for this investigation.

Table 9: 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 sand (ASC NEPM 1999, amended 2013) have been adopted. Sand has been selected as it provides the most conservative screening level values. Soil sampled from former dwelling/shed locations consisted of silty sand and topsoil material. 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.
Direct contact petroleum hydrocarbon HSL	Direct contact HSL have been adopted from Friebel & Nadebaum (2011) and provide assessment criteria for human health risk where direct contact with TPH contaminated soil is likely.



SAC	Applicability
Ecological assessment criteria (EAC)	A preliminary assessment of ecological risk has been undertaken with reference to ecological screening levels (ESL). ESL apply principally to contamination contained in the top 2m of soil. ESLs for course grained soils in urban residential and open spaces (ASC NEPM 1999, amended 2013) have been adopted as a conservative measure.
Ecological investigation levels (EILs)	Site EILs have been calculated using methodology outlined in ASC NEPM (1999, amended 2013). Added contaminant levels have been calculated using physicochemical properties of site soils (pH and CEC) from previous site laboratory testing undertaken by MA (2013) and ambient background concentrations (ABC) have been taken from Olszowy et al. (1995) for aged contamination in high traffic areas in NSW.
Asbestos in soil	Based on the preliminary nature of this assessment the 'presence/absence' of asbestos in soil has been adopted as the SAC.

### 5.2 Guideline Values for Contaminant Assessment

Guideline values used in this assessment are presented below.

#### 5.2.1 Health Investigation Levels for Soil Assessment

Table 10: Adopted health investigation levels for soil (HIL)	and laboratory detection levels
(LOR).	

Contaminant of Concern	Adopted HIL (mg/kg)	LOR (mg/kg)
Benzo(a)pyrene TEQ1	3	0.5
Arsenic (total)	100	4.0
Cadmium	20	0.5
Chromium (VI)	100	1.0
Copper	6,000	1.0
Lead	300	1.0
Mercury	40	0.1
Nickel	400	1.0
Zinc	7,400	1.0
Vinyl Chloride	0.03	1.0



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Contaminant of Concern	Adopted HIL (mg/kg)	LOR (mg/kg)
Total PAH	300	<2.55
Aldrin + Dieldrin	6	0.2
Chlordane	50	0.1
DDT+DDD+DDE	240	0.3
Heptachlor	6	0.1
PCB (total)	1	<0.7
MEK <sup>3</sup>	44	<10.0
Styrene⁴	120	<1.0
Toluene⁴	223	<0.5
Trichloroflouromethane <sup>3</sup>	5.8	<1.0
Asbestos in soil	0.01% w/w <sup>2</sup> bonded 0.001% w/w <sup>2</sup> friable asbestos No visible asbestos on soil surface	0.01% w/w

#### Notes:

<sup>1</sup> Benzo(a)pyrene TEQ – HIL is based on 8 carcinogenic PAHs and their potency relative to Benzo(a)pyrene as outlined in the NEPM (1999, amended).

<sup>2</sup>W/W – Weight for weight, e.g. 0.1g/kg would equal 0.01% w/w.

<sup>3</sup> SAC adopted from Canadian guidelines, Ministry of the Environment (2011) Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act, Table 3.

<sup>4</sup> SAC adopted from Dutch guidelines, (Esdat 2009) Dutch Soil Remediation Circular 2009, Table 1.



	0m-<1m	1m - <2m	2m - <4m	4m+	Soil Saturation Concentration (Csat)1
Toluene	160	220	310	540	560
Ethylbenzene	57	NL	NL	NL	64
Xylenes	NL	NL	NL	NL	300
Naphthalene	NL	NL	NL	NL	9
Benzene	0.5	0.5	0.5	0.5	360
F1 (C₀ – C₁₀)	44	70	110	200	950
F2 (C <sub>10</sub> – C <sub>16</sub> )	110	240	440	NL	560

## 5.2.2 Health Screening Levels for Petroleum Hydrocarbon Compounds Table 11: Residential soil HSLs for vapour intrusion in sand (mg/kg).

#### Notes:

<sup>1</sup> The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum vapour risk for the given scenario. For these scenarios, no HSL is presented and the HSL is shown as 'not limiting' or NL (NEPM, 1999 amended)

Table 12: Direct contact TPH health screening levels (HSL) and laboratory LOR.

Contaminant of Concern	Soil Criteria (mg/kg)	LOR (mg/kg)
TPH (C₀-C10)	4,400	25
TPH(C10-C16)	3,300	50
TPH (C16-C34)	4,500	100
TPH (C <sub>34</sub> – C <sub>40</sub> )	6,300	100
Benzene	100	0.2
Toluene	14,000	0.5
Ethyl benzene	4,500	1
Naphthalene	1,400	1
Xylene (total)	12,000	3



5.2.3 Ecological Screening Levels for Petroleum Hydrocarbon Compounds Table 13: TPH and BTEX ecological screening levels (ESL) (for coarse grained soil) and LOR.

Contaminant of Concern	Soil Criteria (mg/kg)	LOR (mg/kg)
F1 (C₀-C10)	180	25
F2 (C10-C16)	120	50
F3 (C16-C34)	300	100
F4 (C <sub>34</sub> - C <sub>40</sub> )	2,800	100
Benzene	50	0.2
Toluene	85	0.5
Ethyl benzene	70	1
Xylene (total)	105	3
Benzo(a)pyrene	0.7	0.1



#### 6 Results

#### 6.1 **Field Investigations**

#### 6.1.1 Sub Surface Conditions

TP313 encountered general refuse (fill) including glass bottles, metal, metal cans and wire. This area was targeted for testing as a possible waste burial pit, based on evidence from aerial photographs.

TP314 – TP316, located within the former chicken processing plant footprint, encountered the former building slab and building materials including metal beams and metal sheeting.

TP301 – TP312 and TP317, within former dwelling and shed footprints, generally encountered fill/disturbed sandy clay/clayey sand soils up to a depth of 0.6 mBGL, overlying residual clays or alluvial sands. Fill/disturbed soils typically contained building materials including tile, brick, concrete, timber, plastic and PACM fragments.

TP318 - TP320 encountered sandy clay topsoil overlying residual clay.

#### 6.2 Laboratory Analytical Results

6.2.1 Soil Analytical Results

Comparison of soil laboratory results with the relevant SAC is available in the laboratory tables in Attachment E. A summary of results is presented in Table 14.

Table 14: Summary of soil laboratory results.	
Analyte	Results Compared to SAC
Heavy metals	HILS
	All results below SAC.
	Ells
	Zinc was detected in 3 samples over the adopted SAC of 200
	mg/kg.
	4816/305/0.15 (680 mg/kg)
	4816/311/0.15 (220 mg/kg)
	4816/317/0.15 (330 mg/kg)
TPH/BTEX	HSL
	All results below SAC.
	<u>ESL</u>

. . . . . ...



Analyte	Results Compared to SAC
	All results below SAC.
	Direct Contact
	All results below SAC.
OCP/OPP	HILs All results below SAC.
РАН	HILs All results below SAC. <u>ESL</u> All results below SAC.
Asbestos in soil	Soil samples reported negative for asbestos in soil detection.

6.2.2 Material Analytical Results

Positive identification of asbestos was made in material samples **4816/306/ASB1**, **4816/306/ASB2** and **4816/312/ASB3**.



# 7 Discussion

## 7.1 Soil Contamination

A summary of identified soil contamination is as follows:

Zinc was detected over the adopted EIL (200 mg/kg) in samples 4816/305/0.15 (680 mg/kg), 4816/311/0.15 (220 mg/kg) and 4816/317/0.15 (330 mg/kg). Samples were collected at the locations of former sheds identified as AEC in MA (2015).

Zinc levels are significantly under adopted HIL (7,400 mg/kg). It is expected that elevated zinc levels are the result of previous galvanised structures/building materials associated with the shed.

## 7.2 Material Contamination

ACM was identified in test pits 309 and 312 (ASB1/0.05, ASB2/0.05 and ASB3/0.1) in the form of fibre cement sheeting fragments.

#### 7.3 Source and Extent of Material Contamination

Material samples ASB1, ASB2 and ASB3 were likely from a former shed (now demolished) which was identified as an AEC in MA (2015). There is a high likelihood of other ACM fragments within the former dwelling and shed footprints.



## 8 Conclusions and Recommendations

Identified SAC exceedances and the positive identification of ACM cement fibre sheeting identifies risks to environmental and human receptors respectively, identified in the preliminary CSM. A remediation action plan (RAP) will be required to address these contamination risks and site remediation be completed prior to residential development and use.

We consider that the site can be readily made suitable for proposed residential development provided that a RAP is developed and implemented accordingly. A likely remediation strategy would involve the removal and offsite disposal of identified asbestos containing material. Where zinc exceeds EIL, we recommend additional testing within the building footprints and curtilage of former sheds exceeding EIL for zinc, to define the extent of zinc contamination. It is possible that future testing will reduce 95% UCL below EIL; however if values still exceed, soil amelioration by way of adding gypsum (or similar) to increase pH and CEC, may allow a higher EIL to be implemented.

Filling identified in burial pit located at TP313 and slab/builder's rubble (TP314-316) of the former chicken processing plant should be removed and disposed of. Soil beneath the slab should be tested for COPC.

Concrete structure adjacent to TP320 should be removed and disposed of. Soil beneath the concrete structure should be tested for COPC.

Following remediation works, a validation report is required to be prepared to confirm site suitability for the proposed development.

Based on the large site area, there remains a risk of unexpected finds (such as fill material), which contain contaminant levels above the adopted SAC. 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.

Prior to any soil or ACM material being removed from site, a formal waste classification assessment in accordance with NSW EPA - Waste Classification Guidelines (2014) is required.



## 9 Limitations

This DSI 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. Therefore, this report should not be read as a guarantee that only contamination identified 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.



## 10 References

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- NEPC (1999, amended 2013) National Environmental Protection (Assessment of Site Contamination) Measure – Referred to as ASC NEPM (1999, amended 2013).
- NSW DEC (2005) Guidelines for Assessing Former Orchards and Market Gardens.
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- NSW EPA (1995) Sampling Design Guidelines.
- NSW OEH (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.
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SEPP 55 Remediation of Land.



## 11 Attachment A – Site Plan





y, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 artens.com.au Internet: http://www.martens.com.au	Project: P1504816	File: JD05V01	Revision: A

# 12 Attachment B – Test Pit Logs



CL	IEN	Г	Precise Planning							COMMENCED 10/09/15 C			COMPLETE	ED 10/09/15				REF TP301			
PR	OJE	СТ	St	age 2 C	Cont	ami	nation A	sse	ssment	sment LOGGED GMT/GL			CHECKED	JF				Sheet 1	of 1		
SIT	E		45	Noong	janh	St	and 25 G	3wy	nn Hughes St,	GEOLOGY Shale			VEGETATION Grass		SS			PROJECT NO	<b>D.</b> P1504816		
EQU				SIONS	Bob	cat 5.8	5t 1.0m.denth		Bargo, NSW		NA		RL SURFACI	E NA West			SI OPE <2%				
	EX	CAV		ION DA	TA	. 0.0 X			MAT	ERIAL DAT	A			West		SA	MPLIN	IG & TEST	'ING	-	
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)			GRAPHIC LOG	CLASSIFICATION	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC ity or particle char y and minor comp consistency/relativ n size, texture/fabi th, weathering.	N acteristics, onents, ve density, ric, colour,		CONSISTENCY	DENSITY INDEX	ТҮРЕ	DEPTH (M)	Α	RESULTS AND ADDITIONAL OBSERVATIONS			
E	Nil	Ν	M	- - 0.25 - - 0.5 				CL- CI	Sandy CLAY - Low to dark brown, with tile, angular), t	o medium pla brick, concre imber fragme	isticity, brown/ ete (2-150mm, nts.	(			B A A	0.1 0.15 0.4	4816/30 4816/30 4816/30	- F )1/ 0.1 )1/ 0.15 )1/ 0.4	ILL 0.2	 25  0.5	
E	Nil	Ν	м	- - 0.75 - - - 1.0				CL- CI	CLAY - Low t light b	o medium pla rown/orange.	asticity,				А	0.7	4816/30	)1/ 0.7	0.3	- - 75 - - - - - - -	
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E	Ni	N	м	- - 0.25 - - 0.45			CL- CI	Sandy CLAY - Low to m with plastic, tile, bri	nedium plasti ck fragments	city, dark brown, (2-100mm).			BA	0.1 0.15 0.4	4816/30 4816/30 4816/30	- F 2/ 0.1 2/ 0.15 2/ 0.4	
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E	Nil	N	м	0.75		-		CL- CI	CLAY - Low to light bi	o medium pla rown/orange.	asticity,								0.7
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EXC					0.3 x <sup>-</sup>	1.0 x (	0.9m depth		МАТ		NA		ASPECT	1	Nest	64		SLOPE	<2%
⊢		CAV				ш		z	INIAI	ERIAL DAI	A			~		54		GAIES	TING
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)			GRAPHIC LOG	CLASSIFICATIO	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC sity or particle chai y and minor comp consistency/relation n size, texture/fab th, weathering.	n racteristics, onents, ve density, ric, colour,		CONSISTENCY	DENSITY INDEX	ТҮРЕ	DEPTH (M)	A	RESU DDITIONAL	JLTS AND . OBSERVATIONS
E	Nil	N	м	_ _  0.25 _				CL- CI	Sandy CLAY - Low to n brown, sandstone, tile a angular), glass, tim	nedium plasti and brick, gra bber and gen	city, light bro avels (2-150) eral rubbish.	own/ mm,			B A A	0.1 0.15 0.3	4816/30 4816/30 4816/30	- 1 15/ 0.1 15/ 0.15	
E	Nil	N	M	0.4    0.75				CL- CI	CLAY - Low to light bi	o medium pla rown/orange.	asticity,				A	0.5	4816/30		
				0.9 - 1.0 -					Test pit termin	ated at 0.9m	on clay.								- 1 <u>.0</u> -
				_ 1.25 _ _															1.25 - -
				  															- 1 <u>.5</u> - -
				 															- 1.75 - -
																			- 2 <u>.0</u> - - -
E N S O V T F	QUIPI Na H Ba A Ha C Co V-b C Tur T Pu	MENT itural e kisting ckhoe nd aug ade ncrete it gsten sh tube	/ ME expos exca buck ger Core Carb	2.25 THOD SI ure SH vation S( et RI Ni r r	JPPOR H Shor C Shot B Rock I No s	T ring tcrete k Bolts suppor	WATER N None X Notr T ♥ Wate ♥ Wate	e obse measu er leve er outf er inflc	MOISTURE DRILLING rved D Dry RESISTA red M Moist L Low W Wet M Mode Wp Plastic limit H High low WI Liquid limit R Refus w	G CONSIS INCE VS VS S Serate F Fi St Sti Sal VSt VG H Ha F Fri	STENCY DEN ry Soft VL ft L fm MD ff D ery Stiff VD rd able	ISITY Very Loo Loose Medium D Dense Very Dens	SAMF se A Dense U D Se Ux pp S S CBR	PLING Auger Bulk s Undis Distur Tube s Pocke Standa Califor	& TESTIN sample ample turbed sample bed sample sample (x m et penetrati mia Bearing	G m) eter on test Ratio	VS V DCP C P FD F M M WS V	ane shear bynamic cone enetrometer ield density foisture conter Vater sample	2.25 CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION IN USCS Agricultural
$\vdash$		_	_			E	XUAVATI(	JN L(	JG TU BE READ IN CONJUN		CCOMPANYI	ING REP	UKINÜTE	S AN	U ABBRE	VIATI	UNS		_
		n	a	rte	ns	S Pty. Lt	d.2015		N Suite 201, Phor mail@mart	ARTENS & AS , 20 george St, ne: (02) 9476 99 tens.com.au W	SOCIATES P Hornsby, NSW 999 Fax: (02) EB: http://www	TY LTD V 2077 A 9476 876 v.martens	ustralia 67 6.com.au		E	ng	gine Exc	ering avat	g Log - ion

CL	ENT	r	Pr	ecise P	lanning	I			COMMENCED	10/09/15	COMPLETE	<b>D</b> 10/	09/15			REF	TP306
PR	OJE	СТ	St	age 2 C	Contami	nation A	sse	ssment	LOGGED	GMT/GL	CHECKED	JF				Sheet 1	of 1
SIT	Έ		45	Noong	anh St	and 25 G	iwyı	n Hughes St,	GEOLOGY	Alluvial	VEGETATI	ON Gra	ass			PROJECT NO	. P1504816
EQU				SIONS	Bobcat 5.	5t		Bargo, NSW		NA		CE NA				SLOPE	-29/
	EX				TA	2.2m deptn		МАТ		` <b>А</b>	ASPECT	vve	est	SA	MPLIN	G & TEST	<2%
					<u>ل</u>	<b>0</b> G	NOI.	MATERIA		N	с	ЕX				00.1201	
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		GRAPHIC LC	CLASSIFICAT	SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grain strengi	ity or particle char y and minor comp consistency/relativ n size, texture/fab th, weathering.	acteristics, onents, ve density, ric, colour,	CONSISTEN	DENSITY IND	ТҮРЕ	DEPTH (M)	A	RESUI DDITIONAL	LTS AND OBSERVATIONS
E	Nil	N	м	- - - 0.25			sc	Clayey SAND - Coars with coal and burnt (10-40mm, angular), F	e grained, da timber, glass PACM fragme	ark grey/brown, , tile, gravels nts (10-40mm).			B	0.1	4816/30 4816/30	- Fi 6/ 0.1 (ASB 2 6/ 0.15 (ASB 2	LL
				- - - 0.5 - -									A	0.3	4816/30	6/ 0.3	 _ _ 0.5 _ _ _ _ _
				    									А	1.0	4816/30	6/ 1.0	- 0.75 - - 1 <u>.0</u> -
Е	Nil	Ν	М	_ 1.25 _ _			SP	SAND - Medium to c	oarse graine	d, light yellow.							- 1.25 - -
				 													- 1.5 - -
																	- 1.75 - - -
				   2.2									A	2.0	4816/30	6/ 2.0	_ 2.0 _ _ _
L	01.115	45.5	<u> </u>	2.25				Test pit termina	ated at 2.2m	on sand.							2.25
E N B H S C V T P	UIPN Na Ex H Bao A Hao Sp C Cor V-b C Tun T Put	iENT tural e disting ckhoe nd aug ade ncrete it gsten sh tub	/ ME *xposi excav bucke ger Core Carbi e	I HOD SI Jare SI vation S( et RI Ni n de Bit	UPPORT H Shoring C Shotcrete B Rock Bol il No suppo	WATER N None e X Not r tts 型 Wate → Wate	e obse measu er leve er outf er inflo	MOISTURE DRILLING red D Dry RESISTA red M Moist L Low I W Wet M Mode Wp Plastic limit H High low WI Liquid limit R Refus w	G CONSIS NCE VS VE S Scrate F Fin St Sti al VSt VE H Ha F Fri	STENCY DENSITY ry Soft VL Very L ft L Loose m MD Mediu ff D Dense ry Stiff VD Very D rd able	SAMF coose A m Dense U pense Ux pp S S CBR	LING & Auger sa Bulk san Undistur Disturbe Tube san Pocket p Standard California	TESTING ample bed sample d sample mple (x m benetrome I penetrational a Bearing	ele m) ter on test Ratio	VS V DCP D PO FD F M M WS V	ane shear ynamic cone enetrometer ield density foisture content Vater sample	CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION Y USCS N Agricultural
					E	EXCAVATIO	ON LO	OG TO BE READ IN CONJUN	CTION WITH A	CCOMPANYING RE	EPORT NOTE	S AND	ABBRE	VIATIO	ONS		
(	r	n C) Cor	a	rte Wartens & As	<b>NS</b> sociates Pty. L	td . 2015		M Suite 201, Phor mail@mart	IARTENS & AS 20 george St, ne: (02) 9476 99 ens.com.au W	SOCIATES PTY LT Hornsby, NSW 2077 999 Fax: (02) 9476 8 EB: http://www.marte	D 7 Australia 3767 ens.com.au		E	'ng	jine Exc	ering avati	Log - on

С	IEN	т	Р	recise P	lanning	3			COMMENCED	10/09/15	COMPLET	ED 10/0	9/15			REF	TP307
P	۲OJE	ЕСТ	S	tage 2 C	ontami	ination A	sse	ssment	LOGGED	GMT/GL	CHECKED	JF				Sheet 1 o	of 1
SI	TE		4	5 Noong	anh St	and 25 G	iwyı	nn Hughes St,	GEOLOGY	Alluvial	VEGETAT	ION Gras	s			PROJECT NO	P1504816
EQ					Bobcat 5.	5t		Bargo, NSW		NA	RL SURFA	CE NA				SI OPE	<29/
F	EX			ION DA	TA	2.1m deptn		МАТ		<b>A</b>	ASPECT	vves	1	SA	MPLIN	G & TEST	<2%
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		GRAPHIC LOG	CLASSIFICATION	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIO bity or particle char y and minor comp consistency/relativ n size, texture/fabi th, weathering.	N acteristics, onents, ve density, ic, colour,	CONSISTENCY	DENSITY INDEX	ТҮРЕ	DEPTH (M)	A	RESUL DDITIONAL (	TS AND DBSERVATIONS
E	Nil	N	м	- - - 0.2			sc	Clayey SAND - Coars with coal and burnt (10-40mm, angular), F	e grained, da timber, glass PACM fragme	ark grey/brown, , tile, gravels ents (10-40mm).			B A	0.1 0.15	4816/30 4816/30	- FI 7/ 0.1 7/ 0.15	LL - - - 
E	Nil	N	м	0.25 - - - - - - - - - - - - -			SP	SAND - Medium to c	oarse graine	d, light yellow.			A	0.3	4816/30	7/ 0.3	0.25
				2.1										2.0	4010/00		-
				$\vdash$				Test pit termina	ated at 2.1m	on sand.							-
1				+													-
	EQUIP N Ni X E 3H Ba HA Ha S Si CC Cc V V-I TC Tu PT PL	MENT atural xisting ackhoe and au pade increte bit ngster ush tul	F / ME expos g exca e buck Jger e Core n Cart be	2.25 ITHOD SU sure SH ivation SC ket RE Nil Pr bide Bit	JPPORT Shoring Shotcrett Rock Bo No support	WATER N None e X Not n its ¥ Wate ort	er outf	MOISTURE DRILLING Inved D Dry RESISTA red M Moist L Low W Wet M Mode Wp Plastic limit H High low WI Liquid limit R Refus W	G CONSIS INCE VS VS erate F Fi St Sti Sal VSt Ve H Ha F Fri	STENCY DENSITY rry Soft VL Very Lc that Loose rm MD Medium ff D Dense rry Stiff VD Very De rd able	SAM bose A Dense U Dnse Ux pp S CBR	PLING & T Auger sar Bulk samp Undisturb Disturbed Tube sam Pocket pe Standard p California	TESTING mple ole ed sample sample (x m netrome benetrati Bearing	B m) ter on test Ratio	VS Va DCP D FD Fi M M WS M	ane shear ynamic cone netrometer eld density loisture content /ater sample	2.25 CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION Y USCS N Agricultural
$\vdash$			~~			ENGAVATIC	JN LO	JG TU DE READ IN CONJUN		COUVIPAINTING RE		S AND A	NDBKE	VIATI(	GNIC		
		m	a	rte	ns	144 2015		N Suite 201, Phor mail@mart	MARTENS & AS , 20 george St, ne: (02) 9476 99 tens.com.au W	SOCIATES PTY LTD Hornsby, NSW 2077 999 Fax: (02) 9476 8 EB: http://www.marte	Australia 767 ns.com.au		E	ng	jine Exc	ering avati	Log - on

CL	IEN <sup>-</sup>	Г	Pi	ecise P	Planning	]			COMMENCED	10/09/15	COMPLETE	<b>D</b> 10/	09/15			REF	TP308
PR	OJE	СТ	St	age 2 C	Contam	ination A	sse	ssment	LOGGED	GMT/GL	CHECKED	JF				Sheet 1	of 1
SIT	Έ		45	Noong	anh St	and 25 G	iwy	nn Hughes St,	GEOLOGY	Alluvial	VEGETATI	ON Gra	ass			PROJECT NO	D. P1504816
EQU				SIONS	Bobcat 5.	5t		Bargo, NSW		NA	RL SURFA	CE NA				SLOPE	<2%
EAC	EX				TA	c 1.5m depth		МАТ		` <b>A</b>	ASPECT	vve	si	SA	MPLIN	G & TEST	ING
					<u> </u>	g	N				<b>≻</b>	X					
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		GRAPHIC LOO	CLASSIFICATIO	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIO bity or particle char y and minor comp consistency/relativ n size, texture/fabi th, weathering.	N acteristics, onents, ve density, ric, colour,	CONSISTENC	DENSITY INDE	ТҮРЕ	DEPTH (M)	A	RESU DDITIONAL	LTS AND OBSERVATIONS
E	Nil	N	м	- - 0.2 0.25 - - -			SC	Clayey SAND - Coars with coal and burnt (10-40mm, angular), F 	e grained, da timber, glass PACM fragme	ark grey/brown, , tile, gravels .nts (10-40mm). 			B A — A	0.1 0.15  0.3	4816/30 4816/30  4816/30	- F 18/ 0.1 18/ 0.15	  0.25 - - - - - - -
E	Nil	Ν	м	0.5 - - 0.75 - 1.0 1.1			SP	SAND - Medium to c	xoarse grained	d, light yellow.			Α	1.0	4816/30	8/ 1.0	0 <u>.5</u> - - - 0.75 - - - - - - - - - - - - - - - - - - -
E	Nil	Ν	м				CL	Sandy CLAY -	Light orange	/orange.			A	1.4	4816/30	8/ 1.4	ESIDUAL
				_				Test pit terminated	d at 1.5m on s	sandy clay.							-
				F													-
E N N B H S C V T ( P	QUIPI Na E: H Ba A Ha Sp C Col V-b C Tur T Pu	MENT itural e kisting ckhoe nd au ade ncrete it gsten sh tub	/ ME expos exca buck ger core Core	2.25 THOD SI ure SH vation SC et RI Ni r de Bit	UPPORT H Shoring C Shotcret B Rock Bo il No supp	WATER N None e X Not r Nts ¥ Wate ort ¥ Wate H Wate	e obse measu er leve er outf er inflo	MOISTURE DRILLING rved D Dry RESISTA red M Moist L Low W Wet M Mode Wp Plastic limit H High low WI Liquid limit R Refus w	G CONSIS NCE VS Ve S Sc erate F Fir St Sti Sal VSt Ve H Ha F Frid	STENCY DENSITY sty Soft VL Very Loo ft L Loose m MD Medium I ff D Dense rd rd able COOMPANYALIC DESE	SAMF Se A Dense U Dense U Se Ux pp S CBR	PLING & Auger sa Bulk san Undistur Disturbe Tube sal Pocket p Standard California	TESTING ample pple bed sample mple (x mi enetrome penetrational a Bearing	le m) ter con test Ratio	VS V DCP D FD F M N WS V	ane shear ynamic cone enetrometer ield density /loisture content Vater sample	2.25 CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION Y USCS N Agricultural
$\vdash$	EXCAVATION LOG TO BE READ IN CONJUNCTION WITH ACCOMPANYING REPORT NOTES AND ABBREVIATIONS																
		n	a	rte	ns sociates Pty.	Ltd . 2015		M Suite 201, Phor mail@mart	ARTENS & AS , 20 george St, ne: (02) 9476 99 tens.com.au WI	SOCIATES PTY LTD Hornsby, NSW 2077 A 999 Fax: (02) 9476 876 EB: http://www.martens	ustralia 67 s.com.au		E	ng	jine Exc	ering avati	Log - on

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С	LIEN	Т	P	recise P	lanning	9			COMMENCED	10/09/15	COMPLET	ED 10/0	9/15			REF	TP309
Р	ROJ	ЕСТ	S	tage 2 C	ontami	ination A	sse	ssment	LOGGED	GMT/GL	CHECKED	JF				Sheet 1	of 1
s	ITE		4	5 Noong	anh St	and 25 C	Эwy	nn Hughes St,	GEOLOGY	Alluvial	VEGETATI	ON Gras	S			PROJECT NO	<b>D.</b> P1504816
E E		INT TION I	DIME	ISIONS	Bobcat 5.	5t 0.8m depth			EASTING	NA	ASPECT	CE NA Wes	t			SLOPE	<2%
	E	CA	VAT	ION DA	TA			MAT	ERIAL DAT	A	-			SA	MPLIN	G & TEST	ING
UCHT-IM	SUPPORT	WATER	MOISTURE	DEPTH (M)	M DRILLING H RESISTANCE	GRAPHIC LOG	<b>CLASSIFICATION</b>	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC city or particle chai y and minor comp consistency/relation n size, texture/fab th, weathering.	N acteristics, orients, ve density, ric, colour,	CONSISTENCY	DENSITY INDEX	ТҮРЕ	DEPTH (M)	А	RESU DDITIONAL	LTS AND OBSERVATIONS
E	Nil	N	м	_ _ _ 0.2			sc	Sandy CLAY - Low to with c	o medium pla car gas strut.	sticity, brown,			B	0.1 0.15	4816/30 4816/30	- F 9/ 0.1 9/ 0.15	ILL - - - 
E	: Nil	N	м	0.25 - - - - - - - - - - - - - - - - - - -			SP	SAND - Medium to c	oarse graine	d, light yellow.			A	0.3	4816/30 4816/30	9/ 0.3 9/ 0.7	0.25_ - - - - 0 <u>.5</u> - - - - - - - - - - - - - - - - - - -
┢				0.8				Test pit termina	ated at 0.8m	on sand.							
				- - - - - - - - - - - - - -													- - - - - - - - - - - - - - - - - - -
	EQUIF N N BH E HA F S S CC C V V TC TI PT P	MENT latural existing ackhoo and au pade oncrete bit ngster ush tub	F / ME expos g exca e buck uger e Core n Carboe	THOD SU ure SH vation SC et RE Ni er	JPPORT JPPORT Shotret Rock Bo No supp	WATER N Non e X Not its ⊻ Wat ort ♀ Wat ► Wat	e obse measu er leve er out er infle	MOISTURE DRILLING erved D Dry RESISTA red M Moist L Low Wet M Mod Wp Plastic limit H High Flow WI Liquid limit R Refus	G CONSIS INCE VS Ve Brate F Fi St Sti sal VSt Ve H Ha F Fri	STENCY DENSITY try Soft VL Very L ft L Loose rm MD Mediuu ff D Dense try Stiff VD Very D rd able	SAMI coose A m Dense U ense Ux pp S CBR	PLING & T Auger san Bulk samp Undisturbed Disturbed Tube sam Pocket pe Standard p California	ESTINC nple ble ed sample ple (x mi netrome benetrations Bearing	le m) ter on test Ratio	VS Va DCP D pe FD Fi M N WS W	ane shear ynamic cone enetrometer eld density loisture content /ater sample	CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION Y USCS N Agricultural
funne	(		a	rte Martens & Ass	<b>NS</b> sociates Pty.	EXCAVATIO	ON L	OG TO BE READ IN CONJUN M Suite 201, Phor mail@marl	CTION WITH A MARTENS & AS , 20 george St, ne: (02) 9476 99 tens.com.au W	CCOMPANYING RI SOCIATES PTY LT Hornsby, NSW 2077 2999 Fax: (02) 9476 8 EB: http://www.marte	EPORT NOTE D 7 Australia 3767 ens.com.au	S AND A	E	ng	nine Exc	ering avati	Log - on

С	LIEN	т	P	recise P	lannin	g			COMMENCED	10/09/15	COMPLETE	D 10/09	9/15			REF	Т	'P310	
PI	ROJI	ст	S	tage 2 C	ontam	ination A	sse	ssment	LOGGED	GMT/GL	CHECKED	JF				Sheet	∎ I of 1	10.0	
s	TE		4	5 Noong	anh St	and 25 G	àwy	nn Hughes St,	GEOLOGY	Shale	VEGETATIO	ON Grass	s			PROJECT	<b>NO</b> . P1	504816	
EC					Bobcat 5	.5t		Bargo, NSW		NA	RL SURFAC	E NA				SI OPE	<20/		
F	EX				TA	x 1.1m deptn		МАТ		<b>A</b>	ASPECT	East		SA	MPLIN	G & TE	STING		
F					<u> </u>	IJ	z				≻	×				00.12	01110		
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		GRAPHIC LOO	CLASSIFICATIO	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC ity or particle char y and minor comp consistency/relativ n size, texture/fab th, weathering.	N acteristics, ionents, ve density, ric, colour,	CONSISTENC	DENSITY INDE	ТҮРЕ	DEPTH (M)	A	RE: DDITION/	SULTS A AL OBSE	ND RVATIONS	3
E	Nil	N	м	  0.2			sc	Clayey SAND - Coa with charcoal fragm (10-150	arse grained, ents and con mm, angular	brown/black, crete gravels ).			B	0.1 0.15	4816/31 4816/31	D/ 0.1 D/ 0.15	- FILL		-
E	Nil	N	м	0.25 - - - - 0.5 - - - -			SP	SAND - Medium to c	oarse graine	d, light yellow.			А	0.3	4816/31	0/ 0.3			0.25_  0 <u>.5</u>  
E	Nil	N		0.75 - - 0.9 - 1.0			CL	— — — — — — — — — — — — — — — — — — —						1.0	4816/31	 0/ 1.0	- Water at	. <u> </u>	0.75_   1 <u>.0</u>
				-															_
								Test pit termin	ated at 1.1m	on clay.									
																			_
				1.25															1.25
				_															_
				-															-
				-															-
				-															-
																			1.0
				_															_
																			4 75
				1.75															1.75
																			_
				_															-
				2.0															- 20
				2.0															2.0
																			-
				_															-
				2 25															2 25
F	EQUIP N N	MENT atural (	/ ME	THOD SL	JPPORT Shoring	WATER N None	e obse	MOISTURE DRILLING erved D Drv RESISTA		STENCY DENSITY ery Soft VL Very Loo	SAMF Se A	LING & T Auger sam	ESTING	6	VS V:	ane shear	CL	ASSIFICATIO	ON
	X E BH Ba HA Ha S S CC Co V V-	xisting ackhoe and au bade increte bit	g exca e buck iger e Core	vation SC et RE Nil	C Shotcre 3 Rock Bo I No supp	te X Notio Dits ⊻ Wation - √ Wation	measu er leve er outt er inflo	rred M Moist L Low el W Wet M Mode Wp Plastic limit H High Now WI Liquid limit R Refus	S So erate F Fin St Sti sal VSt Ve H Ha F Fri	oft L Loose rm MD Medium [ ff D Dense ery Stiff VD Very Dens rd able	B Dense U Se Ux pp I S S	Bulk samp Undisturbe Disturbed Tube samp Pocket per Standard p	le ed samp sample ple (x m netrome enetratio	le m) ter on test	DCP D pe FD F M M WS W	ynamic con enetrometer eld density loisture con /ater sample	e SC tent N	DIL DESCRIP USCS	PTION al
L	IC Tu PT Pu	ngsten Ish tub	i Carb ie	ide Bit		EVO MITE	<u></u>			000101110000		California E	Bearing	Ratio					
MARTENS & ASSOCIATES PTY LTD													BRKE	viA110					
(			a	rte	<b>NS</b> sociates Pty.	Ltd . 2015		N Suite 201, Phor mail@mart	20 george St, ne: (02) 9476 99 ens.com.au W	Hornsby, NSW 2077 A 999 Fax: (02) 9476 876 EB: http://www.marten	ustralia 67 s.com.au		E	ng	nne Exc	erin ava	g L tion	og -	

С	LIEN	IT	Р	recise P	lanning	9			COMMENCED	10/09/15	COMPLETE	<b>)</b> 10/09	9/15			REF	TP3	11
Р	ROJ	ЕСТ	S	tage 2 C	ontam	ination A	sse	ssment	LOGGED	GMT/GL	CHECKED	JF				Sheet 1	of 1	
S			4	5 Noong	anh St	and 25 G	iwy	nn Hughes St, Bargo, NSW	GEOLOGY	Shale		N Gras	S			PROJECT	NO. P1504816	
E)	CAVA		DIME	NSIONS	0.3 x 1.0 >	< 1.2m depth			NORTHING	NA	ASPECT	East				SLOPE	<2%	
	E		VAT	ION DA	ТА			MAT	ERIAL DAT	A				SA	MPLIN	G & TES	TING	
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L M DRILLING H RESISTANCE	GRAPHIC LOG	CLASSIFICATION	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC bity or particle chain y and minor comp consistency/relation n size, texture/fab th, weathering.	nacteristics, orients, ve density, ric, colour,	CONSISTENCY	DENSITY INDEX	ТҮРЕ	DEPTH (M)	Α	RES DDITIONA	ULTS AND L OBSERVAT	IONS
E	Ni	N	м	_ _ _ 			sc	Clayey SAND - Coa with charcoal fragm (10-150	arse grained, ents and con )mm, angular	brown/black, crete gravels ).			B	0.1	4816/31 4816/31	1/ 0.1 1/ 0.15 + DU	FILL P1	- - -
E	Ni	Ν	м	0.25 - - - - - - - - - - - - - - - - - - -			SP	SAND - Medium to c	oarse graine	d, light yellow.			A	0.3	4816/31	1/ 0.3		0.25_ - - 0.5 - - - - - - - - - - - - - - - - - - -
E	Ni	N	w	<u>0.9</u> - - 1.0 - - 1.2			CL	CLAY - Low to medium with shale grave	plasticity, lig els (2-50mm,	ht orange/orange angular).			A	1.0	4816/31	1/ 1.0	Water at 1.1m.	
				1.25				Test pit termin	ated at 1.2m	on clay.								1.25
				_ _ _ <u>1.5</u> _														_ _ 1 <u>.5</u> _
				_  														- - 1.75 - -
				  														- 2.0 - -
	EQUII N I BH E HA F S S CC C V V TC T PT F	PMEN Vatural Existing ackhoo land au spade oncrete -bit ungster ush tut	T / ME expos g exca e buck uger e Core n Carb pe	2.25 STHOD SU sure SH varion SC ket RE Nii er	JPPORT H Shoring C Shotcret 3 Rock Bo I No supp	WATER N None e X Notr otts ሧ Wate → Wate	e obse neasu er leve er outf er inflo	MOISTURE DRILLING rved D Dry RESISTA red M Moist L Low I W Wet M Mode Wp Plastic limit H High low WI Liquid limit R Refus W	G CONSIS INCE VS Ve Brate F Fi St Sti sal VSt Ve H Ha F Fri	STENCY DENSITY ry Soft VL Very Loc oft L Loose rm MD Medium I ff D Dense ry Stiff VD Very Den: rd able	SAMPI Dense A A Dense U U Se Ux T pp P S S CBR C	ING & T uger sam ulk samp indisturbed isturbed ube sam ocket per andard p alifornia I	ESTINO nple ed samp ple (x mr netrome benetratio Bearing	le m) ter on test Ratio	VS V DCP D PI FD F M N WS V	ane shear lynamic cone enetrometer ield density loisture conte Vater sample	CLASSIFI SYMBOLS SOIL DES N USC	2.25 CATION & AND CRIPTION CS icultural
(	(	(C) Co	a	rte	<b>NS</b> sociates Pty.	EXCAVATIO	DN LO	DG TO BE READ IN CONJUN M Suite 201, Phor mail@mart	CTION WITH A MARTENS & AS , 20 george St, ne: (02) 9476 9 tens.com.au W	SOCIATES PTY LTD Hornsby, NSW 2077 A 999 Fax: (02) 9476 876 EB: http://www.marten	ORT NOTES Justralia 67 s.com.au	AND A	E	ng	ns fine Exc	erin avat	g Log tion	-

С	IEN	т	P	recise P	lannin	g			COMMENCED	10/09/15	COMPLET	ED 10/09	9/15			REF	TP312	>
PF	OJE	ст	S	tage 2 C	ontam	ination A	sse	ssment	LOGGED	GMT/GL	CHECKED	JF				Sheet 1	of 1	-
Sľ	ΓЕ		4	5 Noong	anh St	and 25 G	iwy	nn Hughes St,	GEOLOGY	Sandstone	VEGETATI	ON Gras	s			PROJECT NO	P1504816	
EQ	JIPME	NT			Bobcat 5	.5t		Bargo, NSW	EASTING	NA	RL SURFA	CE NA						
EX	FX				0.3 x 1.0 ΤΔ	x 1.0m depth		ΜΔΤ		Δ	ASPECT	East		S۵			<2% ING	
					<u> </u>	0	z			Λ	<b>&gt;</b>	×						
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		GRAPHIC LOG	CLASSIFICATIC	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC sity or particle chai y and minor comp consistency/relatin n size, texture/fab th, weathering.	N racteristics, vonents, ve density, ric, colour,	CONSISTENC)	DENSITY INDE	ТҮРЕ	DEPTH (M)	A	RESUI DDITIONAL	TS AND	s
E	Nil	N	м	_ _ _ <u>0.2</u>			CL- CI	Sandy CLAY - Low to n black, with charcoal and possible ACM f	nedium plasti I sandstone g ragments (10	icity, dark brown/ iravels (2-50mm) )-50mm).	,		B	0.1 0.15	4816/312 4816/312	- Fi 2/ 0.1 2/ 0.15 + DUP	2 	-
E	Nil	Ν	w	0.25			CL- CI	Sandy CLAY - Lo light or	ow to medium ange/orange	n plasticity,			A	0.3	4816/31:	2/ 0.3 - W	'ater at 0.9m.	0.25_ - - 0.5 - - - 0.75_ - - - - - - - - - - - - - - - - - - -
				 				Test pit terminated	d at 1.0m on	sandy clay.								
				1.25 - -														1.25_ 
				_ <u>1.5</u> _ _														- 1 <u>.5</u> - -
				1.75 														
				    2.25														
	EQUIP A Na A Ha A Ha A Ha C Co C Co C Co C Co C Tu C Tu C Tu C Tu C Tu	MENT atural o xisting ackhoe and au bade ncrete bit ngsten sh tub	/ ME expos exca buck ger core Core	THOD SL ure SH vation SC et RE Nil r ide Bit	JPPORT H Shoring C Shotcre 3 Rock Bo I No supp	WATER N None bits ⊻ Wate oort → Wate	e obse neasu er leve er outf	MOISTURE DRILLING rved D Dry RESISTA red M Moist L Low I W Wet M Mode Wp Plastic limit H High Iow WI Liquid limit R Refus	G CONSIS INCE VS Ve S Se erate F Fi St Sti sal VSt Ve H Ha F Fri	STENCY DENSITY ery Soft VL Very oft L Loos rm MD Medi ff D Dens ery Stiff VD Very [ ard able	SAMI Loose A e B Jim Dense U e D Dense Ux pp S S CBR	PLING & T Auger sam Bulk samp Undisturbed Disturbed Tube sam Pocket per Standard p California B	ESTING nple le ed samp sample ple (x mr netrome benetratio Bearing	le m) ter on test Ratio	VS Va DCP D pe FD Fi M M WS W	ane shear ynamic cone enetrometer eld density loisture content /ater sample	CLASSIFICAT SYMBOLS AN SOIL DESCRIF Y USCS N Agricultu	ION D PTION ral
			a	rte Martens & Ase	<b>NS</b> sociates Pty.	EXCAVATIO	ON LO	DG TO BE READ IN CONJUN M Suite 201, Phor mail@mart	CTION WITH A IARTENS & AS , 20 george St, ne: (02) 9476 99 tens.com.au W	ACCOMPANYING R SOCIATES PTY L1 Hornsby, NSW 207 999 Fax: (02) 9476 EB: http://www.mar	EPORT NOTE TD 7 Australia 8767 tens.com.au	S AND A	BBRE'	ng	nine Exc	ering avati	Log - on	

С	IEN.	г	Pr	ecise P	lannin	g			COMMENCED	10/09/15	COMPL	ETED	10/09/1	15			REF	TP:	313
PF	OJE	СТ	St	age 2 C	ontam	ination A	sse	ssment	LOGGED	GMT/GL	CHECK	ED	JF				Sheet 1	of 1	
SI	ΓE		45	Noong	anh St	and 25 G	iwy	nn Hughes St,	GEOLOGY	Sandstone	VEGET	ATION	Grass				PROJECT N	NO. P15048	6
EQ EX			IMEN	SIONS	Bobcat 5	x 0.8m depth		_ Barge, NON	EASTING	NA	RL SUF	T	NA East				SLOPE	<2%	
	EX	CAV	ΆΤ	ION DA	TA			MAT	ERIAL DAT	A					SA	MPLIN	G & TES	TING	
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		GRAPHIC LOG	CLASSIFICATION	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC tity or particle char y and minor comp consistency/relativ n size, texture/fab th, weathering.	N acteristics, onents, ve density, ric, colour,	CONSISTENCY		DENSITY INDEX	TYPE	DEPTH (M)	А	RES DDITIONAI	ULTS AND L OBSERVA	TIONS
E	Nil	Ν	М	- - - - - - - - - - - - - - - - - - -			CL- CI	Sandy CLAY - Dark br general rubbish inc cans, t	own/black, w luding, glass ins and wire.	ith burnt timber, bottles, steel,				B A A	0.1 0.15 0.3 0.5	4816/31 4816/31 4816/31 4816/31	- 3/ 0.1 3/ 0.15 3/ 0.3 3/ 0.5	TOPSOIL (FIL	L)
E	Nil	N	w	0.75		<u> </u>	CL- CI	— — — — — — — CLAY - Low to light or	o medium pla ange/orange	asticity,	- +							<u>water at</u> 0. <u>7111</u> .	0.75
	EQUIP X N: X Ea BH Ba A Ha	MENT atural ( xisting cckhoe norcete	/ ME exca buck ger Core	U.0 U.0 U.0 U.0 U.0 U.0 U.0 U.0 U.0 U.0	JPPORT + Shoring 2 Shotre 3 Rock Bc No supp	WATER N Nork te X Notr otts ¥ Watu	e obse neasu er leve	Test pit terminate Test Test Test MOISTURE DRILLING Prod D Dry RESISTA red M Moist L Low M Wet M Mod W Plastic limit H High low WI Liquid limit R Refus	ad due to wate pit collapse.	STENCY DENSITY ry Soft VL Very oft L Loosi m MD Medi ry Stiff VD Very I rd	Loose A e B Jm Dense U e D Dense U	AMPLIN Aug Bull Unc Disl X Tub	IC & TES er sample Sample Sisturbed Sisturbed se samplen	STING le sample e (x mr)	ie n)	VS Vd DCP D FD F M M	ane shear ynamic cone anetrometer leid density loisture conte dater sambe	CLASSI SYMBO SOIL DE N A	
⊢	Y Pu	sh tube	3			ΕΧΩΔΙΛΑΤΙ								BRE1		ONS			
			a	rte Martens & Ass	<b>NS</b> sociates Pty.	Ltd.2015		N Suite 201, Phor mail@mark	ARTENS & AS 20 george St, ne: (02) 9476 99 tens.com.au W	SOCIATES PTY L1 Hornsby, NSW 207 999 Fax: (02) 9476 EB: http://www.mar	TD 7 Australia 8767 tens.com.au	I ES A		E	ng	nine Exc	erin avat	g Log tion	<b>y</b> -

CL	IEN	r	P	recise P	lannin	g			COMMENCED	10/09/15	COMPLET	ED 1	0/09/15		REF TP314
PR	OJE	СТ	S	age 2 C	ontam	ination A	sse	ssment	LOGGED	GMT/GL	CHECKED	<b>)</b> J	F		Sheet 1 of 1
SI	ГЕ		45	5 Noong	anh St	t and 25 G	wy	nn Hughes St,	GEOLOGY	Sandstone	VEGETAT		Grass		PROJECT NO. P1504816
EQI	JIPME	NT			Bobcat 5	5.5t		Bargo, NSW	EASTING	NA	RL SURFA	ACE N	IA		
EXC					0.3 x 1.0	x 1.2m depth		МАТ		NA	ASPECT	E	ast	<u> </u>	
-	EX						z	MAI	ERIAL DAI	A				SA	MPLING & LESTING
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		GRAPHIC LOG	CLASSIFICATIO	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC ity or particle char y and minor comp consistency/relation n size, texture/fabi th, weathering.	N acteristics, ionents, <i>ve</i> density, ric, colour,	CONSISTENCY	DENSITY INDEX	ТҮРЕ	DEPTH (M)	RESULTS AND ADDITIONAL OBSERVATIONS
E	Nil	N	м	  0.2			sc	Sandy CLAY - Brown/b black plastic, metal (200-60)	lack, with cha beams, conc Dmm, angula	arcoal fragments, rete boulders r).			B A	0.1	- FILL
				0.25  - 0.5									A	0.3	0.25_ 4816/314/ 0.3 - - - 4816/314/ 0.5 0.5
E	Nil	N	м	_ _ _ 			SP	CLAY - Low to light or	o medium pla ange/orange	asticity,					- - - 0.75 -
E	Nil	Ν	w	-		,3 P 1		SANDSTONE - Coars low	e grained, lig strength.	ht grey, inferred					-
				1.2	enterbetetet	×		Test nit terminate	d at 1 2m on	sandstone					
				1.25				rest pit terminate		sandstone.					1.25_
				_ _ 1.5											- - 1.5
				-											-
				 1.75 											- 1.75 - -
				2.0											- - 2.0 -
		MENT		2.25				MORTHER		STENOV DEMONS			0 TEOTING		- - - - - - - - - - - - - - - - - - -
	I Na H Ba IA Ha C Co V-t	tural e disting ckhoe nd au nade ncrete it ngsten	> ME >xpos   exca + buck ger + Core - Carb	re SH vation SC et RE Nil r ide Bit	SPORT Shoring Shotcre Rock B No sup	wAfER N None te X Not n olts 型 Wate port → Wate	obse neasu er leve er outf	MUSIUKE DRILLING rved D Dry RESISTA red M Moist L Low I W Wet M Mode Wp Plastic limit H High low WI Liquid limit R Refus	S CONSIS NCE VS Ve erate F Fin St Sti Sal VSt Ve H Ha F Fri	PLENCY DENSITY Pry Soft VL Very L St L Loose rm MD Mediur ff D Dense Pry Stiff VD Very De able	SAM oose A B n Dense U D ense Ux pp S CBR	Auger Bulk s Undist Distur Tube s Pocke Standa		le m) ter on test Ratio	VS Vane shear DCP Dynamic cone penetrometer FD Field density WS Water sample
F	ı PU	M LUD	U U			EXCAVATIO	N L	OG TO BE READ IN CONJUN	CTION WITH A	CCOMPANYING RE	PORT NOTE	ES AN	D ABBRE	VIATIO	DNS
			a	rte Martens & Ass	<b>NS</b> sociates Pty	. Ltd . 2015		N Suite 201, Phor mail@mart	IARTENS & AS 20 george St, ne: (02) 9476 99 ens.com.au W	SOCIATES PTY LTI Hornsby, NSW 2077 399 Fax: (02) 9476 8 EB: http://www.marte	) Australia 767 ens.com.au		E	ng	ineering Log - Excavation

CL	IEN	Г	Pr	ecise P	lannin	g			COMMENCED	10/09/15	COMPLETED	10/09	/15			REF	TP31	5
PR	OJE	СТ	St	age 2 C	ontan	nination A	sse	ssment	LOGGED	GMT/GL	CHECKED	JF				Sheet 1	of 1	•
SIT	E		45	Noong	anh S	t and 25 (	Gwy	nn Hughes St, Bargo NSW	GEOLOGY	Sandstone	VEGETATION	Grass	8			PROJECT NO	. P1504816	
EQU	IPMEI AVAT	NT ION D	IMEN	ISIONS	Bobcat : 0.3 x 1.0	5.5t x 1.1m depth		Burge, Herry	EASTING	NA	ASPECT	E NA East				SLOPE	<2%	
	EX	CAV	/AT	ION DA	ТА			MAT	ERIAL DAT	А	•			SA	MPLIN	G & TEST	ING	
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L DRILLING	RAPHIC LOG	CLASSIFICATION	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, graii streng	L DESCRIPTIC tity or particle chai y and minor comp consistency/relation n size, texture/fab th, weathering.	DN racteristics, ponents, ve density, ric, colour,	CONSISTENCY	DENSITY INDEX	түре	DEPTH (M)	A	RESUI DDITIONAL	LTS AND OBSERVATION	NS
E	Nil	Ν	м	- - 0.25			sc	Sandy CLAY - Brown/b black plastic, steel l (200-60	lack, with cha beams, conci 0mm, angula	arcoal fragments, rete boulders r).			В	0.1	4816/31 4816/31	- Fi 5/ 0.1 5/ 0.15 5/ 0.2	LL	- - - 0.25_
E	Nil	N	M	<u>0.3</u> _  _   			SP	CLAY - Low to light or	o medium pla ange/orange	 asticity,			<u>A</u>		40 10/31	ar <u>u.s</u>		
E	Nil	 N	w	1.0 			-	SANDSTONE - Coars	e grained, lig strength.	ht grey, inferred	+-+					W - R	/ater at 1.0m. OCK	1.0
				 1.25 				Test pit terminate	d at 1.1m on	sandstone.								- 1.25 - -
				- 1.5 - -														- 1 <u>.5</u> -
				 														_ 1.75_ _ _
				  														_ 2.0 _ _ _ _
E N B H S C V T P	QUIPI Na E: H Ba A Ha Sp C Col C Col V-b C Tur T Pu	MENT itural e kisting ckhoe nd au ade ncrete it gsten sh tube	/ ME exposi exca buck ger Core Carbi e	2.25 THOD SUure SH vation SC et RE Nil r	JPPORT I Shoring Shoten Rock E No sup	WATER N Non tete X Not totts ¥ Wat port ↓ Wat ↓ Wat	e obse measu ter leve ter outt	MOISTURE DRILLIN rved D Dry RESISTA red M Moist L Low W Wet M Mode Wp Plastic limit H High low WI Liquid limit R Refus W	G CONSIS INCE VS Ve S Si serate F Fi St Sti sal VSt Ve H Ha F Fri	STENCY DENSITY ary Soft VL Very Loo oft L Loose rm MD Medium iff D Dense ary Stiff VD Very Der ard able	SAMPL ose A Ai B B Dense U U D D D se Ux Ti pp Pc CBR Ca	ING & T uger samp Indisturbe isturbed i	ESTING ple ed samp sample ble (x mr hetromet enetratio Bearing	le m) ter on test Ratio	VS V; DCP D FD F M N WS V	ane shear ynamic cone enetrometer ield density /loisture content Vater sample	CLASSIFICA SYMBOLS AT SOIL DESCR Y USCS N Agricult	2.25 TION ND IIPTION
	<u> </u>		2	u4 -		EXCAVATI	ON L	DG TO BE READ IN CONJUN	CTION WITH A	SSOCIATES PTY LTD	PORT NOTES	AND A	BBRE	n n	nine	erina	Log -	,
		C) Cop	ð	ITE Martens & Ass	IIS sociates Pty	/. Ltd . 2015		Phor mail@mart	ne: (02) 9476 99 tens.com.au W	999 Fax: (02) 9476 87 EB: http://www.marten	67 Is.com.au			J	Exc	avati	on	

С	LIEN	т	Pr	ecise F	Planning	9			COMMENCED	10/09/15	COMPLET	ED	10/09/15			REF	TP316	6
P		ЕСТ	St	age 2 C	Contam	ination A	SSes	ssment		GMT/GL	CHECKED		JF			Sheet 1	of <b>1</b>	
E		NT	40		Bobcat 5	anu 25 0	awyi	Bargo, NSW	GEOLOGY	NA	RL SURFA		orass NA			PROJECT NO	P P1504816	
E)	(CAVA		DIMEN	SIONS	0.3 x 1.0	x 0.2m depth			NORTHING	NA	ASPECT	1	East			SLOPE	<2%	
$\vdash$	<b>E</b> )		/AT	ION DA	TA		z	МАТ	ERIAL DAT	A				SA	MPLIN	G & TEST	ING	
METUOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	E L M DRILLING H RESISTANCE	GRAPHIC LOG	CLASSIFICATIO	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC ity or particle cha y and minor comp consistency/relati n size, texture/fab th, weathering.	N racteristics, ionents, ve density, ric, colour,	CONSISTENCY	DENSITY INDEX	ТҮРЕ	DEPTH (M)	A	RESUI DDITIONAL (	TS AND	S
E	Nil	N	м	- - 0.2			CL- CI	Sandy CLAY - Dark metal sheetin	brown/black, g, glass and	with charcoal, plastic.			B	0.1 0.15	4816/31 4816/31	- FI 6/ 0.1 6/ 0.15	LL	-
				0.25  0.4				OLD CHIC	KEN SHED S	SLAB.						C	ONCRETE	0.25
				 														0 <u>.5</u>
				_ 0.75 _														- 0.75 -
																		1 <u>.0</u>
				- 1.25 -														1.25
				- - 1.5 -														- 1 <u>.5</u> -
				 1.75 														- - 1.75 - -
				_    														
	EQUIF N N BH B HA H S S CC C V V TC TU PT P	MENT atural of existing ackhoe and au pade oncrete bit ngsten ush tub	/ ME exposi excave bucke ger e Core carbi e	2.25 THOD Si vation Sv et R N r de Bit	UPPORT H Shoring C Shotcre B Rock Bo il No supp	WATER N Nor Not V Wa V Wa	e obse measu ter leve ter outfi	MOISTURE DRILLINC rved D Dry RESISTA red M Moist L Low Wet M Mode Wp Plastic limit H High low Wi Liquid limit R Refus w	CONSI NCE VS Vi s s rate F Fi st st ral VSt Vi H Ha F Fri	STENCY DENSITY ry Soft VL Very L oft L Loose rm MD Medium ff D Dense ry Stiff VD Very De rd able	SAMI Dose A In Dense U Dense Ux pp S CBR	PLING Auger Bulk s Undis Distur Tube Pocke Standa Califo	& TESTIN r sample sample sturbed sample sample (x m et penetrati rnia Bearing	G im) eter ion test Ratio	VS V DCP D FD F M M WS V	ane shear ynamic cone enetrometer ield density foisture content Vater sample	CLASSIFICAT SYMBOLS AN SOIL DESCRI Y USCS N Agricultu	- 2.25 ION ID PTION ıral
Quality Sheet No. 4	(		a	rte Martens & As	<b>NS</b> ssociates Pty.	EXCAVATI	ON LO	DG TO BE READ IN CONJUN M Suite 201, Phor mail@mart	CTION WITH A IARTENS & AS 20 george St, 1e: (02) 9476 9 ens.com.au W	CCOMPANYING RE SOCIATES PTY LTE Hornsby, NSW 2077 999 Fax: (02) 9476 8 EB: http://www.marte	PORT NOTE ) Australia 767 ms.com.au	S AN		ng	ons gine Exc	ering avati	Log - on	

С	LIEN	T Precise Planning COMMENCED 10/09/15 COMPLETED 10/09/15 REF TP317																			
Р	ROJE	ст	S	tage 2 C	ontan	nination A	sse	ssment	LOGGED	GMT/GL		CHECKED	JF				Sheet 1	of 1			
s	TE		4	5 Noong	anh S	t and 25 C	Эwy	nn Hughes St,	GEOLOGY	Sandstone		VEGETATIC	N Grass				PROJECT N	<b>O</b> . P1504816			
EC		NT ION E		SIONS	Bobcat	5.5t		Large, Non		NA		RL SURFAC	E NA East				SLOPE	<2%			
	EX	CA	/AT	ION DA	TA			MAT	ERIAL DAT	A			Luot		SA	MPLIN	G & TES	TING			
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)	L DRILLING H RESISTANCE	R GRAPHIC LOG	<b>CLASSIFICATION</b>	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC bity or particle char y and minor comp consistency/relation n size, texture/fabi th, weathering.	N acteristics, onents, ve density, ric, colour,		CONSISTENCY	DENSITY INDEX	ТҮРЕ	DEPTH (M)	А	RESULTS AND ADDITIONAL OBSERVATIONS				
E	Nil	N	м	- - 0.25			CL	Sandy CLAY - Ligh tile gravel (10-20mr	t brown, with n, angular), p	concrete and lastic, timber.				B A A	0.1 0.15 0.2	4816/31 4816/31 4816/31	- F 7/ 0.1 7/ 0.15 7/ 0.2	-ill			
E	Nil	N	м	     0.75			CL- CI	CLAY - Low t light or	o medium pla ange/orange	isticity,				A	A 0.4 4816/317/ 0.4						
F	+			0.8				Test pit termin	ated at 0.8m	on clay.											
				- 1.0 - 1.25 - 1.25 - - 1.25 - - 1.5 - - 1.75 - - - 2.0 - - - - - - - - - - - - -																	
	EQUIP N N X E BH Ba HA Ha S S CC Cc V V- TC Tu PT Pi	MENT atural o xisting ackhoe and au pade oncrete pit ngsten ash tub	/ ME expos g exca e buck ger e Core c Carb	THOD SU sure SH vation SC et Rt Ni er	JPPORT H Shoring C Shoton 3 Rock E I No sup	g N Non ete X Not Bolts ⊉ Wat ⊖ Wat	e obse measu er leve er out er infle	MOISTURE DRILLING erved D Dry RESISTA red M Moist L Low Wet M Mode Wp Plastic limit H High Flow WI Liquid limit R Refus	G CONSIS INCE VS Ve S Se erate F Fi St Sti sal VSt Ve H Ha F Fri	STENCY DENS rry Soft VL N fft L L m MD N Mf D E rry Stiff VD V rd able	ITY Very Loose Loose Medium De Dense Very Dense	SAMP A A B E binse U U D I Ux I pp F S S CBR C	LING & TE uger samp ulk sample Indisturbed Disturbed s ube samp ocket pen tandard pe alifornia B	ESTING ple e d samp le (x mr etromet enetrations searing	le m) ter on test Ratio	VS Va DCP D FD Fi M N WS W	ane shear ynamic cone enetrometer eld density loisture conten /ater sample	CLASSIFICATIO SYMBOLS AND SOIL DESCRIPT t Y USCS N Agricultural	NION		
		m	2	rto	ne	EXCAVATIO	ON L	DG TO BE READ IN CONJUN M Suite 201,	CTION WITH A MARTENS & AS , 20 george St,	SOCIATES PT Hornsby, NSW	IG REPO	RT NOTES		E	ng	ns fine	ering	y Log -			
(	C	(C) Cop	oyright	Martens & Ass	sociates Pt	y. Ltd . 2015		Phor mail@mart	ne: (02) 9476 99 tens.com.au W	999 ⊢ax: (02) 9 EB: http://www.i	4/6 8767 martens.c	com.au				Exc	avati	ion			

C	LIEN	IT	Precise Planning         COMMENCED         10/09/15         COMPLETED         10/09/15         REF         TP318														
P	ROJ	ECI	r S	tage 2 C	ontan	nination A	sse	ssment	LOGGED	GMT/GL	CHECKED	JF				Sheet 1	of <b>1</b>
E		ENT	4	5 Noong	Spade	and 25 0	śwy	nn Hugnes St, Bargo, NSW	GEOLOGY	Sandstone	VEGETATIC RL SURFAC	DN Gra	ISS			PROJECT N	<b>D.</b> P1504816
E	XCAVA		DIME	NSIONS	0.2 x 0.2	2 x 0.35m depth	1		NORTHING	NA	ASPECT	Eas	st			SLOPE	<2%
	E	KCA	VAT	ION DA	TA			MAT	ERIAL DAT	A				SA	MPLIN	G & TESI	ING
0011217	SUPPORT	WATER	MOISTURE	DEPTH (M)		R GRAPHIC LOG	CLASSIFICATION	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC tity or particle char y and minor comp consistency/relativ n size, texture/fabi th, weathering.	DN racteristics, oonents, ve density, ric, colour,	CONSISTENCY	DENSITY INDEX	ТҮРЕ	DEPTH (M)	A	RESU DDITIONAL	LTS AND OBSERVATIONS
	6 Ni	N	м	- - 0.2			CL- CI	Sandy CLAY - Low to with	o medium pla h rootlets.	asticity, brown,			B	0.1 0.15	4816/31 4816/31	- T 8/ 0.1 8/ 0.15	- 0PSOIL - -
\$	6 Ni	N	м	0.25			CL- CI	CLAY - Low to light or	o medium pla ange/orange	asticity,			A	0.3	4816/31	8/ 0.3	0.25_
				- - 0.5 - -				Test pit termina	ated at 0.35m	on clay.							- 0 <u>.5</u> -
				 0.75  													- 0.75_ - -
				_ <u>1.0</u> _ _ _													- 1 <u>.0</u> - -
				_ 1.25 _ _ _													- 1.25_ - -
				_ 1.5 _ _ _													- 1 <u>.5</u> - -
				_ 1.75 _ _													- 1.75 - -
				_ 2.0 _ _ _ _ 2.25													- 2 <u>0</u> - - - - 225
	EQUII N I BH E HA F S S CC C V V TC T PT F	PMEN Natura Existir Backho land a Spade oncre oncre oncre oncre oncre bit ungste	IT / MI I expo ng exca be buc iuger te Cor en Cart ibe	THOD SL sure SH avation SC ket RE Nii er bide Bit	JPPORT Shorin Shoter Rock E No su	WATER N Nor Yete X Not Bolts ♥ Wa Soport ♥ Wa ► Wa EXCAVAT	e obsi measi ter levi ter out ter infli	MOISTURE DRILLING arved D Dry RESISTA red M Moist L Low W Wet M Mode W Plastic limit H High low WI Liquid limit R Refus W OG TO BE READ IN CONJUNIC	G CONSIG INCE VS V€ S SG erate F Fin St Sti Sal VSt V€ H Ha F Fri CTION WITH Δ	STENCY DENSITY sty Soft VL Very Lo oft L Loose rm MD Medium iff D Dense rrg Stiff VD Very De rd able	SAMP ose A A Dense U I nse Ux pp F S S CBR C	LING & Auger sa Bulk sam Undisturber Disturber Fube san Pocket po Standard California	TESTING ample aple bed sample d sample mple (x mr enetromel penetratio a Bearing	le n) ter on test Ratio	VS Vi DCP D FD FD M M M WS V	ane shear lynamic cone enetrometer ield density doisture content Vater sample	CLASSIFICATION SYMBOLS AND SOIL DESCRIPTION Y USCS N Agricultural
	(	(C) C	Pa	rte Martens & Ass	<b>NS</b> sociates Pt	y. Ltd . 2015		N Suite 201, Phor mail@mart	ARTENS & AS 20 george St, ne: (02) 9476 99 tens.com.au W	SOCIATES PTY LTD Hornsby, NSW 2077 999 Fax: (02) 9476 87 EB: http://www.marter	Australia 767 ns.com.au		E	ng	jine Exc	ering avati	ı Log - ion

CL	IEN <sup>.</sup>	T Precise Planning COMMENCED 10/09/15 COMPLETED 10/09/15 REF TP319																	
SIT	E.	C I	45	Noong	anh St	and 25 C	isse Gwy	nn Hughes St,	GEOLOGY	Sandstone		VEGETATI	JF ON Grass	6			Sheet 1 PROJECT	of <b>1</b> NO. P1504816	
EQU	IPME	ΝТ			Spade			Bargo, NSW	EASTING	NA		RL SURFA	E NA						
EXC					0.2 x 0.2 x	0.4m depth		МАТ		NA <b>A</b>		ASPECT	East		SA		SLOPE		
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		GRAPHIC LOG	CLASSIFICATION	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC city or particle char y and minor comp consistency/relati- in size, texture/fab th, weathering.	DN racteristics, ponents, ve density, ric, colour,		CONSISTENCY	DENSITY INDEX	түре	DEPTH (M)	A	ULTS AND L OBSERVATIONS	5	
s	Nil	N	М	- - 0.2			CL- CI	Sandy CLAY - Low to with	o medium pla h rootlets.	asticity, brow	/n,			B	0.1 0.15	4816/31 4816/31	9/ 0.1 9/ 0.15 	TOPSOIL	-
s	Nil	N	м	0.25 - 0.4			CL- CI	CLAY - Low t light or	o medium pla ange/orange	asticity,				A	0.3	4816/31	9/ 0.3		0.25
				- <u>0.5</u> -				Test pit termin	ated at 0.4m	on clay.									- 0 <u>.5</u> - -
				 0.75 															 0.75 
				 															- 1 <u>.0</u> -
				- 1.25 -															- 1.25_ -
				- 1.5 															- 1.5 -
																			_ 1.75_ _ _
				  															2.0 - -
E N B H S C V T P	QUIPI Na E H Ba A Ha Sp C Co V-t C Tur T Pu	MENT atural e xisting ckhoe nd au ade ncrete it igsten sh tub	/ ME exposi excar buck ger Core Carbi e	2.25 THOD SI Jure SH vation So et RI Ni n de Bit	JPPORT H Shoring C Shotcret 3 Rock Bo I No supp	WATER N Non te X Not tits 및 Wat ort 및 Wat ← Wat	e obse measu er leve er out	MOISTURE DRILLING erved D Dry RESISTA red M Moist L Low Wet M Mode Wp Plastic limit H High Flow WI Liquid limit R Refus	G CONSI: NCE VS VG S Si erate F Fi St Sti sal VSt VG H Ha F Fri	STENCY DEN ary Soft VL oft L rm MD Iff D ary Stiff VD ard able	NSITY Very Loose Loose Medium D Dense Very Dense	SAMF se A ense U D e Ux pp S S CBR	PLING & Ti Auger sam Bulk sampl Undisturbe Disturbed samp Pocket per Standard p California E	ESTING ple le dd samp sample ole (x mr netromel enetratio Bearing	le n) ter on test Ratio	VS Va DCP D FD F M M WS W	ane shear ynamic cone netrometer eld density loisture conte /ater sample	CLASSIFICATI SYMBOLS AND SOIL DESCRIP IN USCS N Agricultura	2.25 DN ) TION
		n	a	rte Martens & Ass	ns sociates Pty.	EXCAVATI	ON L	OG TO BE READ IN CONJUN M Suite 201, Phor mail@mart	CTION WITH A MARTENS & AS , 20 george St, ne: (02) 9476 99 tens.com.au W	SOCIATES F Hornsby, NSV 999 Fax: (02) EB: http://www	ING REPO PTY LTD N 2077 Au 9476 876 w.martens	DRT NOTE ustralia 7 .com.au	S AND A	BBREY	ng	ns fine Exc	erin avat	g Log - tion	

CL	IEN <sup>.</sup>	NT Precise Planning COMMENCED 10/09/15 COMPLETED 10/09/15 REF TP320								)									
SI	E.	C I	45	Noong	anh St	and 25 C	isse Gwy	nn Hughes St,	GEOLOGY	Sandstone		VEGETATIO	DN Grass	6			Sheet 1 PROJECT	of <b>1</b> NO. P1504816	
EQL	IPME	ΝТ			Spade			Bargo, NSW	EASTING	NA		RL SURFAC	E NA						
EXC					0.2 × 0.2 >	0.4m depth		ΜΔΤ		NA <b>TA</b>		ASPECT	East		SA		SLOPE		
METHOD	SUPPORT	WATER	MOISTURE	DEPTH (M)		GRAPHIC LOG	CLASSIFICATION	MATERIA SOIL NAME, plastic colour, secondar moisture condition, ROCK NAME, grai streng	L DESCRIPTIC city or particle char y and minor comp consistency/relati- in size, texture/fab th, weathering.	on ponents, ve density, ric, colour,		CONSISTENCY	DENSITY INDEX	түре	DEPTH (M)	A	ULTS AND L OBSERVATIONS	6	
s	Nil	N	М	- - 0.2			CL- CI	Sandy CLAY - Low to wit	o medium pla h rootlets.	asticity, brown	n,			B	0.1 0.15	4816/32 4816/32	0/ 0.1 0/ 0.15	TOPSOIL	-
s	Nil	Ν	м	<u>0</u> .25 - 0.4			CL- CI	CLAY - Low t light or	o medium pla ange/orange	asticity,				A	0.3	4816/32	0/ 0.3		0.25_
				- <u>0.5</u> -				Test pit termin	ated at 0.4m	on clay.									0.5 - -
				 0.75 															- 0.75_ - -
				 															 1 <u>.0</u>
				- 1.25 -															- 1.25_ -
				- 1.5 															- 1 <u>.5</u> -
																			_ 1.75_ _ _
				  															2.0 - -
E N B H S C V T P	QUIPI Na E H Ba A Ha Sp C Co V-t C Tur T Pu	MENT atural e xisting ckhoe nd au ade ncrete it agsten sh tub	/ ME exposi exca buck ger Core Carbi e	2.25 THOD SU ure SH vation So et RI Ni n de Bit	JPPORT H Shoring C Shotcret 3 Rock Bo I No supp	WATER N Non te X Not tits 및 Wat ort 및 Wat → Wat	e obse measu er leve er out	MOISTURE DRILLING rved D Dry RESISTA red M Moist L Low W Wet M Mode Wp Plastic limit H High liow WI Liquid limit R Refus w	G CONSI: ANCE VS VE S Si erate F Fi St Sti sal VSt VE H Ha F Fri	STENCY DEN: ary Soft VL oft L mm MD ff D ary Stiff VD v ard able	SITY Very Loos Loose Medium De Dense Very Dense	SAMF Bense U De Ux pp I S S CBR (	PLING & T Auger sam Bulk samp Undisturbe Disturbed Disturbed Disturbed Disturbed Disturbed Disturbed Pocket per Standard p California E	ESTING ple le disample sample ole (x mr netromet enetratic Bearing I	le n) ter on test Ratio	VS V DCP D FD F M N WS V	ane shear ynamic cone enetrometer ield density loisture conte /ater sample	CLASSIFICATI SYMBOLS AND SOIL DESCRIP IN USCS N Agricultur	2.25 ON D'TION
		n c) Cor	a	rte Martens & Ass	ns sociates Pty.	EXCAVATI	ON L	OG TO BE READ IN CONJUN M Suite 201, Phor mail@mart	CTION WITH A MARTENS & AS , 20 george St, ne: (02) 9476 99 tens.com.au W	SOCIATES P Hornsby, NSW 999 Fax: (02) S EB: http://www	NG REPC TY LTD / 2077 Au 9476 8767 /.martens.	DRT NOTE: Istralia 7 .com.au	S AND A	BBRE	ng	nine Exc	ering	g Log - tion	

# 13 Attachment C – Historical Aerial Photographs



Detailed Site Investigation: 45 Noongah Street and 25 Gwynn Hughes Road, Bargo, NSW P1504816JR06V01 - January 2017 Page 33



	D		-
1990 Aerial NSW Department of Lands (1990)	Figure 2		
	Drawing No./	'ID:	

oy, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 artens.com.au Internet: http://www.martens.com.au	Project: P1504816	File:	Revision:
	F 1304010	3003001	~



	Drawing No./	/ID:	
1994 Aerial NSW Department of Lands (1994)	Figure 3		
y, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767 artens.com.au Internet: http://www.martens.com.au	Project: P1504816	File: JD05V01	Revisior A



Drawing	No./ID:

by, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767	Project:	File:	Revision:
nartens.com.au Internet: http://www.martens.com.au	P1504816	JD05V01	А

# 14 Attachment D – EPA Records Search



Detailed Site Investigation: 45 Noongah Street and 25 Gwynn Hughes Road, Bargo, NSW P1504816JR06V01 - January 2017 Page 35



Development Application 63/88

Thank you for your letter of 11 March 1988 concerning a proposal to construct a chicken processing plant at Lot 22, Noongah Street, Bargo.

The Commission would have no objection to the proposal but the following comments are made for Council's consideration:-

\* What is the maximum daily kill.

\* .What is the estimated water usage for each kill.

\* Storage area for sealed offal container should be drained into the waste water drainage system.

Furthermore, the applicant will require a formal approval from the Commission under Section 17K of the State Pollution Control Commission Act for the installation and disposal of the waste water arising from the processing plant.

Should you require further information in regard to this matter may I suggest you contact G. Dover at this office.

Yours faithfully,

J.P. 0 GORMAN for Secretary.

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# 15 Attachment E – Laboratory Summary Tables



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EQL

NEPM 2013 Table 1A(1) HILs Res A Soil NEPM 2013 EILs Urban Res and Open Spaces

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		
1	4	0.4	1	1	0.1	1	1		
300	100	20		6000	40	400	7400		
1100	100		410	75		75	200		

## Field\_ID LocCode Sample\_Depth\_Range Sampled\_Date-Time Matrix\_Description

4816/302	4816/302	0.15	10/09/2015	22	4	<0.4	19	8	<0.1	10	58
4816/303	4816/303	0.15	10/09/2015	26	6	<0.4	17	11	<0.1	8	47
4816/304	4816/304	0.15	10/09/2015	21	<4	<0.4	15	9	<0.1	6	100
4816/305	4816/305	0.15	10/09/2015	34	6	1	14	10	<0.1	2	680
4816/306	4816/306	0.15	10/09/2015	6	<4	<0.4	3	3	<0.1	1	50
4816/307	4816/307	0.15	10/09/2015	7	<4	<0.4	4	2	<0.1	1	61
4816/309	4816/309	0.15	10/09/2015	9	<4	<0.4	6	1	<0.1	2	4
4816/311	4816/311	0.15	10/09/2015	7	<4	0.4	5	1	<0.1	1	220
4816/312	4816/312	0.15	10/09/2015	13	4	<0.4	6	7	<0.1	1	73
4816/313	4816/313	0.3	10/09/2015	7	10	<0.4	7	10	<0.1	1	69
4816/314	4816/314	0.15	10/09/2015	11	<4	<0.4	18	2	<0.1	3	7
4816/316	4816/316	0.15	10/09/2015	34	5	<0.4	10	10	<0.1	7	68
4816/317	4816/317	0.15	10/09/2015	16	<4	<0.4	12	6	<0.1	5	330
4816/319	4816/319	0.15	10/09/2015	53	<4	<0.4	10	37	<0.1	4	75
4816/320	4816/320	0.15	10/09/2015	18	14	0.7	46	4	<0.1	5	38

## Statistical Summary

Number of Results	15	15	15	15	15	15	15	15
Number of Detects	15	7	3	15	15	0	15	15
Minimum Concentration	6	<4	<0.4	3	1	<0.1	1	4
Minimum Detect	6	4	0.4	3	1	ND	1	4
Maximum Concentration	53	14	1	46	37	<0.1	10	680
Maximum Detect	53	14	1	46	37	ND	10	680
Average Concentration	19	4.3	0.3	13	8.1	0.05	3.8	125
Median Concentration	16	2	0.2	10	7	0.05	3	68
Standard Deviation	13	3.5	0.24	11	8.8	0	2.9	175
Number of Guideline Exceedances	0	0	0	0	0	0	0	3
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	3



Multons			BT	EX							TPH				
consulting engineers	Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	C6-C10 less BTEX (F1)	c10-C16	c16-C34	c34-C40	E2-NAPHTHALENE	60 - 90 mg/kg	210 - C14	c15 - C28	c29-C36	C6-C10
FOL	0.2	1	0.5	2	1	25	50	100	100	50	25	50	100	100	25
Direct Contact HSL-A	100	4500	14000	_	_		3300	4500	6300						4400
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand															
0-1m	0.5	57	160				110								44
1-2m	0.5		220				240								70
2-4m	0.5		310				440								110
>4m	0.5		540												200
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil															
0-2m	50	70	85			180	120	300	2800						
NEPM 2013 EILs Urban Res and Open Spaces										170					

## Field\_ID LocCode Sample\_Depth\_Range Sampled\_Date-Time Matrix\_Description

4816/302	4816/302	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/303	4816/303	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/304	4816/304	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/305	4816/305	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/306	4816/306	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/307	4816/307	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/309	4816/309	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/311	4816/311	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/312	4816/312	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/313	4816/313	0.3	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/314	4816/314	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/316	4816/316	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	190	150	<50	<25	<50	<100	200	<25
4816/317	4816/317	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/319	4816/319	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
4816/320	4816/320	0.15	10/09/2015	<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
Trip Blank	Trip Blank		10/09/2015	<0.2	<1	<0.5	<2	<1	-	-	-	-	-	<25	-	-	-	<25
Statistical 9	Summary																	

														_
16	16	16	16	16	15	15	15	15	15	16	15	15	15	16
0	0	0	0	0	0	0	1	1	0	0	0	0	1	0
<0.2	<1	<0.5	<2	<1	<25	<50	<100	<100	<50	<25	<50	<100	<100	<25
ND	ND	ND	ND	ND	ND	ND	190	150	ND	ND	ND	ND	200	ND
<0.2	<1	<0.5	<2	<1	<25	<50	190	150	<50	<25	<50	<100	200	<25
ND	ND	ND	ND	ND	ND	ND	190	150	ND	ND	ND	ND	200	ND
0.1	0.5	0.25	1	0.5	13	25	59	57	25	13	25	50	60	13
0.1	0.5	0.25	1	0.5	12.5	25	50	50	25	12.5	25	50	50	12.5
0	0	0	0	0	0	0	36	26	0	0	0	0	39	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
	16           0           <0.2	16         16           0         0           <0.2	16         16         16           0         0         0           <0.2	16         16         16         16           0         0         0         0           <0.2	16         16         16         16         16           0         0         0         0         0           <0.2	16         16         16         16         15           0         0         0         0         0         0           <0.2	16         16         16         16         16         15         15           0         0         0         0         0         0         0         0           <0.2	16         16         16         16         15         15         15           0         0         0         0         0         0         0         1           <0.2	16         16         16         16         15         15         15         15           0         0         0         0         0         0         0         1         1           <0.2	16         16         16         16         15         15         15         15         15           0         0         0         0         0         0         0         1         1         0           <0.2	16         16         16         16         15         15         15         15         15         16           0         0         0         0         0         0         0         1         1         0         0           <0.2	16         16         16         16         15         15         15         15         16         15           0         0         0         0         0         0         1         1         0         0         0         0         0         0         0         15         15         15         15         16         15           0         0         0         0         0         0         1         1         0         0         0           <0.2	16         16         16         16         15         15         15         15         16         15         15           0         0         0         0         0         0         1         1         1         0         0         0         0           <0.2	16         16         16         16         15         15         15         15         16         15         15         15           0         0         0         0         0         0         1         1         1         0         0         0         1         1



							DALL/	hanala							
naphthene	naphthylene	hracene	z(a)anthracene	zo(a) pyrene	zo(b+k)fluoranthene	zo(g,h,i) perylene	/HAH/I	enz(a,h)anthracene	:inogenic PAHs (as B(a)P TPE)	ranthene	rene	eno(1,2,3-c,d) pyrene	hthalene	nanthrene	ene
Ace	Ace	And	Ber	Be	Ber	Bel	- 5	- Bio Bio Bio Bio Bio Bio Bio Bio Bio Bio	Car	- E	문		Z	- Be	Å
iiig/kg	Ting/kg	під/кд	під/кд	під/кд	під/кд	під/кд	під/кд	під/кд	mg/kg	iiig/kg	під/кд	mg/kg	під/кд	під/кд	mg/kg
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
									3						
				0.7											

## Field\_ID LocCode Sample\_Depth\_Range Sampled\_Date-Time Matrix\_Description

EQL NEPM 2013 Table 1A(1) HILs Res A Soil NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil

0-2m

4816/302	4816/302	0.15	10/09/2015	< 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
4816/303	4816/303	0.15	10/09/2015	<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
4816/304	4816/304	0.15	10/09/2015	<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
4816/305	4816/305	0.15	10/09/2015	<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
4816/306	4816/306	0.15	10/09/2015	<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
4816/307	4816/307	0.15	10/09/2015	< 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
4816/309	4816/309	0.15	10/09/2015	<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
4816/311	4816/311	0.15	10/09/2015	< 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
4816/312	4816/312	0.15	10/09/2015	<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
4816/313	4816/313	0.3	10/09/2015	<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
4816/314	4816/314	0.15	10/09/2015	<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
4816/316	4816/316	0.15	10/09/2015	<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	<1 - 0.1	0.5	<0.1
4816/317	4816/317	0.15	10/09/2015	< 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
4816/319	4816/319	0.15	10/09/2015	<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
4816/320	4816/320	0.15	10/09/2015	< 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

Statistical Summary																
Number of Results	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Number of Detects	0	0	0	0	0	0	0	1	0	0	1	0	0	1	1	1
Minimum Concentration	<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
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	0.1	ND	ND	0.1	ND	ND	ND	0.5	0.1
Maximum Concentration	<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	0.5	0.1
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	0.1	ND	ND	0.1	ND	ND	0.1	0.5	0.1
Average Concentration	0.05	0.05	0.05	0.05	0.025	0.1	0.05	0.053	0.05	0.25	0.053	0.05	0.05	0.067	0.08	0.053
Median Concentration	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
Standard Deviation	0	0	0	0	0	0	0	0.013	0	0	0.013	0	0	0.065	0.12	0.013
Number of Guideline Exceedances	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



Martens								C	rganocl	hlorine I	Pesticide	es											Org	ganopho	sphorou
consulting engineers	4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	Dieldrin	Endosulfan l	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Azinophos methyl	Bromophos-ethyl	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos
	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
NEPM 2013 Table 1A(1) HILs Res A Soil														10			6		300			160			
NEPM 2013 EILs Urban Res and Open Spaces									180																

## Field ID LocCode Sample Depth Range Sampled Date-Time Matrix Description

Tielu_ID	LOCCOUE	Sample_Depth_Range	Sampled_Date-Time	Wathx_Description																									
4816/301	4816/301	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/301	4816/301	0.4	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/302	4816/302	0.15	10/09/2015	ĺ	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/303	4816/303	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/304	4816/304	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/305	4816/305	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/306	4816/306	0.15	10/09/2015		<0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/307	4816/307	0.15	10/09/2015		<0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/309	4816/309	0.15	10/09/2015		<0.1	< 0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/311	4816/311	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/312	4816/312	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/313	4816/313	0.3	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/314	4816/314	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/316	4816/316	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/317	4816/317	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/318	4816/318	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/319	4816/319	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
4816/320	4816/320	0.15	10/09/2015		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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				18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
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
Minimum (	Concentration	า			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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
Maximum	Concentratio	n			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<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
Average Co	oncentration				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 Co	ncentration				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 D	eviation				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 Ex	ceedances			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 Ex	ceedances(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
B		. ,,																											

sphorou	s Pestic	ides			
Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Ronnel
mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
0.1	0.1	0.1	0.1	0.1	0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
18	18	18	18	18	18
0	0	0	0	0	0
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ND	ND	ND	ND	ND	ND
<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
ND	ND	ND	ND	ND	ND
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	0	0	0	0	0
0	0	0	0	0	0
0	0	0	0	0	0

Field Dupli Filter: SDG	cates (SOIL) in('ENVIRC		SDG Fleid ID Samoled Date/Time	ENVIROLAB 2015-09-11700:00:00 4816/311 10/09/2015	ENVIROLAB 2015:09-11T00:00:00 4816/DUP1 10/09/2015	C ar	ENVIROLAB 2015-09-11T00:00:00 4816/312 10/09/2015	ENVIROLAB 2015-09-11700:00:00 4816/DUP2 10/09/2015	RPD
Chem Gre	ChemNam	Units	EQL						
Inorganics	Moisture	%	0.1	13.0	16.0	21	19.0	19.0	0
,									
Lead	Lead	ma/ka	-	0.7	8.0	13	13.0	8.0	48
					5				
Metals	Arsenic	mg/kg	4	<4.0	<4.0	0	4.0	<4.0	0
	Cadmium	ma/ka	0.4	0.4	0.4	0	<0.4	<0.4	0
	Chromium	ma/ka	1	5.0	3.0	50	6.0	4.0	40
	Copper	ma/kg	1	1.0	2.0	67	7.0	6.0	15
ſ	Mercury	ma/ka	0.1	<0.1	40.1	0	<0.1	<0.1	0
	Nickel	ma/ka		1.0	1.0	D	1.0	1.0	0
	Zinc	mg/kg	1	220.0	260.0	17	73.0	54.0	99

124	A B C D E	F	G H I J K	L
1	Lognormal UCL S	Statistics fo	r Uncensored Full Data Sets	
2				
3	User Selected Options			
4	Date/Time of Computation 21/10/2015 9:41:54 AM			
5	From File WorkSheet.xls			
6	Full Precision OFF			
7	Confidence Coefficient 95%			
8	Number of Bootstrap Operations 2000			
9				
10				
11	⊺∠n			
12	4	0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
13	TAIN A COLOR	General	Statistics	*
14	I otal Number of Observations	15	Number of Distinct Observations	15
15			Number of Missing Observations	0
16	Minimum	4	Mean	125.3
17	Maximum	680	Median	68
18	SD	174.8	Std. Error of Mean	45.13
19	Coefficient of Variation	1.395	Skewness	2.683
20				
21	Chapito Will Tast Statistic	Lognormal	IGOF Test	
22	5% Shapiro Wilk Critical Value	0.909	Shapiro wilk Lognormal GOF Test	
23		0.001	Lilliofors Lognormal GOE Toot	
24	5%   illiefors Critical Value	0.211	Data appear Lognormal at 5% Significance Level	
25		ognormal	at 5% Significance Level	
20		Logilollia		
27		Lognorma	al Statistics	
20	Minimum of Logged Data	1.386	Mean of logged Data	4.152
30	Maximum of Logged Data	6.522	SD of logged Data	1.284
31				
32	Assu	ming Logno	ormal Distribution	
33	95% H-UCL	437.9	90% Chebyshev (MVUE) UCL	281.1
34	95% Chebyshev (MVUE) UCL	348.3	97.5% Chebyshev (MVUE) UCL	441.6
35	99% Chebyshev (MVUE) UCL	624.8		
36				
37	Nonpara	ametric Dist	tribution Free UCLs	
38	95% CLT UCL	199.6	95% Jackknife UCL	204.8
39	95% Standard Bootstrap UCL	197.8	95% Bootstrap-t UCL	348.1
40	95% Hall's Bootstrap UCL	464.5	95% Percentile Bootstrap UCL	206 6
41	95% BCA Bootstrap UCL	239.4		
42	90% Chebyshev(Mean, Sd) UCL	260.7	95% Chebyshev(Mean, Sd) UCL	322.1
43	97.5% Chebyshev(Mean, Sd) UCL	407.2	99% Chebyshev(Mean, Sd) UCL	574.4
<b>4</b> 4				
45		Suggested	UCL to Use	
46	95% Chebyshev (Mean, Sd) UCL	322.1		
47				
48	Note: Suggestions regarding the selection of a 95%	UCL are pro	ovided to help the user to select the most appropriate 95% UC	CL.
49	These recommendations are based upon the resu	Its of the si	mulation studies summarized in Singh, Singh, and laci (2002)	)
50	and Singh and Singh (2003). Howeve	er, simulatio	ns results will not cover all Real World data sets.	
51	For additional insight	t the user m	nay want to consult a statistician.	
52				

# 16 Attachment F – Laboratory Analytical Certificates and Chain of Custody Documentation



coc 1119 4:04pm

SOIL ANALYSIS CHAIN OF CUSTODY FORM

consulting engineers since 1989								
	-		Ac	dditional Testing	D			
Name	Stage 2 – 45 Noong	gah St and 25	5 Gwynn Hugh	es Street, Bargo, N	JSW			
Martens Contact Officer	Grant Taylor				Contact Email	<u>granttaylor@martens.</u>	com.au	
	Sample Date	10/09/20	015	Dispatch Date	11/09/2015	Turnaround Time		standard
Sampling and Shipping	Our Reference	P150481	6JCOC02V01		Shipping Method (X)	Hand	Post	0
	On Ice (X)	×	No Ice (X)	Other (	(X)			

×

Courier

Name	ENVIROLO	Q					
Sample Delivery Address	12 Ashle	y Street, Chatswo	po				
Delivery Contact	Name	Aileen	Phone	9910 6200	Fax	Emo	ii ahie@envirolabservices.com.au
Please Send Report By (X)	Post	Fax	Email	X Reporting Er	nail Address	<u>granttaylor@mart</u>	ens.com.au & jfulton@martens.com.au

Laboratory

Imple ID	Sample depth	OCP/OPP	WH	Combo 5b	Asbestos I.D. (WA dept. of heatth)	Btex	ТКН	Asbestos I.D. (Material)	НОГД
5/302/0.15	0.15			×	1				
6/303/0.15	0.15			×					
6/304/0.15	0.15			×					
6/305/0.15	0.15			×					
6/306/0.15	0.15		-	×					
6/307/0.15	0.15			×					
6/309/0.15	0.15			×					
6/311/0.15	0.15			×					
6/312/0.15	0.15			×					
16/313/0.3	0.3			×					
6/314/0.15	0.15			×					
6/316/0.15	0.15			×					
6/317/0.15	0.15			×					
6/319/0.15	0.15			×					
6/320/0.15	0.15			×		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 Takes		

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

ENVIROLAB

Date Received: 11 0911

Time Received: 16 13 0 Received by: 0, F

Security: Intact/Broken/None

Temp: Cooling: Coolin

134206

Job No:

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

Suite 201, 20 George Street Hornsby NSW 2077, Australia Ph 02 9476 9999 Fax 02 9476 8767

Head Office

# SOIL ANALYSIS CHAIN OF CUSTODY

Page of

						Asbestos			Asbestos	
NLAS	6 Sample ID	Sample depth	OCP/OPP	WH	Combo 5b	dept. of health)	Btex	TRH	I.D. (Material)	ПОН
9	4816/301/0.15	0.15	×							
T)	4816/301/0.4	0.4	x							
ط)	4816/318/0.15	0.15	×							
				i.						
õ	4816/301/0.1	0.1				×				
3	4816/302/0.1	0.1				x				
12	4816/303/0.1	0.1				×				
22	4816/304/0.1	0.1				x				
52	4816/305/0.1	0.1				x				
24	4816/306/0.1	0.1				×				
25	4816/307/0.1	0.1				×				
20	4816/309/0.1	0.1				×				
27	4816/310/0.1	0.1				x				
28	4816/312/0.1	0.1				x				
52	4816/313/0.1	0.1				×		1 · · · · · · · · · · · · · · · · · · ·		
30	4816/314/0.1	0.1				×				
2	4816/316/0.1	0.1				×				
32	4816/317/0.1	0.1				×				
33	4816/318/0.1	0.1				×				
34	4816/320/0.1	0.1				×				
0										
15	4816/306/ASB1	0.1							×	
36	481 (/306/ASB2	512 an jar 0.1							×	
tr tr	4816/312/ASB3	0.1							×	
38	4816/DUP1		•	×						
39	4816/DUP2			×						
5	Trip Blank						×	×		
41	Trip Spike						×	×		



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

CERTIFICATE OF ANALYSIS

134206

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

Attention: Grant Taylor

## Sample log in details:

Your Reference: No. of samples: Date samples received / completed instructions received

## P1504816JCOC02V01, Bargo

38 Soils 3 Materials 11/09/2015 / 11/09/2015

## 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:
 18/09/15
 /
 18/09/15

 Date of Preliminary Report:
 Not Issued

 NATA accreditation number 2901. This document shall not be reproduced except in full.

 Accredited for compliance with ISO/IEC 17025.

 Tests not covered by NATA are denoted with \*.

## **Results Approved By:**

Jacinta/Hurst

Jacinta/Hurst Laboratory Manager



# Client Reference: P1504816JCOC02V01, Bargo

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	134206-1	134206-2	134206-3	134206-4	134206-5
Your Reference		4816/302	4816/303	4816/304	4816/305	4816/306
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	17/09/2015	17/09/2015	17/09/2015	17/09/2015	17/09/2015
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	%	86	88	90	88	89

vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	134206-6	134206-7	134206-8	134206-9	134206-10
Your Reference		4816/307	4816/309	4816/311	4816/312	4816/313
Depth		0.15	0.15	0.15	0.15	0.3
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	17/09/2015	17/09/2015	17/09/2015	17/09/2015	17/09/2015
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C 10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	90	90	90	84	88

## Client Reference:

# P1504816JCOC02V01, Bargo

vTRH(C6-C10)/BTEXN in Soil Our Reference: Your Reference	UNITS	134206-11 4816/314	134206-12 4816/316	134206-13 4816/317	134206-14 4816/319	134206-15 4816/320
Depth Date Sampled Type of sample		0.15 10/09/2015 Soil	0.15 10/09/2015 Soil	0.15 10/09/2015 Soil	0.15 10/09/2015 Soil	0.15 10/09/2015 Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	17/09/2015	17/09/2015	17/09/2015	17/09/2015	17/09/2015
TRHC6 - C9	mg/kg	<25	<25	<25	<25	<25
TRHC6 - C10	mg/kg	<25	<25	<25	<25	<25
vTPHC6 - C 10 less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	88	87	89	86	83

vTRH(C6-C10)/BTEXN in Soil			
Our Reference:	UNITS	134206-40	134206-41
Your Reference		Trip Blank	Trip Spike
Depth		-	-
Date Sampled		10/09/2015	10/09/2015
Type of sample		Soil	Soil
Date extracted	-	14/09/2015	14/09/2015
Date analysed	-	17/09/2015	17/09/2015
TRHC6 - C9	mg/kg	<25	[NA]
TRHC6 - C10	mg/kg	<25	[NA]
Benzene	mg/kg	<0.2	99%
Toluene	mg/kg	<0.5	98%
Ethylbenzene	mg/kg	<1	98%
m+p-xylene	mg/kg	<2	97%
o-Xylene	mg/kg	<1	98%
Surrogate aaa-Trifluorotoluene	%	94	74

# Client Reference: P1504816JCOC02V01, Bargo

svTRH (C10-C40) in Soil						
Our Reference:	UNITS	134206-1	134206-2	134206-3	134206-4	134206-5
Your Reference		4816/302	4816/303	4816/304	4816/305	4816/306
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	15/09/2015
TRHC 10 - C 14	mg/kg	<50	<50	<50	<50	<50
TRHC 15 - C28	mg/kg	<100	<100	<100	<100	<100
TRHC29 - C36	mg/kg	<100	<100	<100	<100	<100
TRH>C 10-C 16	mg/kg	<50	<50	<50	<50	<50
TRH>C10 - C16 less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C16-C34	mg/kg	<100	<100	<100	<100	<100
TRH>C34-C40	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	98	94	93	99	90
				1		1
svTRH (C10-C40) in Soil						

SVIRT(C10-C40)III30II						
Our Reference:	UNITS	134206-6	134206-7	134206-8	134206-9	134206-10
Your Reference		4816/307	4816/309	4816/311	4816/312	4816/313
Depth		0.15	0.15	0.15	0.15	0.3
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015	15/09/2015	15/09/2015
TRHC 10 - C 14	mg/kg	<50	<50	<50	<50	<50
TRHC 15 - C28	mg/kg	<100	<100	<100	<100	<100
TRHC29 - C36	mg/kg	<100	<100	<100	<100	<100
TRH>C10-C16	mg/kg	<50	<50	<50	<50	<50
TRH>C10 - C16 less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C16-C34	mg/kg	<100	<100	<100	<100	<100
TRH>C34-C40	mg/kg	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	89	92	90	94	98
svTRH (C10-C40) in Soil						
--	-------	------------	------------	------------	------------	------------
Our Reference:	UNITS	134206-11	134206-12	134206-13	134206-14	134206-15
Your Reference		4816/314	4816/316	4816/317	4816/319	4816/320
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015	15/09/2015	15/09/2015
TRHC 10 - C14	mg/kg	<50	<50	<50	<50	<50
TRHC 15 - C28	mg/kg	<100	<100	<100	<100	<100
TRHC29 - C36	mg/kg	<100	200	<100	<100	<100
TRH>C 10-C 16	mg/kg	<50	<50	<50	<50	<50
TRH>C10 - C16 less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH>C16-C34	mg/kg	<100	190	<100	<100	<100
TRH>C34-C40	mg/kg	<100	150	<100	<100	<100
Surrogate o-Terphenyl	%	96	104	93	104	115

PAHs in Soil						
Our Reference:	UNITS	134206-1	134206-2	134206-3	134206-4	134206-5
Your Reference		4816/302	4816/303	4816/304	4816/305	4816/306
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
l ype of sample		Soli	Soli	Soll	Soll	Soli
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
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	0.23	NIL(+)VE	NIL(+)VE
Surrogate p-Terphenyl-d14	%	109	101	101	104	99

PAHs in Soil						
Our Reference:	UNITS	134206-6	134206-7	134206-8	134206-9	134206-10
Your Reference		4816/307	4816/309	4816/311	4816/312	4816/313
Depth		0.15	0.15	0.15	0.15	0.3
DateSampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
l ype of sample		Soli	Soll	Soll	Soll	Soli
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
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	%	79	100	101	100	104

PAHs in Soil						
Our Reference:	UNITS	134206-11	134206-12	134206-13	134206-14	134206-15
Your Reference		4816/314	4816/316	4816/317	4816/319	4816/320
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
		501	SOII	501	501	501
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
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	0.5	<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	0.77	NIL(+)VE	NIL(+)VE	NIL(+)VE
Surrogate p-Terphenyl-d14	%	102	103	105	114	107

#### Client Reference:

Organochlorine Pesticides in soil						
Our Reference:	UNITS	134206-1	134206-2	134206-3	134206-4	134206-5
Your Reference		4816/302	4816/303	4816/304	4816/305	4816/306
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	16/09/2015	16/09/2015	16/09/2015	16/09/2015	16/09/2015
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	%	100	95	93	97	98

#### Client Reference:

Organochlorine Pesticides in soil						
Our Reference:	UNITS	134206-6	134206-7	134206-8	134206-9	134206-10
Your Reference		4816/307	4816/309	4816/311	4816/312	4816/313
Depth		0.15	0.15	0.15	0.15	0.3
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	16/09/2015	16/09/2015	16/09/2015	16/09/2015	16/09/2015
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	%	92	97	94	98	97

#### Client Reference: P15

Organochlorine Pesticides in soil						
Our Reference:	UNITS	134206-11	134206-12	134206-13	134206-14	134206-15
Your Reference		4816/314	4816/316	4816/317	4816/319	4816/320
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	16/09/2015	16/09/2015	16/09/2015	16/09/2015	16/09/2015
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	%	92	95	95	107	95

#### **Client Reference:**

Organochlorine Pesticides in soil				
Our Reference:	UNITS	134206-16	134206-17	134206-18
Your Reference		4816/301	4816/301	4816/318
Depth		0.15	0.4	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	16/09/2015	16/09/2015	16/09/2015
HCB	mg/kg	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	92	97

#### Client Reference: P1504816JC

P1504816JCOC02V	01, Bargo
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Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS 	134206-1 4816/302 0.15 10/09/2015 Soil	134206-2 4816/303 0.15 10/09/2015 Soil	134206-3 4816/304 0.15 10/09/2015 Soil	134206-4 4816/305 0.15 10/09/2015 Soil	134206-5 4816/306 0.15 10/09/2015 Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	16/09/2015	16/09/2015	16/09/2015	16/09/2015	16/09/2015
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	%	100	95	93	97	98
Organophosphorus Pesticides Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS 	134206-6 4816/307 0.15 10/09/2015 Soil	134206-7 4816/309 0.15 10/09/2015 Soil	134206-8 4816/311 0.15 10/09/2015 Soil	134206-9 4816/312 0.15 10/09/2015 Soil	134206-10 4816/313 0.3 10/09/2015 Soil
 Date extracted		14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	16/09/2015	16/09/2015	16/09/2015	16/09/2015	16/09/2015
Azinphos-methyl (Guthion)	ma/ka	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	ma/ka	<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
	0/	02	07	04	08	07

Organophosphorus Pesticides						
Our Reference:	UNITS	134206-11	134206-12	134206-13	134206-14	134206-15
Your Reference		4816/314	4816/316	4816/317	4816/319	4816/320
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	16/09/2015	16/09/2015	16/09/2015	16/09/2015	16/09/2015
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	%	92	95	95	107	95
	1					
Organophosphorus Pesticides						

organophosphorus resucides				
Our Reference:	UNITS	134206-16	134206-17	134206-18
Your Reference		4816/301	4816/301	4816/318
Depth		0.15	0.4	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil
Date extracted	-	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	16/09/2015	16/09/2015	16/09/2015
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	90	92	97

<b></b>	1					
Acid Extractable metals in soil						
Our Reference:	UNITS	134206-1	134206-2	134206-3	134206-4	134206-5
Your Reference		4816/302	4816/303	4816/304	4816/305	4816/306
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
l ype of sample		Soli	Soli	Soli	Soll	Soli
Date prepared	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015	15/09/2015	15/09/2015
Arsenic	mg/kg	4	6	<4	6	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	1	<0.4
Chromium	ma/ka	19	17	15	14	3
Copper	ma/ka	8	11	9	10	3
Lead	mg/kg	22	26	21	34	6
Leau	iiig/kg		20		-0.4	-0.1
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	8	6	2	1
Zinc	mg/kg	58	47	100	680	50
Acid Extractable metals in soil		404000.0		10,1000,0	404000.0	404000 40
Our Reference:	UNITS	134206-6	134206-7	134206-8	134206-9	134206-10
Your Reference		4816/307	4816/309	4816/311	4816/312	4816/313
Deptin		0.15	0.15	0.15	0.15	0.3
Type of sample		Soil	Soil	Soil	Soil	Soil
			1.1/00/00.15	1.1/00/00.15		
Date prepared	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015	15/09/2015	15/09/2015
Arsenic	mg/kg	<4	<4	<4	4	10
Cadmium	mg/kg	<0.4	<0.4	0.4	<0.4	<0.4
Chromium	mg/kg	4	6	5	6	7
Copper	mg/kg	2	1	1	7	10
Lead	mg/kg	7	9	7	13	7
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	ma/ka	1	2	1	1	1
Zinc	ma/ka	61	4	220	73	69
Lino	mg/ng	01	7	220	10	00
Acid Extractable metals in soil						
Our Reference:	UNITS	134206-11	134206-12	134206-13	134206-14	134206-15
Your Reference		4816/314	4816/316	4816/317	4816/319	4816/320
Depth		0.15	0.15	0.15	0.15	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015	15/09/2015	15/09/2015
Arsenic	ma/kg	<4	5	<4	<4	14
Cadmium	ma/ka	<0.4	<0.4	<0.4	<0.4	0.7
Chromium	ma/ka	18	10	12	10	46
Coppor	malka	2	10	6	37	
	111g/Kg	~	10	10	57	4
	тg/кg		34	16	53	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	7	5	4	5
Zinc	mg/kg	7	68	330	75	38

#### Client Reference:

Acid Extractable metals in soil				
Our Reference:	UNITS	134206-38	134206-39	134206-42
Your Reference		4816/DUP1	4816/DUP2	4816/314 -
				TRIPLICATE
Depth		-	-	0.15
Date Sampled		10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil
Date prepared	-	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015
Arsenic	mg/kg	<4	<4	5
Cadmium	mg/kg	0.4	<0.4	<0.4
Chromium	mg/kg	3	4	19
Copper	mg/kg	2	6	1
Lead	mg/kg	8	8	12
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	1	1	3
Zinc	mg/kg	260	54	6

Moisture Our Reference: Your Reference Depth Date Sampled Type of sample Date prepared	UNITS 	134206-1 4816/302 0.15 10/09/2015 Soil 14/09/2015	134206-2 4816/303 0.15 10/09/2015 Soil 14/09/2015	134206-3 4816/304 0.15 10/09/2015 Soil 14/09/2015	134206-4 4816/305 0.15 10/09/2015 Soil 14/09/2015	134206-5 4816/306 0.15 10/09/2015 Soil 14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015	15/09/2015	15/09/2015
Moisture	%	23	18	23	21	9.2
Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS 	134206-6 4816/307 0.15 10/09/2015 Soil	134206-7 4816/309 0.15 10/09/2015 Soil	134206-8 4816/311 0.15 10/09/2015 Soil	134206-9 4816/312 0.15 10/09/2015 Soil	134206-10 4816/313 0.3 10/09/2015 Soil
Date prepared	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015	15/09/2015	15/09/2015
Moisture	%	6.2	15	13	19	33
Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS 	134206-11 4816/314 0.15 10/09/2015 Soil	134206-12 4816/316 0.15 10/09/2015 Soil	134206-13 4816/317 0.15 10/09/2015 Soil	134206-14 4816/319 0.15 10/09/2015 Soil	134206-15 4816/320 0.15 10/09/2015 Soil
Date prepared	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015	15/09/2015	15/09/2015
Moisture	%	17	17	22	26	21
			-	-	-	
Moisture Our Reference: Your Reference Depth Date Sampled Type of sample	UNITS	134206-16 4816/301 0.15 10/09/2015 Soil	134206-17 4816/301 0.4 10/09/2015 Soil	134206-18 4816/318 0.15 10/09/2015 Soil	134206-38 4816/DUP1 - 10/09/2015 Soil	134206-39 4816/DUP2 - 10/09/2015 Soil
Date prepared	-	14/09/2015	14/09/2015	14/09/2015	14/09/2015	14/09/2015
Date analysed	-	15/09/2015	15/09/2015	15/09/2015	15/09/2015	15/09/2015
Moisture	%	15	18	17	16	19
			·	1	1	1
Moisture Our Reference: Your Reference	UNITS	134206-40 Trip Blank				

Tour Relefence		прыанк
Depth		-
Date Sampled Type of sample		10/09/2015 Soil
Date prepared	-	14/09/2015
Date analysed	-	15/09/2015
Moisture	%	0.9

Asbestos ID - soils NEPM*						
Our Reference:	UNITS	134206-19	134206-20	134206-21	134206-22	134206-23
Your Reference		4816/301	4816/302	4816/303	4816/304	4816/305
Depth		0.1	0.1	0.1	0.1	0.1
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17- 18/09/2015	17- 18/09/2015	17- 18/09/2015	17- 18/09/2015	17- 18/09/2015
Sample mass tested	g	576.25g	923.87g	604.10g	914.46g	712.13g
Sample Description	-	Brown	Brown	Brown	Brown fine-	Brown
		coarse-	coarse-	coarse-	grained soil &	coarse-
		grained soil &	grained soil &	grained soil &	rocks	grained soil &
		rocks	rocks	rocks		rocks
Asbestos ID in soil	-	No asbestos				
		detected at				
		of 0 1g/kg				
		Organic	Organic	Organic	Organic	Organic
		fibres	fibres	fibres	fibres	fibres
		detected	detected	detected	detected	detected
Trace Analysis	-	No asbestos				
		detected	detected	detected	detected	detected
ACM>7mm Estimation*	g					
ACM <7mm Estimation*	g					
FA and AF Estimation*	g					
Total Asbestos g/kg*	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
ACM >7mm Estimation %(w/w)*	%	<0.01	<0.01	<0.01	<0.01	<0.01
ACM <7mm Estimation %(w/w)*	%	<0.001	<0.001	<0.001	<0.001	<0.001
FA and AF Estimation %(w/w)*	%	<0.001	<0.001	<0.001	<0.001	<0.001
Total Asb Est w/w* Note <sup>#</sup>	%	<0.001	<0.001	<0.001	<0.001	<0.001

#### Client Reference: P1

Asbestos ID - soils NEPM*						
Our Reference:	UNITS	134206-24	134206-25	134206-26	134206-27	134206-28
Your Reference		4816/306	4816/307	4816/309	4816/310	4816/312
Depth		0.1	0.1	0.1	0.1	0.1
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17-	17-	17-	17-	17-
		18/09/2015	18/09/2015	18/09/2015	18/09/2015	18/09/2015
Sample mass tested	g	968.53g	570.90g	674.43g	855.76g	688.75g
Sample Description	-	Brown	Brown fine-	Brown	Brown	Brown fine-
		coarse-	grained soil &	coarse-	coarse-	grained soil &
		grained	rocks	grained soil &	grained soil &	rocks
Ashastas ID is sail			No ochostoo	Ne sebestes	Ne sebestes	
Aspestos ID in soli	-	detected at				
		reporting limit				
		of 0.1g/kg				
		Organic	Organic	Organic	Organic	Organic
		TIDres detected	TIDres detected	TIDRES detected	TIDres detected	TIDres detected
Trace Analysis		No ashestos				
	_	detected	detected	detected	detected	detected
ACM>7mm Estimation*	g					
ACM < 7mm Estimation*	g					
FA and AF Estimation*	g					
Total Asbestos g/kg*	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
ACM >7mm Estimation %(w/w)*	%	<0.01	<0.01	<0.01	<0.01	<0.01
ACM <7mm Estimation %(w/w)*	%	<0.001	<0.001	<0.001	<0.001	<0.001
FA and AF Estimation %(w/w)*	%	<0.001	<0.001	<0.001	<0.001	<0.001
Total Asb Est w/w* Note <sup>#</sup>	%	<0.001	<0.001	<0.001	<0.001	<0.001

#### Client Reference: P

Asbestos ID - soils NEPM*						
Our Reference:	UNITS	134206-29	134206-30	134206-31	134206-32	134206-33
Your Reference		4816/313	4816/314	4816/316	4816/317	4816/318
Depth		0.1	0.1	0.1	0.1	0.1
Date Sampled		10/09/2015	10/09/2015	10/09/2015	10/09/2015	10/09/2015
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17- 18/09/2015	17- 18/09/2015	17- 18/09/2015	17- 18/09/2015	17- 18/09/2015
Sample mass tested	g	1242.96g	839.64g	637.00g	673.47g	684.34g
Sample Description	-	Brown coarse- grained clayey soil	Brown fine- grained soil & rocks	Brown fine- grained soil & rocks	Brown fine- grained soil & rocks	Brown coarse- grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected				
Trace Analysis	-	No asbestos detected				
ACM>7mm Estimation*	g					
ACM < 7 mm Estimation*	g					
FA and AF Estimation*	g					
Total Asbestos g/kg*	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
ACM >7mm Estimation %(w/w)*	%	<0.01	<0.01	<0.01	<0.01	<0.01
ACM <7mm Estimation %(w/w)*	%	<0.001	<0.001	<0.001	<0.001	<0.001
FA and AF Estimation %(w/w)*	%	<0.001	<0.001	<0.001	<0.001	<0.001
Total Asb Est w/w* Note <sup>#</sup>	%	<0.001	<0.001	<0.001	<0.001	<0.001

#### Client Reference:

Asbestos ID - soils NEPM*		
Our Reference:	UNITS	134206-34
Your Reference		4816/320
Depth		0.1
Date Sampled		10/09/2015
Type of sample		Soil
Date analysed	-	17-
		18/09/2015
Sample mass tested	g	948.00g
Sample Description	-	Brown
		coarse-
		grained soil &
Askastas ID in sail		Ne sebestes
Aspestos ID III soli	-	detected at
		reporting limit
		of 0.1g/kg
		Organic
		fibres
Trace Analysis	-	NO aspestos
ACM>7mm Estimation*	a	delected
	g	
ACM < / mm Estimation*	g	
FA and AF Estimation*	g	
Total Asbestos g/kg*	g/kg	<0.1
ACM >7mm Estimation %(w/w)*	%	<0.01
ACM <7mm Estimation %(w/w)*	%	<0.001
FA and AF Estimation %(w/w)*	%	<0.001
Total Asb Est w/w* Note <sup>#</sup>	%	<0.001

Asbestos ID - materials				
Our Reference:	UNITS	134206-35	134206-36	134206-37
Your Reference		4816/306/AS	4816/306/AS	4816/312/AS
		B1	B2	B3
Depth		0.1	0.1	0.1
Date Sampled		10/09/2015	10/09/2015	10/09/2015
Type of sample		Material	Material	Material
Date analysed	-	17/09/2015	17/09/2015	17/09/2015
Mass / Dimension of Sample	-	65x45x5mm	140x35x7mm	100x36x5mm
Sample Description	-	Grey	Grey	Grey
		compressed	compressed	compressed
		fibre cement	fibre cement	fibre cement
		material	material	material
Asbestos ID in materials	-	Chrysotile	Chrysotile	Chrysotile
		asbestos	asbestos	asbestos
		detected	detected	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 actually="" are="" at="" is="" pql.="" the="" the<br="" this="">most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present.</pql>
	2. 'TEQ zero' values are assuming all contributing PAHs reported as <pql and="" approach="" are="" below="" but="" calculation="" conservative="" contribute="" false="" is="" least="" more="" negative="" pahs="" pql.<="" present="" susceptible="" td="" teq="" teqs="" that="" the="" this="" to="" when="" zero.=""></pql>
	3. 'TEQ half PQL' values are assuming all contributing PAHs reported as <pql are="" half="" pql.<br="" stipulated="" the="">Hence a mid-point between the most and least conservative approaches above.</pql>
	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.
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 - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation.
	<b>NOTE</b> <sup>#</sup> The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.
	Results reported with "" is equivalent to no visible asbestos identified using Polarised Light Microscopy and Dispersion Staining Techniques.
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.

Client Reference: P1504816JCOC02V01, Bargo									
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery	
vTRH(C6-C10)/BTEXN in Soil						Base II Duplicate II % RPD			
Date extracted	-			14/09/2 015	134206-1	14/09/2015  14/09/2015	LCS-6	14/09/2015	
Date analysed	-			17/09/2 015	134206-1	17/09/2015  17/09/2015	LCS-6	17/09/2015	
TRHC6 - C9	mg/kg	25	Org-016	<25	134206-1	<25  <25	LCS-6	102%	
TRHC6 - C10	mg/kg	25	Org-016	<25	134206-1	<25  <25	LCS-6	102%	
Benzene	mg/kg	0.2	Org-016	<0.2	134206-1	<0.2  <0.2	LCS-6	90%	
Toluene	mg/kg	0.5	Org-016	<0.5	134206-1	<0.5  <0.5	LCS-6	94%	
Ethylbenzene	mg/kg	1	Org-016	<1	134206-1	<1  <1	LCS-6	107%	
m+p-xylene	mg/kg	2	Org-016	<2	134206-1	<2  <2	LCS-6	109%	
o-Xylene	mg/kg	1	Org-016	<1	134206-1	<1  <1	LCS-6	106%	
naphthalene	mg/kg	1	Org-014	<1	134206-1	<1  <1	[NR]	[NR]	
<i>Surrogate</i> aaa- Trifluorotoluene	%		Org-016	94	134206-1	86    88    RPD: 2	LCS-6	96%	
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate	Duplicate results	Spike Sm#	Spike %	
svTRH (C10-C40) in Soil					SII#	Base II Duplicate II %RPD		Recovery	
Date extracted	-			14/09/2 015	134206-1	14/09/2015  14/09/2015	LCS-6	14/09/2015	
Date analysed	-			14/09/2 015	134206-1	14/09/2015  14/09/2015	LCS-6	14/09/2015	
TRHC 10 - C 14	mg/kg	50	Org-003	<50	134206-1	<50    <50	LCS-6	116%	
TRHC 15 - C28	mg/kg	100	Org-003	<100	134206-1	<100  <100	LCS-6	109%	
TRHC 29 - C 36	mg/kg	100	Org-003	<100	134206-1	<100  <100	LCS-6	87%	
TRH>C10-C16	mg/kg	50	Org-003	<50	134206-1	<50  <50	LCS-6	116%	
TRH>C16-C34	mg/kg	100	Org-003	<100	134206-1	<100  <100	LCS-6	109%	
TRH>C34-C40	mg/kg	100	Org-003	<100	134206-1	<100  <100	LCS-6	87%	
Surrogate o-Terphenyl	%		Org-003	95	134206-1	98  98  RPD:0	LCS-6	105%	
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery	
PAHs in Soil						Base II Duplicate II % RPD			
Date extracted	-			14/09/2 015	134206-1	14/09/2015  14/09/2015	LCS-6	14/09/2015	
Date analysed	-			14/09/2 015	134206-1	14/09/2015  14/09/2015	LCS-6	14/09/2015	
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	LCS-6	95%	
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]	
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]	
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	LCS-6	88%	
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	LCS-6	98%	
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]	
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	LCS-6	96%	

Client Reference: P1504816JCOC02V01, Bargo										
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate	Duplicate results	Spike Sm#	Spike %		
PAHs in Soil						Base II Duplicate II % RPD		1 COVELY		
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	LCS-6	102%		
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	LCS-6	96%		
Benzo(b,j+k) fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	134206-1	<0.2  <0.2	[NR]	[NR]		
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	134206-1	<0.05  <0.05	LCS-6	109%		
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
<i>Surrogate p</i> -Terphenyl- d14	%		Org-012 subset	102	134206-1	109  104  RPD:5	LCS-6	109%		
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate	Duplicate results	Spike Sm#	Spike %		
Organochlorine Pesticides in soil					31#	Base II Duplicate II % RPD		Recovery		
Date extracted	-			14/09/2	134206-1	14/09/2015   14/09/2015	LCS-6	14/09/2015		
Date analysed	-			015 16/09/2 015	134206-1	16/09/2015  16/09/2015	LCS-6	16/09/2015		
HCB	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
alpha-BHC	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	78%		
gamma-BHC	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
beta-BHC	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	93%		
Heptachlor	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	83%		
delta-BHC	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
Aldrin	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	78%		
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	97%		
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
Endosulfan I	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
pp-DDE	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	99%		
Dieldrin	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	106%		
Endrin	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	115%		
pp-DDD	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	97%		
Endosulfan II	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
pp-DDT	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	LCS-6	68%		
Methoxychlor	mg/kg	0.1	Org-005	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]		
Surrogate TCMX	%		Org-005	97	134206-1	100  100  RPD:0	LCS-6	112%		

		Clie	nt Referenc	e: P	1504816JCO	C02V01, Bargo		
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Organophosphorus Pesticides						Base II Duplicate II % RPD		
Date extracted	-			14/09/2	134206-1	14/09/2015  14/09/2015	LCS-6	14/09/2015
Date analysed	-			16/09/2 015	134206-1	16/09/2015  16/09/2015	LCS-6	16/09/2015
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	LCS-6	82%
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	LCS-6	84%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	LCS-6	90%
Dimethoate	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	LCS-6	83%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	LCS-6	110%
Malathion	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	LCS-6	82%
Parathion	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	LCS-6	107%
Ronnel	mg/kg	0.1	Org-008	<0.1	134206-1	<0.1  <0.1	[NR]	[NR]
Surrogate TCMX	%		Org-008	97	134206-1	100    100    RPD: 0	LCS-6	112%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Acid Extractable metals in soil						Base II Duplicate II % RPD		
Date prepared	-			14/09/2 015	134206-1	14/09/2015    14/09/2015	LCS-1	14/09/2015
Date analysed	-			15/09/2 015	134206-1	15/09/2015  15/09/2015	LCS-1	15/09/2015
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	134206-1	4  5  RPD:22	LCS-1	121%
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	134206-1	<0.4  <0.4	LCS-1	114%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	134206-1	19  19  RPD:0	LCS-1	116%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	134206-1	8  9  RPD:12	LCS-1	114%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	134206-1	22  23  RPD:4	LCS-1	114%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	134206-1	<0.1  <0.1	LCS-1	106%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	134206-1	10  11  RPD:10	LCS-1	112%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	134206-1	58    56    RPD: 4	LCS-1	115%

		Client Reference	e: P1504816JCOC02	V01, Bargo	
QUALITYCONTROL	UNITS	Dup.Sm#	Duplicate	Spike Sm#	Spike % Recovery
vTRH(C6-C10)/BTEXNin			Base + Duplicate + %RPD		
501					
Date extracted	-	134206-11	14/09/2015  14/09/2015	134206-2	14/09/2015
Date analysed	-	134206-11	17/09/2015  17/09/2015	134206-2	17/09/2015
TRHC6 - C9	mg/kg	134206-11	<25  <25	134206-2	96%
TRHC6 - C10	mg/kg	134206-11	<25  <25	134206-2	96%
Benzene	mg/kg	134206-11	<0.2  <0.2	134206-2	84%
Toluene	mg/kg	134206-11	<0.5  <0.5	134206-2	90%
Ethylbenzene	mg/kg	134206-11	<1  <1	134206-2	101%
m+p-xylene	mg/kg	134206-11	<2  <2	134206-2	103%
o-Xylene	mg/kg	134206-11	<1  <1	134206-2	100%
naphthalene	mg/kg	134206-11	<1  <1	[NR]	[NR]
Surrogate aaa-	%	134206-11	88  86  RPD:2	134206-2	90%
Trifluorotoluene					
QUALITYCONTROL	UNITS	Dup.Sm#	Duplicate	Spike Sm#	Spike % Recovery
svTRH (C10-C40) in Soil			Base + Duplicate + %RPD		
Date extracted	-	134206-11	14/09/2015  14/09/2015	134206-2	14/09/2015
Date analysed	-	134206-11	15/09/2015  15/09/2015	134206-2	14/09/2015
TRHC 10 - C 14	mg/kg	134206-11	<50    <50	134206-2	119%
TRHC 15 - C28	mg/kg	134206-11	<100  <100	134206-2	99%
TRHC29 - C36	mg/kg	134206-11	<100  <100	134206-2	74%
TRH>C10-C16	mg/kg	134206-11	<50  <50	134206-2	119%
TRH>C16-C34	mg/kg	134206-11	<100  <100	134206-2	99%
TRH>C34-C40	mg/kg	134206-11	<100  <100	134206-2	74%
Surrogate o-Terphenyl	%	134206-11	96  92  RPD:4	134206-2	99%
QUALITYCONTROL	UNITS	Dup.Sm#	Duplicate	Spike Sm#	Spike % Recovery
PAHs in Soil			Base + Duplicate + %RPD		
Date extracted	-	134206-11	14/09/2015  14/09/2015	134206-2	14/09/2015
Date analysed	-	134206-11	14/09/2015  14/09/2015	134206-2	14/09/2015
Naphthalene	mg/kg	134206-11	<0.1  <0.1	134206-2	90%
Acenaphthylene	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Acenaphthene	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Fluorene	mg/kg	134206-11	<0.1  <0.1	134206-2	84%
Phenanthrene	mg/kg	134206-11	<0.1  <0.1	134206-2	95%
Anthracene	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Fluoranthene	mg/kg	134206-11	<0.1  <0.1	134206-2	92%
Pyrene	mg/kg	134206-11	<0.1  <0.1	134206-2	98%
Benzo(a)anthracene	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Chrysene	mg/kg	134206-11	<0.1  <0.1	134206-2	92%
Benzo(b,j+k)fluoranthene	mg/kg	134206-11	<0.2  <0.2	[NR]	[NR]
Benzo(a)pyrene	mg/kg	134206-11	<0.05  <0.05	134206-2	103%
Indeno(1,2,3-c,d)pyrene	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]

		<b>Client Reference</b>	e: P1504816JCOC02	V01, Bargo	
QUALITY CONTROL PAHs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Benzo(g,h,i)perylene	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Surrogate p-Terphenyl-d14	%	134206-11	102    104    RPD: 2	134206-2	99%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	134206-11	14/09/2015  14/09/2015	134206-2	14/09/2015
Date analysed	-	134206-11	16/09/2015  16/09/2015	134206-2	16/09/2015
НСВ	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
alpha-BHC	mg/kg	134206-11	<0.1  <0.1	134206-2	82%
gamma-BHC	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
beta-BHC	mg/kg	134206-11	<0.1  <0.1	134206-2	91%
Heptachlor	mg/kg	134206-11	<0.1  <0.1	134206-2	83%
delta-BHC	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Aldrin	mg/kg	134206-11	<0.1  <0.1	134206-2	98%
Heptachlor Epoxide	mg/kg	134206-11	<0.1  <0.1	134206-2	95%
gamma-Chlordane	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
alpha-chlordane	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Endosulfan I	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
pp-DDE	mg/kg	134206-11	<0.1  <0.1	134206-2	99%
Dieldrin	mg/kg	134206-11	<0.1  <0.1	134206-2	105%
Endrin	mg/kg	134206-11	<0.1  <0.1	134206-2	112%
pp-DDD	mg/kg	134206-11	<0.1  <0.1	134206-2	100%
Endosulfan II	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
pp-DDT	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Endosulfan Sulphate	mg/kg	134206-11	<0.1  <0.1	134206-2	82%
Methoxychlor	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Surrogate TCMX	%	134206-11	92  91  RPD: 1	134206-2	102%

		<b>Client Reference</b>	e: P1504816JCOC02	V01, Bargo	
QUALITYCONTROL Organophosphorus Pesticides	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	134206-11	14/09/2015  14/09/2015	134206-2	14/09/2015
Date analysed	-	134206-11	16/09/2015    16/09/2015	134206-2	16/09/2015
Azinphos-methyl (Guthion)	mg/kg	134206-11	<0.1  <0.1	134206-2	66%
Bromophos-ethyl	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Chlorpyriphos	mg/kg	134206-11	<0.1  <0.1	134206-2	86%
Chlorpyriphos-methyl	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Diazinon	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Dichlorvos	mg/kg	134206-11	<0.1  <0.1	134206-2	90%
Dimethoate	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Ethion	mg/kg	134206-11	<0.1  <0.1	134206-2	87%
Fenitrothion	mg/kg	134206-11	<0.1  <0.1	134206-2	115%
Malathion	mg/kg	134206-11	<0.1  <0.1	134206-2	101%
Parathion	mg/kg	134206-11	<0.1  <0.1	134206-2	101%
Ronnel	mg/kg	134206-11	<0.1  <0.1	[NR]	[NR]
Surrogate TCMX	%	134206-11	92  91  RPD:1	134206-2	102%
QUALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	134206-11	14/09/2015  14/09/2015	134206-2	14/09/2015
Date analysed	-	134206-11	15/09/2015    15/09/2015	134206-2	15/09/2015
Arsenic	mg/kg	134206-11	<4    8	134206-2	89%
Cadmium	mg/kg	134206-11	<0.4    <0.4	134206-2	93%
Chromium	mg/kg	134206-11	18  31  RPD:53	134206-2	96%
Copper	mg/kg	134206-11	2  1  RPD:67	134206-2	94%
Lead	mg/kg	134206-11	11    15    RPD: 31	134206-2	88%
Mercury	mg/kg	134206-11	<0.1  <0.1	134206-2	107%
Nickel	mg/kg	134206-11	3  3  RPD:0	134206-2	87%
Zinc	mg/kg	134206-11	7  7  RPD:0	134206-2	79%

#### **Report Comments:**

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 134206-11 for Cr. Therefore a triplicate result has been issued as laboratory sample number 134206-42.

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Asbestos: Sampels: 134206-19, 21, 22, 25 to 33

Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 500mL of sample in it's own container.

Asbestos ID was analysed by Approved Identifier:	Lulu Scott
Asbestos ID was authorised by Approved Signatory:	Lulu Scott

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.

SOIL CONSERVATION SERVICE Scone Research Centre

Report No: Client Reference:

SCO13/308R1 J Fulton Martens & Associates Pty Ltd 6/37 Leighton Place Hornsby NSW 2077

Lab No	Method	C1A/5	C2A/4	C2B/4	CS	A/4 CEC 2	k exchange	sable cation	ns (me/100	g)		C8B/1		P9B/2	P18E	8/3 AWC (	%0)
	Sample Id	EC (dS/m)	Ηq	pH (CaCl <sub>2</sub> )	CEC	Na	K	Ca	Mg	Al	ESP (%)	P sorp (mg/kg)	P sorp index	EAT	FC 0.1bar	WP 15bar	AWC
1	3944/103/0.1	0.02	5.8	4.6	6.1	0.1	0.3	3.5	1.6	0.8	2	334	2.6	3(1)	19	8	11
2	3944/103/0.7	0.01	6.1	4.7	6.0	0.2	0,1	1.2	2.9	0.5	3	625	4.1	5	19	10	6
3	3944/107/0.25	0.01	5.8	4.5	5.4	0.2	0.1	1.3	1.7	1.1	4	585	3.9	5	29	11	18
4	3944/107/0.65	0.02	6.0	4.5	10.5	0.6	0.2	0.8	5.9	1.2	6	777	5.3	5	27	17	10
D/M.V	- mointre content	+ (02) hu vid	aiaht														

AWC = moisture content (%) by weight

KN Joury

END OF TEST REPORT

# 17 Attachment G – Data Validation Report



Detailed Site Investigation: 45 Noongah Street and 25 Gwynn Hughes Road, Bargo, NSW. P1504816JR06V01- January 2017



45 Noongah St and 25 Gwynn Hughes St, Bargo, NSW

#### 1. Sample Handling

- 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





45 Noongah St and 25 Gwynn Hughes St, Bargo, NSW

### 2. Precision / Accuracy Statement

- 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

 $\checkmark$ 

Partially Satisfactory

Unsatisfactory







45 Noongah St and 25 Gwynn Hughes St, Bargo, NSW

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

- a. Number of Primary Samples analysed (does not include duplicates)
- b. Number of days of sampling
- c. Number and Type of QA/QC Samples analysed

Intra-Laboratory Field Duplicates

Inter-Laboratory Field triplicates

Trip Blanks

Wash Blanks

Other (Field Blanks, Spikes, Trip Blanks, etc.)

#### Field Duplicates

Adequate Numbers of intra-laboratory field duplicates analysed?

Adequate Numbers of inter-laboratory field duplicates analysed?

Were RPDs within Control Limits?

- i. Organics (+ 50%)
- ii. Metals / Inorganics (+ 35%)
- iii. Nutrients (+ 50%)

### COMMENTS

RPD for chromium and copper was 50 % and 67 % respectively at duplicate sample location 4816/311. RPD for lead and chromium was 48 % and 40 % respectively at duplicate sample location 4816/312. Difference between primary and duplicate soil chromium, copper and lead values suggest variable soil chromium, copper and lead concentrations. Chromium, copper and lead levels



Media	Number
Soil:	34
Water:	-
Material	3
	1
Soil	Water
2	
1	
1	





45 Noongah St and 25 Gwynn Hughes St, Bargo, NSW

are well below HIL of 20 mg/kg, 6000 mg/kg and 300 mg/kg respectively. Therefore variability observed is not likely to signify any localised exceedance of SAC and the data is considered fit for use.

# 4. 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



 $\checkmark$