



# Soil Characterisation Assessment Report

**5 Kelloway Avenue, Camden NSW 2570**

Prepared for: NSW Land and Housing Corporation

A301022.0319.11 | SCA1.V1F | Date: 06.07.2022



**ADE**  
CONSULTING  
GROUP

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For and on behalf of  
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# 1 Introduction

## 1.1 Background

ADE Consulting Group Pty Ltd (ADE) was commissioned by NSW Land and Housing Corporation (LaHC) to undertake a Soil Characterisation Assessment of the in-situ and stockpiled soil materials within the subject area located at the former residential property on Lot 5 Kelloway Avenue, Camden NSW 2570, hereafter referred to as 'the Site' (refer to *Appendix I – Aerial Photographs*). The in-situ and stockpiled soil materials within the subject area were assessed for their suitability for re-use on site.

## 1.2 Site Information

**Table 1 - Summary of Site Information and Project Information.**

Site Details	
<b>Client Name:</b>	NSW Land and Housing Corporation
<b>ADE Project Number:</b>	A301022.0319.11
<b>Site Address:</b>	5 Kelloway Avenue, Camden NSW 2570
<b>Dates of Field Work:</b>	27.06.2022
<b>Date of Inspection:</b>	27.06.2022
<b>Date of Report:</b>	06.07.2022
<b>Subject Area:</b>	Residential Lot 5 Kelloway Avenue, Camden NSW 2570, former residential property, subject stockpiled soil materials and in-situ soil materials to a maximum depth of 0.3 m below ground level (BGL) (Refer to <i>Appendix I – Aerial Photographs</i> and <i>Appendix II - Photographs</i> ).
<b>Soil Matrix:</b>	<p><b>Stockpile:</b> Materials generally consisted of sandy CLAY (CL): medium plasticity, brown, fine to medium grained, moist. No other foreign materials, being Asbestos Containing Materials (ACM), paint chips, sulfidic ores and hydrocarbon odours / staining were observed within the soil materials inspected.</p> <p><b>In-situ:</b> Soil materials generally consisted of sandy CLAY (CL): medium plasticity, brown mottled with red and grey patches, fine to medium grained, moist. No other foreign materials, being Asbestos Containing Materials (ACM), paint chips, sulfidic ores and hydrocarbon odours / staining were observed within the soil materials inspected.</p>
<b>Approximate Volume:</b>	<p><b>Stockpile:</b> Approximately 3 m<sup>3</sup></p> <p><b>In-situ:</b> Approximately 135 m<sup>3</sup></p>
<b>Sample Size:</b>	<p>One (1) soil sample was collected from the stockpiled soil materials for chemical and asbestos analysis; and</p> <p>Two (2) soil samples were collected from the in-situ soil materials for chemical and asbestos analysis.</p>

## 2 Objectives

The in-situ and stockpiled soil materials within the subject area were analysed to determine if they are suitable for re-use / remain onsite. To determine if the soil materials were suitable for use within the subject area, the soil results were assessed against Health Investigation Levels (HIL) (A), Health Screening Levels (HSL) (A), Ecological Investigation Level (EIL) (A) and Ecological Screening Level (ESL) (A) screening criteria for low density residential land use as outlined in the National Environmental Protection Measure (Assessment of Site Contamination) 1999, 2013 Amendment (NEPM 2013 Amendment).

## 3 Scope of Work

The scope of work required to achieve the objectives of the investigation involved the following:

- Completion of a Safety, Health & Environment Work Method Statement prior to undertaking works;
- Visual inspection of the subject area prior to sample collection;
- Collection of discrete soil samples for chemical characterisation of the in-situ and stockpiled soil materials;
- Collection of discrete soil samples for analysis of asbestos containing materials (ACM);
- Submission of collected samples under chain of custody (COC) conditions to a National Association of Testing Authorities (NATA) Accredited laboratory for analysis;
- Evaluation of analyte concentrations against NEPM 2013 HIL (A), HSL (A), EIL (A) and ESL (A) screening criteria assigned for low density residential land use to assess suitability for use onsite; and
- Preparation of a report outlining the investigation methodology, interpretation of the site data (results), characterisation and conclusions.

## 4 Preliminary Desktop Study

### 4.1 Proposed Excavation Works, Former Environmental Reports and Anecdotal Information

ADE was not supplied with any former environmental reports or anecdotal information pertaining to the subject area.

### 4.2 Acid Sulphate Soils

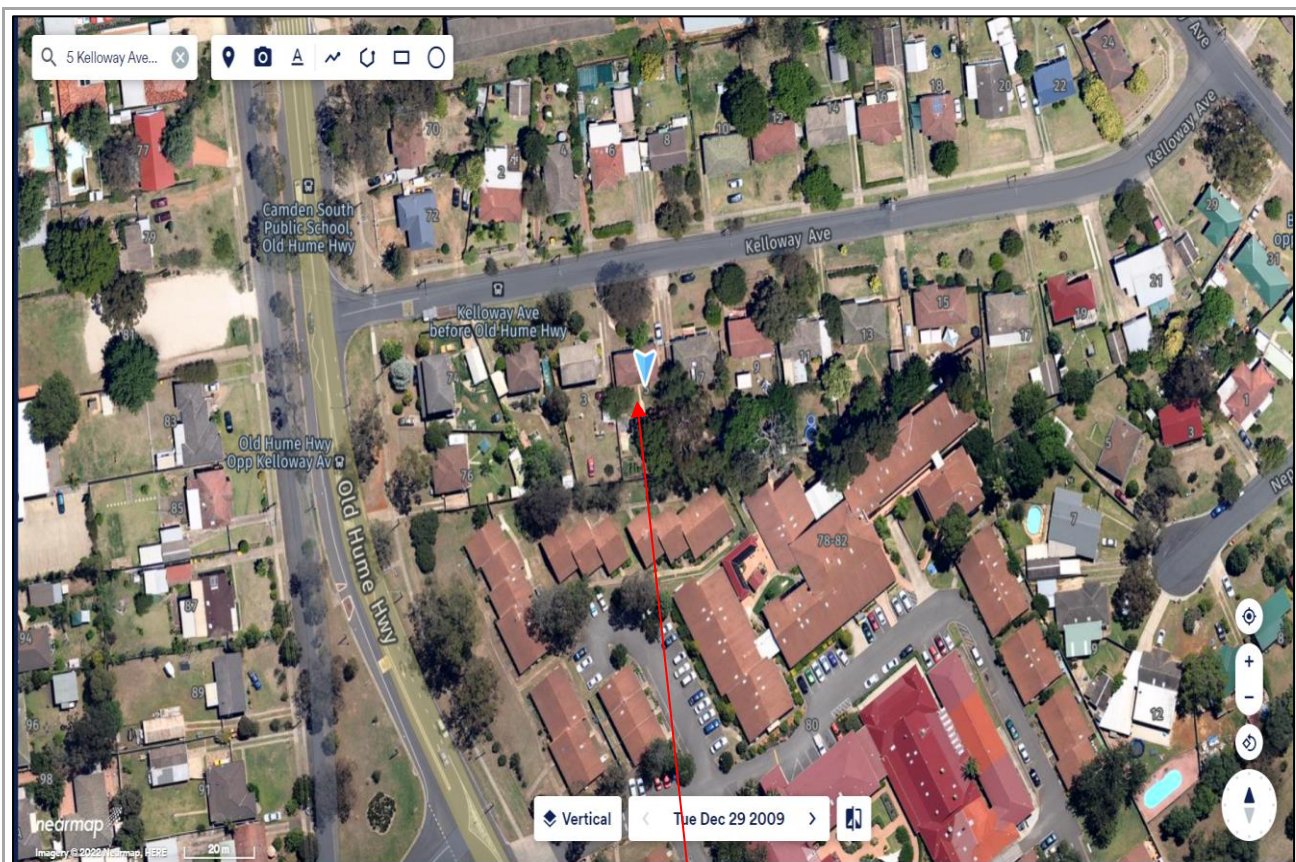
A review of The NSW Government Office of Environment and Heritage E-Spade web page was undertaken to determine the potential for Acid Sulfate Soil (ASS) at the site. The site was identified as having 'No Known Occurrence' in regard to ASS risk (refer to *Appendix IV – Supporting Documents*). Visual (staining) and olfactory (odour) indicators for ASS were not observed in the soil materials inspected.

## 4.3 NSW EPA Contaminated Land Register

A review of the NSW Office of Environment and Heritage (OEH) 'Contaminated Land – Record of Notices' listed by the NSW EPA under the Contaminated Land Management Act 1997 did not identify any current notices related to the source site (refer to *Appendix IV – Supporting Documents*). A review of the 'List of NSW Contaminated Sites Notified to the EPA' indicates that no notified or potentially contaminated sites occur within a 500 m radius of the subject area.

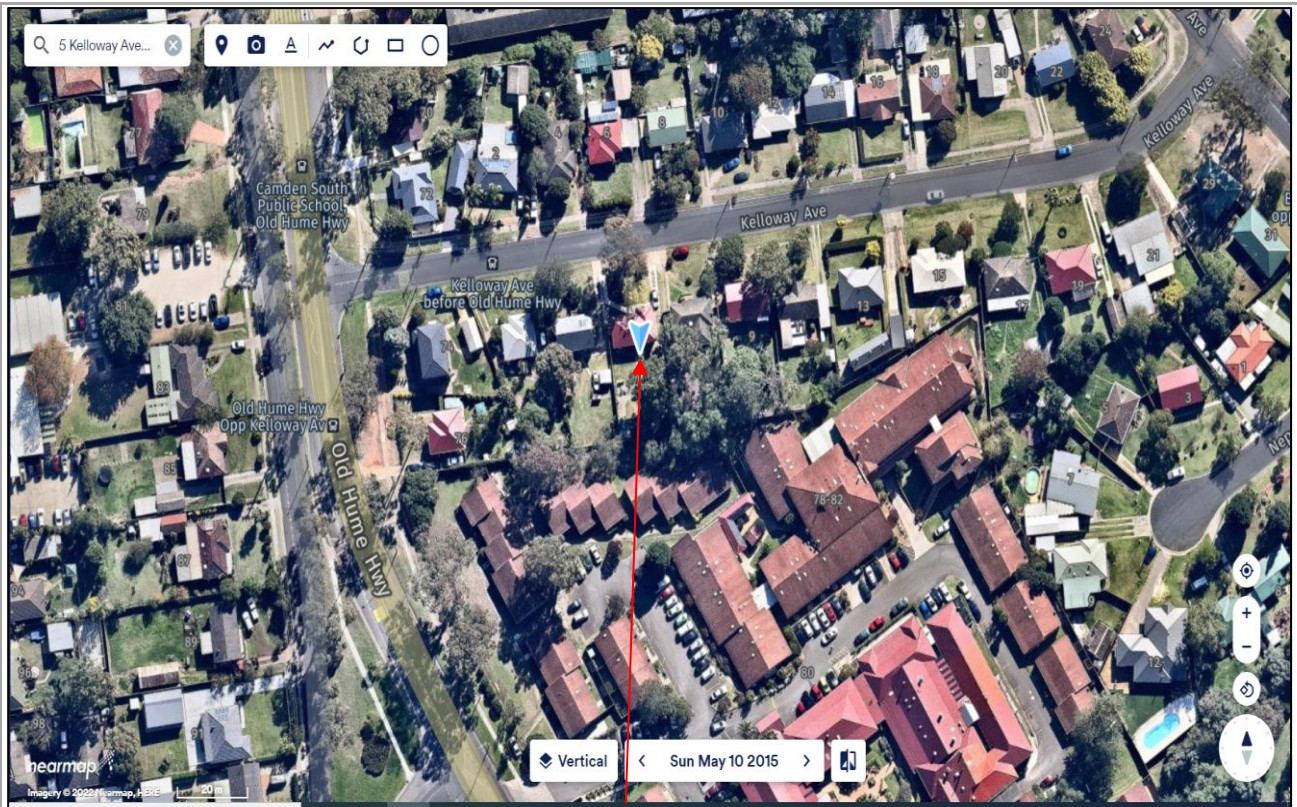
## 4.4 Former Land Use

A review of the historical aerial maps dated back to 2009 indicated that the subject area had been used for low density residential purposes.

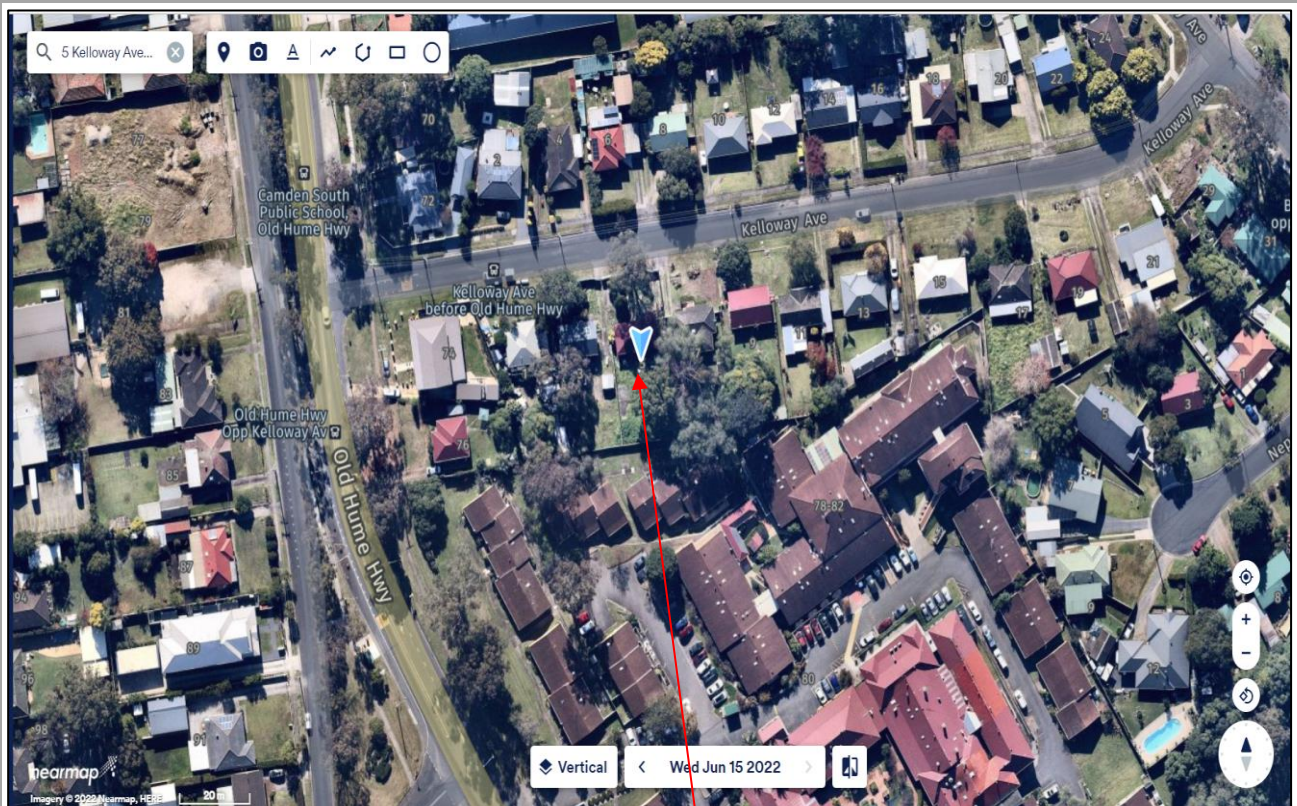


**Aerial photograph 1.** Approximate location of the residential lot 5 Kelloway Avenue, Camden NSW 2570, December 2009 (map adapted from Nearmap, accessed on the 06.07.2022).





**Aerial photograph 2.** Approximate location of the residential lot 5 Kelloway Avenue, Camden NSW 2570, May 2015 (map adapted from Nearmap, accessed on the 06.07.2022).



**Aerial photograph 3.** Approximate location of the residential lot 5 Kelloway Avenue, Camden NSW 2570, June 2022 (map adapted from Nearmap, accessed on the 06.07.2022).



# 5 Sampling Plan, Methodology, Field Investigations and Investigation Pattern

## 5.1 Scope of Analysis

Based on the former site use, anecdotal evidence and review of The Land and Water Conservation Acid Sulfate Soil Risk Maps, the following suite of analytes has been included within the scope of analysis:

- Heavy Metals – Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel and Zinc (M8).
- Total Recoverable Hydrocarbons (TRH).
- Polycyclic Aromatic Hydrocarbons (PAHs).
- Polychlorinated Biphenyls (PCBs).
- Benzene, Toluene, Ethyl-Benzene and Xylene (BTEX).
- Organochlorine Pesticides (OCPs).
- Organophosphorous Pesticides (OPPs).
- Asbestos.

## 5.2 Sampling Plan

ADE was advised by the client to collect one (1) sample from the stockpile and two (2) samples from the in-situ soil materials to characterise the soil materials.

## 5.3 Equipment Decontamination

All sampling equipment comprised of dedicated disposable materials (e.g. nitrile gloves) which were changed between each sample. As such, additional decontamination procedures were not deemed necessary. All disposable sampling equipment and rubbish was collected and removed prior to leaving site.

## 5.4 Documentation

A field observation log was kept by sampling personnel. Details recorded in the log included:

- Location and sample number;
- Soil profile notes;
- Sampling method;
- Sample identification;
- Sample description; and
- Sample point measurements.

A master sample register was maintained. As samples were received, they were given a unique sequential number from the sample register into which details from the labels were entered. Before packing and dispatch of samples for analysis, a COC form was completed. This form recorded details of the individual samples being dispatched and the type of analysis required for each sample.



## 5.5 Sampling and Laboratory Submission

During the investigation, one (1) sample was collected from the stockpiled soil materials and two (2) samples were collected from in-situ soil materials within the site. The test pits were excavated within the subject area to a maximum depth of 0.3 m.

Field activities were conducted by an experienced occupational hygienist wearing disposable PPE (e.g. nitrile gloves) which were changed between samples. Utilising an excavator supplied by the client, test pits were excavated at each predetermined location to the desired target depth. Once the target depth was achieved, ADE entered the shallow, open excavation and sampled representatively from the walls of the excavated pit. Samples for chemical characterisation were placed in sterile glass jars with Teflon lined lids. Samples collected for the analysis of asbestos were placed in new, disposable zip lock bags. The samples were transferred to a cooler box which contained ice packs (or equivalent) present to maintain the samples at a temperature below approximately 4°C.

Samples collected by ADE on the 27<sup>th</sup> of June 2022 for analysis of M8, TRH, PAHs, PCBs, BTEX, OCPs, OPPs and Asbestos were submitted to Sydney Laboratory Services (SLS). Copies of the completed Chain of Custody forms were retained on the central filing system and the original was sent to the analytical laboratory together with the samples. **Table 2** below summarises the samples collected from the subject area (refer to *Appendix VI – Chain of Custody*).

**Table 2.** Summary of Samples Collected from within the Subject Area

Location	Sample I.D.	Sample Type	Sample Depth (BGL)	Sample description
Stockpile	A301022.0319.11 – 5 Kelloway Avenue – SP1	Soil (chemical analysis)	0.3 m	Sandy CLAY (CL): medium plasticity, brown, fine to medium grained, moist.
	A301022.0319.11 – 5 Kelloway Avenue – SP1	Soil (NEPM)	0.3 m	
In-situ	A301022.0319.11 – 5 Kelloway Avenue – TP1	Soil (chemical analysis)	0.3 m	Sandy CLAY (CL): medium plasticity, brown mottled with red and grey patches, fine to medium grained, moist.
	A301022.0319.11 – 5 Kelloway Avenue – TP1	Soil (NEPM)	0.3 m	
In-situ	A301022.0319.11 – 5 Kelloway Avenue – TP2	Soil (chemical analysis)	0.3 m	
	A301022.0319.11 – 5 Kelloway Avenue – TP2	Soil (NEPM)	0.3 m	

## 5.6 Limitations of field investigation

This report is limited to the specified soil materials within the subject area of the former building footprint perimeter plus 0.5 m and resultant surface scrap stockpile. Soil materials not included within the subject area soil descriptions and adjacent soil materials including all in-situ soils beneath 0.3 m BGL and areas adjacent to the subject areas, are not included within the scope of this report.

## 6 Summary of Results

### 6.1 Summary of Field Observations

The in-situ soil materials observed within the subject areas generally consisted of sandy CLAY (CL): medium plasticity, brown mottled with red and grey patches, fine to medium grained, moist. No other foreign materials, being Asbestos Containing Materials (ACM), paint chips, sulfidic ores and hydrocarbon odours / staining were observed within the soil materials inspected.

The stockpiled soil materials observed within the subject areas generally consisted of sandy CLAY (CL): medium plasticity, brown, fine to medium grained, moist. No other foreign materials, being Asbestos Containing Materials (ACM), paint chips, sulfidic ores and hydrocarbon odours / staining were observed within the soil materials inspected.

Following the inspection of the excavated test pits and stockpile, a visual inspection of the soil surface of the subject area was undertaken to determine the presence / absence of Asbestos Containing Materials (ACM). No ACMs were observed on the soil surface of the subject area at the time of the inspection.

## 7 Soil Characterisation Assessment

As per the site assessment criteria, the soil materials have been compared against the land use criteria outlined in the *National Environment Protection (Assessment of Site Contamination) Measure* (1999), 2013 Amendment, to determine the suitability for the re-use of the soil materials within the Site. The site assessment criteria for EILs and ESLs are summarised in **Section 7.1** (as follows).

### 7.1 Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs)

ADE understands that the proposed future land use will include the construction of residential properties with gardens and access to soil. To assess the impact on ecosystems including site vegetation from contamination within the upper 2 m of the subsurface, Schedule B1 of NEPM (2013) presents Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for different land uses. Urban Residential / Public Open Space (mg/kg) is the adopted land use criteria for this investigation.

The methodology outlined in Schedule B1 NEPM (2013) may be considered conservative for the evaluation of what is potentially to be within a building envelope was developed to protect soil processes, soil biota (flora and fauna), terrestrial invertebrates and vertebrates. Derivation of Site specific EILs for metals (Cr, Cu, Ni & Zn) involves first establishing the appropriate added contaminant limit (ACL) values from Table 1B(1) – 1B(3) of Schedule B1 of the NEPM (2013). The tables take into account the land use purposes as well as soil-specific properties such as pH and CEC to determine the CoPCs recommended ACL. Please note that the generic ACL is taken directly from Table 1(B)1 to 1(B)5 of Schedule B1 of the NEPM (2013) for this investigation. The ACL values are then added to the respective ambient background concentration (ABC) of the contaminant, determined via suitable reference data or baseline investigations or through the use of methods defined by Olsoxy et al. (1995) or Haon et al. (2004), to produce the site specific EIL ( $EIL = ABC + ACL$ ).

For the purpose of this investigation, ABC was determined by adopting the most conservative NSW “old suburbs with high traffic” published value by Olszowy et al. (1995) Trace Elements Surface Soils from Urban and Rural Areas in Australia.

ESLs are presented based on a review of Canadian guidelines for petroleum hydrocarbons in soil and application of the Australian methodology (Schedule B5b) to derive Tier 1 ESLs for BTEX, Benzo(a)pyrene and F1 and F2 (Warne 2010a, 2010b). The Canadian Council of the Ministers of the Environment (CCME) has adopted risk-based TPH standards for human health and ecological aspects for various land uses in the Canada-wide standard for petroleum hydrocarbons (PHC) in soil (CCME 2008) (CWS PHC). The standards establish soil values including ecologically based criteria. Using the most conservative estimate for CEC and % clay content, values for low density residential use were adopted and are presented in **Table 3** (below).



**Table 3. Site Assessment Criteria – Low Density Residential Land Use (HIL-A / HSL-A)**

Analyte	HILs		HSLs		EILs		ESLs		Results		Conclusion
	HIL A (mg/kg)	Vapour Intrusion (0 m to <1 m) - HSL A <sup>1,3</sup> (mg/kg)	HSL Intrusive Maintenance Worker (Shallow Trench) <sup>3</sup> (mg/kg)	Direct Contact - HSL A (mg/kg)	ABC (mg/kg)	ACL	Total EIL A (mg/kg)	ESL A (mg/kg)	Maximum Total Concentration Detected, mg/kg	Upper Confidence Limit (UCL) 95 %	Re-use on site (NEPM 2013)
Arsenic (total)	100	-	-	-	5	230	235	-	12.4	-	Acceptable
Cadmium	20	-	-	-	-	-	-	-	0.35	-	Acceptable
Chromium (Total)	100	-	-	-	13	190	203	-	24.3	-	Acceptable
Copper	6,000	-	-	-	28	800	828	-	30.7	-	Acceptable
Lead	300	-	-	-	163	1100	1263	-	41.6	-	Acceptable
Mercury (inorganic)	40	-	-	-	-	-	-	-	ND	-	Acceptable
Nickel	400	-	-	-	5	30	35	-	30.2	-	Acceptable
Zinc	7,400	-	-	-	122	230	352	-	95.8	-	Acceptable
Carcinogenic PAHs (as BaP TEQ) <sup>2</sup>	3	-	-	-	-	-	-	-	0.73	-	Acceptable
Polycyclic aromatic hydrocarbons (PAHs)	300	-	-	-	-	-	-	-	ND	-	Acceptable
Benzo(a)pyrene	-	-	-	-	-	-	-	0.7	ND	-	Acceptable
PCBs (Total)	1	-	-	-	-	-	-	-	ND	-	Acceptable
DDT+DDE+DDD	240	-	-	-	-	180	180	-	ND	-	Acceptable
Aldrin and Dieldrin	6	-	-	-	-	-	-	-	ND	-	Acceptable
Chlordane	50	-	-	-	-	-	-	-	ND	-	Acceptable
Endosulfan	270	-	-	-	-	-	-	-	ND	-	Acceptable
Endrin	10	-	-	-	-	-	-	-	ND	-	Acceptable
Heptachlor	6	-	-	-	-	-	-	-	ND	-	Acceptable
Hexachlorobenzene	10	-	-	-	-	-	-	-	ND	-	Acceptable
Methoxychlor	300	-	-	-	-	-	-	-	ND	-	Acceptable
Chlorpyrifos	160	-	-	-	-	-	-	-	ND	-	Acceptable
Benzene	-	NL	350	120	-	-	-	50	ND	-	Acceptable
Toluene	-	NL	NL	18000	-	-	-	85	ND	-	Acceptable
Ethyl Benzene	-	NL	NL	5300	-	-	-	70	ND	-	Acceptable
Xylene	-	NL	NL	15000	-	-	-	105	ND	-	Acceptable
Naphthalene	-	NL	NL	1900	-	170	170	-	ND	-	Acceptable
TRH: C <sub>6</sub> – C <sub>10</sub> (F1)	-	NL	NL	5100	-	-	-	180	ND	-	Acceptable
TRH: C <sub>10</sub> -C <sub>16</sub> (F2)	-	NL	NL	3800	-	-	-	120	ND	-	Acceptable
TRH: C <sub>16</sub> - C <sub>34</sub> (F3)	-	NL	NL	5300	-	-	-	300	ND	-	Acceptable
TRH: C <sub>34</sub> – C <sub>40</sub> (F4)	-	-	NL	7400	-	-	-	2800	ND	-	Acceptable
Asbestos	-	-	NL	<0.005%	-	-	-	-	ND	-	Acceptable

**Notes to Table 3:**

- 1 Human exposure settings based on land use have been established for HILs (see Taylor and Langley 1998). These are:
  - A. Low Density Residential. (For details on derivation of HILs for human exposure settings based on land use see Schedule B(7A) of NEPM 2013.
- 2 Carcinogenic PAHs: HIL is based on the 8 carcinogenic PAHs and their Toxic Equivalency Factor (TEFs) (potency relative to B(a)P). The B(a)P TEQ (Toxic Equivalency Quantity) is calculated by multiplying the concentration of each carcinogenic PAH in the sample by its B(a)P TEF.
- 3 Most conservative criteria adopted outlined for vapour risk and direct contact.
- 4 Laboratory detection limits adopted for screening purposes.
- 5 To obtain F1, subtract the sum of BTEX from the C<sub>6</sub>-C<sub>10</sub> fraction.
- 5 FA – Fibrous Asbestos, AF – Asbestos Fines. Soils must be “Asbestos Free” to meet site assessment criteria (SAC).

## 7.2 Discussion of Results

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ADE assessed the samples collected against the NEPM 2013 ‘HIL-A’, ‘HSL-A’, ‘EIL-A’ and ‘ESL-A’, for low density residential land use to assess suitability for use onsite.

The concentrations of heavy metals (As, Cd, Cu, Cr, Hg, Ni, Zi & Pb), TRH, BTEX, PAHs, PCBs, OCPs and OPPs in the soil samples collected from the subject area do not exceed the ‘HIL-A’, ‘HSL-A’, ‘EIL-A’ and ‘ESL-A’ outlined in NEPM, 2013.

No asbestos was observed within any of the test pits or detected within the soil samples collected from the subject area (refer to *Appendix V – Analytical Reports*).

## 8 Conclusions

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Based on the data and evidence collected during the investigation, it is the opinion of ADE Consulting Group Pty Ltd that:

- Analytical results of the soil samples collected from within the subject area revealed that the in-situ and stockpiled soil materials characteristics meet the ‘HIL-A’, ‘HSL-A’, ‘EIL-A’ and ‘ESL-A’ assigned threshold values outlined, within the NEPM (2013).

## 9 Classification

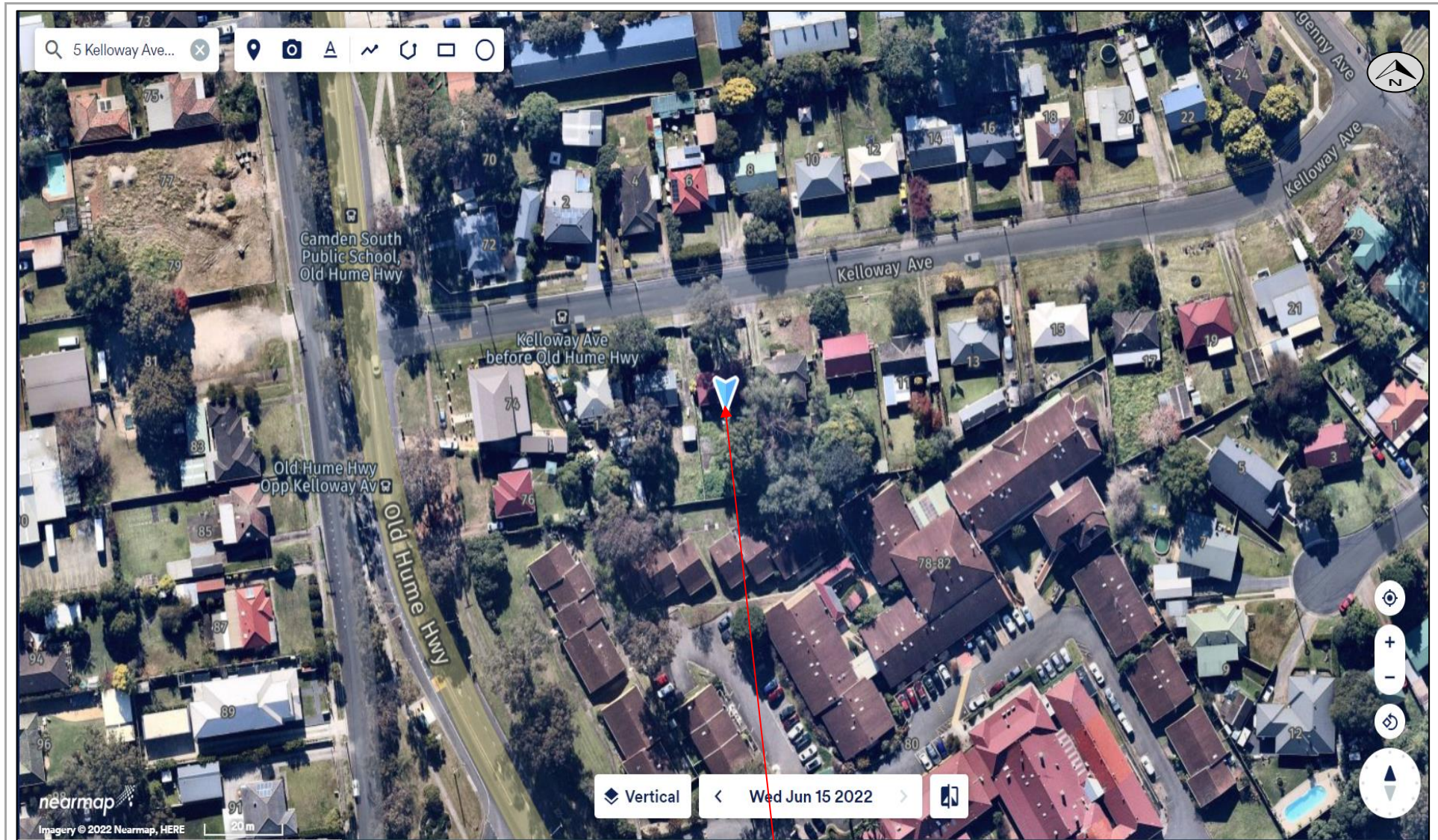
<b>Waste Description:</b>	<p><b>Stockpile:</b> Soil materials generally consisted of sandy CLAY (CL): medium plasticity, brown, fine to medium grained, moist. No other foreign materials, being Asbestos Containing Materials (ACM), paint chips, sulfidic ores and hydrocarbon odours / staining were observed within the soil materials inspected.</p> <p><b>In-situ:</b> Soil materials generally consisted of sandy CLAY (CL): medium plasticity, brown mottled with red and grey patches, fine to medium grained, moist. No other foreign materials, being Asbestos Containing Materials (ACM), paint chips, sulfidic ores or hydrocarbon odours / staining were observed within the soil materials inspected.</p>
<b>Approximate Volume:</b> <b>Re-Use on Site (NEPM)</b>	<p>138 m<sup>3</sup></p> <p><b>Meets the 'HIL-A', 'HSL-A', 'EIL-A' and 'ESL-A' criteria as per NEPM 2013.</b></p>



## 10 References

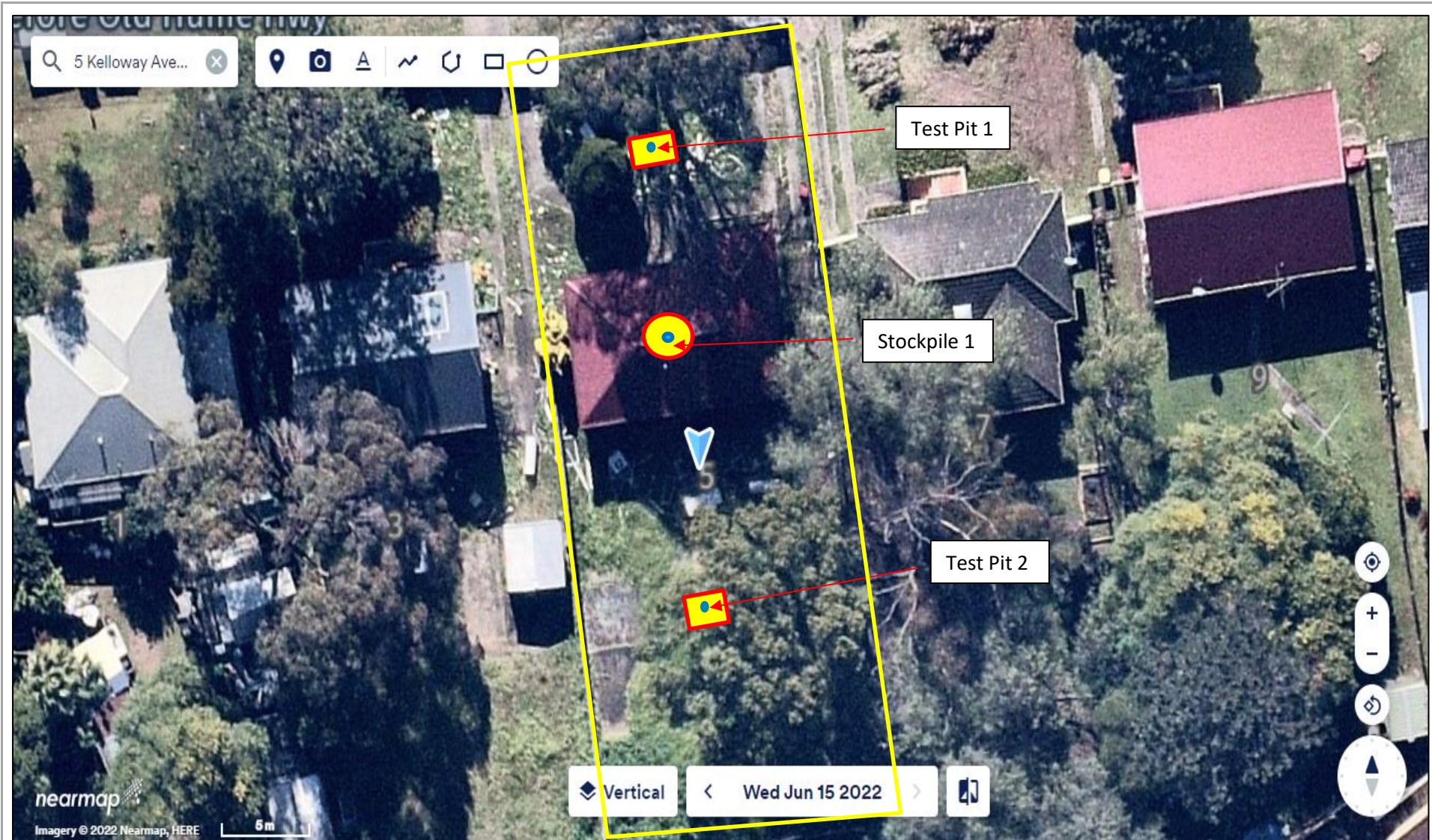
- Assessment of Site Contamination, National Environment Protection (Assessment of Site Contamination) Measure, 1999 (2013 Amendment).
- NSW EPA Sampling Design Guidelines, (NSW EPA 1995).
- Australian Standard AS 4482.1 Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds 2005.
- Australian Standard AS 4482.1 Guide to the sampling and investigation of potentially contaminated soil. Part 2: Volatile substances 2005.
- Victorian EPA Industrial Waste Resource Guidelines for Soil Sampling, 2010.
- Western Australian Department of Health, 'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia', May 2009.
- ASSMAC & DLWC 1996, An Illustrated Guide to Acid Sulfate Soils and Groundwater, Acid Sulfate Soils Management Advisory Committee and Department of Land and Water Conservation, Kempsey.
- Olszowy, H, Torr, P, Imray, P 1995, Trace element concentrations in soils from rural and urban areas of Australia, Contaminated sites monograph no. 4, South Australian Health Commission.

## Appendix I – Aerial Photograph



**Aerial Photograph 4.** Approximate location of the subject area (zoomed out) located at residential lot 5 Kelloway Avenue, Camden NSW 2570 (map adapted from <https://maps.au.nearmap.com/>, as accessed on the 06.07.2022).





**Aerial Photograph 5.** Approximate location of the subject area (zoomed in), test pitting to sample soils after building removal located at residential lot 5 Kelloway Avenue, Camden NSW 2570 (map adapted from <https://maps.au.nearmap.com/>, as accessed on the 06.07.2022).

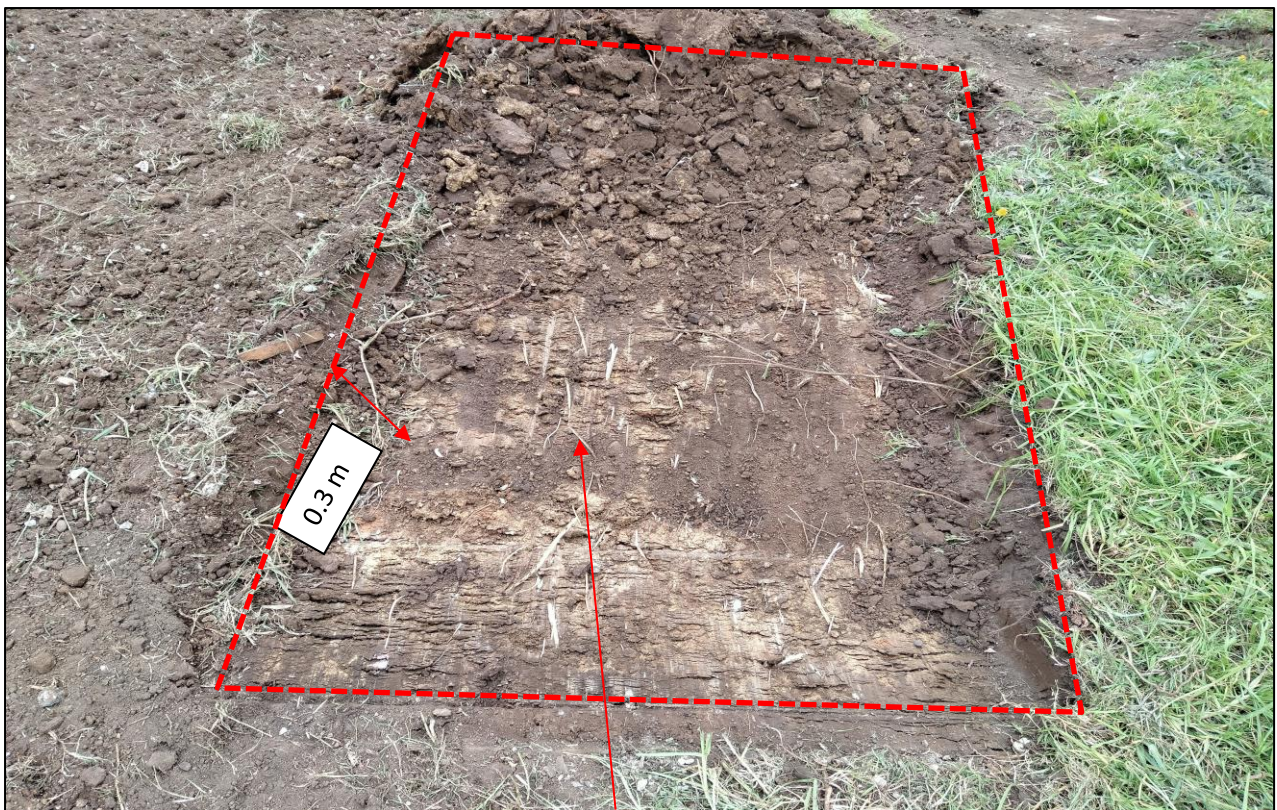
## Appendix II – Photographs

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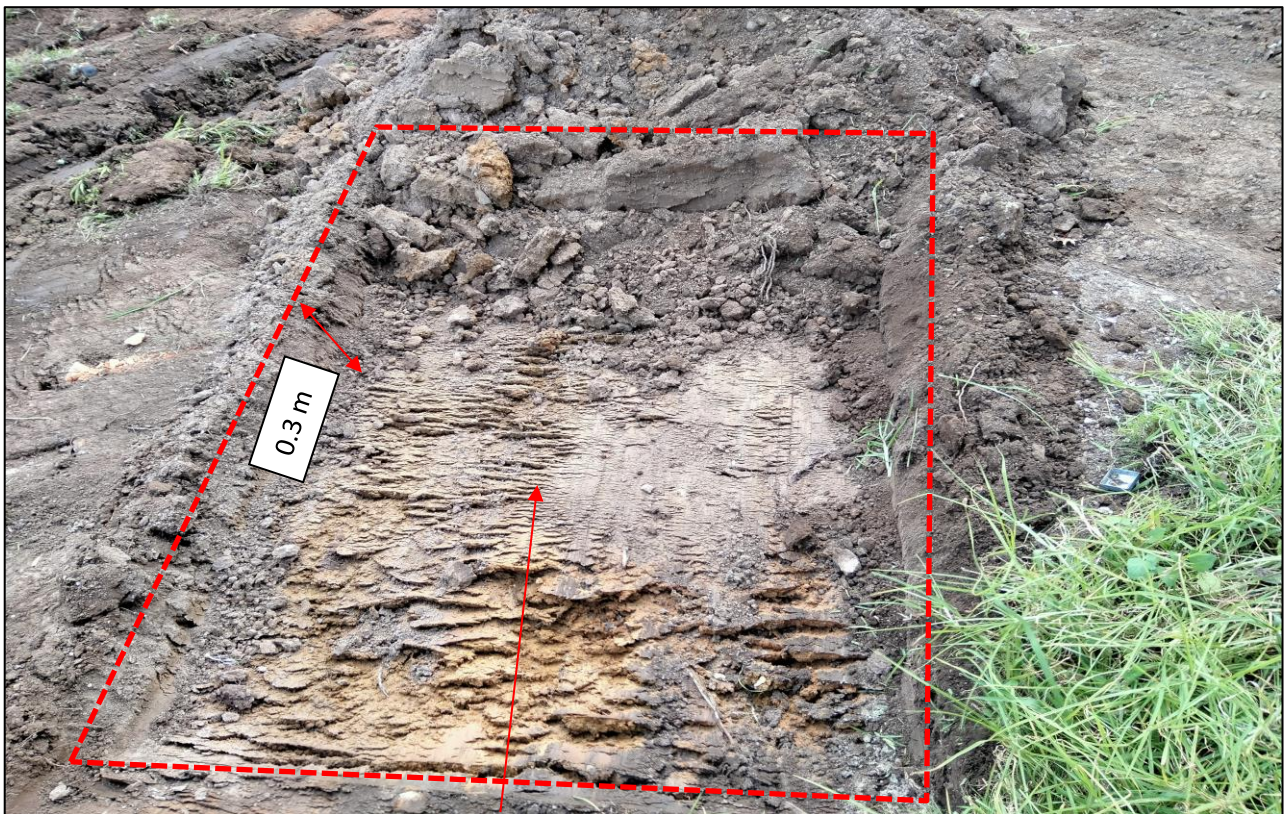


**Photograph 1.** Subject area, stockpiled soil material within residential lot located at 5 Kelloway Avenue, Camden NSW 2570, as observed on the 27.06.2022.



**Photograph 2.** Subject area, in-situ (TP1) soil materials within residential lot located at 5 Kelloway Avenue, Camden NSW 2570, as observed on the 27.06.2022.





**Photograph 3.** Subject area, in-situ (TP2) soil materials within residential lot located at 5 Kelloway Avenue, Camden NSW 2570, as observed on the 27.06.2022.

## Appendix III – Statement of Limitations

This report has been prepared for the exclusive use of the client. ADE has used a degree of care and skill ordinarily exercised in similar investigations by reputable members of the environmental industry in Australia. No other warranty, expressed or implied, is made or intended. No one section or part of a section, of this report should be taken as giving an overall idea of this report. Each section must be read in conjunction with the whole of this report, including its appendixes and attachments.

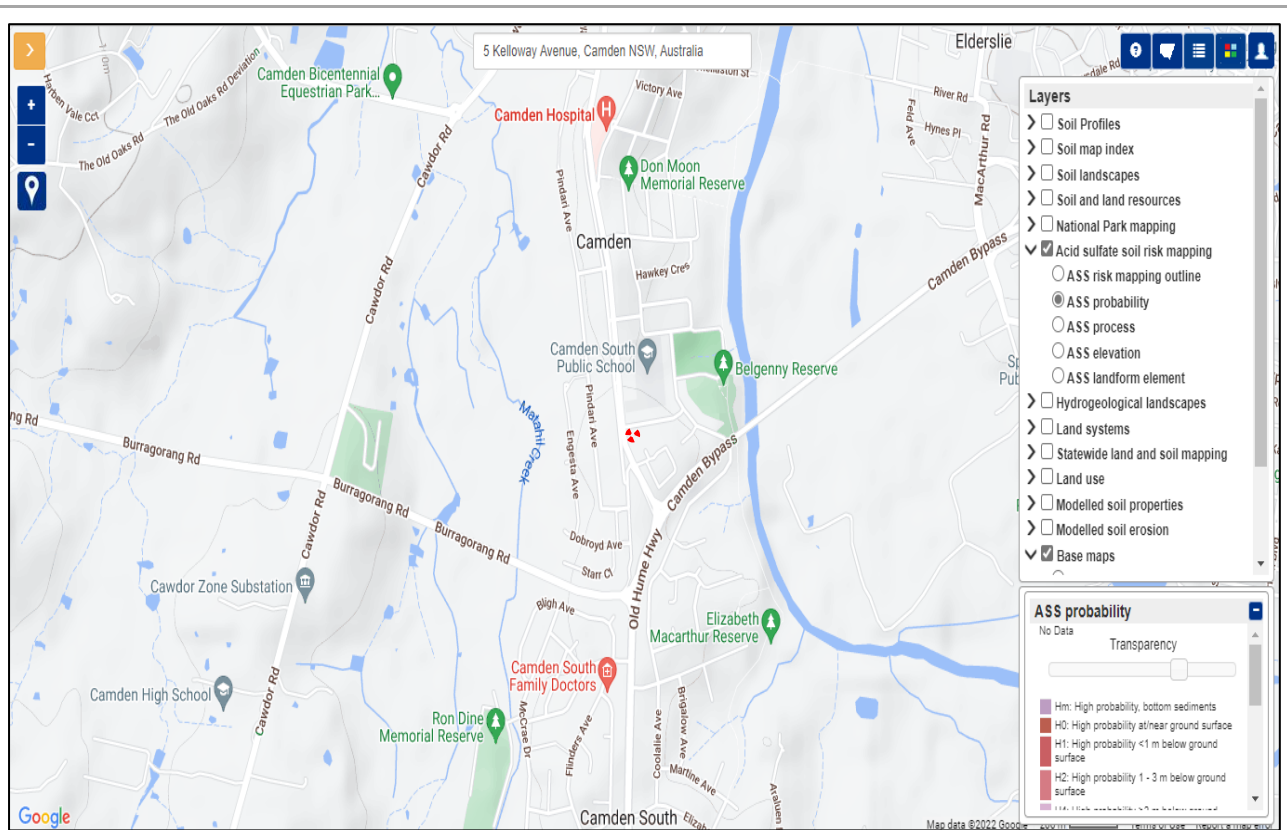
Any other party should satisfy themselves that the scope of work conducted, and report herein meets their specific needs. ADE cannot be held liable for third party reliance on this document, as ADE is not aware of the specific needs of the third party.

The subsurface environment can present substantial uncertainty due to its complex heterogeneity. The conclusions presented in this report are based on limited investigation of conditions at specific sampling locations chosen to be as representative as possible under the given circumstances. However, it is possible that this investigation may not have encountered all areas of contamination at the site due to the limited sampling and testing program undertaken.

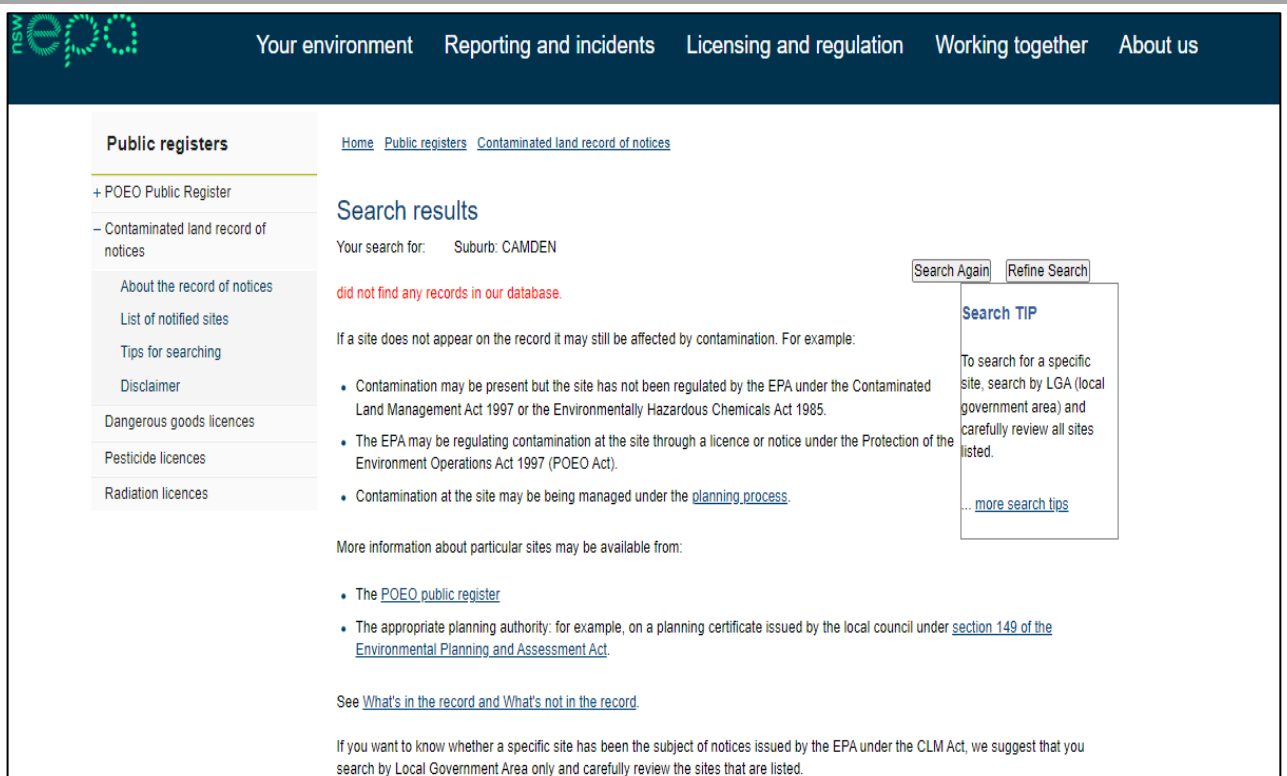
The material subject to classification pertains only to the site and subject area outlined within the report and must be consistent with the waste description reported. If there are any unexpected finds that are not consistent with this classification, ADE must be notified immediately.

ADE's professional opinions are based upon its professional judgement, experience, training and results from analytical data. In some cases, further testing and analysis may be required, thus producing different results and/or opinions. ADE has limited its investigation to the scope agreed upon with its client.

## Appendix IV – Supporting Documents



**Figure 1.** Screenshot of the NSW Government Office of Environment and Heritage E-Spade web page, undertaken to determine the potential for Acid Sulfate Soil at the site. Map adapted from <https://www.environment.nsw.gov.au/eSpade2WebApp#>, accessed on the 06.07.2022.



**Figure 2.** Screenshot of the NSW EPA 'Contaminated Land – Record of Notices' listed by the NSW EPA under the *Contaminated Land Management Act 1997* which identifies no former notices within the source site suburb of 'Camden', NSW (screenshot adapted from [epa.nsw.gov.au](http://epa.nsw.gov.au), accessed on the 06.07.2022).



## Appendix V – Analytical Reports



## Sydney Laboratory Services

A division of A. D. Envirotech Australia Pty Ltd  
Unit 4/10-11 Millennium Court,  
Silverwater 2128  
Ph: (02) 9648-6669

A.B.N. 52 093 452 950

**Analysis report:** A301022.0319.11

**Laboratory LOT NO:** 2203460

**Date Received:** 28.06.2022

**Date Analysed:** 05.07.2022

**Report Date:** 05.07.2022

**Client:** ADE Consulting Group

**Job Location:** NSW LaHC

**Analytical method:** Polarised Light Microscopy with dispersion staining (ADE method ABI)

\*Asbestos identification as per "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" is not covered by NATA scope of accreditation

**Analysis performed by:**

A handwritten signature in blue ink that reads 'Sifan Xu'.

Sifan Xu

**Approved asbestos identifier**

**Results Authorised By:**

A handwritten signature in blue ink that reads 'Sifan Xu'.

Sifan Xu

**Approved Signatory**



**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025 - Testing.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with \*.

**General Comments:**

Sydney Laboratory Services is responsible for all the information in the report, except that provided by the customer. All sampling information included in the report has been provided by the client

Information provided by the client can affect the validity of the results.

Sample analysed as received.

Samples are stored for minimum period of 1 month if longer time is not advised by client.

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 0.01g/kg (0.001% w/w) for friable asbestos and 0.1g/kg (0.01% w/w) for bonded asbestos.

This form of analysis is outside the scope of NATA accreditation.

**Bonded asbestos containing material (bonded ACM)** : Bonded ACM comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve.

**Fibrous asbestos (FA)**: FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).

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

Note: The screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres.



**Accreditation No.14664.**

Accredited for compliance with ISO/IEC 17025 - Testing.

The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Tests not covered by NATA are denoted with \*.

Client Sample ID.	Laboratory Sample No.	Sample Description/Matrix	Sample Dimensions (cm) unless stated otherwise	Result	Comments
5 Kelloway - TP1	2022024085	*Soil	500 ml (543 grams)	No Chrysotile asbestos found	Nil
				No Amosite asbestos found	Nil
				No Crocidolite asbestos found	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
5 Kelloway - TP2	2022024086	*Soil	500 ml (544 grams)	No Chrysotile asbestos found	Nil
				No Amosite asbestos found	Nil
				No Crocidolite asbestos found	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil
5 Kelloway - SP1	2022024087	*Soil	500 ml (537 grams)	No Chrysotile asbestos found	Nil
				No Amosite asbestos found	Nil
				No Crocidolite asbestos found	Nil
				No Synthetic Mineral Fibres found	Nil
				Organic fibres found	Nil



**Sydney Laboratory Services**

A division of A. D. Envirotech Australia Pty Ltd  
A.C.N. 093 452 950  
Unit 4/10-11 Millennium Court,  
Silverwater 2128  
Ph: (02) 9648-6669



**Accreditation No.14664**  
Accredited for compliance with ISO/IEC 17025 - Testing.

This certificate of analysis contains General Comments and Analytical Results. Quality Control Report and Laboratory Quality Acceptance Criteria have been issued separately.

This report supersedes any previous report(s) with this reference. This document shall not be reproduced, except in full.

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This report has been electronically signed by authorised signatories below.

Authorised By

A handwritten signature in blue ink, appearing to read 'Kaiyu Li', is shown.

**Kaiyu Li**

### General Comments

Samples are analysed on as received basis. Sampling is not covered by NATA accreditation.

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

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

Samples were analysed within holding time described by laboratory internal procedures if not stated otherwise. If samples delivered do not meet required analytical criteria, results will be marked with ^.

However surrogate standards are added to samples, results are not corrected for standards recoveries.

Analysis of VOC in water samples are performed on unfiltered waters (as received) spiked with surrogates and injection standards only.

SLS is responsible for all the information in the report, except that provided by the customer.

All sampling information included in the report has been provided by customer.

Information provided by the customer can affect the validity of the results.

## Certificate of Analysis

<b>Contact:</b>	Saurabh Aher	<b>Date Reported:</b>	5/07/2022
<b>Customer:</b>	ADE Consulting Group	<b>No. of Samples:</b>	3
<b>Address:</b>	Unit 6 7 Millennium Court Silverwater NSW	<b>Date Received:</b>	28/06/2022
		<b>Date of Analysis:</b>	28/06/2022
<b>Cust Ref:</b>	A301022.0319.11		

**Glossary:**

- \*NATA accreditation does not cover the performance of this service
- ND-not detected,
- NT-not tested
- INS-Insufficient material to perform the test
- LCS-Laboratory Control Sample
- RPD-Relative Percent Difference
- N/A-Not Applicable
- < less than
- > greater than
- PQL- Practical Quantitation Limit
- ^Analytical result might be compromised due to sample condition or holding time requirements
- Reaction rate 1 = Slight
- Reaction rate 2 = Moderate
- Reaction rate 3 = High
- Reaction rate 4 = Vigorous

## Certificate of Analysis

Sample ID: 2022024085 2022024086 2022024087  
Sample Name 5 Kelloway - TP1 5 Kelloway - TP2 5 Kelloway - SP1

Parameter	Units	PQL			
<b>ESA-P-ORG7 &amp; ORG8</b>					
Benzene	mg/kg	0.5	<0.50	<0.50	<0.50
Toluene	mg/kg	0.5	<0.50	<0.50	<0.50
Ethylbenzene	mg/kg	1	<1.0	<1.0	<1.0
m.p Xylene	mg/kg	2	<2.0	<2.0	<2.0
o Xylene	mg/kg	1	<1.0	<1.0	<1.0
Sum of BTEX	mg/kg	2	<2.00	<2.00	<2.00
Total Xylenes	mg/kg	2	<2.0	<2.0	<2.0
Fluorobenzene (Surr.)	%		77	87	98
C6-C10	mg/kg	35	<35	<35	<35
C6-C10 minus BTEX	mg/kg	35	<35	<35	<35
C6-C9	mg/kg	25	<25	<25	<25
<b>ESA-MP-01,ICP-01</b>					
Arsenic	mg/kg	5	8.5	7.2	12.4
Cadmium	mg/kg	0.3	<0.30	<0.30	0.35
Chromium	mg/kg	5	18.8	13.9	24.3
Copper	mg/kg	5	17.7	8.1	30.7
Lead	mg/kg	10	31.5	15.9	41.6
Mercury	mg/kg	0.2	<0.20	<0.20	<0.20
Nickel	mg/kg	10	12.0	<10.0	30.2
Zinc	mg/kg	5	73.3	18.9	95.8
<b>ESA-P-12</b>					
% Moisture Content	%		14.2	14.1	13.6
<b>ESA-P-ORG(12 - 15)</b>					
Acenaphthene	mg/kg	0.3	<0.30	<0.30	<0.30
Acenaphthylene	mg/kg	0.3	<0.30	<0.30	<0.30



## Certificate of Analysis

Sample ID: 2022024085 2022024086 2022024087

Sample Name 5 Kelloway - TP1 5 Kelloway - TP2 5 Kelloway - SP1

Parameter	Units	PQL			
Anthracene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[a]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[a]pyrene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[b]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[g,h,i]perylene	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo[k]fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30
Chrysene	mg/kg	0.3	<0.30	<0.30	<0.30
Dibenzo[a,h]anthracene	mg/kg	0.3	<0.30	<0.30	<0.30
Fluoranthene	mg/kg	0.3	<0.30	<0.30	<0.30
Fluorene	mg/kg	0.3	<0.30	<0.30	<0.30
Indeno(1,2,3-cd)pyrene	mg/kg	0.3	<0.30	<0.30	<0.30
Naphthalene	mg/kg	0.3	<0.30	<0.30	<0.30
Phenanthrene	mg/kg	0.3	<0.30	<0.30	<0.30
Pyrene	mg/kg	0.3	<0.30	<0.30	<0.30
Sum of Positive PAHs	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo(a)pyrene TEQ (Zero)	mg/kg	0.3	<0.30	<0.30	<0.30
Benzo(a)pyrene TEQ (Half PQL)	mg/kg	0.3	0.36	0.36	0.36
Benzo(a)pyrene TEQ (PQL)	mg/kg	0.3	0.73	0.73	0.73
p-Terphenyl-d14 (Surr.)	%		130	131	107
aldrin	mg/kg	0.1	<0.10	<0.10	<0.10
a-BHC	mg/kg	0.1	<0.10	<0.10	<0.10
b-BHC	mg/kg	0.1	<0.10	<0.10	<0.10
d-BHC	mg/kg	0.1	<0.10	<0.10	<0.10
g-BHC (lindane)	mg/kg	0.1	<0.10	<0.10	<0.10
cis-chlordane	mg/kg	0.1	<0.10	<0.10	<0.10
trans-chlordane	mg/kg	0.1	<0.10	<0.10	<0.10

## Certificate of Analysis

Sample ID: 2022024085 2022024086 2022024087  
Sample Name 5 Kelloway - TP1 5 Kelloway - TP2 5 Kelloway - SP1

Parameter	Units	PQL			
4,4'-DDD	mg/kg	0.1	<0.10	<0.10	<0.10
4,4'-DDE	mg/kg	0.1	<0.10	<0.10	<0.10
4,4'-DDT	mg/kg	0.1	<0.10	<0.10	<0.10
dieldrin	mg/kg	0.1	<0.10	<0.10	<0.10
endosulfan I	mg/kg	0.2	<0.20	<0.20	<0.20
endosulfan II	mg/kg	0.2	<0.20	<0.20	<0.20
endosulfan sulfate	mg/kg	0.1	<0.10	<0.10	<0.10
endrin	mg/kg	0.2	<0.20	<0.20	<0.20
endrin aldehyde	mg/kg	0.1	<0.10	<0.10	<0.10
endrin ketone	mg/kg	0.1	<0.10	<0.10	<0.10
heptachlor	mg/kg	0.1	<0.10	<0.10	<0.10
heptachlor epoxide	mg/kg	0.1	<0.10	<0.10	<0.10
hexachlorobenzene	mg/kg	0.1	<0.10	<0.10	<0.10
methoxychlor	mg/kg	0.1	<0.10	<0.10	<0.10
TCMX (Surr.)	%		119	105	134
chlorpyrifos	mg/kg	0.1	<0.10	<0.10	<0.10
chlorpyrifos methyl	mg/kg	0.1	<0.10	<0.10	<0.10
diazinon	mg/kg	0.1	<0.10	<0.10	<0.10
fenchlorphos	mg/kg	0.1	<0.10	<0.10	<0.10
methyl parathion	mg/kg	0.1	<0.10	<0.10	<0.10
prophos	mg/kg	0.1	<0.10	<0.10	<0.10
tributylphosphorotrithioite	mg/kg	0.1	<0.10	<0.10	<0.10
Aroclor 1016	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1221	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1232	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1242	mg/kg	0.5	<0.50	<0.50	<0.50

# Certificate of Analysis

Sample ID: 2022024085 2022024086 2022024087  
Sample Name 5 Kelloway - TP1 5 Kelloway - TP2 5 Kelloway - SP1

Parameter	Units	PQL			
Aroclor 1248	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1254	mg/kg	0.5	<0.50	<0.50	<0.50
Aroclor 1260	mg/kg	0.5	<0.50	<0.50	<0.50
2-fluorobiphenyl (Surr.)	%		130	116	125
ESA-P-ORG(3,8)					
>C10-C16	mg/kg	50	<50	<50	<50
>C16-C34	mg/kg	100	<100	<100	<100
>C34-C40	mg/kg	100	<100	<100	<100
>C10-C40 (Sum of total)	mg/kg	50	<50	<50	<50
>C10-C14	mg/kg	50	<50	<50	<50
>C15-C28	mg/kg	100	<100	<100	<100
>C29-C36	mg/kg	100	<100	<100	<100
>C10-C36 (Sum of total)	mg/kg	50	<50	<50	<50



## Appendix VI – Chain of Custody



Tray-71

Document Revision Date: 30.06.2020						ESA-F-02 COC - Chain Of Custody (Internal: Sydney Laboratory Services)												ADECONSULTINGGROUP SOLUTIONS THROUGH INNOVATION							
PROJECT:		NSW LaHC				LABORATORY REFERENCE NO. (Lab use ONLY):												A301022-0319-11							
PROJECT NUMBER - INVOICE NUMBER		A301022.0319.11				RECEIVED BY: Tree												SIGNATURE: TT							
SAMPLES DELIVERED BY:		ADE Consulting Group 6/7 Millennium Ct, Silverwater NSW 2128				SAMPLES: 3 CHILLED: <input checked="" type="checkbox"/> PRESERVED: <input checked="" type="checkbox"/>												PRESERVATION METHOD: <input checked="" type="checkbox"/>							
SAMPLERS:		Kaushik Botta				MINIMAL HEADSPACE: <input checked="" type="checkbox"/> WITHIN HOLDING TIME: <input checked="" type="checkbox"/>												CUSTODY SEAL INTACT: <input checked="" type="checkbox"/>							
TURNAROUND: ASAP		24h: <input checked="" type="checkbox"/> 48h: <input checked="" type="checkbox"/> 72h: 5 WORKING DAYS: X				DATE: 28.06.22 TIME: 10:30am												TEMPERATURE UPON RECEIPT: <input checked="" type="checkbox"/>							
SAMPLING DATE:		27.06.2022				LIMS LOT NO. 2203460												LIMS/EXCEL SIGNATURE:							
AFTER TEST STORAGE:		ROOM TEMP: <input checked="" type="checkbox"/> FRIDGE: X FREEZER: <input checked="" type="checkbox"/> > 4 WEEKS: <input checked="" type="checkbox"/> OTHER: <input checked="" type="checkbox"/>				COMMENTS:																			
REPORT FORMAT:		HARD COPY: <input checked="" type="checkbox"/> E-MAIL: X				ANALYSES REQUIRED												NOTES							
CONSULTANTS SIGNATURE:		CONSULTANT E-MAIL: kaushik.botta@ade.group siddhartha.sapkota@ade.group				Chem Lab												Asbestos							
PROJECT Co-ordinator SIGNATURE:		PROJECT Co-ordinator E-MAIL: kaushik.botta@ade.group				Lead												Lead							
2022024		SAMPLE DATA				CONTAINER DATA												POTENTIAL HAZARDOUS CONTAMINANTS:							
LIMS Sample ID (Lab Use)	Sample ID (ADE)	MATRIX	SAMPLE DATE	TYPE & PRESERVATIVE	NO.	Lead	8 Metal Suite	BTEX	PAH	OC/OPP	PCB	VTRH (C6-C10)	TRH (C10-C40)	pH/EC	pH/pH fox	PFAS	Bulk	Dust	Dust Swab	Soil 65g	Soil 500g NEPM	Airborne Asbestos Monitoring	Lead dust	<input checked="" type="checkbox"/> ASBESTOS <input checked="" type="checkbox"/> LEAD/ARSENIC <input type="checkbox"/> OTHER: _____	<input checked="" type="checkbox"/> HYDROCARBONS <input type="checkbox"/> NO KNOWN CONTAMINATION
085	5 Kelloway-TP1	Soil	27.06.2022	p	1		X	X	X	X	X	X	X								X				
086	5 Kelloway-TP2	Soil	27.06.2022	p	2		X	X	X	X	X	X	X								X				
087	5 Kelloway-SP1	Soil	27.06.2022	p	3		X	X	X	X	X	X	X								X				

**Comments:**

Container Type and Preservative: P = Unpreserved Plastic; PN = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; PNA = Sodium Hydroxide Preserved Plastic; PC = HCl preserved Plastic; VC = Vial HCl Preserved; SP = Sulfuric Preserved Plastic; VB = Vial Sodium Bisulphate Preserved; VS = Vial Sulfuric Preserved; V = Unpreserved Vial; G = Amber Glass Unpreserved; SG = Sulfuric Preserved Amber Glass; F = Formaldehyde Preserved Glass; HS = HCl preserved Speciation bottle; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottle; ST = Sterile Bottle; J = Unpreserved Glass Jar; ASS = Plastic Bag for Acid Sulfate Soils; B = Unpreserved Bag.

Due: 05.07.22





*Further details regarding ADE's Services are available via*

✉ [info@ade.group](mailto:info@ade.group) 🌐 [www.ade.group](http://www.ade.group)

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