PHASE 2 ENVIRONMENTAL SITE ASSESSMENT
6 EDITH STREET, KINGSWOOD NSW 2747

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Prepared for:	Liquid Gold 888 Pty Ltd
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6 EDITH STREET, KINGSWOOD NSW 2747

Executive Summary

On the 9 September 2019, EHO Consulting Pty Limited (EHO) were engaged by Mr Anthony Nakhoul of Liquid Gold 888 Pty Ltd (the Client), to undertake a limited Phase 2 Environmental Site Assessment (P2ESA) of the property located at 6 Edith Street, Kingswood NSW 2747 (the Site).

The objective of the assessment is to provide an assessment of the Site in accordance with the requirements of the NSW State Environmental Planning Policy No 55 – Remediation of Land (SEPP 55), assessing suitability of the Site in support of a development application (DA) submitted by the Client to develop the Site as a boarding house.

The scope included collection of soil samples from a total of three (3) locations in the south western corner of the property (the front yard) which is where fill has been imported to level the property within the fence line, and submission of the samples to an independent NATA accredited laboratory for analysis of general contaminants of concern including asbestos.

The investigation of fill material placed in the south western section of the property located at 6 Edith Street, Kingswood NSW 2747 for the purposes of levelling the front yard within the fence line has found that the material is unsuitable not only for the proposed site use, that being a boarding house as per the DA currently under submission with Penrith City Council but is also unsuitable for the current site use, that being a single storey detached residence with assessible soil.

As the fill material which has been investigated at the Site has been found to unsuitable for both the current and proposed site use immediate action is recommended from a human health perspective to protect the tenant, visitors and surrounding properties. These actions include may but may not be limited to:

- The Client should notify the property owner, as it is understood the Client is engaged on behalf of the property owner, so that the tenant can be informed of the associated risk;
- All care should be taken to avoid disturbing the soil under the grass in the front yard.
    - In particular, care should be taken when mowing the grass to ensure that it is not cut close to the level of the soil.
    - The property owner should take steps to encourage the current or future tenants to maintain the lawn in good condition. This may include:
        - Subsidising maintenance of the lawn;
        - Engaging a professional to maintain/promote growth of the lawn;
- No new gardens or plants should be established in the front yard;
- Anyone engaged to carry out works of any kind which may include disturbance of the fill material in the front yard of the Site, within the fence line needs to be informed that a human risk from asbestos fines exists.

In order to make the property suitable for the proposed use the unsuitable material needs to be either

- removed from the Site by a licenced friable asbestos removalist and disposed of as Asbestos Waste under NSW EPA Waste Classification,
- the proposed development needs to be amended to ensure that potential disturbance of the unsuitable material is minimised.

Remedial options in order to meet the DA requirements for the proposed development include but may not be limited to:

- onsite remediation by removing the grass under monitored conditions by a licenced friable asbestos removalist as asbestos waste and paving the front yard with a permanent surface such as pavers or concrete; or
- removal of the contaminated and disposal of the fill entirely under monitored conditions by a licenced friable asbestos removalist as asbestos waste, and replacing with clean fill and re-turfing.

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1. Introduction

1.1 Background

On the 9 September 2019, EHO Consulting Pty Limited (EHO) were engaged by Mr Anthony Nakhoul of Liquid Gold 888 Pty Ltd (the Client), to undertake a limited Phase 2 Environmental Site Assessment (P2ESA) of the property located at 6 Edith Street, Kingswood NSW 2747 (the Site).

1.2 Purpose of Investigation

The purpose of the site works carried out as part of the assessment was to investigate the depth, physical and chemical characteristics of fill material which historic photos indicated was imported onto the south-west portion of the Site between 9 May 2012 and 5 May 2016.

1.3 Objective of Assessment

The objective of the assessment is to provide an assessment of the Site in accordance with the requirements of the NSW State Environmental Planning Policy No 55 – Remediation of Land (SEPP 55), assessing suitability of the Site in support of a development application (DA) submitted by the Client to develop the Site as a boarding house.

EHO understands that the DA was originally submitted to Penrith City Council (Council) and was rejected as based on the documentation provided in support of the DA, Council could not at the time, with certainty, be satisfied that the Site is not contaminated. EHO have not been provided with any other particulars of the DA.

1.4 Site Setting

The Site is located in a street of primarily single storey, brick and tile, detached dwellings with fenced boundaries and is on the eastern site of Edith Street Kingswood NSW 2747.

Surrounding properties are all residential, with a complex of single storey semi-detached townhouses located on the opposite site on the street on a battle-axe block, behind the first row of houses.

There is no industry in the immediate area nor sensitive receivers other than residences for several hundred metres in any direction. The western boundary of Western Sydney University is located approximately 350 m to the east.

The nearest identified waterway is Werrington Creek, located some 700 m to the east on the eastern side of Western Sydney University.

The topography of the area is generally flat, with Edith Street sloping gently from the south. The yards of the residences are generally raised slightly above the alignment of Edith Street indicating that either, general filling of the lots may have occurred at the time of initial development of the area or that the alignment of Edith Street follows a natural depression. However, Edith Street and the surrounding area do not appear to be flood prone.

The Site was observed to be occupied by a single storey brick and tile residence with an attached single garage and carport, served by a concrete driveway located at the front of the property on the northern side. The front yard is lawn bordered by low hedges on the house side and by a brick fence on the southern and western sides. The lawn and hedges appeared to be in good condition with no evidence

of die-back or stress other than the area has been through an extremely dry winter and appear to be in a similar condition to other properties in Edith Street.

The brick fence has been used as a retaining wall for fill which has been used to make the lawn within the yard level, whereas the ground level on the outside of the western alignment of the fence is lower and slopes slightly to Edith Street as do most of the other properties in the street.

A partial inspection of the backyard over a fixed fence located on the southern side of the house did not indicated that noticeable filling has occurred at the rear of the Site.

No waste, staining of the surface or activities causing dust being generated were observed on the Site.

No odours were noted as coming from the Site.

No surface water was observed on or within 350 m of the Site.

All works associated with this assessment were carried out in the front yard targeting the filled portion of the Site, as identified in the historical photographs reviewed by Council as part of the DA determination.

1.5 Site History

As this P2ESA is a limited assessment targeting only the fill in the south western corner of the Site, in support of the current DA and Council have as part of the original DA determination, indicated that the application is not in conflict with the requirements of the Sydney Regional Development Plan (No.2-1997), a detailed site history, identification of the Site and assessment of zoning against Local Environmental Plan (LEP) zoning requirements have not be carried out as part of the scope of this assessment.

2. Scope

2.1 Overview

In order to meet the stated objective EHO carried out the following scope:

- Mobilisation of an experienced contaminated land specialist to the Site;
- Undertaking of the requisite service clearance and site familiarisation;
- Collection of soil samples from a total of three (3) locations in the south western corner of the property (the front yard) which is where fill has been imported to level the property within the fence line.
    - Screening of the samples with a PID to assess for the presence of volatile compounds;
        - A copy of the PID calibration certificate is provided as Appendix E to this report.
    - Submission of the soil samples to an independent NATA accredited laboratory to test for the following contaminants of potential concern:
        - Total recoverable hydrocarbons (TRH);
        - Benzene, toluene, ethylbenzene, xylenes and naphthalene (BTEXN);
        - Polycyclic aromatic hydrocarbons (PAH);
        - Phenols;
        - Polychlorinated Biphenyls (PCBs);
        - Organochlorine Pesticides (OCPs);
        - Metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn); and
        - Asbestos
            - Identification; and
            - Quantification in soil.
- Comparison of laboratory results against the adopted site assessment criteria; and
- Production of this limited Phase 2 Environmental Site Assessment report in General accordance with the NSW OEH Guidelines for Consultants Reporting on Contaminated Sites 2011.

2.2 Methodology

The site was examined during the service clearance to ascertain the zones of deepest fill and a total of three boreholes advanced through the fill and into the natural ground using a petrol-powered auger equipped with a 200 mm diameter spiral auger.

Prior to bore advancement the lawn at each location was cut and lifted in a single piece and placed to the side.

Plastic was laid on the lawn adjacent each of the bores and the cuttings from each bore were placed onto the plastic in order of advancement to allow logging and prevent potential contamination of the surface as the bores were advanced. Copies of bore/sample logs are provided as Appendix C to this report.

Samples were collected from the cuttings for laboratory analysis and field screening for volatile compounds with a photo-ionisation detector (PID). Samples were taken from the full depth of the fill using a stainless-steel trowel and single use nitrile gloves. Samples for chemical analysis were placed in

jars with sealable lids provided by the laboratory. Samples for asbestos analysis were double bagged in sealable zip lock bags.

All samples were placed into a cooler containing ice as soon as practicable after PID screening.

The sampling trowel and auger were wiped down so as to be visually free of soil and/or contaminants between each borehole using disposable moist wipes.

All gloves, wipes and plastic were collected and placed into a sealed bag for appropriate offsite disposal.

Following sample collection the boreholes were reinstated by tipping the cuttings from the plastic back into the holes and tamping down with a shovel. Finally the section of grass was replaced level with the surrounding lawn and watered to encourage regrowth.

Samples were transported directly from the Site to the laboratory by road and submitted for analysis under standard Chain of Custody protocols.

2.3 Site Assessment Criteria

The NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (amended 2013) criteria were adopted as site assessment criteria for the purpose of the limited P2ESA. The NEPC NEPM framework is based on a matrix of human health and ecological soil and groundwater investigation and screening levels and guidance for specific contaminants. For the purpose of this assessment only human health criteria for soil have been used as no sensitive ecological receivers have been identified with potential to be impacted by contamination within fill at the Site.

2.3.1 Chemical Assessment

NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (amended 2013) – Schedule B1; Guideline on Investigation Levels for Soil and Groundwater.

- Table 1A(1) Health investigation levels for soil contaminants
  - Residential A – Residential with garden/accessible soil.
- Table 1A(3) Soil Health Screening Levels (HSLs) for vapour intrusion
  - HSL A & HSL B; Low – high density residential: Sand - 0 m to <1 m.

2.3.2 Asbestos Assessment

NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999 (amended 2013) – Schedule B1; Guideline on Investigation Levels for Soil and Groundwater.

- Table 7. Health screening levels for asbestos contamination in soil
  - Residential A – with garden/accessible soil.

3. Results

3.1 Characteristics of Fill

Fill was identified in all bores advanced at the site in depths from 0.25 m toward the house, increasing up to 0.43 m toward the front fence.

The fill encountered was typically Silty SAND / Sandy SILT with some gravel and tile fragments, dry, loosely compacted and low plasticity.

The underlying natural soil was typically Sandy Silty CLAY / Clayey SILT, compact and of low-med plasticity.

3.2 Laboratory Analyses

The laboratory engaged for the purposes of this assessment was SGS who hold current NATA accreditation for all analyses undertaken. The results of laboratory analyses are tabulated in Appendix B of this report with a copy of the SGS Certificate of Analysis provided as Appendix B.

3.3 Chemical Results

3.3.1 Chemical Results Exceeding Criteria

No chemical result was found to exceed the screening criteria for any of the analytes which this assessment has considered. Potential chemical contaminants screened are as listed in section 2.1 of this report.

3.3.2 Chemicals Detected but Not Exceeding Criteria

Table 1 summarises chemical contaminants detected above the laboratory limits of reporting (LOR) but not exceeding the adopted site assessment criteria. Where analytes have not been detected above the LOR it is stated within the table.

Table 1 Chemicals Detected but not Exceeding Assessment Criteria

Chemical	LOR (mg/kg)	Range of Results (mg/kg)	Assessment Criteria (mg/kg)
Metals			
– Arsenic (As)	– 1	– 7 - 8	– 100
– Cadmium (Cd)	– 0.3	– <0.3 – 0.4	– 20
– Chromium (Cr)	– 0.5	– 16 - 19	– 100
– Copper (Cu)	– 0.5	– 56 - 98	– 6000
– Mercury (Hg)	– 0.05	– 0.21 – 0.38	– 10
– Nickel (Ni)	– 0.5	– 10 - 13	– 400
– Lead (Pb)	– 1	– 89 - 120	– 300
– Zinc (Zn)	– 2	– 220 - 330	– 7400

Chemical	LOR (mg/kg)	Range of Results (mg/kg)	Assessment Criteria (mg/kg)
PAH – Carcinogenic PAHs – Total PAHs	 – 0.3 – 0.8	 – <0.3 – 0.7 – <0.8 - 3	 – 3 – 300
TRH – F1 – F2	 – 25 – 25	 – All less than LOR – All less than LOR	 – 45 – 110
BTEXN – Benzene – Toluene – Ethylbenzene – Xylenes – Naphthalene	 – 0.1 – 0.1 – 0.1 – 0.3 – 0.1	 – All less than LOR – All less than LOR – All less than LOR – All less than LOR – All less than LOR	 – 0.5 – 160 – 55 – 40 – 3
Speciated Phenols	0.5 – 2	All less than relevant LOR	100*
OC & OP Pesticides	0.1 – 0.5	All less than relevant LOR	6*
PCBs	0.2	All less than LOR	1

*Lowest single analyte criteria for chemical group (most conservative criteria)

3.3.3 Asbestos

Asbestos was detected as asbestos fines in two (2) of the three (3) samples submitted to the laboratory. Table 2 summaries the concentration of asbestos detected in soil.

Table 2 Asbestos Detected in Soil

Sample No	Type of Asbestos Detected	Result (%w/w)	Assessment Criteria (%w/w)
S1	>2mm - <7mm FA/AF	0.001	0.001
S2	None detected	<0.001	
S3	>2mm - <7mm FA/AF	0.002	

4. Discussion

The laboratory results indicate that the fill material which has been placed in the front yard of the Site and specifically that material placed in the south-western corner to level the yard within the fence line material is suitable from a chemical perspective for the proposed site use, that being a boarding house. However, asbestos in the form of asbestos fines (>2 mm /<7 mm) has been detected in two (2) of the three (3) samples collected and at concentrations equal to, or greater than the adopted site criteria for this assessment (see Section 2.3.2). This means that the fill is **unsuitable** not only for the proposed but also the current site use.

Based on guidance provided in the NSW EPA Guidelines on the Duty to report Contamination under the Contaminated Land Management Act 1997, the duty to report the property as a contaminated site would not be triggered (No Duty to Report) as long as the lawn is maintained in a healthy condition and no digging of any kind occurs in the front yard (eg. a dog digging a hole, or planting of shrubs etc) where fill has been used to level of the site.

5. Conclusion and Recommendations

5.1.1 Conclusion

The investigation of fill material placed in the south western section of the property located at 6 Edith Street, Kingswood NSW 2747 for the purposes of levelling the front yard within the fence line has found that the material is unsuitable not only for the proposed site use, that being a boarding house as per the DA currently under submission with Penrith City Council but is also unsuitable for the current site use, that being a single storey detached residence with assessible soil.

EHO consider that the objectives of this limited P2ESA have been met in full.

5.1.2 Recommendations

As the fill material which has been investigated at the Site has been found to unsuitable for both the current and proposed site use immediate action is recommended from a human health perspective to protect the tenant, visitors and surrounding properties. These actions include may but may not be limited to:

- The Client should notify the property owner, as it is understood the Client is engaged on behalf of the property owner, so that the tenant can be informed of the associated risk;
- All care should be taken to avoid disturbing the soil under the grass in the front yard.
    - In particular, care should be taken when mowing the grass to ensure that it is not cut close to the level of the soil.
    - The property owner should take steps to encourage the current or future tenants to maintain the lawn in good condition. This may include:
        - Subsidising maintenance of the lawn;
        - Engaging a professional to maintain/promote growth of the lawn;
- No new gardens or plants should be established in the front yard;
- Anyone engaged to carry out works of any kind which may include disturbance of the fill material in the front yard of the Site, within the fence line needs to be informed that a human risk from asbestos fines exists.

In order to make the property suitable for the proposed use the unsuitable material needs to be either

- removed from the Site by a licenced friable asbestos removalist and disposed of as Asbestos Waste under NSW EPA Waste Classification,
- the proposed development needs to be amended to ensure that potential disturbance of the unsuitable material is minimised.

Remedial options in order to meet the DA requirements for the proposed development include but may not be limited to:

- onsite remediation by removing the grass under monitored conditions by a licenced friable asbestos removalist as asbestos waste and paving the front yard with a permanent surface such as pavers or concrete; or
- removal of the contaminated and disposal of the fill entirely under monitored conditions by a licenced friable asbestos removalist as asbestos waste, and replacing with clean fill and re-turfing.

6. Limitations

Observations and sampling/test results were indicative of the conditions present at the time of our investigation are a snapshot of conditions as they were at the time of the investigation, and may not be representative of past or future conditions.

Our report is limited in to the agreed scope of works outlined in our fee proposal.

The report has been prepared for the benefit of the Client and no other party. EHO Consulting assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EHO Consulting or for any loss or damage suffered by any other party in relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

EHO Consulting will not be liable to update or revise the report to take into account any events, emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to nor ownership of the properties, buildings and structures referred to in the report, nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

7. References

NSW EPA (2011), Guidelines for Consultants Reporting on Contaminated Sites

NEPC National Environmental Protection (Assessment of Site Contamination) Measure; 1997 (amended 2013).

Appendix A – Figures

⊗ Soil Sample Location

FIGURE 1

SITE LOCATION AND SAMPLING PLAN

6 Edith Street, Kingswood NSW – 10 September 2019

Appendix B – Laboratory Certificate of Analysis

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Craig Wellings
Client	EHO CONSULTING PTY LIMITED
Address	16/380 PENNANT HILLS ROAD PENNANT HILLS NSW 2120
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Email	craig@ehoc.com.au
Project	**JN00869 - Kingswood**
Order Number	(Not specified)
Samples	3

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE197563 R0**
Date Received	12 Sep 2019
Date Reported	19 Sep 2019

COMMENTS

Accredited for compliance with ISO/IEC 17025 - Testing. NATA accredited laboratory 2562(4354).

No respirable fibres detected in all soil samples using trace analysis technique.

Sample #1: Asbestos found in approx 4x2x1mm cement sheet fragments.
Sample #3: Asbestos found in approx 5x3x1mm cement sheet fragments.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin.

SIGNATORIES

Akheeqar Beniameen
Chemist

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Yusuf Kuthpudin
Asbestos Analyst

Parameter	Units	LOR	Sample Number: SE197563.001 Sample Matrix: Soil Sample Date: 10 Sep 2019 Sample Name: S1	SE197563.002 Soil 10 Sep 2019 S2	SE197563.003 Soil 10 Sep 2019 S3
VOC's in Soil Method: AN433 Tested: 13/9/2019					
Monocyclic Aromatic Hydrocarbons					
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1
Polycyclic VOCs					
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
Surrogates					
d4-1,2-dichloroethane (Surrogate)	%	-	**97**	**103**	**96**
d8-toluene (Surrogate)	%	-	**130**	**129**	**130**
Bromofluorobenzene (Surrogate)	%	-	**105**	**104**	**103**
Totals					
Total Xylenes	mg/kg	0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6
Volatile Petroleum Hydrocarbons in Soil Method: AN433 Tested: 13/9/2019					
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C9	mg/kg	20	<20	<20	<20
Surrogates					
d4-1,2-dichloroethane (Surrogate)	%	-	**97**	**103**	**96**
d8-toluene (Surrogate)	%	-	**130**	**129**	**130**
Bromofluorobenzene (Surrogate)	%	-	**105**	**104**	**103**
VPH F Bands					
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

Parameter	Units	LOR	Sample Number: SE197563.001 Sample Matrix: Soil Sample Date: 10 Sep 2019 Sample Name: S1	SE197563.002 Soil 10 Sep 2019 S2	SE197563.003 Soil 10 Sep 2019 S3
TRH (Total Recoverable Hydrocarbons) in Soil Method: AN403 Tested: 13/9/2019					
TRH C10-C14	mg/kg	20	<20	<20	<20
TRH C15-C28	mg/kg	45	**57**	**51**	**55**
TRH C29-C36	mg/kg	45	**46**	**71**	<45
TRH C37-C40	mg/kg	100	<100	<100	<100
TRH C10-C36 Total	mg/kg	110	<110	**120**	<110
TRH C10-C40 Total (F bands)	mg/kg	210	<210	<210	<210
TRH F Bands					
TRH >C10-C16	mg/kg	25	<25	<25	<25
TRH >C10-C16 - Naphthalene (F2)	mg/kg	25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	**100**	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120
PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: AN420 Tested: 13/9/2019					
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	**0.1**	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	**0.2**	**0.3**	<0.1
Pyrene	mg/kg	0.1	**0.2**	**0.3**	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	**0.3**	<0.1
Chrysene	mg/kg	0.1	<0.1	**0.3**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	**0.1**	**0.4**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	**0.3**	<0.1
Benzo(a)pyrene	mg/kg	0.1	**0.1**	**0.4**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	**0.1**	**0.4**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	**0.1**	**0.4**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	**0.6**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	**0.7**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	**0.6**	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	**3.0**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	**3.0**	<0.8
Surrogates					
d5-nitrobenzene (Surrogate)	%	-	**86**	**88**	**88**
2-fluorobiphenyl (Surrogate)	%	-	**84**	**86**	**84**
d14-p-terphenyl (Surrogate)	%	-	**88**	**88**	**86**
Speciated Phenols in Soil Method: AN420 Tested: 13/9/2019					
Phenol	mg/kg	0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2

Parameter	Units	LOR	Sample Number: SE197563.001 Sample Matrix: Soil Sample Date: 10 Sep 2019 Sample Name: S1	SE197563.002 Soil 10 Sep 2019 S2	SE197563.003 Soil 10 Sep 2019 S3
Speciated Phenols in Soil Method: AN420 Tested: 13/9/2019 (continued)					
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2
Surrogates					
2,4,6-Tribromophenol (Surrogate)	%	-	**91**	**92**	**96**
d5-phenol (Surrogate)	%	-	**102**	**102**	**102**
OC Pesticides in Soil Method: AN420 Tested: 13/9/2019					
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1
Total CLP OC Pesticides	mg/kg	1	<1	<1	<1
Surrogates					
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**73**	**73**	**70**
OP Pesticides in Soil Method: AN420 Tested: 13/9/2019					
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2
Total OP Pesticides*	mg/kg	1.7	<1.7	<1.7	<1.7

Parameter	Units	LOR	Sample Number: SE197563.001 Sample Matrix: Soil Sample Date: 10 Sep 2019 Sample Name: S1	SE197563.002 Soil 10 Sep 2019 S2	SE197563.003 Soil 10 Sep 2019 S3
OP Pesticides in Soil Method: AN420 Tested: 13/9/2019 (continued)					
Surrogates					
2-fluorobiphenyl (Surrogate)	%	-	**84**	**86**	**84**
d14-p-terphenyl (Surrogate)	%	-	**88**	**88**	**86**
PCBs in Soil Method: AN420 Tested: 13/9/2019					
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1
Surrogates					
Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	**73**	**73**	**70**
Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: AN040/AN320 Tested: 16/9/2019					
Arsenic, As	mg/kg	1	**8**	**7**	**7**
Cadmium, Cd	mg/kg	0.3	**0.4**	<0.3	<0.3
Chromium, Cr	mg/kg	0.5	**19**	**16**	**16**
Copper, Cu	mg/kg	0.5	**68**	**56**	**98**
Nickel, Ni	mg/kg	0.5	**13**	**10**	**10**
Lead, Pb	mg/kg	1	**120**	**96**	**89**
Zinc, Zn	mg/kg	2	**330**	**220**	**240**
Mercury in Soil Method: AN312 Tested: 16/9/2019					
Mercury	mg/kg	0.05	**0.38**	**0.21**	**0.24**
Moisture Content Method: AN002 Tested: 13/9/2019					
% Moisture	%w/w	1	**13.3**	**13.7**	**13.0**

Parameter	Units	LOR	Sample Number: SE197563.001 Sample Matrix: Soil Sample Date: 10 Sep 2019 Sample Name: S1	SE197563.002 Soil 10 Sep 2019 S2	SE197563.003 Soil 10 Sep 2019 S3
Fibre Identification in soil Method: AN602 Tested: 18/9/2019					
FibreID					
Asbestos Detected	No unit	-	Yes	No	Yes
SemiQuant					
Estimated Fibres*	%w/w	0.01	<0.01	<0.01	<0.01
Gravimetric Determination of Asbestos in Soil Method: AN605 Tested: 18/9/2019					
Total Sample Weight*	g	1	**850**	**818**	**916**
ACM in >7mm Sample*	g	0.01	<0.01	<0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	**0.0117**	<0.0001	**0.0226**
AF/FA in <2mm Sample*	g	0.0001	<0.0001	<0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	**0.001**	<0.001	**0.002**
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	**0.001**	<0.001	**0.002**
Fibre Type*	No unit	-	-	-	-

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Mercury in Soil **Method: ME-(AU)-[ENV]AN312**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Mercury	LB183251	mg/kg	0.05	<0.05	0%	97%	96%

Moisture Content **Method: ME-(AU)-[ENV]AN002**

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB183142	%w/w	1	0 - 3%

OC Pesticides in Soil **Method: ME-(AU)-[ENV]AN420**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Hexachlorobenzene (HCB)	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Alpha BHC	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Lindane	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Heptachlor	LB183140	mg/kg	0.1	<0.1	0%	118%	105%
Aldrin	LB183140	mg/kg	0.1	<0.1	0%	123%	104%
Beta BHC	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Delta BHC	LB183140	mg/kg	0.1	<0.1	0%	111%	97%
Heptachlor epoxide	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
o,p'-DDE	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Alpha Endosulfan	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Gamma Chlordane	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Alpha Chlordane	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
trans-Nonachlor	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
p,p'-DDE	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Dieldrin	LB183140	mg/kg	0.2	<0.2	0%	122%	90%
Endrin	LB183140	mg/kg	0.2	<0.2	0%	117%	104%
o,p'-DDD	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
o,p'-DDT	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Beta Endosulfan	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
p,p'-DDD	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
p,p'-DDT	LB183140	mg/kg	0.1	<0.1	0%	109%	105%
Endosulfan sulphate	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Endrin Aldehyde	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Methoxychlor	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Endrin Ketone	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Isodrin	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Mirex	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Total CLP OC Pesticides	LB183140	mg/kg	1	<1	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB183140	%	-	81%	3%	87%	74%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

OP Pesticides in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Dichlorvos	LB183140	mg/kg	0.5	<0.5	0%	78%	82%
Dimethoate	LB183140	mg/kg	0.5	<0.5	0%	NA	NA
Diazinon (Dimpylate)	LB183140	mg/kg	0.5	<0.5	0%	88%	93%
Fenitrothion	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Malathion	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Chlorpyrifos (Chlorpyrifos Ethyl)	LB183140	mg/kg	0.2	<0.2	0%	88%	93%
Parathion-ethyl (Parathion)	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Bromophos Ethyl	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Methidathion	LB183140	mg/kg	0.5	<0.5	0%	NA	NA
Ethion	LB183140	mg/kg	0.2	<0.2	0%	78%	83%
Azinphos-methyl (Guthion)	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Total OP Pesticides*	LB183140	mg/kg	1.7	<1.7	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
2-fluorobiphenyl (Surrogate)	LB183140	%	-	94%	2%	88%	84%
d14-p-terphenyl (Surrogate)	LB183140	%	-	98%	2%	90%	90%

PAH (Polynuclear Aromatic Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB183140	mg/kg	0.1	<0.1	0 - 7%	104%	102%
2-methylnaphthalene	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
1-methylnaphthalene	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Acenaphthylene	LB183140	mg/kg	0.1	<0.1	10 - 35%	104%	100%
Acenaphthene	LB183140	mg/kg	0.1	<0.1	0 - 57%	107%	109%
Fluorene	LB183140	mg/kg	0.1	<0.1	0 - 7%	NA	NA
Phenanthrene	LB183140	mg/kg	0.1	<0.1	7 - 97%	107%	108%
Anthracene	LB183140	mg/kg	0.1	<0.1	3 - 26%	106%	104%
Fluoranthene	LB183140	mg/kg	0.1	<0.1	15 - 80%	101%	103%
Pyrene	LB183140	mg/kg	0.1	<0.1	4 - 66%	106%	106%
Benzo(a)anthracene	LB183140	mg/kg	0.1	<0.1	4 - 51%	NA	NA
Chrysene	LB183140	mg/kg	0.1	<0.1	3 - 42%	NA	NA
Benzo(b&j)fluoranthene	LB183140	mg/kg	0.1	<0.1	3 - 29%	NA	NA
Benzo(k)fluoranthene	LB183140	mg/kg	0.1	<0.1	8 - 31%	NA	NA
Benzo(a)pyrene	LB183140	mg/kg	0.1	<0.1	3 - 29%	109%	106%
Indeno(1,2,3-cd)pyrene	LB183140	mg/kg	0.1	<0.1	1 - 29%	NA	NA
Dibenzo(ah)anthracene	LB183140	mg/kg	0.1	<0.1	0%	NA	NA
Benzo(ghi)perylene	LB183140	mg/kg	0.1	<0.1	1 - 13%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=0	LB183140	TEQ (mg/kg)	0.2	<0.2	1 - 31%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR	LB183140	TEQ (mg/kg)	0.3	<0.3	1 - 26%	NA	NA
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	LB183140	TEQ (mg/kg)	0.2	<0.2	1 - 28%	NA	NA
Total PAH (18)	LB183140	mg/kg	0.8	<0.8	5 - 57%	NA	NA
Total PAH (NEPM/WHO 16)	LB183140	mg/kg	0.8	<0.8			

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d5-nitrobenzene (Surrogate)	LB183140	%	-	100%	2 - 10%	88%	84%
2-fluorobiphenyl (Surrogate)	LB183140	%	-	94%	2%	88%	84%
d14-p-terphenyl (Surrogate)	LB183140	%	-	98%	2%	90%	90%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

PCBs in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arochlor 1016	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1221	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1232	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1242	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1248	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1254	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1260	LB183140	mg/kg	0.2	<0.2	0%	95%	93%
Arochlor 1262	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Arochlor 1268	LB183140	mg/kg	0.2	<0.2	0%	NA	NA
Total PCBs (Arochlors)	LB183140	mg/kg	1	<1	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Tetrachloro-m-xylene (TCMX) (Surrogate)	LB183140	%	-	81%	3%	80%	75%

Speciated Phenols in Soil Method: ME-(AU)-[ENV]AN420

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Phenol	LB183140	mg/kg	0.5	<0.5	0%	100%
2-methyl phenol (o-cresol)	LB183140	mg/kg	0.5	<0.5	0%	NA
3/4-methyl phenol (m/p-cresol)	LB183140	mg/kg	1	<1	0%	NA
Total Cresol	LB183140	mg/kg	1.5	<1.5	0%	NA
2-chlorophenol	LB183140	mg/kg	0.5	<0.5	0%	NA
2,4-dimethylphenol	LB183140	mg/kg	0.5	<0.5	0%	NA
2,6-dichlorophenol	LB183140	mg/kg	0.5	<0.5	0%	NA
2,4-dichlorophenol	LB183140	mg/kg	0.5	<0.5	0%	112%
2,4,6-trichlorophenol	LB183140	mg/kg	0.5	<0.5	0%	86%
2-nitrophenol	LB183140	mg/kg	0.5	<0.5	0%	NA
4-nitrophenol	LB183140	mg/kg	1	<1	0%	NA
2,4,5-trichlorophenol	LB183140	mg/kg	0.5	<0.5	0%	NA
2,3,4,6/2,3,5,6-tetrachlorophenol	LB183140	mg/kg	1	<1	0%	NA
Pentachlorophenol	LB183140	mg/kg	0.5	<0.5	0%	77%
2,4-dinitrophenol	LB183140	mg/kg	2	<2	0%	NA
4-chloro-3-methylphenol	LB183140	mg/kg	2	<2	0%	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
2,4,6-Tribromophenol (Surrogate)	LB183140	%	-	71%	2%	71%
d5-phenol (Surrogate)	LB183140	%	-	108%	3%	107%

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Total Recoverable Elements in Soil/Waste Solids/Materials by ICPOES Method: ME-(AU)-[ENV]AN040/AN320

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Arsenic, As	LB183250	mg/kg	1	<1	15%	101%	96%
Cadmium, Cd	LB183250	mg/kg	0.3	<0.3	0%	115%	88%
Chromium, Cr	LB183250	mg/kg	0.5	<0.5	1%	99%	100%
Copper, Cu	LB183250	mg/kg	0.5	<0.5	7%	104%	98%
Nickel, Ni	LB183250	mg/kg	0.5	<0.5	11%	102%	99%
Lead, Pb	LB183250	mg/kg	1	<1	3%	105%	97%
Zinc, Zn	LB183250	mg/kg	2	<2.0	10%	102%	87%

TRH (Total Recoverable Hydrocarbons) in Soil Method: ME-(AU)-[ENV]AN403

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C10-C14	LB183140	mg/kg	20	<20	0%	88%	85%
TRH C15-C28	LB183140	mg/kg	45	<45	0 - 24%	78%	108%
TRH C29-C36	LB183140	mg/kg	45	<45	0%	75%	63%
TRH C37-C40	LB183140	mg/kg	100	<100	0%	NA	NA
TRH C10-C36 Total	LB183140	mg/kg	110	<110	0%	NA	NA
TRH C10-C40 Total (F bands)	LB183140	mg/kg	210	<210	0%	NA	NA

TRH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH >C10-C16	LB183140	mg/kg	25	<25	0%	85%	75%
TRH >C10-C16 - Naphthalene (F2)	LB183140	mg/kg	25	<25	0%	NA	NA
TRH >C16-C34 (F3)	LB183140	mg/kg	90	<90	0 - 26%	75%	105%
TRH >C34-C40 (F4)	LB183140	mg/kg	120	<120	0%	80%	NA

VOC's in Soil Method: ME-(AU)-[ENV]AN433

Monocyclic Aromatic Hydrocarbons

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene	LB183139	mg/kg	0.1	<0.1	0%	90%	84%
Toluene	LB183139	mg/kg	0.1	<0.1	0%	89%	102%
Ethylbenzene	LB183139	mg/kg	0.1	<0.1	0%	93%	88%
m/p-xylene	LB183139	mg/kg	0.2	<0.2	0%	89%	87%
o-xylene	LB183139	mg/kg	0.1	<0.1	0%	88%	85%

Polycyclic VOCs

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Naphthalene	LB183139	mg/kg	0.1	<0.1	0%	NA	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB183139	%	-	101%	4 - 8%	93%	83%
d8-toluene (Surrogate)	LB183139	%	-	100%	12 - 22%	84%	96%
Bromofluorobenzene (Surrogate)	LB183139	%	-	104%	7 - 10%	88%	83%

Totals

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Total Xylenes	LB183139	mg/kg	0.3	<0.3	0%	NA	NA
Total BTEX	LB183139	mg/kg	0.6	<0.6	0%	NA	NA

QC SUMMARY

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Volatile Petroleum Hydrocarbons in Soil **Method: ME-(AU)-[ENV]AN433**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
TRH C6-C10	LB183139	mg/kg	25	<25	0%	86%	97%
TRH C6-C9	LB183139	mg/kg	20	<20	0%	82%	90%

Surrogates

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
d4-1,2-dichloroethane (Surrogate)	LB183139	%	-	101%	4 - 8%	93%	83%
d8-toluene (Surrogate)	LB183139	%	-	100%	12 - 22%	84%	96%
Bromofluorobenzene (Surrogate)	LB183139	%	-	104%	7 - 10%	88%	83%

VPH F Bands

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery
Benzene (F0)	LB183139	mg/kg	0.1	<0.1	0%	NA	NA
TRH C6-C10 minus BTEX (F1)	LB183139	mg/kg	25	<25	0%	85%	101%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Recoverable Hydrocarbons - Silica (TRH-Si) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents .
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf) The fibres detected may or may not be asbestos fibres.

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN602	AS4964.2004 Method for the Qualitative Identification of Asbestos in Bulk Samples , Section 8.4, Trace Analysis Criteria, Note 4 states:"Depending upon sample condition and fibre type, the detection limit of this technique has been found to lie generally in the range of 1 in 1,000 to 1 in 10,000 parts by weight, equivalent to 1 to 0.1 g/kg."
AN602	The sample can be reported “no asbestos found at the reporting limit of 0.1 g/kg” (<0.01%w/w) where AN602 section 4.5 of this method has been followed, and if- (a) no trace asbestos fibres have been detected (i.e. no ‘respirable’ fibres): (b) the estimated weight of non-respirable asbestos fibre bundles and/or the estimated weight of asbestos in asbestos-containing materials are found to be less than 0.1g/kg: and (c) these non-respirable asbestos fibre bundles and/or the asbestos containing materials are only visible under stereo-microscope viewing conditions.
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

IS	Insufficient sample for analysis.	LOR	Limit of Reporting
LNR	Sample listed, but not received.	↑↓	Raised or Lowered Limit of Reporting
*	NATA accreditation does not cover the performance of this service.	QFH	QC result is above the upper tolerance
		QFL	QC result is below the lower tolerance
**	Indicative data, theoretical holding time exceeded.	-	The sample was not analysed for this analyte
		NVL	Not Validated

Unless it is reported that sampling has been performed by SGS, the samples have been analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calcuated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC and MU criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: www.sgs.com.au.pv.sgsvr/en-gb/environment.

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Appendix C – Bore Logs

ECHO CONSULTING
ENVIRONMENTAL HAZMAT OCCUPATIONAL

SOIL BORE LOG

Project No: JN00869 **Date:** 10/9/19 **Logged By:** CRAIG WOLLINGS

Client: LIQUID GOLD 888 P/L. **Drill Method:** HAND AUGER (POWER)

Location: 6 EDITH ST. KINGSWOOD NSW 2747

Bore Identification: BORE 1

Depth (mbgl)	Water Observed (mbgl)	Sample Information			Material Type	Material Description
		PID (ppm)	ID	Duplicate		GRASS (APPROX 50mm thick) over
0.0 - 0.39	NWO	0.0	S1 0.1 - 0.3m		SM	Silty SAND with grass roots, dry, loose, low plasticity, grey (FILL) some gravel (to 10mm ø) & occasional tile fragments.
0.39 - 0.43					CL	Sandy Silty CLAY / Clayey SILT, dry, compact low-med plasticity, grey mottled orange/brown, remnants of roots (NATURAL).

Bore Terminated at 0.43 mbgl. Refusal? –

Bore Identification: BORE 2

Depth (mbgl)	Water Observed (mbgl)	Sample Information			Material Type	Material Description
		PID (ppm)	ID	Duplicate		Grass (approx 50mm thick) over
0.0 - 0.25	NWO	0.0	S2 - 0.1 - 0.25		SM	(FILL) - Silty SAND with some gravel, tile fragments & roots, dry, loose, low plasticity, grey
0.25 - 0.3					CL	(NATURAL) - Sandy Silty CLAY / Clayey SILT, dry, compact, low-med plasticity, grey mottled orange/brown, rootlets.

Bore Terminated at 0.3 mbgl. Refusal? -

ECHO CONSULTING
ENVIRONMENTAL HAZMAT OCCUPATIONAL

SOIL BORE LOG

Project No: JN 00869 **Date:** 10/9/19 **Logged By:** CRAIG WELLINGS

Client: LIQUID GOLD 888 P/L. **Drill Method:** HAND AUGER (POWER)

Location: 6 EDITH ST, KINGSWOOD NSW 2747

Bore Identification: BORE 3

Depth (mbgl)	Water Observed (mbgl)	Sample Information			Material Type	Material Description
		PID (ppm)	ID	Duplicate		GRASS (approx 50mm thick) over
0.0-0.29	NWO	0.0	S3 0.1-0.25m		SM	(FILL) - Silty SAND / Sandy SILT with some gravel, tile fragments, & grass roots, dry, loose, low plasticity (gravel to 10mm ø), grey.
0.29-0.34					CL	(NATURAL) - Sandy Silty CLAY / Clayey SILT, dry, compact, low-med plasticity, grey mottled orange/brown - rootlets,

Bore Terminated at 0.34 mbgl. Refusal? –

Bore Identification:

Depth (mbgl)	Water Observed (mbgl)	Sample Information			Material Type	Material Description
		PID (ppm)	ID	Duplicate		

Bore Terminated at mbgl. Refusal? -

Appendix D – PID Calibration Certificate

Calibration & Service Report
Gas Monitor

Company:	Active Environmental Solutions Hire	**Manufacturer:**	RAE Systems	**Serial #:**	592-915461
Contact:	Aleks Todorovic	**Instrument:**	MiniRAE 3000	**Asset #:**	-
Address:	2 Merchant Avenue	**Model:**	PGM 7320	**Part #:**	-
	Thomastown Vic 3074	**Configuration:**	VOC	**Sold:**	-
Phone:	03 9464 2300 | **Fax**: 03 9464 3421	**Wireless:**	-	**Last Cal:**	-
Email:	Hire@aesolutions.com.au	**Network ID:**	-	**Job #:**	-
		Unit ID:	-	**Cal Spec:**	Std

Item	Test	Pass/Fail	Comments
Battery	Li Ion	✓	
Charger	Charger, Power supply	✓	
	Cradle	✓	
Pump	Flow	✓	>500 mL/min
Filter	Filter, fitting, etc	✓	
Alarms	Audible, visual, vibration	✓	
Display	Operation	✓	
PCB	Operation	✓	
Connectors	Condition	✓	
Firmware	Version	✓	2.16
Datalogger	Operation	✓	
Monitor Housing	Condition	✓	
Case	Condition/Type	✓	
Sensors			
Oxygen		-	
LEL		-	
PID	10.6eV	✓	
Toxic 1		-	
Toxic 2		-	
Toxic 3		-	
Toxic 4		-	
Toxic 5		-	

Engineer's Report

Setup, service and calibration for hire

Calibration Certificate

Sensor	Type	Serial No:	Span Gas	Concentration	Traceability Lot #	CF	Reading	
							Zero	Span
Oxygen								
LEL								
PID	10.6eV	23030045VC	Isobutylene	100 PPM	2440-3-1	1	0	100 PPM
Toxic 1								
Toxic 2								
Toxic 3								
Toxic 4								
Toxic 5								

Calibrated/Repaired by: Milenko Sisic

Date: 26/08/2019

Next due: 26/02/2020

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