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03 March 2025

APPROVED TOWN PLANNING SERVICES PTY LTD.
110 HANNELL STREET
WICKHAM NSW 2293

Attention: Ms. Elise Short _ Principal Planner

Dear Elise,

Re: Updated Environmental Advice – Addendum to Earlier Detailed Site Investigation

Towards the end of 2024, PES was approached by a planning entity, Approved Town Planning Services (Approved), acting for another proponent planning a development on land that PES had since completed a Detailed Site Investigation for another client (November 2019).

While the client from our 2019 engagement elected not to proceed with its childcare facility development, we are advised by Approved that another, new development is now planned for this land. We were briefed to the latest proponent's end use for this land, also, a childcare facility.

The land in question is adjoining parcels of land that was and as we understand it, remains described as Lot 228 DP 1096131, Lot 1 DP 784404 and Lot 1 DP 779130 and known as Nos 29, 31 and 33 Cessnock Road, Gillieston Heights; a suburb of the City of Maitland local government area in the Hunter Region of New South Wales.

At the time of the 2019 investigation, each of these three (3) adjoining allotments was occupied by a residential dwelling and some outbuildings. The land was assessed with the permission of the current landowners and in some cases while they were in residence.

With respect to the earlier contamination investigation and the relevance of its findings to this new proposal we are advised by Approved that Maitland City Council's relevant officers (assessing officer and Senior Contamination Officer) that Council will allow the existing DSI to be utilised in support of the latest development proposal provided it:

- ✓ Is not more than 7 years old.
- ✓ is accompanied by a detailed addendum/cover letter detailing an updated site inspection, comments on any history since the report was prepared, and
- ✓ any relevance of the design changes proposed as opposed to the original DA.

At Approved's request, PES has re-visited the land in question and conducted an inspection such that with confidence we can address Council's stipulations. The following comments shall be regarded as PES' updated inspection report and ensuing comments as they pertain to the current proposal.

1. The PES officer who conducted this re-inspection was the same employee who was part of the PES team that undertook the 2019 investigation. Thus, his knowledge of the site(s) then and now underpins his observations.
2. PES can report that the nature and configuration of the built infrastructure standing thereon in 2019 had not changed from the residential occupancies existing of long standing, long before our 2019 investigation.
3. These allotments are essentially at the highest point in this general locale with little topsoil remaining. The residual clay would act as a smear layer against vertical migration of contaminants, if any.
4. To reiterate, the hazards of concern identified in 2019 across this land, generally, was evidence of some below ground impact by asbestos. No free fibres of asbestos were identified, and the nature of the asbestos was determined to be bonded.
5. Exceedances above the adopted health and environmental investigation levels were reported in 2019 for lead and B(a)P.
6. PES contended at the time and continues to contend the source of the lead contamination to be lead-containing paints applied as a protective coating to the external surfaces of the residential built infrastructure standing on these allotments.
7. The benzo-a-pyrene is of the family of polycyclic aromatic hydrocarbons (PAHs) that are formed during the incomplete combustion of organic matter. In this instance, PES has reasoned its presence at this location to be attributable to the high volume of vehicular traffic that has passed in close proximity to this land for a considerable length of time. This substance will have become an aerosol on leaving the vehicle(s) and been deployed by a prevailing breeze and / or speed of traffic through the air and onto this land.

In precis, our 2019 report assessed the proposed development in context of a childcare facility land use with accessibility of site soils. As such, PES compared the sampling results to the NEPC (2013) - HIL 'A' & HSL 'A & B' and ESL / EIL URPOS criteria for Metals, TRH, BTEX, PAHs, OCPs/OPPs and Asbestos. With the results analysed, four (4) exceedances of the above-mentioned criteria were observed including the observation of non-friable (bonded) ACMs in trenches produced.

BH05 0.0-0.25 (410 mg/kg), BH06 0.0-0.2 (670 mg/kg), BH08 0.0-0.2 and CR_31_S (3400 mg/kg) exceeded HIL 'A' criteria for Lead (300 mg/kg). Sample BH08 0.0-0.2 and CR_31_S exceeded the adopted criteria by > 250 %.

A 95% UCL_{mean} calculation was conducted on sample results from surface soils across the site for lead. The results of the calculation (413.8 mg/kg) were above the adopted criteria.

To provide waste classification at that time; TCLP analysis was conducted on BH05 0.0-0.25 (lead & B(a)P), BH06 0.0-0.2 (lead), BH07 0.0-0.2 (lead & B(a)P), BH07 0.2-0.3(lead), BH08 0.0-0.2 (lead & B(a)P), BH09 0.0-0.2 (lead) & CR_31_S (lead). These samples exceeded the POEO (Waste) Regulation 2014 – EPA (2014) *Waste Classification Guidelines Part 1: Classifying waste.* - Specific Contaminant Concentrations – CT1 (General Solid Waste) criteria. CR_31_S exceeded the *General Solid Waste* criteria and is to be classified as *Restricted Solid Waste, Non-Putrescible.* The remaining samples met the *GSW (Special Waste – Asbestos)* criteria.

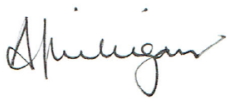
PES concluded in 2019 that based on the site history, site walkover and soil analysis results; the site could be made suitable for the proposed redevelopment as a childcare facility following remediation.

We would contend that there have been no polluting activities performed on this land both prior to our 2019 investigation and in the intervening period since 2019. Asbestos is an occupational hygiene hazard and by its nature, will be fixed in place. B(a)P while an environmental contaminant is unlikely to have migrated either vertically or laterally leading PES to contend that below ground conditions will be largely the same as those observed and / or identified in 2019 and with some natural attenuation in the intervening years may be marginally improved.

Accordingly, PES does not resile from the conclusions and recommendations arising from our work. In response to the contamination identified and articulated in our Detailed Site Investigation, we continue to recommend the preparation of a *Remedial Action Plan* (RAP) to outline the remediation options available.

Also, PES recommends further sampling surrounding the buildings on site following their removal to determine the appropriate Waste Classification for any soil leaving site under remediation actions articulated in the RAP. These built infrastructure 'footprints' were inaccessible to us in 2019.

Yours Sincerely



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PRACTICAL ENVIRONMENTAL SOLUTIONS

Detailed Site Investigation for Contamination

Nos. 29-33 CESSNOCK ROAD,
GILLIESTON HEIGHTS NSW

Prepared for:

CAPE ENGANO UNIT TRUST

NOVEMBER 2019

Prepared by:

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DISTRIBUTION

DOCUMENT STATUS & REVIEW

Revision	Prepared By	Reviewed By	Date Issued
0	**David McQueeney** B. EnvScMgt. Practical Environmental Solutions Pty Ltd	**Anthony Milligan | Managing Director** BConMgt (Building), Eng Surv., Occupational Hygiene (BOHS) **SafeWork NSW Asbestos Assessor Licence No. 000161** Practical Environmental Solutions Pty Ltd.	18 December 2019

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Revision	Electronic	Paper	Issued To	Date Issued
0	1	0	**Mr. Chris Speek** MAVID Property Pty Ltd. Nº. 81 Mustang Drive RUTHERFORD NSW 2320	18 December 2019
0	1	0	**Practical Environmental Solutions Pty Ltd (PES)** Project File	18 December 2019

1 EXECUTIVE SUMMARY

Practical Environmental Solutions (PES) has been commissioned by Cape Engano Unit Trust (the Client) to complete a Detailed Site Investigation on adjoining parcels of land described as Lot 228 DP 1096131, Lot 1 DP 784404 and Lot 1 DP 779130 and known as Nos 29, 31 and 33 Cessnock Road, Gillieston Heights; a suburb of the City of Maitland local government area in the Hunter Region of New South Wales.

The adjoining sites have a south east frontage of 62m to Cessnock Road and covers an approximate area of 2600 m^2.

Our Client is the proponent for an application to go before Maitland City Council (MCC) seeking approval for a development planned for the land. With access to architectural design plans, PES understands that a childcare facility is planned for the site(s).

Accordingly, this investigation seeks to develop an understanding of the current and historical activities that either have been or are being conducted on the land and its surrounds. This will include assessing Areas of Environmental Concern (AECs) and Potential Contaminants of Concern (PCOCs) and provide a judgment of the potential for contamination on the site, if any, to impact on the commercial use(s) planned for this land. Additionally, the investigation will establish the need for further assessment or remediation, if considered necessary.

To achieve this objective, the scope of work included a site history investigation, site 'walkover' and the production of a series of bore holes and trenches across the site. On Friday 18, Monday 28 & Tuesday 29 October 2019, an environmental scientist from PES undertook the field assessment phase of our investigation.

From eleven (11) bore holes; twelve (12) plus one (1) QA / QC soil samples were collected and sent for analysis. Additionally, eleven (11) inspection trenches were produced across the site(s) to provide a greater understanding of the below ground conditions.

PES assessed the proposed development in context of proposed land use and accessibility of site soils. As such, PES compared the sampling results to the NEPC (2013) - HIL 'A' & HSL 'A & B' and

ESL / EIL URPOS criteria for Metals, TRH, BTEX, PAHs, OCPs/OPPs and Asbestos. With the results analysed, four (4) exceedances of the above-mentioned criteria were observed including the observation of non-friable (bonded) ACMs in trenches produced. Sampling locations are identified in Appendix A, Drawing 1.

BH05 0.0-0.25 (410 mg/kg), BH06 0.0-0.2 (670 mg/kg), BH08 0.0-0.2 and CR_31_S (3400 mg/kg) exceeded HIL 'A' criteria for Lead (300 mg/kg). Sample BH08 0.0-0.2 and CR_31_S exceeded the adopted criteria by > 250 %.

A 95% UCL_{mean} calculation was conducted on sample results from surface soils across the site for lead. The results of the calculation (413.8 mg/kg) were above the adopted criteria.

To provide waste classification; TCLP analysis was conducted on BH05 0.0-0.25 (lead & B(a)P), BH06 0.0-0.2 (lead), BH07 0.0-0.2 (lead & B(a)P), BH07 0.2-0.3(lead), BH08 0.0-0.2 (lead & B(a)P), BH09 0.0-0.2 (lead) & CR_31_S (lead). These samples exceeded the POEO (Waste) Regulation 2014 – EPA (2014) *Waste Classification Guidelines Part 1: Classifying waste.* - Specific Contaminant Concentrations – CT1 (General Solid Waste) criteria. CR_31_S exceeded the *General Solid Waste* criteria and would ordinarily be classified as *Restricted Solid Waste; Non-Putrescible (Special Waste Asbestos).* However, PES contends the source of the lead contamination to be lead-containing paints applied as a protective coating to the external surfaces of the residential built infrastructure standing on these allotments and, under these circumstances, is subject to a pre-classification of *General Solid Waste; Non-putrescible*. The remaining samples met the *GSW (Special Waste – Asbestos)* criteria.

PES identified asbestos-containing materials (ACMs) in the form of *non-friable* fibre cement sheet fragments in the trenches produced across the site. Results of sampling from the initial bore holes produced did not identify any 'free-fibres' of asbestos. Additionally, potential ACMs were identified on the built infrastructure standing on the adjoining sites.

PES concludes that based on the site history, site walkover and soil analysis results; the site can be made suitable for the proposed redevelopment as a childcare facility following remediation. PES recommends a further sampling surrounding the buildings on site and the preparation of a *Remedial Action Plan* (RAP) to outline the remediation options available.

LIST OF ABBREVIATIONS

ACM - Asbestos Containing Material

AEC - Area of Environmental Concern

AHD - Australian Height Datum

ANZECC - Australian and New Zealand Environment and Conservation Council

B(a)P TEQ - Total equivalents of Benzo(a)Pyrene (carcinogenic compounds)

BGL - Below Ground Level

BH – Borehole

BTEX - Benzene, Toluene, Ethylbenzene and Xylenes

COC - Chemical of Concern

DQI - Data Quality Indicators

DQO - Data Quality Objectives

ENM - Excavated Natural Material

ESA - Environmental Site Assessment

GSW – General Solid Waste

HIL - NEPM Schedule B1 Health Investigation Level, 2013.

LOR - Limit of Reporting

µg/L - micrograms per litre

mg/kg - milligrams per kilogram

mg/L - milligrams per litre

NATA - National Association of Testing Authorities

NEPC – National Environmental Protection Council

NEPM - National Environment Protection Measure

NSW DECCW - NSW Department of Environment, Climate Change and Water (currently NSW OEH)

NSW OEH - NSW Office of Environment and Heritage

NSW EPA - Environment Protection Authority of New South Wales

PAH - Polycyclic Aromatic Hydrocarbon

PID - Photoionization Detection

TCLP – Toxicity Characteristic Leachate Procedure

BH – Bore hole

UCL – Upper Confidence Limit

VENM – Virgin Excavated Natural Material

PRACTICAL ENVIRONMENTAL SOLUTIONS

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2 INTRODUCTION

This report presents the findings of a Preliminary Site Investigation for collective, adjoining allotments of land in Gillieston Heights; a suburb of the City of Maitland local government area in the Hunter Region of New South Wales. Land identification details are provided in Section 3 of this report.

The assessment was carried out at the request of Cape Engano Unit Trust. We understand that a childcare facility development is planned for an amalgamation of these allotments, from hereon to be referred to within this report as the 'site'.

The investigation is being undertaken to identify past and present contaminating activities, if any, report on site condition(s) and provide a preliminary assessment of site contamination. The investigation commenced on the morning of Tuesday 15 October 2019 with a site 'walkover'. Further site investigation work was conducted over Friday 18 October and Monday 28 October 2019, respectively.

The assessment has been developed in reference to guidelines made or approved by the NSW Environment Protection Authority (EPA), ASC NEPM 2013 Schedule B1 and consistent with EPA (1998) planning guidelines relevant to State Environmental Planning Policy 55 – Remediation of Land (SEPP 55).

2.1 Goals and Objectives

The goals and objectives of this environmental contamination assessment are:

- Identify potential, past and present forms of contamination;
- Identify potential types of contamination;
- Evaluate the site for the potential of various types of contamination;
- Determine the appropriateness of the site for the proposed land use (residential land development) through soil analysis;
- Provide preliminary results and conclusions of the potential contamination at the site; and
- Calculate the need for further assessment, management or remediation.

2.2 Scope of Works

This assessment comprised the following scope of works:

- Review of documents provided by the current landowner and/or previous owners (if available);
- Assessment of site geology, hydrogeology and topography;
- Review of site history through Maitland City Council records, NSW DECC records, SafeWork NSW, Historical Title Information (past and present), historical aerial photographs and EPA records;
- A thorough site inspection to identify potential areas of environmental concern (AEC) or possible environmental contaminants;
- From deemed AECs, produce below-ground bore holes with retrieval of representative samples of soils for analysis;
- Production of inspection trenches across the site;
- Preparation of a Detailed Site Investigation report which discusses the findings of the assessment; in reference to the ASC NEPM (2013) guidelines.

3 SITE IDENTIFICATION & DESCRIPTION

The three (3) adjoining allotments are identified as Lot 228 DP 1096131, Lot 1 DP 784404 and Lot 1 DP 779130, respectively, and known as Nos 29, 31 and 33 Cessnock Road, Gillieston Heights; as is shown in accompanying **Drawing 1, Appendix A.**

The allotments have a combined south-east frontage of 62 metres to Cessnock Road and cover an approximate total area of 2600 m^2.

Each allotment is currently occupied by a residential dwelling building and outbuilding(s) of differing configurations. PES identified a layer of silty topsoil with some anthropogenic waste (including asbestos) over much of the accessible surface of the site, with an area of what we contend to be an 'ash' material identified. The material appears to be the type of residue one would expect to be produced when cleaning out an incinerator or the like.

4 PUBLISHED DATA AND SITE HISTORY SUMMARY

4.1 Regional Geology

The 1:250,000 scale Maitland Geological Map indicates the site is located in the Palaeozoic-aged, Maitland Group, Branxton Formation; comprising conglomerate, sandstone and siltstone.

4.2 Hydrogeology

The regional groundwater flow regime is inferred to the east of the site towards Wallis Creek.

A search of the NSW Department of Primary Industries, Office of Water Maps (NSW DPI, http://allwaterdata.water.nsw.gov.au/water.stm) and the Commonwealth Governments Bureau of Meteorology 'Groundwater Explorer' (http://www.bom.gov.au/weave/explorer.html) was conducted. Ground water well GW051647 is located approximately 1.185km to the south-east of the site. Water bearing zone data from this well did not indicate groundwater flow direct.

After reviewing the site and surrounding topography and the direction to the nearest surface water features, it can be considered that groundwater flow is, generally, in an easterly direction. Groundwater well information and summaries can be found in Lotsearch Pty Ltd.'s report in **Appendix H.**

4.3 Acid Sulphate Soils

Review of the Maitland City Council Acid Sulfate Soils Map – Sheet ASS_001 indicated the site is not underlain by any potential acid sulphate soils. The site is classified as Class 5 for which Council consent is not required for any works below natural ground surface or works by which the water table is likely to be lowered. The site has an extremely low probability of occurrence for ASS.

4.4 Topography

The site is sloping to the south-east towards Wallis Creek. The site lies at approximately 46m Australian Height Datum (AHD).

4.1 Adjacent Land Uses

Adjacent sites comprised the following:

Direction	Description
North	To the north of the site lies a residential subdivision.
East	To the east of the site lies a vacant block then a new residential subdivision, followed by a detention basin, more residential occupancy and on to Wallis Creek and associated flood plains.
South	To the south of the site is a new residential subdivision and on to agricultural land.
West	To the west of the site lies is a residential subdivision and on to agricultural land.

4.2 Extent of Site History Review

The brief review of site history comprised the following:

- City Council Historical Record Search;
- Summary of Owners;
- Review of Historical Aerial Photographs; and
- Searches with Environmental Protection Authority (EPA) for Contaminated Land Notices.

Details are presented in the following sections.

4.1 Maitland City Council Historical Records Search

PES conducted a search of MCC's historical records relating to the properties. Development Applications (DAs) were identified for all three (3) allotments for construction of extensions, a garage, and a swimming pool (currently still in-situ & operational).

4.2 Historical Title Search

Table 1: Summary of Owners Report

Summary of proprietor(s)

Lot 228 DP 1096131

(No. 29 Cessnock Road, Gillieston Heights)

Year	Proprietor(s)
	(Lot 228 DP 1096131)
2015 – to date	David Alan Babic
2009 – 2015	Tony Kenneth Latham
2008 – 2009	John Humphrey Slater, retired labourer
2006 – 2008	John Humphrey Slater, retired labourer Nina Slater, his wife
	(Lot 2 of a Re-subdivision of part Lots 1, 2 & 28 Section 3 of the East Greta subdivision Parish Heddon – Area 1 Rood – Conv Book 3246 No. 465)
1976 – 2006	John Humphrey Slater, retired labourer Nina Slater, his wife

	(Lot 2 of a Re-subdivision of part Lots 1, 2 & 28 Section 3 of the East Greta subdivision Parish Heddon – Area 1 Rood – Conv Book 3025 No. 448)
1971 – 1976	Pearl Hungerford, widow
	(Lot 2 of a Re-subdivision of part Lots 1, 2 & 28 Section 3 of the East Greta subdivision Parish Heddon – Area 1 Rood – Conv Book 3025 No. 447)
1971 – 1971	William Charles Whyte, textile worker Margaret Mary Whyte, his wife
1965 – 1971	Wensley Francis Whyte, farmer / executor William Charles Whyte, textile worker / executor Veronica Martha Asimus, estate
	(Lot 2 of a Re-subdivision of part Lots 1, 2 & 28 Section 3 Town East Greta – Conv Book 2572 No. 411)
1961 – 1965	Veronica Martha Asimus, widow
1961 – 1961	The Council of the City of Maitland *(vide Section 602 of the Local Government Act, 1919)*
	(Lot 2 Section 3 Town East Greta – Conv Book 666 No. 299)
1899 – 1961	The East Greta Coal Mining Company Limited

Summary of proprietor(s)

Lot 1 DP 784404

(No. 31 Cessnock Road, Gillieston Heights)

Year	Proprietor(s)
	(Lot 1 DP 784404)
2015 – todate	David Alan Babic
2015 – 2015	Laurence John Hinton
2007 – 2015	Eunice Grace Hinton, widow
1989 – 2007	Amos John Hinton, linesman Eunice Grace Hinton, his wife
	(Allotment 3 Section 3 of the East Greta subdivision Parish Heddon – Area 1 Rood 0 ½ Perch – Conv Book 3208 No. 382)
1975 – 1989	Amos John Hinton, linesman Eunice Grace Hinton, his wife
1974 – 1975	Walter John Jowett, mine worker / executor Emma Jowett, estate
	(Allotment 3 Section 3 of the East Greta subdivision Parish Heddon – Area 1 Rood 0 ½ Perch – Conv Book 3069 No. 267)
1972 – 1974	Emma Jowett, widow
1972 – 1972	Emma Jowett, widow / executrix Albert Edward Jowett, estate

	(Allotment 3 Section 3 of the East Greta subdivision Parish Heddon – Area 1 Rood 0 ½ Perch – Conv Book 1946 No. 425)
1944 – 1972	Albert Edward Jowett, miner
1929 – 1944	Albert Edward Jowett, miner / executor Charles Augustus Jowett, shot firer / executor Elizabeth Jowett, widow / life estate Walter Jowett, estate
	(Allotment 3 Section 3 of the East Greta subdivision Parish Heddon – Area 1 Rood ½ Perch – Conv Book 772 No. 354)
1904 – 1929	Walter Jowett, deputy

PRACTICAL ENVIRONMENTAL SOLUTIONS

Summary of proprietor(s)

Lot 1 DP 779130

(No. 33 Cessnock Road, Gillieston Heights)

Year	Proprietor(s)
	(Lot 1 DP 779130)
2015 – todate	David Alan Babic
2009 – 2015	Stephen David Babic
1991 – 2009	Wendy Lorraine Babic
1988 – 1991	David William James Walsh, freezer hand Cheryl Joyce Johnson, hairdresser
	(Allotment 4 Section 3 of East Greta subdivision – Area 1 Rood – Conv Book 3360 No. 316)
1979 – 1988	David William James Walsh, freezer hand Cheryl Joyce Johnson, hairdresser
1978 – 1979	Raymond John Edmonds, labourer Phyllis May Henry, married woman Violet Olive Edmonds, executrix Norman Wensley Edmonds, estate
	(Allotment 4 Section 3 of East Greta subdivision – Area 1 Rood – Conv Book 3263 No. 211)
1976 – 1978	Raymond John Edmonds, labourer

	Phyllis May Henry, married woman Norman Wensley Edmonds, pensioner
	(Allotment 4 Section 3 of East Greta subdivision – Area 1 Rood – Acknowledgment Book 2932 No. 199)
1969 – 1976	Imelda Ethel Edmonds, widow
	(Allotment 4 Section 3 of East Greta subdivision – Area 1 Rood – Conv Book 2013 No. 830)
1947 – 1969	Raymond Charles Edmonds, timber contractor
1930 – 1947	Charles Henry Pont, retired / executor William Kennedy, storekeeper / executor John Griffiths, estate
	(Allotment 4 Section 3 of East Greta subdivision – Area 1 Rood – Conv Book 737 No. 688)
1903 – 1930	John Griffiths, storekeeper

4.3 SafeWork NSW Dangerous Goods Search

After visiting the site, PES contends that there is no evidence to suggest that the land would have any records pertaining to it in the records held by SafeWork NSW for the site.

4.4 Review of Historical Aerial Photographs

Historical aerial photographs were purchased through Lotsearch Pty Ltd. Copies of the relevant photographs can be found in Lotsearchs' Report in **Appendix H**. The following summary details information obtained via historical aerial photographic 'flyovers' of the site and satellite imagery obtained from Google Earth:

Year	Description
1954	Mainly vacant land surrounding the site, limited development having occurred. Built infrastructure is standing on each of the adjoining allotments. Cessnock Road appears to be a small track.
1966	Limited changes have occurred on the site or surrounding them. Some minor development (residential) to the west has occurred. Minor contouring evident of Nº. 31. No change on the other sites is obvious. Cessnock Road appears to have been sealed.
1976	Limited changes have occurred on the site or surrounding them. Some minor development (residential) to the west has occurred. Nº. 29 appears to have fill placed to the rear of the site, behind where the current large tree is located. Nº. 31 has some sheds standing to the rear of the dwelling.
1984	Significant residential development has occurred to the north, south and west of the site. There appears to have been a shed constructed on Nº 33.
1993	Development has occurred to the north east of the site (Relocatable home Village). No changes on site evident.
2001	Limited notable change has occurred on or off the sites. The shed to Nº.31 now covers the entire rear boundary of the allotment.
2006	Limited notable change has occurred on or off the sites.
2010	Some construction of surrounding vacant blocks, pool constructed to the rear of Nº. 33 (still present today), otherwise limited notable change has occurred on or off the sites. Since this date, the small storage shed to the rear of Nº.33 has been removed. Additionally, all shed structures to the rear yard at Nº.31 were removed by July 2015.

4.5 NSW EPA Records

A review and search of the EPA public register indicated the site has no statutory notices issued under the provision of the Protection of the Environment Operations Act 1997 (POEO Act).

One (1) licenced activity exists within a 1 km radius of the site (summarised in the Table 2 below).

Table 2: EPA licenced activities under the POEO Act 1997

EPL	Organisation	Name	Address	Suburb	Activity	Distance	Direction
5583	MCC	All water bores in the Maitland LGA		Maitland	Other activities	367m	North-east

Additionally, three (3) licenced activities, now revoked or surrendered, were found within 1 km of the site.

4.6 Site History Summary

Based on a review of historical data, public searches and site investigations, the site history can be summarised as follows:

- Since the earliest available aerial imagery (1954), the three allotments have been residential occupancies.
- Prior to that, land use is unknown but intuitively they would most likely have been utilised as agricultural / grazing land.
- During our intrusive investigation(s) PES encountered the presence of ash-like fill & evidence of fill in various nominated areas on the site.

5 CONCEPTUAL SITE MODEL

The ASC NEPM (2013) details that a conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors.

Table 3: Conceptual Site Model

Potential Contaminant Sources
Imported fill, ACMs remaining in fill and residual soils from past built infrastructure such as sheds, disturbed natural soils, imported ash, slag waste and coal chitter, potential contaminated soils to footprints of building, including flaking, lead-containing paint from buildings. Motor vehicles stored on the sites, passing motor vehicles. Storage of chemical on the sites (e.g. paints).
Pathways
Earthworks, service trenches, cracks in hardstand, stormwater runoff, rainwater infiltration / leaching, top down migration through soil, dust mobilisation.
Receptors
Workers involved in the potential remediation / restoration or development of the site (onsite), future site users (onsite), site users – children and staff (onsite), surface water runoff (offsite) into adjacent drainage channels and creek lines, nearby local residents and surrounding properties (offsite).

6 POTENTIAL CONTAMINANTS

Based on the available site history information and observations made during the site inspection the principal sources of potential contamination are considered to be:

- Possible fill materials of an unknown origin that may contain a range of contaminants including heavy metals, total recoverable hydrocarbons (TPHs), Benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), Organophosphorus (OPPs), and Asbestos.

The potential for contamination from the above sources is considered high. This classification was reached as a result of the site history and knowledge of the presence of imported fill on site.

Based on the potential risk presented by potential fill material on parts of the site, PES proceeded to assess the material for chemical contamination.

7 FIELD WORK

7.1 Sampling Rationale

Sampling frequency and locations were considered in reference to the NSW EPA *Contaminated Sites Sampling Design Guidelines* (1995) and AS4482.1:2005 *Guide to the sampling and investigation of potentially contaminated soil*.

Initially, using a shovel and hand-auger PES produced ten (10) below ground bore holes across the adjoining sites. Later using a mechanical excavator, PES produced eleven (11) trenches across the sites to further assess below ground conditions.

Accordingly, a total of twelve (12) plus one (1) QA / QC soil samples were selected for analysis based on the contention that they were representative of surface and below ground conditions across the site and such that likely contamination, if any, would be detected. The samples consisted

of material from the fill / disturbed natural soils across the site and into the natural, residual site soils at different depths. Selection criteria included:

- Material type and depth;
- Visual or olfactory evidence of possible contamination (i.e. odour or staining);
- Proximity to a known or potential source of contamination.

Also, given the site history PES retrieved soil samples from the overlying fill / disturbed natural soils to be tested for the presence or absence of asbestos.

7.2 Methods

Fieldwork for this investigation was carried out on Friday 18, Monday 28 & Tuesday 29 October 2019 and comprised the following:

- Production below ground of ten (10) boreholes to depths down to 0.8m b.g.l over the site using a shovel and hand auger to assess subsurface conditions and collect samples for contamination analysis.

- Production of eleven (11) trenches across the site down to the residual clay layer and beyond, to further assess below ground conditions for contamination; and

- Collection of one (1) additional soil sample from the corridor colloquially referred to as the 'drip line' surrounding the dwelling known as Nº 31 Cessnock Road.

The bore hole and trench locations were set out by an environmental scientist from PES. The approximate locations of the test pits are shown on **Drawing 3, Appendix A**.

Soil profiles were recorded; including observations and the material types, with complete soil profile descriptions provided in Appendix F**.**

Soil samples were collected directly from the walls of the bore holes directly, not that in contact with the auger / shovel.

All sampling data was recorded on PES chain of custody sheets, and the general sampling procedure comprised:

- The use of high-nitrile disposable gloves for each sampling event;
- Transfer of samples into laboratory-prepared glass jars, and capping immediately;
- Transfer of samples into snap-lock plastic backs for screening of volatile organic compounds (VOCs) using a calibrated photoionisation detector (PID) – a calibration certificate is provided in Appendix G.
- Labelling of sample containers with individual and unique identification, including project number, sample location and sample depth;
- Placement of sample jars and replicate sample bags into a cooled, insulated and sealed container for transport to the laboratory;
- Use of chain of custody (C-O-C) documentation ensuring the sample tracking and custody could be cross-checked at any point in the transfer of samples from the field to the laboratory.

The process of obtaining samples and their transportation, storage and delivery to laboratories for analysis was documented on a PES standard chain-of-custody form. Copies of completed forms are contained in **Appendix E.**

8 DATA QUALITY OBJECTIVES (DQOS)

It is accepted practice that the nature and quality of the data produced in an investigation will be determined by the Data Quality Objectives (DQOs). The DQO process is detailed in the United States Environmental Protection Agency (US EPA) Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QAIG-4: EPA/240/B-06/001), February 2006.

The seven-step DQO process developed by the US EPA, shown in Table 4 below, is recommended by NEPC (2013) when site contamination data is being relied upon to make risk-based decisions as part of a detailed site investigation. They are designed to clarify the study objectives, define the appropriate data types and specify tolerable levels of potential errors.

8.1 The 7 Steps in Defining DQOs

Table 4: Seven Step DQO Process

Step	Data Quality Objective Step
1	**State the problem** – The first step in the DQO process is to define the problem that has initiated the investigation and to identify the resources available to resolve the problem
2	**Identify the goal of the study** – Identify the objectives or decisions that need to be made about the contamination problem and the new environmental data required to make them.
3	**Identify information inputs** – Identify data and information needed to answer study questions.
4	**Define the boundaries of the study** – Define the spatial and temporal boundaries of the environmental media that the data must represent.
5	**Develop the analytical approach** – Define the parameter of interest, specifying the action levels, and integrating information in Steps 1 – 4 into a single statement that gives a logical basis for choosing between alternative actions. This includes decision making based on the outcome of hypothesis testing and estimation through appropriate statistical means.
6	**Specify performance or acceptance criteria** – Specify the decision rule and decision-maker's acceptable limits on decision errors, which are used to establish performance goals for limiting uncertainties in the data. Criteria must be specific to both existing and new data.
7	**Develop the plan for obtaining data** – Identify a resource effective sampling and analysis plan for generating data that is expected to satisfy the DQOs.

For the purpose of establishing the overall project goals, stakeholder and applicable environmental context, the first four (4) steps of the DQO process have been adapted to communicate the framework under which particular questions of study are addressed through individual DQOs. This is referred to as systematic planning and is defined as an integral part of the process by US EPA (2006).

8.1 Step 1: State the problem

Historical land use activities on the site present potential contamination risk that could impact the suitability of the site's proposed use as a childcare facility. Following an investigation by a geotechnical engineer, possible fill material, including a pocket of what we contend to be incinerator ash waste was identified on the one of the allotments (No 29), and suspected fill material across all adjoining sites. The aim of the current assessment is to further investigate the site, including conducting below ground intrusive sampling.

Subsequently, the client has requested a contaminated land assessment be conducted in line with SEPP 55 and guidance endorsed by NSW state and local Government regulators to appropriately investigate environmental media of concern and make justifiable conclusions on site suitability.

8.2 Step 2: Identify the decision / goal of the study

The goal of the study is to determine if the site is suitable for its proposed use, identify options for remediation if required to render the site suitable for the proposed use, or determine particular land uses that the site is suitable for in its current state.

8.3 Step 3: Identify the information inputs

Information inputs relevant to the study questions include:

- Site history and environmental setting;
- CSM refined through the findings of intrusive sampling;
- Soil analytical data for investigations completed previously on the site.

These factors have contributed to the identification of the Potential Contaminants of Concern (PCoC) described in table 5 below:

Table 5: Description of PCoC

PCoC	Description and relationship
OPPs / OCPs	Organochlorine pesticides (OCPs) and organophosphorus pesticides (OPPs). Pest controls and wastes.
Heavy Metals	Elements that are naturally occurring and environmentally persistent. Often found in vehicle exhaust emissions, chemicals, paints, pest control, timber treatment products, wastes, and as a product of industrial processes (smelting etc.). The typical analytical suite includes arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.
TRHs, BTEXN and PAHs	Total recoverable hydrocarbons (TRHs) F1 (C_6 - C_{10}), F2 (>C_{10} – C_{16}), F3 (>C_{16} – C_{34}), and F4 (>C_{34} – C_{40}); benzene, toluene, ethylbenzene, meta- para & ortho- xylenes, naphthalene (BTEXN); polycyclic aromatic hydrocarbons (PAHs). Typical contaminants associated with fuels, oils and lubricants. PAHs may also be present in combusted material (ash or char) and coal products.
Asbestos	A mineral associated with general building products such as cladding and lining materials, insulations, piping, gaskets and brake pads. Totally banned in building products in 1989, and fully banned in Australia after 31 December 2003.

8.4 Step 4: Define the boundaries of the study

Vertical - The environmental media of concern will be site soils, and groundwater if encountered, sampled at varying depths with the purpose of assessing the vertical extent of potential contamination. Sampling depths will vary spatially however, soil sampling will focus on the shallow subsurface / overlying fill media.

The spatial (lateral) boundaries of the site are identified in Appendix A, Drawing 1.

Constraints within the study boundary – the following issues present limitations upon sampling strategy for the site:

- Location of belowground services.

The boundaries of the study area are subject to some alteration with each location presented as indicative. Any changes will consider the rationale of the location of the sampling location and endeavour to obtain the same information for the CSM from the alternate location.

8.5 Step 5: Develop the analytical approach

The decision rules for this investigation are as follows:

1. If a review of the data obtained from this and previous investigations indicate a degree of uncertainty on contamination delineation and distribution, then the proposed remedial strategies will be refined to provide remediation and/or management of those uncertainties and limitations with respect to the proposed redevelopment.
2. If it is determined that additional information is required to further reduce the uncertainties associated with the distribution and characteristics of soil and fill requiring remediation and/or management, with respect to the proposed redevelopment, then appropriate recommendations for further technical assessment or investigation will be provided.

8.6 Step 6: Specify performance or acceptance criteria

The acceptable limits on decision errors to be applied in the investigation and the manner of addressing possible decision errors have been developed based on the Data Quality Indicators (DQIs) of precision, accuracy, representativeness, comparability and completeness (PARCC) and are presented in Table 6 (sub-section 9.1 below).

The tolerable limits on decision errors are as follows:

- Probability that 95% of data will satisfy the DQOs, therefore a limit on the decision error will be 5% that a conclusive statement may be incorrect.

In applying statistical analysis of a data set: The performance / acceptance criteria for each study question varies.

- No individual sample result should have a concentration that exceeds 250% of Site Assessment criteria;
- A normal distribution will only be used if the coefficient of variance is not greater than 1.2; and
- The standard deviation of a sample population should not exceed 50% of the Site Assessment criteria.

The potential for significant decision errors are to be minimised by completing a robust Quality Assurance/Quality Control (QA/QC) program and by completing an investigation that has an appropriate sampling and analytical density for the purposes of the investigation and that the representative sampling is undertaken.

8.7 Step 7: Develop the plan for obtaining data

The historical use of the Site(s) for residential occupation, including filling, present the potential for contamination to be present on the Site. Given the history of the Site and the general contamination history the PCOCs include, but may not be limited to, heavy metals, PAHs, TRH, BTEXN, organochlorine pesticides (OCPs), organophosphorus pesticide (OPPs), and asbestos. Many of these chemicals may be mobile within the unconsolidated fill / disturbed natural materials and able to migrate vertically and laterally to local waterways. The overall design of the investigation on the Site requires considerations of these factors.

PES will work closely with the analytical laboratories and sampling equipment suppliers to ensure that appropriate procedures and processes are developed and implemented prior to and during the field work, to ensure that sample handling, and transport to and processing by the analytical laboratories is appropriate.

9 FIELD QUALITY ASSURANCE AND QUALITY CONTROL (QA/QC)

9.1 Internal Intra-Laboratory Duplicate Assessment

In order to assess field quality assurance / quality control (QA/QC) procedures, one (1) duplicate samples (DUP 1) was collected and analysed with primary sample BH02 0.0-0.25 for metals, TRH, BTEXN, PAHs, and OPPs/OCPs. The results of the field duplicate sampling are presented in Table 6 (below). The results of the field duplicate sampling indicated that Relative Percentage Differences (RPD's) were unable to be calculated for TRH, BTEXN, PAHs and OPPs/OCPs as results were below the laboratory limit of reporting. Only metals were able to be analysed.

Table 6: Validation Field Duplicate Assessment

	BH02 0.0-0.25	DUP 1	RPD %	LOR mg/kg	10 X LOR
Arsenic	7.6	2.5	101.0	2	20
Cadmium	< 0.4	< 0.4	N/A	5	5
Chromium	13	8	47.6	5	50
Copper	22	26	16.7	5	50
Mercury	< 0.1	< 0.1	*N/A*	0.1	1
Lead	75	23	*106.1*	5	50
Nickel	13	20	42.4	5	50
Zinc	120	120	0.0	5	50

The results in the field duplicate analysis indicate the duplicates were acceptable when compared to the appropriate criteria (see below).

The overall precision of laboratory split samples and laboratory duplicates is generally assessed by their Relative Percentage Difference ('RPD'). The RPD of duplicated analyses were calculated and compared to the following criteria for acceptability. The acceptance criteria are listed in AS4482.1 (2005). PES has utilised the duplicate results produced by the laboratory internal Quality Control Review.

RPDs were calculated between the primary sample concentration and its corresponding intra-laboratory duplicate. As stipulated by the NEPM, the RPD acceptance criteria is 30% however it is noted that higher variations can be expected for organic analysis, samples with low analyte concentrations or non-homogenous samples (NEPC 2013). As such, the primary laboratory RPD acceptance criteria were used and are as follows:

1. Results <10 times the LOR: No Limit;
2. Results between 10-20 times the LOR: RPD must lie between 0-50%; and
3. Results >20 times the LOR: RPD must lie between 0-30%

The laboratory produced one intra-laboratory duplicate sample during analysis. Given that the purpose of the sampling works was to provide preliminary indications as to the presence/absence of contamination, this was deemed appropriate. Of the valid RPDs (where concentrations were above the laboratory LOR), none of them were reported outside of the acceptable limits defined above. Analytical results for intra-laboratory duplicate sample and RPDs are included in Appendix C. See Table 6 (over page) for the quality control procedures adopted by PES.

Table 6: Quality Control Procedures

Quality control sample	Frequency	Results [1]
Precision		
Field duplicates	≥ 5%	≤ 30 - 50% [2]
Inter-laboratory duplicates	≥ 5%	≤ 30 - 50% [2]
Laboratory duplicates	≥ 10%	Lab specified [3]
Accuracy		
Surrogate spikes	Organics by GC	70 – 130% [4]
Matrix spikes (MSs)	≥ 1/media type	70 - 130% [5]
Laboratory control samples (LCSs)	≥ 1/lab batch	70 - 130% [6]
Certified reference material (CRM)	LCS for metals	Lab specified [7]
Representativeness		
Rinsate samples	≥ 1/field batch	< LOR
Trip blanks	≥ 1/field batch (volatiles)	< LOR
Trip spikes	≥ 1/field batch (volatiles)	70 - 130%, ≤ 30 - 50% [8]
Laboratory blanks	≥ 1/lab batch	< LOR

Table notes:

1. Where results are laboratory specified, the laboratory analytical reports should be consulted for specific information.
2. Relative percentage differences (RPDs) for field duplicates from AS 4482.1-2005.
3. RPDs for laboratory duplicates specified by the laboratory. Based on the magnitude of the results compared to the level of reporting (LOR), e.g. laboratory result < 10 x laboratory limit of reporting (LOR) = no limit, 10 – 20 x LOR = 0-50%, > 20 x LOR = 0-20%.
4. Surrogate recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
5. MS recoveries specified by laboratory based on global acceptance criteria.
6. LCS recoveries specified by laboratory based on global acceptance criteria or dynamic recovery limits based on statistical evaluation of actual laboratory data.
7. CRM recoveries specified by laboratory based on global acceptance criteria.
8. Trip spike results are specified as either recoveries or RPDs.

9.2 Data evaluation

Validation data will be analysed using the method described in NEPC (2013) for site assessment which state that no single result can characterise a site (and by extension spoil to be removed from site) and that the 95% upper confidence limits (UCLs) of the arithmetic average concentration should be compared to the acceptable limit.

In addition to the above, NEPC (2013) describes that the relevance of localised elevated values must be considered. The validation results must also meet the following criteria:

- The standard deviation of the results must be less than 50% of the criterion
- No single value exceeds 250% of the criteria.

10 ASSESSMENT INVESTIGATION LEVELS

10.1 Assessment Criteria

This preliminary site investigation was undertaken in reference with the following guidelines:

- AS4482.1:2005 Guide to the sampling and investigation of potentially contaminated soil
- National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended 2013, National Environment Protection Council (NEPC 2013)
- Contaminated Sites: Sampling Design Guidelines, NSW EPA, 1995 (EPA 1995)
- Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites, NSW EPA, 1997 (EPA 1997)
- Contaminated Sites: Guidelines for the NSW Site Auditor Scheme, 2nd Edition, NSW EPA, 2006 (DEC 2006)
- Contaminated Sites: Guidelines on Duty to Report Contamination under the Contaminated Land Management Act 1997, NSW DECC, June 2009 (DECC 2009).

10.2 Soil Guideline Criteria

As the affected site is to be developed for use that includes a tertiary educational facility (nearest land use setting is secondary schools), the contaminants for soil sampling were assessed against the following criteria:

- Health based Investigation and Screening Levels for residential purposes, including childcare facilities, in this instance equivalent to Health Investigation Level 'A' (HIL 'A') (NEPC 2013).
- Health Screening Levels A & B (HSLs 'A & B') for vapour intrusion, for residential purposes, including childcare facilities, at various depths (NEPC 2013):
    - Vapour Intrusion – Soil HSL A & B – Silt 0m - <1m;
    - Vapour Intrusion – Soil HSL A & B – Clay 1m - 2m;

- Management limits for hydrocarbons for residential, parkland and public open space, Fine soil texture (NEPC 2013);
- Site Specific Ecological Investigation / Screening Levels (EILs / ESLs) for Urban residential and public open space use, aged soils (NEPC 2013)

11 LABORATORY TESTING

11.1 Analytical Programme

Laboratory testing was undertaken by MGT - Eurofins, a National Association of Testing Authorities, Australia (NATA) registered laboratory and Australian Safer Environment and Technology (NATA) registered laboratory. Analytical methods used are shown on the laboratory sheets in **Appendix D.**

A total of twelve (12) + one (1) QA/QC soil samples were selected to provide a detailed assessment of the below ground conditions. The samples were selected to target identified potential sources of contamination arising from the sites historical usage and surrounding site uses.

The selected samples were analysed for the following potential contaminants:

- Total Recoverable Hydrocarbons (TRH);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Organochlorine Pesticides (OCPs);
- Organophosphorus Pesticides (OPPs);
- Benzene, Toluene, Ethyl Benzene, Xylene & Naphthalene (BTEXN); and
- Metals: Arsenic (As); Cadmium (Cd); Chromium (Cr); Copper (Cu); Lead (Pb); Mercury (Hg); Nickel (Ni); Zinc (Zn); and
- Asbestos.

12 ASSESSMENT OF RESULTS AND FIELD INVESTIGATION

12.1 Subsurface Conditions

The subsurface conditions are presented in detail in **Table 8** and in the laboratory results in **Appendix D.** These should be read in conjunction with the general notes preceding them. These explain definitions of the classification methods and descriptive terms.

A summary of the subsurface conditions encountered in the test pits (TP1 – TP8) are presented below in **Table 8**.

Table 8 – Soil Profile Summary

FROM (m)	TO (m)	DESCRIPTION
0.00	0.3 / 0.4	Fill / Disturbed Natural – Moist dark brown silty material with gravel and minor fragments of coal, demo waste and asbestos (*non-friable*) fragments.
0.3 / 0.4	0.3 / 0.9	Natural – Dense, fine-grained grey clays into weathered sandstone rock and bedrock.

12.2 Observations

PES observed a layer of disturbed natural soils in varying thickness (0.3 - 0.4m) across various sections of the site. A pocket of possible incinerator ash waste was identified to the rear of Nº. 29. The site is sloping to the south.

The overlying disturbed natural material generally comprised of brown gravelly - silty topsoil with minor fragments of coal waste and minor demolition fragments, including asbestos. No oil or grease staining or evidence of a spill was observed.

There are no immediate (within 500m) land uses surrounding these allotments that we would contend to have the potential to cause contamination on the site.

Olfactory signs of gross contamination (i.e. staining and odour) were **not** observed across the site or within any of the bore holes or trenches produced.

PES did not encounter groundwater in any test pits produced.

12.3 Soil Analytical Results

The analysis of the twelve (12) soil samples from the site are detailed in Tables 9 - 12 **Appendix C – Soil Analysis Results.** These results are tabulated for comparison against the adopted Tier 1 investigation levels stipulated in the ASC NEPM (2013) Guidelines.

Presented below is a summary of the soil analytical results:

Heavy Metals

There were four (4) exceedances against the Soil HIL 'A' criteria.

Polycyclic Aromatic Hydrocarbons (PAH)

There were no exceedances from the twelve (12) samples against the EILs (URPOS) criteria. No exceedances compared to the Soil HIL 'A' were recorded.

Organophosphorus Pesticides & Organochlorine Pesticides

There were no exceedances against the Soil HIL 'A' criteria.

Benzene, Toluene, Ethylbenzene & Xylene

There were no exceedances against the Soil HIL 'A' criteria.

Total Recoverable Hydrocarbons

There were no exceedances against the Soil HSLs 'A & B'.

Asbestos

No 'free fibres' of asbestos were detected in the eight (8) samples taken from the surface soils across the site. A small number of Bonded (*non-friable*) asbestos fragments were identified in trenches produced across the site(s).

VOC Measurements (PID)

PID screening was undertaken on all collected soil samples; the maximum VOC concentration was 2.2 ppm which is considered negligible.

12.4 95% Upper Confidence Limit Calculations

The 95% Upper Confidence Limits (UCLs) of the average concentrations for the soil results were calculated using ProUCL for soil analytical results exceeding the adopted investigation levels in reference to the procedures discussed in NEPC (2013) Schedule B2 Section 13 and NSW EPA (1995) Sampling Design Guidelines.

The criteria stipulate the results should meet the following criteria:

- The standard deviation of the results should be less than 50% of the relevant investigation or screening level, and
- No single value should exceed 250% of the relevant investigation or screening level.

Based on this the following samples did not meet that criteria set out above (for lead):

- BH05 0.0 - 0.25
- BH06 0.0 - 0.2
- CR_31_S
- BH08 0.0 - 0.2

BH08 0.0 - 0.2 and CR_31_S exceeded both of the above criteria and were treated as 'hotspots'. Subsequently, PES excluded these results from 95% UCL calculations.

Calculation sheets for data statistics, including average, standard deviation and 95%UCL of the average, are attached. ProUCL calculates the UCL comparing a number of different methods, including normal distribution, lognormal distribution, gamma distribution and nonparametric. ProUCL then recommends an appropriate method for the data set.

The 95% Upper Confidence Limit (UCL) was calculated for concentrations of lead recorded outside the hot spots identified for the site. The 95% UCL has been calculated for surface samples.

The calculations from surface samples indicated:

- The 95% UCL for Lead was 413.8 mg/kg, above the HIL 'A' of 300 mg/kg, with a standard deviation of 222.6 mg/kg, above 50% of the HIL 'A'.

Attached in Table 13 **Appendix C – Soil Analysis Results** is the statistical analysis sheet.

12.5 Soil Waste Classification

To provide a waste classification for the site soils, PES compared the sampling results of the surface soils and identified slag waste to the EPA (2014) *Waste Classification Guidelines Part 1: Classifying Waste.*

Laboratory results were compared to the Contaminant Threshold (CT) and Specific Contaminant Concentration (SCC) values for *General and Restricted Solid Waste* in the NSW EPA (2014) *Waste Classification Guidelines.* Additionally, TCLP analysis was conducted on samples that exceeded the GSW threshold values.

The results of analysis indicated CT values for *Restricted Solid Waste* were exceeded by samples BH05 0.0-0.25, BH06 0.0-0.2, BH08 0.0-0.2 and CR_31_S for lead.

Samples BH05 0.0-0.25 (BaP), BH07 0.0-0.2 (lead and BaP), BH07 0.2-0.3 (lead) and BH08 0.0-0.2 (BaP) and BH09 0.0-0.2 (lead) exceeded the *GSW* CT values.

Following TCLP analysis only CR_31_S exceeded the GSW value Tier 2 b concentrations. PES would contend that the source of the lead contamination encountered on this land emanated from lead-affected paint applied to the residential structures standing thereon and, as such, is subject to a pre-classification as *General Solid Waste; Non-Putrescible*.

The results for the remaining samples are now below the GSW Tier 2 a & b leachable concentrations.

The findings of this assessment confirm that the materials meet the requirements for 'Maximum values of specific contaminant concentration (SCC1)' following TCLP testing (<TCLP 1 threshold values) or pre-classification (residential premises with soils impacted by lead containing paints) and can now be classified and shall be taken offsite as **'General Soil Waste; Non-Putrescible – Special Waste; Asbestos'.**

13 DISCUSSION

The presence of a layer of disturbed surface soil observed at depths to approximately 0.4m b.g.l across the site, has been identified as the only potential source of contamination on the site.

No indications of hydrocarbons including staining or olfactory odours were identified. ACMs were identified in the surface soils, only, across the site. Additionally, an incinerator ash waste material was identified on a discrete area of the site (rear of Nº. 29).

The results of analysis show four (4) exceedances of the adopted criteria (HILs 'A').

Based on the findings of this *DSI*, and comparison of analytical results to the NEPC (2013); the site has identified contamination in surface soils above threshold values for Lead. The location of the exceedances is BH05 0.0-0.25, BH06 0.0-0.2, CR_31_S & BH08 0.0-0.2. TCLP analysis proved the lead in the soil is of low leachability.

Additionally, non-friable (bonded) asbestos fragments were identified in surface soils across the site. PES notes the identified ash / incinerator waste did not exceed the adopted criteria (HIL 'A').

PES contends the identified contamination is likely the result of activities conducted within the bounds of each allotment including:

- Buildings currently or formerly standing across the respective allotments that were or are clad in asbestos-containing flat fibre cement sheeting being subject to poor demolition practices;
- Those same buildings releasing lead-containing, degraded paint flakes onto the ground surface immediately adjacent to each structure.

The remainder of the site, based on the analytical testing conducted, does not indicate gross contamination above the adopted Tier 1 investigation or screening levels stipulated in NEPC (2013). However, asbestos-containing building material fragments were identified in surface soils across the site.

14 CONCLUSIONS AND RECOMMENDATIONS

The site observations, historical information and intrusive below-ground investigation across the accessible area(s) of the allotments support the contention that the land on which our Client proposes to develop a childcare facility has primarily been used for residential purposes.

The AEC for the site was the overlying disturbed natural / fill across the entire site with a high potential for contamination.

Following sampling from site soils, PES compared the sampling results to the NEPC (2013) - HIL 'A' & HSL 'A & B' and EIL / ESL URPOS criteria for Metals, TRH, BTEXN, PAHs, OCPs/OPPs and Asbestos. With the results analysed, four (4) exceedances of the above-mentioned criteria were observed.

The overlying disturbed natural / fill silty soils at BH05 0.0-0.25, BH06 0.0-0.2, CR_31_S & BH08 0.0-0.2 exceeded the adopted lead criteria. However, lead-affected soils from these allotments following TCLP analysis were classified as *General Solid Waste; Non-Putrescible (Special Waste – Asbestos)*. PES contends that the source of the lead contamination is lead-containing paints used to protect the external surface(s) of the residential premises standing on these lands. Unimpacted residual soils underlying the topsoil we would consider would likely be classified as VENM following remediation of overlying silty soils including 'hot-spot' removal and validation.

PES recommends the following:

- A Remedial Action Plan be prepared to manage the remediation of site soils affected by contamination;
- Any material generated by construction activity that is surplus to requirement and destined for offsite disposal shall be appropriately classified in accordance with the NSW EPA (2014) Waste Classification Guidelines, including NSW EPA approved resource recovery orders and exemptions.
- Any material being imported to the site should be classified as VENM or ENM in accordance with NSW EPA guidelines.

- Validation soil sampling will be required once the soil excavation is complete to ensure that the residual soils are suitable for the ongoing land use.

- The preparation of a Pre-Demolition Hazardous Substances Management Plan prior to the demolition of the built infrastructure standing on the allotments.

- Additional soil sampling of currently inaccessible surface soils from beneath all built infrastructure once demolition is complete; testing for the presence of lead.

PES concludes that based on the site history, site walkover and soil analysis results; the site presents a medium risk human health and the environment but can be made suitable for the proposed redevelopment as a childcare facility following development of a Remedial Action Plan (RAP) documenting the preferred remediation strategy and procedure for the identified contamination on the site.

15 LIMITATIONS OF THIS REPORT

PES has performed investigation and consulting services for this project with reference to current professional and industry standards for assessment of site contamination.

Whilst every effort has been made to ensure a representative programme of field and laboratory sampling and testing, conditions different to those identified during these tasks may exist. Therefore, PES cannot provide unqualified warranties, nor does PES assume any liability for site conditions not observed or accessible during the time of the investigation.

Despite all reasonable care and diligence, the ground conditions encountered, and concentrations of contaminants measured may not be representative of conditions between the locations sampled and investigated. In addition, site characteristics may change over time in response to variations in natural conditions, chemical reactions and other events, e.g. groundwater movement and/or spillages of contaminating substances. These changes may occur subsequent to PES's investigations and assessment.

This report and associated documentation and the information herein have been prepared solely for the use of Cape Engano Unit Trust. The report and the information contained herein may be further relied on by Maitland City Council solely for the purpose of approving the development application/construction certificate for the residential development proposed for this site. Any reliance assumed by other parties on this report shall be at such party's own risk. Any ensuing liability resulting from use of the report by other parties cannot be transferred to PES.

16 REFERENCES

- National Environment Protection Council (NEPC), (2013). National Environment Protection (Assessment of Site Contamination) Measure 1999, NEPM, Canberra. Schedule B2:
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APPENDIX A

SITE MAP, TEST PIT LOCATIONS & SAMPLE LOCATIONS

PRACTICAL ENVIRONMENTAL SOLUTIONS

LEGEND

Site Boundary

PROJECT TITLE: PSI			**DRAWING TITLE:** Site Identification	PRACTICAL ENVIRONMENTAL SOLUTIONS
CLIENT: Mavid Properties Pty Ltd.				
DATE: 16/10/2019	**SCALE:** NTS	**DESIGNED**:D McQueeney	**DRAWING NUMBER**: 1	**JN**: 19.2577
PRACTICAL ENVIRONMENTAL SOLUTIONS			**SOURCE**: SIX Maps (NSW Government 2019)	N

PROJECT TITLE: DSI			**DRAWING TITLE:** Sampling Locations.		PRACTICAL ENVIRONMENTAL SOLUTIONS
CLIENT: Mavid Properties Pty Ltd.					
DATE: 16/10/2019	**SCALE:** NTS	**DESIGNED**:D McQueeney	**DRAWING NUMBER**: 2	**JN**: 19.2577	N
PRACTICAL ENVIRONMENTAL SOLUTIONS			**SOURCE**: SIX Maps (NSW Government 2019)		

APPENDIX B

SITE PHOTOGRAPHS

Photograph 1: Front Elevation

Photograph 2: Rear of No. 29 (area of Ash-like Waste)

Photograph 3: Ash-like Waste

Photograph 4: Rear Elevation (No.31)

Photograph 5: Trench (No.31)

Photograph 6: Rear Elevation (No.33)

PRACTICAL ENVIRONMENTAL SOLUTIONS

APPENDIX C

SOIL ANALYSIS RESULTS

PRACTICAL ENVIRONMENTAL SOLUTIONS

Sample Identification	PQL	Guideline		BH01 0.0-0.2	BH02 0.0-0.25	BH04 0.0-0.3	BH05 0.0-0.25	BH05 0.45-0.55	BH06 0.0-0.2	BH07 0.0-0.2	BH07 0.2-0.3	BH08 0.0-0.2	BH09 0.0-0.2	BH10 0.0-0.3	DUP 1	CR_31_S
Sample Depth (m)		HIL 'A' [A]	EIL URPOS [B]	0.0-0.2	0.0-0.25	0.0-0.3	0.0-0.25	0.45-0.55	0.0-0.2	0.0-0.2	0.2-0.3	0.0-0.2	0.0-0.2	0.0-0.3	0.0-0.25	Surface
Date				18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	29/10/19
Sample Profile				Surface	Surface	Surface	Surface	Residual	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Sample Purpose				Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment
Sample collected by				DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	JF
Laboratory Report Reference				530495	530495	530495	530495	530495	530495	530495	530495	530495	530495	530495	530495	531936
Polycyclic Aromatic Hydrocarbons (PAH)																
Acenaphthene				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	na
Acenaphthylene				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	na
Anthracene				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	na
Benz(a)anthracene				< 0.5	< 0.5	< 0.5	0.7	< 0.5	< 0.5	0.9	< 0.5	0.6	< 0.5	< 0.5	< 0.5	na
Benzo(a) pyrene			0.7	< 0.5	< 0.5	< 0.5	1	< 0.5	< 0.5	1.1	< 0.5	0.9	< 0.5	< 0.5	< 0.5	na
Benzo(b)&(j)fluoranthene				< 0.5	< 0.5	< 0.5	0.7	< 0.5	< 0.5	0.8	< 0.5	1	< 0.5	< 0.5	< 0.5	na
Benzo(g,h,i)perylene				< 0.5	< 0.5	< 0.5	0.7	< 0.5	< 0.5	0.6	< 0.5	0.7	< 0.5	< 0.5	< 0.5	na
Benzo(k)fluoranthene				< 0.5	< 0.5	< 0.5	0.8	< 0.5	< 0.5	0.9	< 0.5	1.1	< 0.5	< 0.5	< 0.5	na
Chrysene				< 0.5	< 0.5	< 0.5	0.8	< 0.5	< 0.5	1	0.6	0.7	< 0.5	< 0.5	< 0.5	na
Dibenz(a,h)anthracene				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	na
Fluoranthene				< 0.5	< 0.5	< 0.5	2.2	< 0.5	0.7	2.4	0.9	1.1	0.7	< 0.5	< 0.5	na
Fluorene				< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	na
Indeno(1,2,3-c,d)pyrene				< 0.5	< 0.5	< 0.5	0.8	< 0.5	< 0.5	0.5	< 0.5	1	< 0.5	< 0.5	< 0.5	na
Naphthalene			170	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	na
Phenanthrene				< 0.5	< 0.5	< 0.5	0.9	< 0.5	< 0.5	0.9	< 0.5	0.7	< 0.5	< 0.5	< 0.5	na
Pyrene				< 0.5	< 0.5	< 0.5	2	< 0.5	0.7	2.3	0.9	1.1	0.7	< 0.5	< 0.5	na
Carcinogenic PAH (B(a)P equivalent)	0	3		0	0	0	0	1.315	0	0	1.426	0.006	1.284	0	0	na
Sum of reported PAH	0	300		0	0	0	0	10.6	0	1.4	11.4	2.4	8.9	1.4	0	na
Metals																
Arsenic		100	100	3.6	7.6	9.3	7.8	7.2	6.1	3.9	2.9	5.4	5.4	2.5	6.1	11
Cadmium		20		< 0.4	< 0.4	< 0.4	0.8	< 0.4	< 0.4	< 0.4	< 0.4	1.2	< 0.4	< 0.4	< 0.4	1.9
Chromium		100	190	9.9	13	7	16	17	14	17	6.1	19	12	8	11	44
Copper		6000		8.6	22	14	31	< 5	51	21	13	43	22	18	26	78
Mercury		40		< 0.1	< 0.1	< 0.1	0.1	< 0.1	0.1	< 0.1	0.3	< 0.1	0.7	< 0.1	0.1	0.5
Lead		300	1100	55	75	92	**410**	9.9	**670**	240	110	**1300**	210	23	66	**3400**
Nickel		400	30	6.6	13	19	22	< 5	23	23	9	24	11	20	< 5	31
Zinc		7400		100	120	130	480	21	220	190	82	1000	240	81	120	1400

Table 9: PAH and Metals Analysis

Sample Identification	PQL	Guideline		BH01 0.0-0.2	BH02 0.0-0.25	BH04 0.0-0.3	BH05 0.0-0.25	BH05 0.45-0.55	BH06 0.0-0.2	BH07 0.0-0.2	BH07 0.2-0.3	BH08 0.0-0.2	BH09 0.0-0.2	BH10 0.0-0.3	DUP 1
Sample Depth (m)		HIL 'A' [A]	EIL URPOS [B]	0.0-0.2	0.0-0.25	0.0-0.3	0.0-0.25	0.45-0.55	0.0-0.2	0.0-0.2	0.2-0.3	0.0-0.2	0.0-0.2	0.0-0.3	0.0-0.25
Date				18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19
Sample Profile				Surface	Surface	Surface	Surface	Residual	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Sample Purpose				Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment
Sample collected by				DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF
Laboratory Report Reference				530495	530495	530495	530495	530495	530495	530495	530495	530495	530495	530495	530495
Organochlorine Pesticides (OCP)															
Chlordane		50		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
DDD				< 0.05	< 0.05	< 0.05	0.09	< 0.05	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
DDE				< 0.05	< 0.05	< 0.05	0.22	< 0.05	0.58	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
DDT			180	< 0.05	< 0.05	< 0.05	0.13	< 0.05	0.09	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
alpha-BHC				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	< 0.05	< 0.05
Endosulfan 1				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan 2				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulfate				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin Aldehyde				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor		6		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide				< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
HCB		10		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor		300		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene		20		< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1	< 1
DDT+DDD+DDE	0	240		< 0.05	< 0.05	< 0.05	0.44	< 0.05	0.72	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin + Dieldrin	0	6		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.1	< 0.05	< 0.05
Endosulfan	0	270		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Table 10: OCPs Analysis

Sample Identification	PQL	Guideline		BH01 0.0-0.2	BH02 0.0-0.25	BH04 0.0-0.3	BH05 0.0-0.25	BH05 0.45-0.55	BH06 0.0-0.2	BH07 0.0-0.2	BH07 0.2-0.3	BH08 0.0-0.2	BH09 0.0-0.2	BH10 0.0-0.3	DUP 1
Sample Depth (m)		HIL 'A' [A]	EIL URPOS [B]	0.0-0.2	0.0-0.25	0.0-0.3	0.0-0.25	0.45-0.55	0.0-0.2	0.0-0.2	0.2-0.3	0.0-0.2	0.0-0.2	0.0-0.3	0.0-0.25
Date				18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19
Sample Profile				Surface	Surface	Surface	Surface	Residual	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Sample Purpose				Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment	Assessment
Sample collected by				DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF	DM + JF
Laboratory Report Reference				530495	530495	530495	530495	530495	530495	530495	530495	530495	530495	530495	530495
Organophosphorous Pesticides (OPP)															
Dichlorvos				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Mevinphos (Phosdrin)				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Demeton (total)				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Ethoprop				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Monocrotophos				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Phorate				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Dimethoate				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Diazinon				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Disulfoton				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Methyl parathion				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Ronnel				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Fenitrothion				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Malathion				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Chlorpyrifos		160		< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Parathion				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Stirofos				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Prothiofos				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2
Azinophos methyl				< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos				< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2	< 2

Table 11 OPPs

PRACTICAL ENVIRONMENTAL SOLUTIONS

All results are in units of mg/kg, except for asbestos.

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

[A] NEPM 1999 (amended April 2013) Health Investigation Levels (HIL) 'A' (Residential), 'B' (Minimal Soil Access Residential), 'C' (Parks/Open space), 'D' (Commercial/Industrial)

[B] NEPM 1999 (amended April 2013) Ecological Investigation Levels (EIL) AES (Area of Ecological Significance), URPOS (Urban Residential and Public Open Space), C&I (Commercial and Industrial)

HIL for Chromium are for Chromium VI

EIL for Chromium are the added contaminant limit for aged (>2years) Chromium III in soils of 1% clay, the most conservative of the criteria. The background level has been assumed to be zero for the Tier 1 asses

EIL for Nickel are the added contaminant limit for aged (>2years) Nickel in soils of 5% clay, the most conservative of the criteria. The background level has been assumed to be zero for the Tier 1 assessment.

EIL for Lead are the added contaminant limit for aged (>2years) Lead. The background level has been assumed to be zero for the Tier 1 assessment.

EIL for Arsenic are for aged (>2years) Arsenic

EIL for DDT and Naphthalene are for fresh (<2years) DDT and Naphthalene

PCB analysis includes non-Dioxin like and Dixin-like compounds compared to a guideline of non-Dioxin like PCB

Results show n in **BOLD** are in excess of the primary acceptance criteria

Results show n in shading are >250%of the primary acceptance criteria

Results show n in underline are in excess of primary EIL

Where summation required (PAH, OCP, PCB) calculation includes components reported as non detected as 1/2 PQL.

PRACTICAL ENVIRONMENTAL SOLUTIONS

Sample Identification	PQL	Guideline [A]							BH01 0.0-0.2	BH02 0.0-0.25	BH04 0.0-0.3	BH05 0.0-0.25	BH05 0.45-0.55	BH06 0.0-0.2	BH07 0.0-0.2	BH07 0.2-0.3	BH08 0.0-0.2	BH09 0.0-0.2	BH10 0.0-0.3	DUP 1
Sample Depth (m) [B]		HSL 'A' HSL 'B'				ESL URPOS			0.0-0.2	0.0-0.25	0.0-0.3	0.0-0.25	0.45-0.55	0.0-0.2	0.0-0.2	0.2-0.3	0.0-0.2	0.0-0.2	0.0-0.3	0.0-0.25
Date		SAND 0-<1m	SAND 1-<2m	SAND 2-<4m	SAND >4m	Coarse	Fine		18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19	18/10/19
Benzene, Toluene, Ethylbenzene, Xylene (BTEX)																				
Benzene	<0.1	0.5	0.5	0.5	0.5	50	65		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	<0.1	160	220	310	540	85	85		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	<0.1	55	NL	NL	NL	70	125		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
meta- and para-Xylene	<0.2								< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
ortho-Xylene	<0.1								< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total Xylenes	0	40	60	95	170	105	45		< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Polycyclic Aromatic Hydrocarbons (PAH)																				
Naphthalene	<0.5	3	NL	NL	NL	170	170		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Recoverable Hydrocarbons (TRH)																				
TRH C_6-C_{10}	<20								< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
TRH >C_{10}-C_{16}	<50					120	120		< 50	< 50	< 50	< 50	< 50	< 50	< 50	79	< 50	< 50	< 50	< 50
TRH >C_{16}-C_{34}	<100					300	1300		< 100	< 100	< 100	< 100	< 100	< 100	140	450	100	< 100	< 100	< 100
TRH >C_{34}-C_{40}	<100					2800	5600		< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100	< 100
F1	<20	45	70	110	200	180	180		< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20	< 20
F2	<50	110	240	440	NL				< 50	< 50	< 50	< 50	< 50	< 50	< 50	79	< 50	< 50	< 50	< 50

Table 12: BTEXN and TRH Analysis Results (see notes below)

All results are in units of mg/kg.

Blank Cell indicates no criterion available

PQL = Practical Quantitation Limit. Where PQL is for a summation, PQL of all components is summed and may be different from that presented by laboratory

F1 PQL deemed equal TRH C_6-C_{10}.

F2/$F2_{sg}$ PQL deemed equal TRH/TRH_{sg} >C_{10}-C_{16}. $_{sg}$ = silica gel clean up

[A] NEPM 1999 (amended April 2013) Vapour Based Health Screening Levels (HSL) 'A' (Residential), 'B' (Minimal Soil Access Residential), 'C' (Parks/Open space), 'D' (Commercial/Industrial)

[A] NEPM 1999 (amended April 2013) Ecological Screening Levels (ESL) AES (Area of Ecological Significance), URPOS (Urban Residential and Public Open Space), C&I (Commercial and Industrial)

[A] NEPM 1999 (amended April 2013) Management Limits (ML) Sensitive Sites (Residential, open space), Non-Sensitive Sites (Commercial and Industrial)

[A] CRC Care Technical Report 10, September 2011 Direct Contact (DC) Health Screening Levels 'A' (Residential), 'B' (Minimal Soil Access Residential), 'C' (Parks/Open space), 'D' (Commercial/Industrial)

[B] Start of sample over a 0.1m interval

[C] Note that this is a generalisation for the purpose of comparing to the HSL criteria. Where two strata equally represented, most conservative criterion used

NL designates 'Not Limiting' indicating that the pore water concentration required to constitute a vapour risk is higher than the solubility capacity for that compound based on a petroleum mixture. Vapour is therefore not a risk for this compound.

Presented ESL for naphthalene is an Ecological Investigation Level

Results for TRH have been compared to TPH guidelines.

ESL for TRH/TRH_{sg} >C_{16}-C_{34} and >C_{34}-C_{40} are low reliability

F1 = TRH C_6-C_{10} minus BTEX

F2/$F2_{sg}$ = TRH/TRH_{sg} >C_{10}-C_{16} minus naphthalene

Results shown in **BOLD** are in excess of the vapour based HSL

Results shown in shading are >250% of the vapour based HSL

Results shown in underline are in excess of the ESL

Results shown in *italics* are in excess of the management limit

Results shown in patterned cells are in excess of the direct contact HSL

Where summation required (Xylene, F1, F2/$F2_{sg}$) calculation includes components reported as non detected as 1/2 PQL.

Normal UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.15/11/2019 2:56:34 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%

Surface Soils (Lead)

General Statistics

Total Number of Observations	7	Number of Distinct Observations	7
		Number of Missing Observations	0
Minimum	55	Mean	250.3
Maximum	670	Median	210
SD	222.6	SD of logged Data	0.925
Coefficient of Variation	0.889	Skewness	1.293

Normal GOF Test

Shapiro Wilk Test Statistic	0.86	**Shapiro Wilk GOF Test**
5% Shapiro Wilk Critical Value	0.803	Data appear Normal at 5% Significance Level
Lilliefors Test Statistic	0.233	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.304	Data appear Normal at 5% Significance Level

Data appear Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	413.8	95% Adjusted-CLT UCL (Chen-1995)	432.6
		95% Modified-t UCL (Johnson-1978)	420.6

Suggested UCL to Use

95% Student's-t UCL	413.8		

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
Recommendations are based upon data size, data distribution, and skewness.
These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).
However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.

Table 12: 95% UCL Analysis (Lead in Surface Soils)

APPENDIX D

SOIL LABORTORY RESULTS AND QUALITY ASSURANCE/QUALITY CONTROL

Practical Environmental Solutions P/L
11 Ulick St
Mereweather
NSW 2291

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Attention: **David McQueeney**

Report **683528-S**
Project name CESSNOCK RD GILLESTON HEIGHTS
Project ID 19.2577
Received Date Oct 18, 2019

Client Sample ID			**BH01 0.0-0.2**	**BH02 0.0-0.25**	**BH04 0.0-0.3**	**BH05 0.0-0.25**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M19-Oc29827**	**M19-Oc29828**	**M19-Oc29829**	**M19-Oc29830**
Date Sampled			**Oct 18, 2019**	**Oct 18, 2019**	**Oct 18, 2019**	**Oct 18, 2019**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	67
TRH C29-C36	50	mg/kg	< 50	67	< 50	63
TRH C10-C36 (Total)	50	mg/kg	< 50	67	< 50	130
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	83	73	83	77
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.3
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	1.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.8
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.7
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	1.0
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.7
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.7
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.8
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.8

Client Sample ID			BH01 0.0-0.2	BH02 0.0-0.25	BH04 0.0-0.3	BH05 0.0-0.25
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc29827	M19-Oc29828	M19-Oc29829	M19-Oc29830
Date Sampled			Oct 18, 2019	Oct 18, 2019	Oct 18, 2019	Oct 18, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	2.2
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.8
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	0.9
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	2.0
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	10.6
2-Fluorobiphenyl (surr.)	1	%	54	121	120	120
p-Terphenyl-d14 (surr.)	1	%	115	148	70	76
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.09
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.22
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.13
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	0.44
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.44
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	63	142	84	102
Tetrachloro-m-xylene (surr.)	1	%	51	109	106	106
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			BH01 0.0-0.2	BH02 0.0-0.25	BH04 0.0-0.3	BH05 0.0-0.25
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc29827	M19-Oc29828	M19-Oc29829	M19-Oc29830
Date Sampled			Oct 18, 2019	Oct 18, 2019	Oct 18, 2019	Oct 18, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	88	135	69	80
Heavy Metals						
Arsenic	2	mg/kg	3.6	7.6	9.3	7.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.8
Chromium	5	mg/kg	9.9	13	7.0	16
Copper	5	mg/kg	8.6	22	14	31
Lead	5	mg/kg	55	75	92	410
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	0.1
Nickel	5	mg/kg	6.6	13	19	22
Zinc	5	mg/kg	100	120	130	480
% Moisture	1	%	11	14	12	13

Client Sample ID			BH05 0.45-0.55	BH06 0.0-0.2	BH07 0.0-0.2	BH07 0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc29831	M19-Oc29832	M19-Oc29833	M19-Oc29834
Date Sampled			Oct 18, 2019	Oct 18, 2019	Oct 18, 2019	Oct 18, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	50
TRH C15-C28	50	mg/kg	< 50	< 50	100	380
TRH C29-C36	50	mg/kg	< 50	< 50	70	160
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	170	590

Client Sample ID			BH05 0.45-0.55	BH06 0.0-0.2	BH07 0.0-0.2	BH07 0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc29831	M19-Oc29832	M19-Oc29833	M19-Oc29834
Date Sampled			Oct 18, 2019	Oct 18, 2019	Oct 18, 2019	Oct 18, 2019
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	61	82	72	72
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	79
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	79
TRH >C16-C34	100	mg/kg	< 100	< 100	140	450
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	140	529
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	1.4	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	1.7	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.9	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	0.9	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	1.1	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	0.8	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	0.6	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	0.9	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	1.0	0.6
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	0.7	2.4	0.9
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	0.9	< 0.5
Pyrene	0.5	mg/kg	< 0.5	0.7	2.3	0.9
Total PAH*	0.5	mg/kg	< 0.5	1.4	11.4	2.4
2-Fluorobiphenyl (surr.)	1	%	119	122	114	127
p-Terphenyl-d14 (surr.)	1	%	69	74	72	80
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	0.58	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	0.09	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05

Client Sample ID			BH05 0.45-0.55	BH06 0.0-0.2	BH07 0.0-0.2	BH07 0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc29831	M19-Oc29832	M19-Oc29833	M19-Oc29834
Date Sampled			Oct 18, 2019	Oct 18, 2019	Oct 18, 2019	Oct 18, 2019
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	0.72	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	0.72	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	85	96	107	110
Tetrachloro-m-xylene (surr.)	1	%	105	107	100	105
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2

Client Sample ID			BH05 0.45-0.55	BH06 0.0-0.2	BH07 0.0-0.2	BH07 0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc29831	M19-Oc29832	M19-Oc29833	M19-Oc29834
Date Sampled			Oct 18, 2019	Oct 18, 2019	Oct 18, 2019	Oct 18, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	68	75	76	90
Heavy Metals						
Arsenic	2	mg/kg	7.2	6.1	3.9	2.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	17	14	17	6.1
Copper	5	mg/kg	< 5	51	21	13
Lead	5	mg/kg	9.9	670	240	110
Mercury	0.1	mg/kg	< 0.1	0.1	< 0.1	0.3
Nickel	5	mg/kg	< 5	23	23	9.0
Zinc	5	mg/kg	21	220	190	82
% Moisture	1	%	20	6.7	15	9.5

Client Sample ID			BH08 0.0-0.2	BH09 0.0-0.2	BH10 0.0-0.3	DUP 1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc29835	M19-Oc29836	M19-Oc29837	M19-Oc29838
Date Sampled			Oct 18, 2019	Oct 18, 2019	Oct 18, 2019	Oct 18, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	71	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	70	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	141	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	77	83	78	83
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	100	< 100	< 100	< 100

Client Sample ID			BH08 0.0-0.2	BH09 0.0-0.2	BH10 0.0-0.3	DUP 1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc29835	M19-Oc29836	M19-Oc29837	M19-Oc29838
Date Sampled			Oct 18, 2019	Oct 18, 2019	Oct 18, 2019	Oct 18, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	1.3	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	1.5	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.8	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	0.6	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	0.9	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	1.0	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	0.7	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	1.1	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	0.7	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	1.1	0.7	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	1.0	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	0.7	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	1.1	0.7	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	8.9	1.4	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	120	114	123	110
p-Terphenyl-d14 (surr.)	1	%	75	70	75	69
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	0.10	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Toxaphene	1	mg/kg	< 1	< 1	< 1	< 1
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	0.1	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	135	104	115	117
Tetrachloro-m-xylene (surr.)	1	%	104	100	108	96

Client Sample ID			BH08 0.0-0.2	BH09 0.0-0.2	BH10 0.0-0.3	DUP 1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M19-Oc29835	M19-Oc29836	M19-Oc29837	M19-Oc29838
Date Sampled			Oct 18, 2019	Oct 18, 2019	Oct 18, 2019	Oct 18, 2019
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	< 2	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	< 2	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Omethoate	2	mg/kg	< 2	< 2	< 2	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	81	71	81	73
Heavy Metals						
Arsenic	2	mg/kg	5.4	5.4	2.5	6.1
Cadmium	0.4	mg/kg	1.2	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	19	12	8.0	11
Copper	5	mg/kg	43	22	18	26
Lead	5	mg/kg	1300	210	23	66
Mercury	0.1	mg/kg	< 0.1	0.7	< 0.1	0.1
Nickel	5	mg/kg	24	11	20	< 5
Zinc	5	mg/kg	1000	240	81	120
% Moisture	1	%	19	9.4	8.0	14

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B10			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Oct 21, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Melbourne	Oct 21, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 21, 2019	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Oct 21, 2019	
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Melbourne	Oct 21, 2019	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Organochlorine Pesticides	Melbourne	Oct 21, 2019	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)			
Organophosphorus Pesticides	Melbourne	Oct 21, 2019	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8081)			
Metals M8	Melbourne	Oct 21, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Melbourne	Oct 21, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

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NATA # 1261 Site # 18217

Brisbane
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	Practical Environmental Solutions P/L	**Order No.:**		**Received:**	Oct 18, 2019 2:40 PM
Address:	11 Ulick St Mereweather NSW 2291	**Report #:**	683528	**Due:**	Oct 22, 2019
		Phone:	0401 507 517	**Priority:**	1 Day
		Fax:		**Contact Name:**	David McQueeney
Project Name:	CESSNOCK RD GILLESTON HEIGHTS				
Project ID:	19.2577				

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Moisture Set	Eurofins | mgt Suite B10
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	BH01 0.0-0.2	Oct 18, 2019		Soil	M19-Oc29827	X	X
2	BH02 0.0-0.25	Oct 18, 2019		Soil	M19-Oc29828	X	X
3	BH04 0.0-0.3	Oct 18, 2019		Soil	M19-Oc29829	X	X
4	BH05 0.0-0.25	Oct 18, 2019		Soil	M19-Oc29830	X	X
5	BH05 0.45-0.55	Oct 18, 2019		Soil	M19-Oc29831	X	X
6	BH06 0.0-0.2	Oct 18, 2019		Soil	M19-Oc29832	X	X
7	BH07 0.0-0.2	Oct 18, 2019		Soil	M19-Oc29833	X	X
8	BH07 0.2-0.3	Oct 18, 2019		Soil	M19-Oc29834	X	X
9	BH08 0.0-0.2	Oct 18, 2019		Soil	M19-Oc29835	X	X

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		Phone:	0401 507 517	**Priority:**	1 Day
		Fax:		**Contact Name:**	David McQueeney
Project Name:	CESSNOCK RD GILLESTON HEIGHTS				
Project ID:	19.2577				

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Moisture Set	Eurofins | mgt Suite B10
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
10	BH09 0.0-0.2	Oct 18, 2019		Soil	M19-Oc29836	X	X
11	BH10 0.0-0.3	Oct 18, 2019		Soil	M19-Oc29837	X	X
12	DUP 1	Oct 18, 2019		Soil	M19-Oc29838	X	X
Test Counts						12	12

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	100			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	87			70-130	Pass	
Toluene	%	90			70-130	Pass	
Ethylbenzene	%	97			70-130	Pass	
m&p-Xylenes	%	94			70-130	Pass	
Xylenes - Total	%	94			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	91			70-130	Pass	
TRH C6-C10	%	91			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	82			70-130	Pass	
Acenaphthylene	%	83			70-130	Pass	
Anthracene	%	78			70-130	Pass	
Benz(a)anthracene	%	75			70-130	Pass	
Benzo(a)pyrene	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	%	80			70-130	Pass	
Benzo(g.h.i)perylene	%	110			70-130	Pass	
Benzo(k)fluoranthene	%	77			70-130	Pass	
Chrysene	%	83			70-130	Pass	
Dibenz(a.h)anthracene	%	112			70-130	Pass	
Fluoranthene	%	82			70-130	Pass	
Fluorene	%	86			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	119			70-130	Pass	
Naphthalene	%	83			70-130	Pass	
Phenanthrene	%	81			70-130	Pass	
Pyrene	%	81			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	89			70-130	Pass	
4.4'-DDD	%	99			70-130	Pass	
4.4'-DDE	%	107			70-130	Pass	
a-BHC	%	95			70-130	Pass	
Aldrin	%	93			70-130	Pass	
b-BHC	%	79			70-130	Pass	
d-BHC	%	90			70-130	Pass	
Dieldrin	%	92			70-130	Pass	
Endosulfan I	%	88			70-130	Pass	
Endosulfan II	%	83			70-130	Pass	
Endosulfan sulphate	%	102			70-130	Pass	
Endrin	%	77			70-130	Pass	
Endrin ketone	%	72			70-130	Pass	
g-BHC (Lindane)	%	79			70-130	Pass	
Heptachlor	%	88			70-130	Pass	
Heptachlor epoxide	%	85			70-130	Pass	
Hexachlorobenzene	%	112			70-130	Pass	
Methoxychlor	%	99			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	93			70-130	Pass	
Dimethoate	%	104			70-130	Pass	
Ethion	%	94			70-130	Pass	
Fenitrothion	%	111			70-130	Pass	
Methyl parathion	%	128			70-130	Pass	
Mevinphos	%	90			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	94			80-120	Pass	
Cadmium	%	90			80-120	Pass	
Chromium	%	86			80-120	Pass	
Copper	%	88			80-120	Pass	
Lead	%	89			80-120	Pass	
Mercury	%	97			75-125	Pass	
Nickel	%	87			80-120	Pass	
Zinc	%	91			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M19-Oc29954	NCP	%	126			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M19-Oc29954	NCP	%	119			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M19-Oc31417	NCP	%	103			70-130	Pass	
Acenaphthylene	M19-Oc31417	NCP	%	104			70-130	Pass	
Anthracene	M19-Oc31417	NCP	%	90			70-130	Pass	
Benz(a)anthracene	M19-Oc31417	NCP	%	83			70-130	Pass	
Benzo(a)pyrene	M19-Oc31417	NCP	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	M19-Oc31417	NCP	%	78			70-130	Pass	
Benzo(g.h.i)perylene	M19-Oc31417	NCP	%	119			70-130	Pass	
Benzo(k)fluoranthene	M19-Oc31417	NCP	%	99			70-130	Pass	
Chrysene	M19-Oc31417	NCP	%	103			70-130	Pass	
Dibenz(a.h)anthracene	M19-Oc31417	NCP	%	113			70-130	Pass	
Fluoranthene	M19-Oc31417	NCP	%	105			70-130	Pass	
Fluorene	M19-Oc31417	NCP	%	107			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M19-Oc31417	NCP	%	109			70-130	Pass	
Naphthalene	M19-Oc31417	NCP	%	105			70-130	Pass	
Phenanthrene	M19-Oc31417	NCP	%	102			70-130	Pass	
Pyrene	M19-Oc31417	NCP	%	103			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	M19-Oc27945	NCP	%	79			70-130	Pass	
Dimethoate	M19-Oc27945	NCP	%	75			70-130	Pass	
Ethion	M19-Oc27945	NCP	%	71			70-130	Pass	
Fenitrothion	M19-Oc27945	NCP	%	89			70-130	Pass	
Methyl parathion	M19-Oc27945	NCP	%	74			70-130	Pass	
Mevinphos	M19-Oc27945	NCP	%	82			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M19-Oc29828	CP	%	94			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	M19-Oc29828	CP	%	77			70-130	Pass	
Toluene	M19-Oc29828	CP	%	83			70-130	Pass	
Ethylbenzene	M19-Oc29828	CP	%	87			70-130	Pass	
m&p-Xylenes	M19-Oc29828	CP	%	85			70-130	Pass	
o-Xylene	M19-Oc29828	CP	%	86			70-130	Pass	
Xylenes - Total	M19-Oc29828	CP	%	85			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M19-Oc29828	CP	%	80			70-130	Pass	
TRH C6-C10	M19-Oc29828	CP	%	89			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	M19-Oc29828	CP	%	117			70-130	Pass	
4.4'-DDD	M19-Oc29828	CP	%	121			70-130	Pass	
4.4'-DDE	M19-Oc29828	CP	%	100			70-130	Pass	
4.4'-DDT	M19-Oc29828	CP	%	104			70-130	Pass	
a-BHC	M19-Oc29828	CP	%	115			70-130	Pass	
Aldrin	M19-Oc29828	CP	%	120			70-130	Pass	
b-BHC	M19-Oc29828	CP	%	102			70-130	Pass	
d-BHC	M19-Oc29828	CP	%	111			70-130	Pass	
Dieldrin	M19-Oc29828	CP	%	90			70-130	Pass	
Endosulfan I	M19-Oc29828	CP	%	117			70-130	Pass	
Endosulfan II	M19-Oc29828	CP	%	114			70-130	Pass	
Endosulfan sulphate	M19-Oc29828	CP	%	94			70-130	Pass	
Endrin	M19-Oc29828	CP	%	93			70-130	Pass	
Endrin aldehyde	M19-Oc29828	CP	%	83			70-130	Pass	
Endrin ketone	M19-Oc29828	CP	%	97			70-130	Pass	
g-BHC (Lindane)	M19-Oc29828	CP	%	102			70-130	Pass	
Heptachlor	M19-Oc29828	CP	%	75			70-130	Pass	
Heptachlor epoxide	M19-Oc29828	CP	%	106			70-130	Pass	
Hexachlorobenzene	M19-Oc29828	CP	%	97			70-130	Pass	
Methoxychlor	M19-Oc29828	CP	%	77			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M19-Oc29828	CP	%	111			75-125	Pass	
Cadmium	M19-Oc29828	CP	%	85			75-125	Pass	
Chromium	M19-Oc29828	CP	%	105			75-125	Pass	
Copper	M19-Oc29828	CP	%	95			75-125	Pass	
Lead	M19-Oc29828	CP	%	71			75-125	Fail	Q08
Mercury	M19-Oc29828	CP	%	86			70-130	Pass	
Nickel	M19-Oc29828	CP	%	88			75-125	Pass	
Zinc	M19-Oc29828	CP	%	46			75-125	Fail	Q08
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M19-Oc29827	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M19-Oc27941	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M19-Oc27941	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M19-Oc27941	NCP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M19-Oc29827	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M19-Oc29827	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M19-Oc29827	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M19-Oc29827	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M19-Oc29827	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M19-Oc29827	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M19-Oc27941	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M19-Oc29827	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	M19-Oc29827	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	M19-Oc29827	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	M19-Oc29827	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	M19-Oc29827	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	M19-Oc29827	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	M19-Oc29827	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Oc29827	CP	mg/kg	3.6	3.9	8.0	30%	Pass	
Cadmium	M19-Oc29827	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M19-Oc29827	CP	mg/kg	9.9	10.0	<1	30%	Pass	
Copper	M19-Oc29827	CP	mg/kg	8.6	9.7	13	30%	Pass	
Lead	M19-Oc29827	CP	mg/kg	55	66	18	30%	Pass	
Mercury	M19-Oc29827	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M19-Oc29827	CP	mg/kg	6.6	8.0	20	30%	Pass	
Zinc	M19-Oc29827	CP	mg/kg	100	120	14	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-Oc29827	CP	%	11	11	4.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Oc29828	CP	mg/kg	7.6	7.5	2.0	30%	Pass	
Cadmium	M19-Oc29828	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M19-Oc29828	CP	mg/kg	13	13	1.0	30%	Pass	
Copper	M19-Oc29828	CP	mg/kg	22	22	<1	30%	Pass	
Lead	M19-Oc29828	CP	mg/kg	75	73	2.0	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Mercury	M19-Oc29828	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M19-Oc29828	CP	mg/kg	13	13	<1	30%	Pass	
Zinc	M19-Oc29828	CP	mg/kg	120	120	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-Oc29837	CP	%	8.0	7.8	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference.

Authorised By

Andrew Black	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Practical Environmental Solutions P/L
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Mereweather
NSW 2291

NATA Accredited
Accreditation Number 1261
Site Number 18217

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.

Attention: **David McQueeney**

Report **685264-S**
Project name GILLIESTON HEIGHTS
Project ID 192577
Received Date Oct 29, 2019

Client Sample ID			**CR_31_S**
Sample Matrix			**Soil**
Eurofins Sample No.			**S19-Oc45709**
Date Sampled			**Oct 29, 2019**
Test/Reference	LOR	Unit	
Heavy Metals			
Arsenic	2	mg/kg	11
Cadmium	0.4	mg/kg	1.9
Chromium	5	mg/kg	44
Copper	5	mg/kg	78
Lead	5	mg/kg	3400
Mercury	0.1	mg/kg	0.5
Nickel	5	mg/kg	31
Zinc	5	mg/kg	1400
% Moisture	1	%	9.6

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Metals M8	Sydney	Oct 30, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Oct 30, 2019	14 Days
- Method: LTM-GEN-7080 Moisture			

eurofins | Environment Testing

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NATA # 1261 Site # 20794

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NATA # 1261
Site # 23736

Company Name: Practical Environmental Solutions P/L
Address: 11 Ulick St
Mereweather
NSW 2291

Project Name: GILLIESTON HEIGHTS
Project ID: 192577

Order No.:
Report #: 685264
Phone: 0401 507 517
Fax:

Received: Oct 29, 2019 2:55 PM
Due: Oct 30, 2019
Priority: 1 Day
Contact Name: David McQueeney

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Metals M8	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	CR_31_S	Oct 29, 2019		Soil	S19-Oc45709	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	105			70-130	Pass	
Cadmium	%	105			70-130	Pass	
Chromium	%	108			70-130	Pass	
Copper	%	107			70-130	Pass	
Lead	%	113			70-130	Pass	
Mercury	%	109			70-130	Pass	
Nickel	%	106			70-130	Pass	
Zinc	%	107			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	B19-Oc44147	NCP	%	96			70-130	Pass	
Cadmium	B19-Oc44147	NCP	%	101			70-130	Pass	
Chromium	B19-Oc44147	NCP	%	102			70-130	Pass	
Copper	B19-Oc44147	NCP	%	102			70-130	Pass	
Lead	B19-Oc44147	NCP	%	109			70-130	Pass	
Mercury	B19-Oc44147	NCP	%	110			70-130	Pass	
Nickel	B19-Oc44147	NCP	%	99			70-130	Pass	
Zinc	B19-Oc44147	NCP	%	111			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	B19-Oc44146	NCP	mg/kg	16	15	2.0	30%	Pass	
Cadmium	B19-Oc44146	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	B19-Oc44146	NCP	mg/kg	25	25	<1	30%	Pass	
Copper	B19-Oc44146	NCP	mg/kg	17	18	6.0	30%	Pass	
Lead	B19-Oc44146	NCP	mg/kg	42	43	3.0	30%	Pass	
Mercury	B19-Oc44146	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	B19-Oc44146	NCP	mg/kg	6.4	5.9	9.0	30%	Pass	
Zinc	B19-Oc44146	NCP	mg/kg	170	180	6.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S19-Oc41605	NCP	%	7.6	7.0	8.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Andrew Black	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Practical Environmental Solutions P/L
11 Ulick St
Mereweather
NSW 2291

NATA Accredited
Accreditation Number 1261
Site Number 1254

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.

Attention: **David McQueeney**

Report **685787-L**
Project name CESSNOCK RD GILLESTON HEIGHTS
Project ID 19.2577
Received Date Nov 01, 2019

Client Sample ID			**BH05 0.0-0.25**	**BH06 0.0-0.2**	**BH07 0.0-0.2**	**BH07 0.2-0.3**
Sample Matrix			**US Leachate**	**US Leachate**	**US Leachate**	**US Leachate**
Eurofins Sample No.			**M19-No00429**	**M19-No00430**	**M19-No00431**	**M19-No00432**
Date Sampled			**Oct 18, 2019**	**Oct 18, 2019**	**Oct 18, 2019**	**Oct 18, 2019**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.001	mg/L	< 0.001	-	< 0.001	-
Heavy Metals						
Lead	0.01	mg/L	0.07	0.18	0.05	0.01
USA Leaching Procedure						
Leachate Fluid[C01]		comment	1.0	1.0	1.0	1.0
pH (initial)	0.1	pH Units	6.3	5.6	5.9	5.8
pH (Leachate fluid)	0.1	pH Units	5.1	5.1	5.1	5.1
pH (off)	0.1	pH Units	5.0	5.0	5.0	5.0
pH (USA HCl addition)	0.1	pH Units	1.5	1.5	1.5	1.5

Client Sample ID			**BH08 0.0-0.2**	**BH09 0.0-0.2**	**CR_31_S**
Sample Matrix			**US Leachate**	**US Leachate**	**US Leachate**
Eurofins Sample No.			**M19-No00433**	**M19-No00434**	**M19-No00435**
Date Sampled			**Oct 18, 2019**	**Oct 18, 2019**	**Oct 18, 2019**
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene	0.001	mg/L	< 0.001	-	-
Heavy Metals					
Lead	0.01	mg/L	0.13	0.07	1.0
USA Leaching Procedure					
Leachate Fluid[C01]		comment	1.0	1.0	1.0
pH (initial)	0.1	pH Units	5.9	6.4	7.9
pH (Leachate fluid)	0.1	pH Units	5.1	5.1	5.0
pH (off)	0.1	pH Units	5.0	5.0	5.3
pH (USA HCl addition)	0.1	pH Units	1.6	1.5	1.7

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Polycyclic Aromatic Hydrocarbons	Melbourne	Nov 01, 2019	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Heavy Metals	Sydney	Nov 04, 2019	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

eurofins | Environment Testing

ABN – 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
6 Monterey Road
Dandenong South VIC 3175
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: Practical Environmental Solutions P/L
Address: 11 Ulick St
Mereweather
NSW 2291

Project Name: CESSNOCK RD GILLESTON HEIGHTS
Project ID: 19.2577

Order No.:
Report #: 685787
Phone: 0401 507 517
Fax:

Received: Nov 1, 2019 11:00 AM
Due: Nov 4, 2019
Priority: 1 Day
Contact Name: David McQueeney

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Benzo(a)pyrene	Lead	Lead	USA Leaching Procedure	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X		X	
Sydney Laboratory - NATA Site # 18217								X		X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	BH05 0.0-0.25	Oct 18, 2019		US Leachate	M19-No00429	X	X		X	
2	BH06 0.0-0.2	Oct 18, 2019		US Leachate	M19-No00430		X		X	
3	BH07 0.0-0.2	Oct 18, 2019		US Leachate	M19-No00431	X	X		X	
4	BH07 0.2-0.3	Oct 18, 2019		US Leachate	M19-No00432		X		X	
5	BH08 0.0-0.2	Oct 18, 2019		US Leachate	M19-No00433	X	X		X	
6	BH09 0.0-0.2	Oct 18, 2019		US Leachate	M19-No00434		X		X	
7	CR_31_S	Oct 18, 2019		US Leachate	M19-No00435			X		X
Test Counts						3	7	7	7	7

eurofins | Environment Testing

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Lead			mg/L	< 0.01			0.01	Pass	
LCS - % Recovery									
Heavy Metals									
Lead			%	102			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	M19-No00429	CP	%	100			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	M19-No00429	CP	mg/L	0.07	0.07	1.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised By

Andrew Black	Analytical Services Manager
Emily Rosenberg	Senior Analyst-Metal (VIC)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

APPENDIX E

CHAIN OF CUSTODY (FIELD & DESPATCH)

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	Practical Enviro. Solutions	Project №	M.2577	Project Manager	David McQueeney
Address		Project Name	8 Cessnock Rd, Gillieston Heights	EDD Format (ESdat, EQuIS etc)	
Contact Name	DAVID McQueeney				
Phone №	0413 212 601				
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	David McQueeney	
Handed over by		
Email for Invoice		
Email for Results		

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

BTO

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply

☐ Overnight (reporting by 9am)♦ ☐ Same day♦ ☑ 1 day♦ ☐ 2 days♦ ☐ 3 days♦ ☐ 5 days (Standard) ☐ Other( )

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH01 0.0-0.2	18/10/19	S	X						1		
2	BH02 0.0-0.25									1		
3	BH04 0.0-0.3									1		
4	BH05 0.0-0.25									1		
5	BH05 0.45-0.55									1		
6	BH06 0.0-0.2									1		
7	BH07 0.0-0.2									1		
8	BH07 0.2-0.3									1		
9	BH08 0.0-0.2									1		
10	BH09 0.0-0.2	↓	↓	↓						1		
	Total Counts											

Method of Shipment: ☐ Courier (#) ☒ Hand Delivered ☐ Postal — Name: David McQueeney — Signature: — Date: 18/10/19 — Time: 1500

Laboratory Use Only											
Received By	SUE	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	18/10/19	Time	2-40pm	Temperature	
Received By	Caifeng	SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	21/10	Time	9a	Report №	683528

Eurofins Environment Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1 21 Smallwood Place Murarrie QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2 91 Leach Highway Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
6 Monterey Road Dandenong South VIC 3175
03 8564 5000 EnviroSampleVic@eurofins.com

Company	PES	Project №		Project Manager	David McQueeney
Address		Project Name		EDD Format ESdat, EQuIS etc	
Contact Name	David McQueeney			Sampler(s)	David McQueeney
Phone №	0413212601			Handed over by	" "
Special Directions				Email for Invoice	" "
Purchase Order				Email for Results	" "
Quote ID №					

Analyses — Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	B10	Containers: 500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	BH10 0.0-0.3	18/10/14	S	X							1		
2	Dup 1	18/10/14	S	X							1		
3													
4													
5													
6													
7													
8													
9													
10													
	Total Counts												

Containers — Change container type & size if necessary.

Required Turnaround Time (TAT) — Default will be 5 days if not ticked.

♦Surcharge will apply
☐ Overnight (reporting by 9am)♦
☐ Same day♦ ☑ 1 day♦
☐ 2 days♦ ☐ 3 days♦
☐ 5 days (Standard)
☐ Other( )

Method of Shipment: ☐ Courier (#) ☒ Hand Delivered ☐ Postal

Name: David McQueeney Signature: Date: 18/10/14 Time:

Laboratory Use Only

Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date		Time	Temperature
Received By	Courier	SYD | BNE | (MEL) | PER | ADL | NTL | DRW	Signature		Date	21/10	Time 9 a	Report № 683528

Eurofins Environment Testing Australia Pty Ltd

Submission of samples to the laboratory will be deemed as acceptance of Eurofins | Environment Testing Standard Terms and Conditions unless agreed otherwise. A copy is available on request.

CHAIN OF CUSTODY RECORD

ABN 50 005 085 521

☐ Sydney Laboratory
Unit F3 Bld.F, 16 Mars Rd, Lane Cove West, NSW 2066
02 9900 8400 EnviroSampleNSW@eurofins.com

☐ Brisbane Laboratory
Unit 1, 21 Smallwood Pl., Murarrie, QLD 4172
07 3902 4600 EnviroSampleQLD@eurofins.com

☐ Perth Laboratory
Unit 2, 91 Leach Highway, Kewdale WA 6105
08 9251 9600 EnviroSampleWA@eurofins.com

☐ Melbourne Laboratory
2 Kingston Town Close, Oakleigh, VIC 3166
03 8564 5000 EnviroSampleVic@eurofins.com

Company	PES	Project №	192577	Project Manager	David McQueeny
Address	Mayfield	Project Name	Gilliestons Heights	EDD Format (ESdat, EQuIS, Custom)	
Contact Name	David McQueeny				
Phone №					
Special Directions					
Purchase Order					
Quote ID №					

Sampler(s)	Julien Fouhy	
Handed over by	"	"
Email for Invoice	David McQueeny	
Email for Results	"	"

Analyses (Note: Where metals are requested, please specify "Total" or "Filtered") SUITE code must be used to attract SUITE pricing.

Containers

Turnaround Time (TAT) Requirements (Default will be 5 days if not ticked)

☐ Overnight (9am)* ☑ 1 Day* ☐ 2 Day* ☐ 3 Day* ☐ 5 Day * Surcharges apply ☐ Other ( )

№	Client Sample ID	Sampled Date/Time (dd/mm/yy hh:mm)	Matrix (Solid (S) Water (W))	Analyses: 8 Metals	1L Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
1	CR_31_S	29/10/19	S	X							1		
2													
3													
4													
5													
6													
7													
8													
9													
10													
	Total Counts												

Method of Shipment	☐ Courier (#)	☑ Hand Delivered	☐ Postal	Name	Julien Fouhy	Signature		Date	29/10/19	Time	14:50
Eurofins | mgt Laboratory Use Only	Received By	SUE	SYD | BNE | MEL | PER | ADL | (NTL) | DRW	Signature		Date	29/10/19	Time	2:55pm	Temperature	
	Received By		SYD | BNE | MEL | PER | ADL | NTL | DRW	Signature		Date	__/__/__	Time	__:__	Report №	685264

Enviro Sample Vic

From: Andrew Black
Sent: Friday, 1 November 2019 11:00 AM
To: Enviro Sample Vic
Subject: 1 DAY TAT ADDITIONAL LEACHATE: FW: TCPL Analysis Request - Reports 683528 & 685264

Importance: High

Urgent 1 day TAT additional for leachate thanks team. Please note that the last sample mentioned is for another job and is in Sydney, the rest in Melbourne.

Andrew Black
Phone: +61 410 220 750
Email: AndrewBlack@eurofins.com

From: David McQueeney [mailto:davidmcqueeney@practicalenvirosolutions.com]
Sent: Friday, 1 November 2019 10:57 AM
To: Andrew Black
Subject: TCPL Analysis Request - Reports 683528 & 685264

EXTERNAL EMAIL*

Hi Andrew,

Can i please request TCLPs for the following samples:

- BH05 0.0-0.25 - Lead and B(a)P
- BH06 0.0-0.2 - Lead
- BH07 - 0.0-0.2 - Lead & B(a)P
- BH07 0.2-0.3 - Lead
- BH08 0.0-0.2 - Lead & B(a)P
- BH09 0.0-0.2 - Lead
- CR_31_S - Lead (685264)

D.S 18/10
OC29830 - R1695
OC29832 -
OC29833 -
OC29834 -
OC29835 -
OC29836 -
OC45709 - syd.

Fastest TAT please.

Kind regards,

David McQueeney | Environmental Scientist

BEnvScMgt, SafeWork NSW Licenced Asbestos Assessor (001274)

ASET7140/80320/1-8

CHAIN OF CUSTODY RECORD

Company Name: PRACTICAL ENVIRONMENTAL SOLUTIONS
Postal Address: PO BOX 167 MAYFIELD NSW 2304
Phone: 0401 507 517
Fax:

Order No:
Project: Cessnock Rd Gillieston Heights
Job No: 19.2577
Contact Name: DM

PRACTICAL ENVIRONMENTAL SOLUTIONS

Special Directions & Comments:

Fibro / Asbestos

Secondary Laboratory Details:

URGENT

	Sample ID	Date	Asbestos Bulk ID	Asbestos Fibre Counting	Asbestos Soil	Synthetic Mineral Fibre - Non NATA	Lead	Other / Specify	Comments
1	SH01 0.0-0.2	18/10/19			X				
2	BH02 0.0-0.25								
3	BH03 0.0-0.3								
4	BH04 0.0-0.2								
5	BH07 0.0-0.2								
6	BH08 0.0-0.2								
7	BH09 0.0-0.2								
8	BH10 0.0-0.3								

RECEIVED
21 OCT 2019
BY:

Relinquished by: David Williams
Date & Time: 18/10/19
Signature:

Received by:
Date & Time: 21/10/19 2:50pm
Signature:

Turn-around Time

Fastest ☒ 24 Hrs ☐ 48 Hrs ☐ 72 Hrs ☐ 5 Days ☐

Method of Shipment

Courier ☐
Post ☒
Hand ☐

PRACTICAL ENVIRONMENTAL SOLUTIONS

APPENDIX F

BORE HOLE LOGS

Practical Environmental Solutions Pty Ltd
1/2 Frost Drive, Mayfield West
PO BOX 167 Mayfield NSW 2304
www.practicalenvirosolutions.com
M: 0401 507 517 P: (02) 4967 6888
ACN 1400 75994 ABN 35 578 413 720

SOIL BORE HOLE LOG:	BH01		
JOB NUMBER:	19.2577	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 – 0.25		Disturbed Natural - Gravelly Silt, dark brown, minor concrete and coal fragments throughout	Moist	Friable	2.2	BH01 0.0 -0.2	No evidence of staining or odours
0.30 – 0.70		Total depth at 0.3m					
0.75 – 2.25							
		End of Hole at 2.25m					

Practical Environmental Solutions Pty Ltd
1/2 Frost Drive, Mayfield West
PO BOX 167 Mayfield NSW 2304
www.practicalenvirosolutions.com
M: 0401 507 517 P: (02) 4967 6888
ACN 1400 75994 ABN 35 578 413 720

SOIL BORE HOLE LOG:	BH02		
JOB NUMBER:	19.2577	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 – 0.70		Disturbed Natural - Gravelly Silt, dark brown, minor concrete and coal fragments throughout 1 glass fragment	Moist	Friable	1.6	BH02 0.0 -0.25 Dup 1	No evidence of staining or odours Field duplicate taken
		Natural - residual red clay with grey mottles	Moist	Dense	na	na	No evidence of staining or odours no sample
0.75		Natural - weathered red rock	dry	Friable	na	na	No evidence of staining or odours
0.80		Bedrock - red sandstone	dry	Friable	na	na	No evidence of staining or odours
0.85		End of Hole at 0.8m					
0.90 – 2.25							

Practical Environmental Solutions Pty Ltd
1/2 Frost Drive, Mayfield West
PO BOX 167 Mayfield NSW 2304
www.practicalenvirosolutions.com
M: 0401 507 517 P: (02) 4967 6888
ACN 1400 75994 ABN 35 578 413 720

SOIL BORE HOLE LOG:	BH03		
JOB NUMBER:	19.2394	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 – 0.25		Disturbed Natural - Gravelly Silt, dark brown, minor concrete and coal fragments throughout	Moist	Friable	1.6		No evidence of staining or odours
0.30		Natural - yellow sandstone (bedrock)					
0.35 – 1.15		End of Hole at 0.3m					
1.20 – 2.25							

Practical Environmental Solutions Pty Ltd
1/2 Frost Drive, Mayfield West
PO BOX 167 Mayfield NSW 2304
www.practicalenvirosolutions.com
M: 0401 507 517 P: (02) 4967 6888
ACN 1400 75994 ABN 35 578 413 720

SOIL BORE HOLE LOG:	BH04		
JOB NUMBER:	19.2394	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 0.05 0.10 0.15 0.20 0.25 0.30		Disturbed Natural - Gravelly Silt, dark brown, minor concrete and coal fragments throughout	Moist	Friable	1.8	BH04 0.0 -0.2	No evidence of staining or odours
0.35		Natural - Weathered sandstone into red sandstone bedrock	dry	dense		No sample	
0.40 0.45 0.50 0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15		End of hole at 0.38m					
1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25							

Practical Environmental Solutions Pty Ltd
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PO BOX 167 Mayfield NSW 2304
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ACN 1400 75994 ABN 35 578 413 720

SOIL BORE HOLE LOG:	BH05		
JOB NUMBER:	19.2394	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 0.05 0.10 0.15 0.20		Disturbed Natural - Gravelly Silt, pale brown, minor concrete and coal fragments throughout	dry	Friable	1.1	BH05 0.0 -0.2	No evidence of staining or odours
0.25 0.30 0.35 0.40 0.45 0.50		Natural - Orange brown clay with minor red mottles. Minor gravel in top 0.05m	dry	dense	1.1	BH05 0.45-0.55	No evidence of staining or odours
0.55 0.60 0.65 0.70 0.75 0.80 0.85 0.90 0.95 1.00 1.05 1.10 1.15		End of Hole at 0.55m					
1.20 1.25 1.30 1.35 1.40 1.45 1.50 1.55 1.60 1.65 1.70 1.75 1.80 1.85 1.90 1.95 2.00 2.05 2.10 2.15 2.20 2.25							

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SOIL BORE HOLE LOG:	BH06		
JOB NUMBER:	19.2394	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 – 0.25		Disturbed Natural - Gravelly Silt, dark brown, minor concrete and coal fragments throughout	Moist	Friable	2.2	BH06 0.0 -0.2	No evidence of staining or odours
0.30		Natural - sandstone bedrock (yellow white)					
0.35 – 0.85		Total depth at 0.3m					
0.90 – 2.25							

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SOIL BORE HOLE LOG:	BH07		
JOB NUMBER:	19.2394	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 – 0.10		Disturbed Natural - Gravelly Silt, dark brown, minor concrete and coal fragments throughout	Moist	Friable	1.7	BH07 0.0 -0.2	No evidence of staining or odours
0.15 – 0.25		Fill - crushed coal pocket, gravel and sand sized	Moist	Friable	1.3	BH07 0.2 -0.3	Fill material - no odours
0.30 – 0.50		Disturbed Natural - yellow / brown clay minor, gravel throughout.	dry	friable		no sample	No evidence of staining or odours
0.55 – 0.60		Natural - weathered rock, pale yellow into bedrock					
0.65 – 2.25		End of Hole at 0.60m					

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SOIL BORE HOLE LOG:	BH08		
JOB NUMBER:	19.2394	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 – 0.25		Disturbed Natural - Gravelly Silt, dark brown, minor concrete and coal fragments throughout - metal fragment at 0.3m	Moist	Friable	1.4	BH08 0.0 -0.2	No evidence of staining or odours
0.30 – 0.60		Disturbed Natural? - yellow / brown clay minor, gravel throughout.	dry	friable	na	no sample	No evidence of staining or odours
0.65 – 0.75		Natural - weathered rock, pale yellow into weathered bedrock	dry	dense	na	na	No evidence of staining or odours
0.80 – 2.25		End of Hole at 0.85m					

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SOIL BORE HOLE LOG:	BH09		
JOB NUMBER:	19.2394	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 – 0.45		Disturbed Natural - Gravelly Silt, dark brown, minor concrete and coal fragments throughout - metal fragment at 0.3m	dry	friable	1.4	BH09 0.0 -0.2	No evidence of staining or odours
0.50		Natural - red to brown weathered rock, into a stiff clay	Dry	Desnse	nA	NA	No evidence of staining or odours
0.55		End of Hole at 0.50m					
0.60 – 2.25							

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SOIL BORE HOLE LOG:	BH10		
JOB NUMBER:	19.2394	DATE:	18/10/2019
CLIENT:	Maivd Properties Pty Ltd	LOGGED:	DM
SITE ADDRESS:	29-33 Cessnock Road, Gillieston Heights	OPERATOR Co.:	N/A
SURFACE TYPE:	Grass	PLANT:	Shovel and Hand-Auger

Depth (m)	Graphic	**Soil Description** Soil type, plasticity/particle characteristics, colour, minor components	Mosture	Consistency / Density	PID (ppm)	Field Sample #	Other Notes
		Ground Surface					
0.00 – 0.35		Fill - Gravel with grey fines throughout, possible slag waste, incinerator waste, some coal / charcoal fragments	dry	friable	1.4	BH10 0.0 -0.3	No evidence of staining or odours, possible slag waste.
0.40 – 0.50		Natural - Residual yellow clays	Dry	dense	NA	NA	No evidence of staining or odours.
0.55		End of Hole at 0.55m					
0.60							
0.65							
0.70							
0.75							
0.80							
0.85							
0.90							
0.95							
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1.90							
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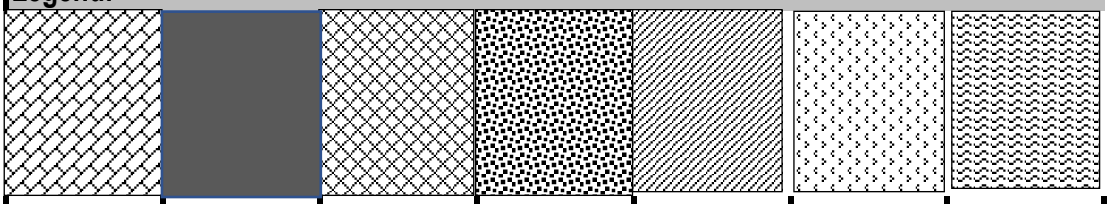
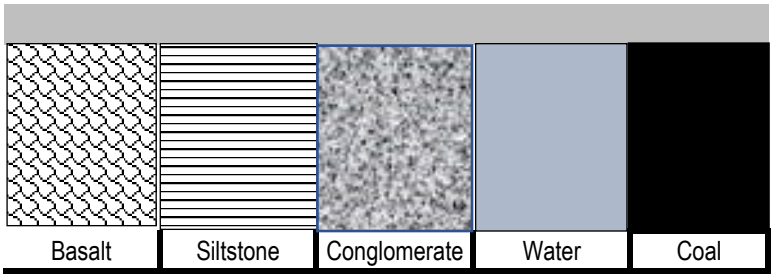
2.05							
2.10							
2.15							
2.20							
2.25							

Legend:




Basalt
Siltstone
Conglomerate
Water
Coal

APPENDIX G

PID CALIBRATION CERTIFICATE

PRACTICAL ENVIRONMENTAL SOLUTIONS

CALIBRATION CERTIFICATE

Date of Calibration: - 12th June 2019

Certificate Number: - 247279

Calibrated by: - T.Payne

Signed: -

Customer: - Air-Met Scientific Pty Ltd

Description: - Tiger

Manufacturer: - ION Science Ltd

Type Number: - N/A

Serial Number: - T-115093

Service Due date: - June 2020

This instrument has been factory calibrated to fully documented procedures in accordance with our ISO 9001:2008 Quality Management System.
Measurement standards are derived from volumetric and time sources which have been calibrated at an accredited laboratory traceable to National or International standards. The following list indicates the serial numbers of equipment used during the calibration procedure.

BAR02	C9559 / A12446[1]				

[1] Gas mixtures prepared using equipment traceable to N.P.L. standards against Suppliers Certificate No.

The instrument has been calibrated at a temperature of 19.1°C ± 0.25°C and a barometric pressure of 1006.4 mbar ± 2 mbar.

ION Science hereby certify that on the day of calibration the instrument was working according to the manufacturer's original sales specification as checked by the calibration procedure, unless otherwise stated.
Copies of this certificate may only be reproduced in full.
Calibrations are valid as certified only on date of Calibration. For correct instrument operation please see the User Manual.

RESULTS ON DESPATCH

Applied Concentration	Instrument Indication
100.3 ppm Isobutylene	101.2 ppm Isobutylene

The estimated applied gas uncertainty is ± 2.0%

Comments: -

PD-FM-086-07