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Environmental &
Safety Professionals

Preliminary Site Investigation 5 – 13 Louth Park Road, South Maitland New South Wales



Prepared for: Stevens Group

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Executive Summary

ESP - Environmental and Safety Professionals has been engaged by Perception Planning on behalf of Stevens Group (the client) to carry out a Preliminary Site Investigation (PSI) at 5 – 13 Louth Park Road, South Maitland NSW 2320 (the site).

The aims of the investigation were:

- Investigate previous site land uses and potential contamination types as a result of former activities;
- Provide a discussion of present site conditions;
- Provide a desktop assessment of site contamination issues;
- Investigate the suitability of site soils with respect to potential chemical contamination at limited locations; and
- Assess the need for further investigation.

Based on the findings of the PSI, the following conclusions are provided:

- A desktop review of the site history in conjunction with the observations made during the site inspection and fieldwork indicated that the sources of potential soil contaminants of concern are likely to be due imported fill material and hazardous building materials.
- Ten boreholes were advanced using a hand auger and hand tools in a judgemental manner across the site to a maximum depth of 0.7m BGL.
- No stained or odorous soils were noted during the site inspection and subsequent sample collection. Minor amounts of ash were observed within borehole BH03 and BH10.
- Potential asbestos containing material (PACM) was observed as external wall sheeting on all dwellings on the site, as well as on several sheds and outhouses. This PACM was observed to range from good condition at 13 Louth Park Rd to poor condition at 9 Louth Park Rd. Additionally, PACM fragments and debris were identified on the ground surface adjacent to the west side of the dwelling at 9 Louth Park Rd, and appeared to have originated from the dwelling which was observed to be in poor condition. A detached shed at the rear of 9 Louth Park Rd had collapsed and appeared to contain broken PACM fragments and debris.
- Collected samples were screened in the field for the presence of volatile organic compounds (VOCs) by use of a photo-ionisation detector (PID). The results of PID field screening indicated no volatile organic compounds detected in all sample locations.
- No exceedances of the adopted human health investigation level criteria (HIL-D) were detected in any of the soil samples tested for Heavy metals, TRHs, BTEXN, PAHs, Phenols, PCBs, Herbicides and Pesticides.
- Two exceedances of the adopted ecological investigation level (EIL) were reported for zinc in BH04 and BH10. These exceedances were identified at depths greater than 0.4m BGL.
- Three exceedances of the adopted EIL were reported for benzo(a)pyrene in BH01, BH03 and BH07 and showed a decreasing trend with increasing depth below ground level.
- Following statistical appraisal of analytes reporting EIL exceedances, it was confirmed that both zinc and benzo(a)pyrene exceeded the adopted ecological investigation level in fill material on the site.

- In light of the exceedances of the adopted ecological investigation level criteria, leachate testing was conducted on select samples for zinc and PAHs to determine the leachability potential of contaminants in soil into the underlying groundwater aquifer.
- Leachate testing identified no exceedances of the aesthetic, drinking water or primary contact recreation criteria for all samples analysed. However, all samples analysed for zinc exceeded the fresh water ecological criteria.
- The site is considered suitable for commercial/industrial use provided the following recommendations are implemented.

Based on the findings of the PSI, the following recommendations are provided:

- A Detailed Site Investigation (DSI) in accordance with NSW EPA (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* is required to determine the vertical delineation of chemical soil contamination, onsite groundwater chemical concentrations and assess the need for the preparation of a Remediation Action Plan (RAP).
- Any in-situ soil material required to be disposed of as part of the proposed development is to be classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines Part 1: Classifying waste* and disposed of in a licensed facility to accept such a waste.
- A hazardous materials survey should be conducted to visually and analytically identify asbestos containing material in the existing residential infrastructure, storage areas and on the soil surface at 9 Louth Park Rd prior to demolition and earthworks. If any Asbestos containing material is identified, appropriate measures should be implemented to ensure safe and suitable removal and disposal to prevent contamination of the site and exposure to and workers or potential future residents.

Contents

Document Control..... i

Executive Summary..... ii

1. Introduction 6

 1.1 Background 6

 1.2 Objectives..... 6

 1.3 Scope of Works 6

2. Site Conditions 8

 2.1 Site Identification 8

 2.2 Site Activities..... 8

 2.3 Site Inspections 8

 2.4 Topography 9

 2.5 Summary of Site Geology, Hydrogeology and Hydrology..... 9

3. Site History and Information Review 10

 3.1 Surrounding Land Use..... 10

 3.2 Site History..... 10

 3.3 Review of Historical Photographs 10

 3.4 Historical Title Information 11

 3.5 NSW Environmental Protection Authority (EPA) Databases 15

 3.6 NSW Department of Primary Industries (DPI) Office of Water Database 16

 3.7 Previous Investigations 17

 3.8 SafeWork NSW Hazardous Chemicals Site Search..... 17

4. Conceptual Site Model 18

 4.1 Chemical Hazards and Contamination Sources 18

 4.2 Potential Sensitive Receptors 18

 4.3 Potential Exposure Pathways..... 18

 4.4 Data Gaps 19

5. Site Investigations 23

 5.1 Soil Assessment Methodology 23

 5.2 Soil Investigation 23

 5.3 Field Screening and Observations..... 23

 5.4 Sample Analysis..... 24

6. Adopted Guidelines..... 25

7. Quality Assurance & Quality control..... 27

7.1	Quality Assurance Program (QA)	27
7.2	Quality Control Program (QC)	27
7.3	Soil Quality Control Samples	28
7.4	Laboratory Quality Control Samples	28
7.5	QA/QC conclusion	29
8.	Interpretation of Results	30
8.1	Laboratory Results	30
8.2	Statistical Appraisal	30
8.3	Leachate Analysis	31
8.4	Interpretation of Results	31
9.	Conclusions and Recommendations	32
9.1	Conclusions	32
9.2	Recommendations	32
10.	Limitations	34
11.	References	35
12.	Appendices	36

Appendices

Appendix I	Figures
Appendix II	Site Photographs
Appendix III	Historical Aerial Photographs
Appendix IV	Historical Titles
Appendix V	Bore Logs & Stockpiles Sampling Sheet
Appendix VI	Analytical Results Tables
Appendix VII	NATA Accredited Laboratory Reports and Chain of Custody Documentation
Appendix VIII	EIL Calculations for Selected Metals
Appendix IX	Statistical Appraisal
Appendix X	PID Calibration Certificate

1. Introduction

1.1 Background

ESP - Environmental and Safety Professionals has been engaged by Perception Planning on behalf of Stevens Group (the client) to carry out a Preliminary Site Investigation (PSI) at 5 – 13 Louth Park Road, South Maitland NSW 2320 (the site).

ESP understands that the client has requested an environmental assessment of the site in accordance with the State Environmental Planning Policy No. 55 (SEPP 55) guidelines as part of a Development Application (DA) for the construction of a service station on the site.

1.2 Objectives

The objectives of the PSI were to:

- Investigate previous site land uses and potential contamination due to former activities;
- Provide a discussion of present site conditions;
- Provide a desktop assessment of site contamination issues;
- Investigate the suitability of site soils with respect to potential chemical contamination at limited locations; and
- Assess the need for further investigation.

1.3 Scope of Works

To achieve the investigation objectives the following works were undertaken:

- **Site inspection** – a visual inspection was undertaken to identify any obvious potentially contaminating activities and/or potentially contaminated areas of the site subject to investigation.
- **Site history review** – a historical site review, including the collection and review of information pertaining to the site’s previous use, was undertaken to investigate the potential sources, types and locations of contamination.
- **Desktop review** – a desktop-based review of available information which included the following work elements relevant to site:
 - Review of published geological and hydrogeological conditions;
 - Historical title search;
 - Desktop Investigation of potentially contaminated surrounding sites; and
 - Review of NSW EPA registers.
- **Soil investigations** – eleven (ten primary and one duplicate) soil samples were collected from in-situ soils on the site with the use of hand tools. Ten bore holes were advanced onsite by hand auger to a maximum depth of 0.7 metres below ground level. Collected samples were submitted for analysis to a National Association of Testing Authorities (NATA) accredited laboratories.
- **Data Appraisal** – comparison of results with appropriate ecological and health-based guidelines.

- **Reporting** – documentation of all investigations, assessment works and results, including provision of appropriate conclusions and recommendations where required.

The site investigation was carried out in general accordance with the NSW Environment Protection Authority (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* and NSW Environment Protection Authority (2017) *Contaminated Land management: Guidelines for the NSW Site Auditor Scheme (3rd Edition)*.

2. Site Conditions

2.1 Site Identification

The site location is depicted on the site plan provided in Figure 1 of Appendix I. Relevant site details are tabulated below in Table 2.1.

Table 2.1 Summary of Site Details

Lot / Plan Description	Lot 1, 2, 3 & 4 DP 1109043 Lot 17 & 18 DP 1044795 Lot 6 DP 199882 Lot 1 DP 794525 Lot 1 DP 782 596
Address	5 – 13 Louth Park Road, South Maitland NSW 2320
Coordinates (MGA56) of the approximate centre of the site	Easting: 365159.616 Northing: 6376402.409
Local Government Authority	Maitland City Council
Site Zoning	RU1 Primary Production
Site Area	Approximately 4,450m ²
Current Land Use	Residential

2.2 Site Activities

All lots on the site are currently owned by the Bunder family (Robert Paul Bunder, Susan Maria Bunder, Guy Bunder & Nikia Bunder), with the first lot (Lot 1 DP 794525) acquired by Guy Bunder in June 2005 and the last lot (Lot 1 & 3 DP 1109043) acquired by Susan Maria Bunder in April 2019. It is understood that three dwellings on the sites (5, 11 & 13 Louth Park Rd) are currently occupied by tenants, 7 Louth Park Rd comprises a vacant grass lot, and 9 Louth Park Rd houses an unoccupied dwelling. A review of aerial photographs (see Section 3.2.1) confirmed that since 1954 the sites have only been utilised for residential purposes.

2.3 Site Inspections

A site inspection was completed on 28 August 2019. The site has an area of approximately 4,450m².

A summary of the site inspection notes for buildings and outdoor areas are presented in Table 2.2.

Table 2.2 Summary of Site Inspection

Site owner/ occupant/s	Robert Paul Bunder, Susan Marie Bunder, Guy Bunder & Nikia Bunder
Buildings & structures condition	Four residential dwellings, six detached sheds, two detached outhouses. Dwellings & structures ranging from moderate to very poor condition.
Surface type and condition	Grass covered flat site, several trees towards the west and centre of the site. All appear in good, healthy condition.
Staining / odours	None observed
Chemical storage	None observed
Fuel storage infrastructure	None observed

Other underground infrastructure	None observed
Stressed vegetation	None observed
Soil stockpiles / debris	No stockpiled material observed. Anthropogenic debris observed within boreholes including metal, glass, concrete and brick.
Asbestos containing material	Potential asbestos containing debris was observed from Lot 4 DP 1109043. Potential asbestos containing material was observed on all dwellings.

2.4 Topography

At the time of the investigation topography was noted to comprise of relatively flat terrain. A review of site topography via Google Earth indicated elevation around 6-8 metres AHD.

2.5 Summary of Site Geology, Hydrogeology and Hydrology

Geological, hydrogeological and hydrology features at and in the vicinity of site (as reviewed on 9 September 2019) are described in Table 2.3.

Table 2.3 Summary of Geological, Hydrogeological and Hydrology

Feature		Site Description	Source
Geology		Reference to the <i>Newcastle 1:100,000 Geological Series (Sheet 9132, Edition 1, 1975) Map</i> indicates the site is described as forming in the Cainozoic era during the Quaternary period, comprising of gravel, sand and silt (mapping code Qa).	Department of Planning & Environment, Resources & Energy (2019) <i>Geological Maps data base</i>
Acid Sulphate Soils		The site is mapped as being within a Class 4 Acid Sulphate Soils zone	NSW Department of Environment, Climate Change & Water Acid Sulphate Soils maps
Surface Water		The closest surface water is Lynes Canal approximately 420m northeast of the site	Google Pro
Regional Groundwater	Quality	Not Disclosed	NSW DPI – Office of Water geospatial database
	Depth	3.7m at well I.D. GW028696, located approximately 20m east of the site	NSW DPI – Office of Water geospatial database
	Flow Direction	Likely towards the Northeast	Google Earth Pro

3. Site History and Information Review

3.1 Surrounding Land Use

Surrounding land uses noted at the time of the site inspection are summarised below in Table 3.1.

Table 3.1 Surrounding Land Use Summary

Location	Site/ Features
North	Residential/Commercial
East	Residential/Agricultural
South	Residential/Agricultural/Commercial
West	Residential/Commercial/Recreation

3.2 Site History

The review of site history made available for the PSI included the following:

- Review of historical aerial images;
- Historical Title Information; and
- Search of the NSW Environmental Protection Authority Databases

3.3 Review of Historical Photographs

A review of available historical photographs was conducted from images which incorporated the site and surrounding area. Historical photographs are presented in Appendix III and a chronological summary is presented in below in Table 3.2.

Table 3.2 Summary of Historical Aerial Photographs

Date	Comments	Source
1954	Residential dwellings on the sites. Rail overpass approx. 75m to the northwest of the sites. Louth Park Rd turns to the northeast and runs adjacent to the boundaries of 5 & 7 Louth Park Rd.	Spatial Services - Department of Finance, Services & Innovation
1976	No changes observed on site. More dwellings in surroundings, including dwellings opposite 5 & 7 Louth Park Rd; between Louth Park Rd and the rail overpass.	Spatial Services - Department of Finance, Services & Innovation
1993	No changes observed on site. Rail overpass has been demolished, Louth Park Rd has been straightened to its present configuration, and the New England Highway has been upgraded its present configuration. Service station established opposite Louth Park Rd.	Spatial Services - Department of Finance, Services & Innovation
23/09/2006	No changes observed on site and surroundings.	Google Earth Pro
24/08/2012	Small shed at southeast corner of Lot 1 DP 1109043 has been demolished. Large metal shed built in rear yard of 13 Louth Park Rd, with large tree formerly in the yard removed.	Google Earth Pro
11/10/2013	Front porch appears to have been built on dwelling at 9 Louth Park Rd.	Google Earth Pro
23/06/2016	Shed behind dwelling at 5 Louth Park Rd has been demolished.	Google Earth Pro
27/08/2016	Small shed has been built in southern corner of 5 Louth Park Rd.	Google Earth Pro

3.4 Historical Title Information

A historical title search was conducted by InfoTrack Pty Ltd. and a summary of the title holders with potential to cause site contamination is provided below in Table 3.3. Title search documentation is provided in Appendix IV.

Table 3.3 Summary of Relevant Historical Title Holder Information.
As regards Lot 17 in D.P. 1044795

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
21.01.1922 (1922 to 1946)	George Duke (Second-Hand Dealer) (& his deceased estate)	Book 1248 No. 601
06.06.1946 (1946 to 1946)	George Thomas James Eastcott (Shop Assistant)	Book 1993 No. 352
12.07.1946 (1946 to 1955)	Eric Lyall Payne (Carpenter)	Book 1993 No. 353
11.07.1955 (1955 to 1975)	Wesley Albert Freeman (Retired Slaughterman) (& his deceased estate)	Book 2339 No. 993
05.05.1975 (1975 to 1981)	Stephen Robert McDonald (Skin Buyer)	Book 3188 No. 591
13.03.1981 (1981 to 2008)	Robert Garner Watson (Labourer) Elizabeth Ann Watson (Married Woman)	Book 3456 No. 794 Now 17/1044795
21.01.2008 (2008 to 2016)	Elizabeth Ann Watson	17/1044795
10.02.2016 (2016 to date)	# Robert Paul Bunder	17/1044795

Denotes current registered proprietor

As regards Lot 18 in D.P. 1044795

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
03.07.1925 (1925 to 1937)	Frederick James Palin (Labourer)	Book 1392 No. 968
27.07.1937 (1937 to 1944)	Mary May Richmond Walker (Married Woman)	Book 1789 No. 874
22.08.1944 (1944 to 1946)	Clara May Eastcott (Married Woman)	Book 1949 No. 306
12.07.1946 (1946 to 1955)	Eric Lyall Payne (Carpenter)	Book 1993 No. 354
11.07.1955 (1955 to 1975)	Wesley Albert Freeman (Retired Slaughterman) (& his deceased estate)	Book 2339 No. 993
05.05.1975 (1975 to 1981)	Stephen Robert McDonald (Skin Buyer)	Book 3188 No. 591
13.03.1981 (1981 to 2015)	Robert Garner Watson (Labourer) Elizabeth Ann Watson (Married Woman)	Book 3456 No. 794 Now 18/1044795
21.11.2015 (2015 to 2016)	Elizabeth Ann Watson	18/1044795
04.02.2016 (2016 to date)	# Robert Paul Bunder	18/1044795

Denotes current registered proprietor

As regards Lot 6 in D.P. 199882

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
30.06.1921 (1921 to 1947)	Kate Johnston (Widow)	Book 1228 No. 482
20.08.1947 (1947 to 1950)	Alick William Johnston (Butcher) Catherine Jean Johnston (Married Woman)	Book 2031 No. 155
24.11.1950 (1950 to 1975)	Wesley Albert Freeman (Butcher) (& his deceased estate)	Book 2151 No.345
05.05.1975 (1975 to 1981)	Stephen Robert McDonald (Skin Buyer)	Book 3188 No. 591
13.03.1981 (1981 to 2015)	Robert Garner Watson (Labourer) Elizabeth Ann Watson (Married Woman)	Book 3456 No. 794 Now 6/199882
21.11.2015 (2015 to 2016)	Elizabeth Ann Watson	6/199882
04.02.2016 (2016 to date)	# Robert Paul Bunder	6/199882

Denotes current registered proprietor

As regards Lot 1 in D.P. 794525

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
31.05.1921 (1921 to 1927)	Kate Johnston (Widow)	Book 1224 No. 452
07.06.1927 (1927 to 1948)	Ann Smith (Married Woman)	Book 1474 No. 296 (Book 2031 No. 155)
19.03.1948 (1948 to 1951)	Percival Ayliffe (Iron Worker's Assistant)	Book 2048 No. 228
21.03.1951 (1951 to 1982)	Richard William Ribee (Accountant)	Book 2166 No. 101
07.10.1982 (1982 to 1990)	Robert Noel Williams (Leading Hand) Lorraine June Williams (Married Woman)	Book 3775 No. 960 Now 1/794525
01.03.1990 (1990 to 2001)	Paratat Pty Limited	1/794525
07.05.2001 (2001 to 2005)	Andrew John Murton	1/794525
29.06.2005 (2005 to 2013)	Guy Bunder	1/794525
20.02.2013 (2013 to date)	# Guy Bunder # Nikia Bunder	1/794525

Denotes current registered proprietor

As regards Lot 4 in D.P. 1109043

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
08.04.1925 (1925 to 1962)	Charles Henry English (Carter) Lilian May English (Married Woman)	Vol 1383 Fol 173
09.02.1962 (1962 to 1990)	Frank Deren (Labourer)	Vol 2606 Fol 160
24.04.1990 (1990 to 2001)	Paratat Pty Limited	Vol 3814 Fol 229
03.04.2001 (2001 to 2013)	Andrew John Murton	Vol 4458 Fol 693 Now 4/1109043
20.02.2013 (2013 to date)	# Guy Bunder # Nikia Bunder	4/1109043

Denotes current registered proprietor

As regards Lot 1 in D.P. 782596

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
17.04.1909 (1909 to 1965)	Adelaide Dimmock (Married Woman) (& her deceased estate)	Book 892 No. 385
10.02.1965 (1965 to 1989)	Czesow Kolasa (Steelworker) Now Czeslaw Kolasa (& his deceased estate)	Book 2749 No. 452
23.11.1989 (1989 to 2007)	Hammelore Kolasa (Widow) Now Hannelore Kolasa	Book 3794 No. 795 Now 1/782596
26.11.2007 (2007 to 2009)	Bernhard Kolasa (Transmission Application)	1/782596
30.06.2009 (2009 to 2013)	Ty Matthew Robson Jodie Lea Robards	1/782596
16.08.2013 (2013 to 2015)	Ben Paul Taylor	1/782596
18.03.2015 (2015 to date)	# Robert Paul Bunder	1/782596

Denotes current registered proprietor

As regards Lots 1 and 3 in D.P. 1109043

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
01.01.1911 (1911 to 1960)	Victoria Myrtle Rutherford (Spinster)	Book 2482 No. 809
26.09.1960 (1960 to 1961)	Daphne Lucy Tinson (Rigger)	Book 2552 No. 511
28.02.1961 (1961 to 1964)	Andras Horvath (State Spinner) Rozalia Horvath (Married Woman)	Book 2590 No. 38
30.01.1964 (1964 to 2019)	Karel Cerveny (Textile Worker) (& her deceased estate)	Book 2712 No. 245 Now 1/1109043 & 3/1109043
17.04.2019 (2019 to 2019)	Susan Maria Bunder	1/1109043 & 3/1109043
08.05.2019 (2019 to date)	# Robert Paul Bunder # Susan Maria Bunder	1/1109043 & 3/1109043

Denotes current registered proprietor

Note: It is understood that John Rutherford was in ownership of this land prior to 1911, pursuant to the recitals in Book 2482 No. 809. This has not been investigated prior to 1911.

As regards Lot 2 DP 1109043

InfoTrack Pty Ltd noted that, with regards to Lot 2 DP 1109043, no computer title had been issued for this property. Based on preliminary findings, it is likely that the current owner of adjoining lands (i.e. the owner of Lot 1 DP 1109043) also occupy this land by way of possession and not by documentary ownership.

3.5 NSW Environmental Protection Authority (EPA) Databases

A search of the NSW EPA Contaminated Land Record under section 58 of the CLM Act (1997) was conducted on 9 September 2019. According to the EPA records, there were no records for the site. However, the former Maitland Gasworks approximately 750m north-west of the site has two current notices. No other sites were reported within 1 Km radius of the site.

A search of the list of contaminated sites notified to the NSW EPA under Section 60 of the Contaminated Land Management Act 1997 (CLM Act) was undertaken on 9 September 2019. The site was not listed on the contaminated site list. One site (Coles Express Service Station) located approximately 350 m north of the site was listed as not requiring Regulation under CLM Act and the former Maitland Gasworks approximately 750m northwest of the site was listed as “Contamination currently regulated under CLM Act”. No other sites were listed within 1 Km radius of the site.

A search of the public register maintained by the NSW EPA under section 308 of the *Protection of the Environment Operations Act 1997* (POEO Act) was undertaken on 9 September 2019. There were no environmental protection licenses, applications, notices, audits and pollution studies identified in the register for the site. Records for Maitland City Council and Department of Primary Industries – Land were found, and a summary presented below. No other records within 1 Km radius of the site.

Table 3.4 Summary of POEO Public Register

Number	Name	Location	Type	Status	Issue Date
10393	MAITLAND CITY COUNCIL	MAITLAND, NSW 2320	POEO licence	Issued	27 Jan 2000
1005556	MAITLAND CITY COUNCIL	MAITLAND, NSW 2320	s.58 Licence Variation	Issued	15 May 2001
1524567	MAITLAND CITY COUNCIL	MAITLAND, NSW 2320	s.58 Licence Variation	Issued	06 Feb 2015
12439	STATE OF NEW SOUTH WALES (Department of Primary Industries - Lands)	Waterways within the Hunter Valley Flood Mitigation Scheme, MAITLAND, NSW 2320	POEO licence	Surrendered	13 Feb 2007
1504670	STATE OF NEW SOUTH WALES (Department of Primary Industries - Lands)	Waterways within the Hunter Valley Flood Mitigation Scheme,	s.58 Licence Variation	Issued	12 Sep 2012

		MAITLAND, NSW 2320			
1528943	STATE OF NEW SOUTH WALES (Department of Primary Industries - Lands)	Waterways within the Hunter Valley Flood Mitigation Scheme, MAITLAND, NSW 2320	s.58 Licence Variation	Issued	12 Mar 2015
1529614	STATE OF NEW SOUTH WALES (Department of Primary Industries - Lands)	Waterways within the Hunter Valley Flood Mitigation Scheme, MAITLAND, NSW 2320	s.80 Surrender of a Licence	Issued	09 Jun 2015

3.6 NSW Department of Primary Industries (DPI) Office of Water Database

A search of the DPI Office of Water Database was conducted on the 9 September 2019. The search identified a total of eight groundwater bores within a 500-metre radius to the site. A summary table is presented in Table 3.5 below.

Table 3.5 Summary of Groundwater Bores

Bore ID	License Number	Purpose	Status	SWL (m)	Final Depth (m)	Completion Date	Distance & Direction from Site
GW200409	N/A	N/A (presumed monitoring)	N/A	N/A	9.25	06/09/2004	30m West
GW200411	N/A	N/A (presumed monitoring)	N/A	N/A	8.50	07/09/2004	40m Northwest
GW200410	N/A	N/A (presumed monitoring)	N/A	N/A	2.40	06/09/2004	50m Northwest
GW028696	N/A	Not Known	N/A	3.70	9.10	01/10/1968	25m East
GW200406	N/A	N/A (presumed monitoring)	N/A	N/A	9.15	07/09/2004	70m West
GW200658	N/A	Stock, Domestic	N/A	21.60	102.00	04/12/2007	140m West
GW201106	N/A	Recreation	N/A	7.20	14.50	27/09/2007	310m West
GW060027	N/A	Irrigation	N/A	N/A	11.90	09/09/1983	310m East-Southeast

3.7 Previous Investigations

No previous investigations or reports for the site have been provided to ESP by the client. ESP understands that this 'phase 1' investigation is an initial part of development application for the property.

3.8 SafeWork NSW Hazardous Chemicals Site Search

No SafeWork NSW Hazardous Chemical register has been provided to ESP by the client, however as the current site use is residential a register is not required to be kept. ESP also conducted a visual assessment during the site investigation and no potential sources for chemical contamination were observed on the site.

4. Conceptual Site Model

In accordance with *Schedule B2 – Guideline on Site Characterisation* of the National Environment Protection Council (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM)* (as amended 2013) and to aid the investigation of the site, ESP developed a preliminary conceptual site model (CSM) assessing plausible pollutant linkages between potential contamination sources, migration pathways and receptors. The CSM also provides a framework for the review of the reliability and useability of the data collected and to identify data gaps in the existing site characterisation.

4.1 Chemical Hazards and Contamination Sources

Based on site observations and available information pertaining to past site land use, Table 4.1 presents potential contamination sources and activities that may have contributed to soil, groundwater or surface water contamination at site are:

- Possible Imported fill at the site;
- Potential for pesticides being sprayed at the site; and
- Potential Building Hazardous Materials.

4.2 Potential Sensitive Receptors

For the purpose of this investigation, 'receptors' includes people, structures, utilities, ecological receptors and water supply wells that are or may be adversely affected by the contaminants of concern.

The following receptors were identified:

- Residents;
- Site workers;
- Maintenance workers;
- Lynes Canal & Wallis Creek;
- Site visitors;
- Downstream offsite residents;
- Underlying Bedrock Aquifer.

4.3 Potential Exposure Pathways

A pathway is a means by which the source (contaminants in soil or groundwater) can contact the identified receptors. Where no pathway exists, there is no risk to the receptor, because exposure cannot occur.

Based on ESP's understanding of site conditions, the potential exposure pathways and receptors are listed below and within Table 4.1.

Potential exposure pathways identified by ESP include:

- Dermal contact, inhalation (dust or vapours) or ingestion of exposed impacted soils;
- Leaching of contaminants and migration of impacted groundwater;

- Surface water run-off and sediment transport; and
- Inhalation or ingestion of exposed hazardous building materials.

4.4 Data Gaps

Based on the site investigations completed to date, the following data gaps have been identified:

- Current levels of contaminants of concern in in-situ soil including Heavy metals (As, Cd, Cr (Total), Cu, Pb, Hg, Ni, Zn), Polycyclic Aromatic Hydrocarbons (PAHs), Total Recoverable Hydrocarbons (TRHs), Benzene, Toluene, Ethylbenzene and Xylene and Naphthalene (BTEXN), Phenols and Pesticides;
- Current levels of contaminants of in groundwater including Heavy metals (As, Cd, Cr (Total), Cu, Pb, Hg, Ni, Zn), Polycyclic Aromatic Hydrocarbons (PAHs), Total Recoverable Hydrocarbons (TRHs), Benzene, Toluene, Ethylbenzene and Xylene and Naphthalene (BTEXN), Phenols and Pesticides; and
- Current hazardous building materials.

Table 4.1. Conceptual Site Model

Primary Contaminant Sources	Release Mechanism	Contaminants of Concern	Potential Receptors		Potential Exposure Pathways	Complete Linkages	Risk	Further Assessment Required
			Current	Future				
Imported fill	Leaching, surface runoff and sediment transport.	Heavy metals, MAH, PAH, BTEXN, TRH, Phenols, Pesticides, Herbicides	Residents, site visitors	Site users/workers, maintenance workers, site visitors	Dermal contact, inhalation (dust or vapours) or incidental ingestion of exposed impacted soils.	Yes	Moderate	Yes – Concentrations of contaminants of concern in soils required.
			Underlying Bedrock Aquifer		Extraction and use of groundwater. Incidental ingestion of groundwater. Migration of impacted groundwater.	Limited	Low	Yes – Onsite use of groundwater was not observed/reported. However, considering that there is a potential for soil contaminants to leach to groundwater, a leachate test (TCLP) is needed to determine risk to groundwater.
			Downstream Offsite Residents					Yes – Offsite use of groundwater is known to be used for stock, irrigation and domestic use based on registered groundwater wells reported within 500m of the site. A leachate test (TCLP) is needed to determine risk to offsite users.

Primary Contaminant Sources	Release Mechanism	Contaminants of Concern	Potential Receptors		Potential Exposure Pathways	Complete Linkages	Risk	Further Assessment Required
			Current	Future				
			Lynes Canal & Wallis Creek		Recreational use of impacted surface water. Incidental ingestion of surface water. Ingestion of fish.			No – Contamination of the Creek unlikely due to dilution, dispersion effects and natural attenuation of organics.
Potential for pesticides being sprayed or injected on soils	Leaching, surface runoff and sediment transport	OCPs, OPPs	Residents, site visitors	Site users/workers, maintenance workers, site visitors	Dermal contact, inhalation (dust or vapours) or ingestion of exposed material	Yes	Moderate	Yes – Concentrations of contaminants of concern in soils required.
			Underlying Bedrock Aquifer		Extraction and use of groundwater. Incidental ingestion of groundwater.	Limited	Low	No – Onsite use of groundwater was not observed/reported. Offsite use of groundwater unlikely as this is an area known to have reticulated water supply. No groundwater wells exist within 500m of the site.
			Downstream Offsite Residents					Yes – Offsite use of groundwater is known to be used for stock, irrigation and domestic use. Groundwater wells exist within 500m of the site.

Primary Contaminant Sources	Release Mechanism	Contaminants of Concern	Potential Receptors		Potential Exposure Pathways	Complete Linkages	Risk	Further Assessment Required
			Current	Future				
			Lynes Canal & Wallis Creek		Recreational use of impacted surface water. Incidental ingestion of surface water. Ingestion of fish.			No – Contamination of the Creek unlikely due to dilution, dispersion effects and natural attenuation of organics.
Potential Building Hazardous Materials	Fire/water damage, weathering, modification	Asbestos	Site workers, maintenance workers, site visitors, residents	Residents, site visitors	Inhalation (dust) or ingestion of disturbed materials.	Limited	Moderate	Yes. Pre-demolition Hazardous Materials Survey required.

5. Site Investigations

5.1 Soil Assessment Methodology

Soil sampling techniques and reporting were undertaken with reference to Standards Australia (2005) *AS4482.1 - Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds (AS4482.1)* and National Environment Protection Council (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM) (as amended 2013)*.

5.2 Soil Investigation

On 28 August and 5 September 2019, ten primary (BH01 – BH10) and one duplicate (DP_28819) soil samples were collected across the site in a judgemental manner with the use of a hand auger and hand tools to a maximum depth of 0.7 m BGL. The borehole locations are depicted in Figure 2 of Appendix I.

Samples were placed in 250ml glass sample containers, immediately sealed with a Teflon-lined screw cap lid and placed in a cool, dark environment prior to being forwarded to a NATA accredited analytical laboratory within specified holding times. Samples submitted to the laboratory were accompanied by chain of custody documentation. A copy of laboratory reports and the completed chain of custody form is presented in Appendix VII.

During advancement of the boreholes, detailed logs of subsurface conditions were recorded and are provided in Appendix V.

5.3 Field Screening and Observations

Field screening and observations recorded during the investigation are provided in the Borehole Log Field sheets in Appendix V. No stained or odorous soils were noted during the site inspection and subsequent sample collection. Minor amounts of ash were observed in boreholes BH03 and BH10.

Potential asbestos containing material (PACM) was observed as external wall sheeting on all dwellings on the site, as well as on several sheds and outhouses. This PACM was observed to range from good condition at 13 Louth Park Rd to poor condition at 9 Louth Park Rd. Additionally, PACM fragments and debris were identified on the ground surface adjacent to the west side of the dwelling at 9 Louth Park Rd, and appeared to have originated from the dwelling which was observed to be in poor condition. A detached shed at the rear of 9 Louth Park Rd had collapsed and appeared to contain broken PACM fragments and debris.

No samples of PACM were collected during the site investigation. No dwellings, sheds or outhouses were internally inspected for the presence of hazardous building materials. Recommendations for the assessment of PACM and hazardous building materials are contained within Section 9.2.

A summary of soils encountered during the investigation is provided in Table 5.1 below.

Table 5.1 Soil Classification and Description

Classification	Description	Depth Range (m)
Fill	Silty SAND – brown, moist, dense	0.0-0.6
Natural	CLAY – light grey, moist, soft	0.7

Collected samples were screened in the field for the presence of volatile organic compounds (VOCs) by use of a photo-ionisation detector (PID). Samples were collected into a plastic zip-lock bags, filled approximately halfway allowing sufficient air space (i.e. headspace) above the sample, and the headspace was measured for VOC concentration with the PID. The results of PID field screening is presented on bore logs in Appendix V and indicated no volatile organic compounds detected in all sample locations.

The site currently holds four residential dwellings, six detached sheds and two detached outhouses. These structures were observed to range from good condition in the large metal shed at the rear of 13 Louth Park Rd, to very poor condition in the dwelling, detached sheds and outhouse at 9 Louth Park Rd which appeared to be abandoned and structurally unsecure.

5.4 Sample Analysis

Analysis of collected soil samples was performed by a National Association of Testing Authorities (NATA) accredited laboratory (Eurofins MGT) in accordance with recognised analytical methodologies. Selected soil samples were submitted for analysis for all or a selection of the following parameters:

- Metals (As, Be, B, Cd, Co, Cr (Total), Cr (VI), Cu, Pb, Hg, Mn, Mo, Ni, Se, Zn);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Total Recoverable Hydrocarbons (TRHs);
- Volatile Organic Compounds (VOCs);
- Benzene, Toluene, Ethylbenzene and Xylene and Naphthalene (BTEXN);
- Phenols;
- Organochlorine Pesticides (OCPs);
- Organophosphorus Pesticides (OPPs);
- Acid Herbicides;
- Cation Exchange Capacity (CEC);
- pH; and
- TCLP analysis of specific contaminants (PAHs, Cu, Pb, Zn).

6. Adopted Guidelines

For the purpose of assessing results of soil sample analysis, primary reference has been made to soil investigation levels from National Environment Protection Council (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM) (as amended 2013)* as listed in Table 6.1.

Table 6.1 Soil Investigation Levels

Adopted Guidelines	Rationale
NEPM, 2013 Soil HILs and HSLs	Soil Health Investigation Levels (HILs): As the site is currently utilised for Residential land use and is proposed to change to Industrial/Commercial land use, reported analytical results were assessed against the industrial/commercial criteria detailed in the NEPM 2013 (i.e. HIL-D).
	Soil Health Screening Levels (HSLs): Soil concentrations to be assessed against NEPM 2013 HSL-D levels for industrial/commercial sites.
NEPM, 2013 Soil EILs and ESLs	Ecological Investigation Levels (EILs): Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) have been adopted in accordance with the NEPM in an industrial/commercial land use acceptance level.
	Ecological Screening Levels (ESLs): ESLs for aged copper, nickel and zinc were calculated in accordance with the NEPM using site-specific pH and cation exchange values (i.e. pH=6.3 and CEC=18.6 cmol/kg) and based on low traffic adjacent site, unless stated otherwise.

Where guidance is not provided within the above publications, reference has been made to guideline values from alternate sources.

Leachate Criteria

Where exceedances of the soil investigation levels are identified, leachate testing of soil samples will be conducted to determine the leachability potential of contaminants to the underlying groundwater aquifer and to establish potential risk to offsite receptors/groundwater users. There are currently no leachate-based criteria for soils relating to offsite impacts of leaching contaminants. In lieu of this, reference has been made to trigger levels detailed within the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, August 2018) and *NHMRC/NRMMC Australian Drinking Water Guidelines 2011. Version 3.5 Updated August 2018*.

Table 6.2 Leachate Investigation Levels

Adopted Guidelines	Rationale
<i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018)</i>	Default Guideline value (DGV) for Fresh Water Based on the proximity of Wallis Creek to the assessment area, the DGV for fresh water ecosystems will be adopted for leachate assessment.

<p><i>NHMRC/NRMMC Australian Drinking Water Guidelines 2011 Version 3.5 Updated August 2018</i></p>	<p>Health-based Screening Levels (HSLs) Based on the identification of offsite groundwater used for irrigation, recreation, stock and domestic uses, trigger values for drinking water guidelines (health and aesthetic) and primary contact recreation have been adopted.</p>
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Aesthetic Criteria

There are currently no aesthetic based criteria for soils. However, consideration has been given to the following aesthetic condition of the soil:

- Discolouration and staining;
- Offensive odours; and
- Presence of waste products (e.g. metals, plastics, building debris etc.)

7. Quality Assurance & Quality control

7.1 Quality Assurance Program (QA)

To satisfy the overall objectives of the assessment, ESP implemented a quality assurance program during the assessment which included:

- The use of appropriately trained and qualified environmental scientists or technicians to perform the works;
- Decontamination and calibration (where required) of field measurement and sampling equipment;
- The use of standardised field sheets;
- The use of chain of custody procedures to provide sample traceability during transport and handling (refer Appendix VII for completed chain of custody forms)
- Storage of collected samples in laboratory prepared containers in a cool, dark environment prior to submission to the laboratory within specified holding times;
- The use of NATA accredited laboratories for analysis of collected samples; and
- Review of quality control information provided in the laboratory reports.

Equipment Decontamination

Prior to and following collection of each sample, all non-disposable sampling equipment underwent decontamination. The decontamination process incorporated the following:

- Removal of any significant adhering soils or sediments;
- Washing of equipment with phosphate-free detergent;
- Rinsing of equipment with fresh water;
- Final rinsing of equipment with de-ionised water; and
- Air drying of equipment prior to use.

7.2 Quality Control Program (QC)

A quality control program was implemented to identify data irregularities which may be attributable to activities undertaken during the quality assurance program. Quality control samples were collected and/or tested to identify data irregularities as sourced from cross contamination, inconsistent sampling methodologies and/or laboratory analytical techniques.

Relative percentage differences (RPDs) were calculated for results from the reported sample pairs (refer equation below) and compared to the 50% limit as detailed in Australian Standard AS4482.1, 2005 to determine whether data variation is acceptable.

$$\text{Relative Percentage Difference (RPD) (\%)} = \frac{\langle C_o - C_s \rangle}{\left\langle \frac{C_o + C_s}{2} \right\rangle} \times 100$$

C_o = concentration obtained from the original sample.

C_s = concentration obtained from the replicate or split sample.

The quality control program performed during this assessment involved the collection and/or analyses of the following samples.

- *Blind Replicate Sample* - replicate sample was submitted to the primary laboratory for analysis as two individual samples without notification to the laboratory that they have been replicated. Blind replicates were analysed at a target rate of one sample per twenty primary samples analysed.
- *Laboratory Quality Control* - as part of their NATA Accreditation, the primary laboratory performed internal duplicate analysis of samples and compared them to applicable guidelines. Sample spikes are also conducted to assess the extent of the matrix bias (recovery interface) and sample to sample precision. In addition, internal laboratory blank samples are run to assess the potential for laboratory equipment errors.

7.3 Soil Quality Control Samples

During the PSI, laboratory analysis was conducted on a total of 10 primary soil samples and 1 blind replicate soil sample. The results of the analysis of soil quality control samples collected are provided in Analytical Results Table 2 within Appendix VI.

Blind Replicate Sample

One blind replicate sample (DP_28819) was collected during the PSI and submitted to the primary laboratory for analysis. A summary of the results is given below:

- One primary (BH09_0.5) and blind replicate (DP_28819) sample were submitted for analysis of Heavy Metals. All RPD were within the 50% limit referenced from Australian Standards AS4482-1 (2005), with the exception of Mercury.

7.4 Laboratory Quality Control Samples

Eurofins | mgt, a National Association of Testing Authorities (NATA) accredited laboratory, was engaged as the primary laboratory. An assessment of the quality control results, including laboratory blanks, matrix spikes and duplicates has been undertaken and summarised below for the soil samples collected.

Primary Laboratory – Eurofins | mgt

A review of the quality control information contained within the laboratory report confirmed:

- All method blank samples indicated levels below the detection limit for the analytical method;
- Percentage recoveries for laboratory control samples ranged between the laboratory limits of 70% to 130% and were within acceptance limits;
- Percentage recoveries for spiked samples ranged between the laboratory limits of 70% to 130% and were within acceptance limits; and
- Relative percent differences (RPDs) RPDs for the duplicate samples were in the between the laboratory limits of range of < 1% to 30.0% and were within acceptance limits, with the exception of TRH >C34-C40. The laboratory report contained a note for this exceedance, stating that the RPD reported passes Eurofins | mgt's QC – Acceptance Criteria as defined in the internal quality control review.

7.5 QA/QC conclusion

Based on the above information relating to the quality assurance/quality control program undertaken during the PSI, it is the opinion of ESP that an acceptable degree of confidence in equipment decontamination, sample collection, transport and laboratory analysis has been achieved and is satisfactory and suitable for the purposes of the assessment.

From an overall perspective it is concluded that the data set provides sufficient understanding of potential site contamination.

8. Interpretation of Results

Summaries of all analytical results compared to the relevant health based and ecological criteria are provided in Analytical Results Table 1&2 within Appendix VI and the NATA accredited laboratory reports and relevant chain of custody documentation are presented in Appendix VII.

8.1 Laboratory Results

8.1.1. Health Investigation Levels

No exceedances of the adopted human health-based criteria (HIL-D) were detected in any of the soil samples tested for Heavy metals, TRHs, BTEXN, PAHs, Phenols, PCBs, Herbicides and Pesticides.

8.1.2. Ecological Investigation Levels

No exceedances of the adopted ecological investigation level criteria (EIL) were detected in any of the soil samples tested for TRHs, BTEXN, Phenols, PCBs, Herbicides and Pesticides.

8.1.2.1. Zinc

A total of two (2) exceedances of the adopted EIL were reported. These exceedances were identified at depths greater than 0.4m BGL.

8.1.2.2. Benzo(a)pyrene

A total of three (3) exceedances of the adopted EIL were reported. These exceedances were identified in boreholes BH01, BH03 and BH07, and showed a decreasing trend with depth below ground level.

8.2 Statistical Appraisal

In accordance with the NEPM, site soil concentrations are considered to be reported below the nominated investigation level where: the average concentration of an analyte is below the relevant investigation level, no single concentration exceeds the investigation level by greater than 250% and the standard deviation does not exceed 50% of the investigation level.

Statistical analysis was conducted on zinc and benzo(a)pyrene concentrations across the site. Due to limited data for benzo(a)pyrene, statistical analysis was carried out using Excel and an online Confidence Level Calculator. Results of the statistical appraisal in fill on the site are presented below and calculations for zinc (using ProUCL 5.1) are shown in Appendix IX.

Table 8.2 Statistical appraisal of analytes reporting EIL/ESL exceedances in soils

Analyte	mg/kg					Statistics			
	NEPM Ecological Criteria	Mean Conc.	Max Conc.	Standard Dev.		The average concentration is above the relevant investigation level	Standard Deviation Exceeds >50% of Investigation Level	Single value exceeds 250% of Investigation Level	95% UCL
FILL									
Zinc	Ecological Criteria	870	598	2,700	762.3	No	Yes	Yes	1,307
Benzo(a)pyrene	Ecological Criteria	1.4	3.6	8.9	3.58	Yes	Yes	Yes	6.64

Following statistical appraisal of analytes reporting EIL exceedances, it was confirmed that both zinc and benzo(a)pyrene exceeded the adopted ecological investigation level in fill material on the site.

8.3 Leachate Analysis

In light of the exceedances of the adopted ecological investigation level criteria, leachate testing was conducted on select samples for Zinc and PAHs to determine the leachability potential of contaminants in soil into the underlying groundwater aquifer.

Leachate test (TCLP analysis) of borehole samples BH01_0.1, BH07_0.3 and BH10_0.7 for PAHs reported values below detection, indicating that the leaching of benzo(a)pyrene in-situ soil is not occurring. Therefore, the risk to downstream offsite anthropogenic and ecological receptors is very low.

Leachate test (TCLP analysis) of borehole samples BH01_0.2, BH02_0.05, BH03_0.5, BH04_0.4, BH05_0.2, BH06_0.2, BH07_0.3, BH08_0.4 and BH10_0.7 for Zinc reported values below the Australian Drinking Water Guidelines aesthetic criteria and primary contact recreation for all sampling locations. However, all sampling locations were above the adopted (DGV) water quality criteria.

8.4 Interpretation of Results

ESP understands that the site will be predominantly hardstand surface and access to soil will be limited. As a result, potential health impacts on future site users is unlikely.

It is anticipated that horizontal delineation of chemical concentrations across the site will not be achieved given the exceedances of ecological criteria for zinc and benzo(a)pyrene showed no geographical confinement to any one area on the site. It is also likely that adjacent offsite soils will show similar chemical concentrations. As a result, exceedances in ecological soil criteria are likely to pose a risk to onsite ecological receptors (i.e. groundwater). Additionally, given that exceedances of the adopted leachate criteria were reported, offsite downstream impacts cannot be disregarded. The site is deemed suitable for commercial/industrial land use, provided that recommendations in Section 9.2 are implemented.

9. Conclusions and Recommendations

9.1 Conclusions

Based on the findings of the PSI, the following conclusions are provided:

- A desktop review of the site history in conjunction with the observations made during the site inspection and fieldwork indicated that the sources of potential soil contaminants of concern are likely to be due imported fill material and hazardous building materials.
- Ten boreholes were advanced using a hand auger and hand tools in a judgemental manner across the site to a maximum depth of 0.7m BGL.
- No stained or odorous soils were noted during the site inspection and subsequent sample collection. Minor amounts of ash were observed within borehole BH03 and BH10.
- Potential asbestos containing material (PACM) was observed as external wall sheeting on all dwellings on the site, as well as on several sheds and outhouses. This PACM was observed to range from good condition at 13 Louth Park Rd to poor condition at 9 Louth Park Rd. Additionally, PACM fragments and debris were identified on the ground surface adjacent to the west side of the dwelling at 9 Louth Park Rd, and appeared to have originated from the dwelling which was observed to be in poor condition. A detached shed at the rear of 9 Louth Park Rd had collapsed and appeared to contain broken PACM fragments and debris.
- Collected samples were screened in the field for the presence of volatile organic compounds (VOCs) by use of a photo-ionisation detector (PID). The results of PID field screening indicated no volatile organic compounds detected in all sample locations.
- No exceedances of the adopted human health investigation level criteria (HIL-D) were detected in any of the soil samples tested for Heavy metals, TRHs, BTEXN, PAHs, Phenols, PCBs, Herbicides and Pesticides.
- Two exceedances of the adopted ecological investigation level (EIL) were reported for zinc in BH04 and BH10. These exceedances were identified at depths greater than 0.4m BGL.
- Three exceedances of the adopted EIL were reported for benzo(a)pyrene in BH01, BH03 and BH07 and showed a decreasing trend with increasing depth below ground level.
- Following statistical appraisal of analytes reporting EIL exceedances, it was confirmed that both zinc and benzo(a)pyrene exceeded the adopted ecological investigation level in fill material on the site.
- In light of the exceedances of the adopted ecological investigation level criteria, leachate testing was conducted on select samples for zinc and PAHs to determine the leachability potential of contaminants in soil into the underlying groundwater aquifer.
- Leachate testing identified no exceedances of the aesthetic, drinking water, or primary contact recreation criteria for all samples analysed. However, all samples analysed for zinc exceeded the fresh water ecological criteria.
- The site is considered suitable for commercial/industrial use provided the following recommendations are implemented.

9.2 Recommendations

In light of the conclusions provided and to ensure the site is made suitable for the proposed industrial/commercial use the following recommendations are provided:

- A Detailed Site Investigation (DSI) in accordance with NSW EPA (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* is required to determine the vertical delineation of chemical soil contamination, onsite groundwater chemical concentrations and assess the need for the preparation of a Remediation Action Plan (RAP).
- Any in-situ soil material required to be disposed of as part of the proposed development is to be classified in accordance with the NSW EPA (2014) *Waste Classification Guidelines Part 1: Classifying waste* and disposed of in a licensed facility to accept such a waste.
- A hazardous materials survey should be conducted to visually and analytically identify asbestos containing material in the existing residential infrastructure, storage areas and on the soil surface at 9 Louth Park Rd prior to demolition and earthworks. If any Asbestos containing material is identified, appropriate measures should be implemented to ensure safe and suitable removal and disposal to prevent contamination of the site and exposure to and workers or potential future residents.

10. Limitations

This report has been commissioned and produced for Stevens Group (the requesting client). The application or use of this report is for the sole purpose of the client and regulating authorities permitted by the client. ESP - Environmental & Safety Professionals accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. The use, application, misuse or misapplication of information (whether in part or whole) or any consequences of its use, provided by ESP is not the responsibility of ESP, its' employees, servants or agents. This report may not be reproduced, or amended in any way without prior approval by the client and ESP. This report must be read in its entirety and in conjunction with the attached documents, only applying the report in accordance with the stated aims as outlined in the introduction of this report.

The interpretation of results, conclusions and recommendations presented in this report are predominantly based on desktop review of previous reports provided by the client, site inspection and limited soil sampling.

Should further information become available regarding conditions at the site or relevant issues including previously unknown sources of contamination or detailed information relating to products previously utilised at the site, ESP reserves the right to review the report and/or additional information in the context of the additional information.

Should additional confirmation of the contamination status of soils be required beyond the locations and depths sampling conducted as part of this assessment then further soil investigation i.e. Detailed Site Investigation (DSI) would be required.

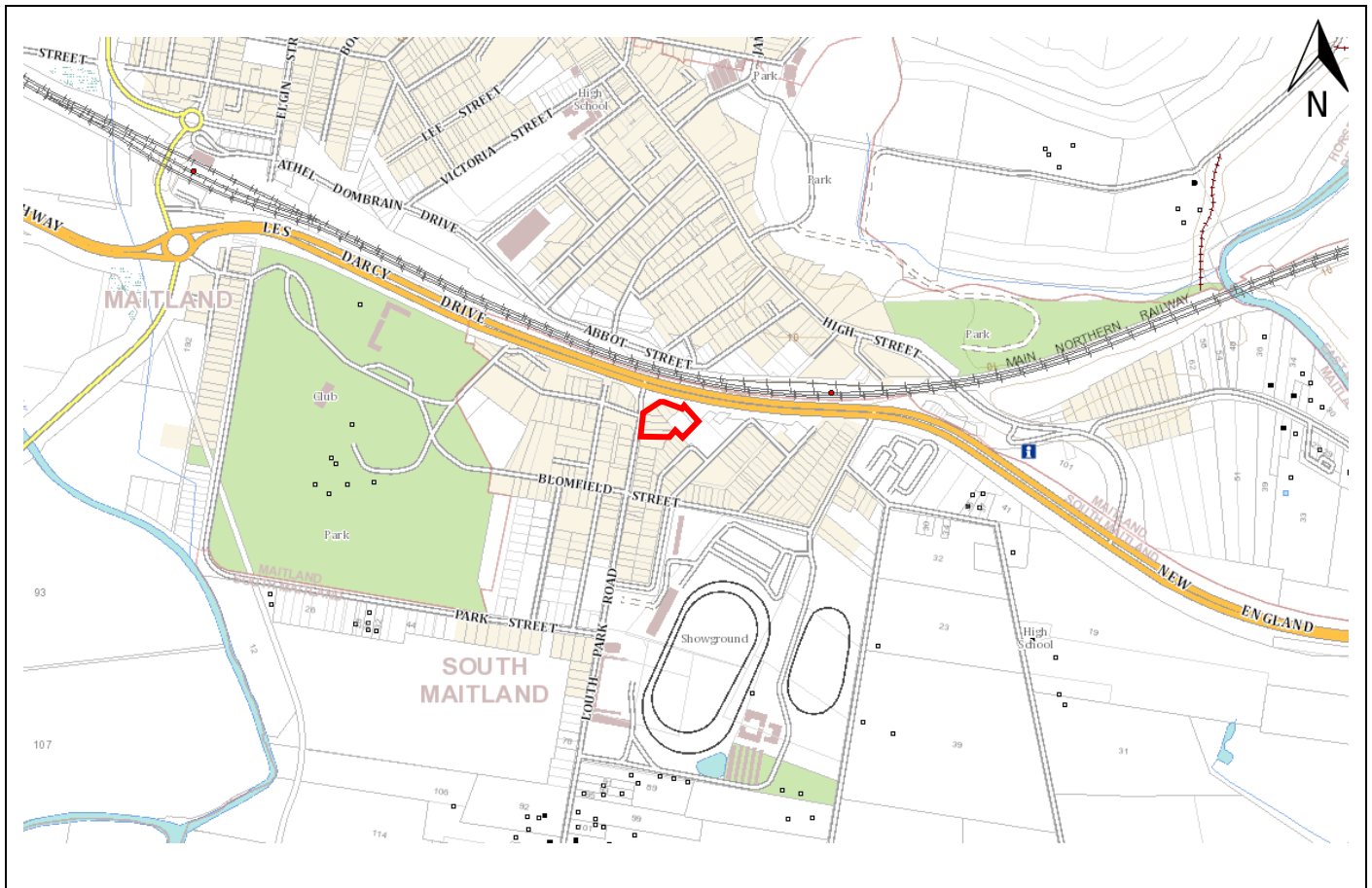
All works carried out in preparing this report have been conducted on a fully professional basis with due care and attention utilising ESP professional knowledge and understanding of relevant and current National and State Standards, Codes of Practice, Regulations and Acts. Changes in Acts, Regulations or guidance information may occur at any time resulting in conclusions contained in this report becoming invalid, incorrect or inappropriate. ESP, at its discretion, may advise the client of the potential impact of such changes but does not accept responsibility for advising of, or implications of, any such changes.

11. References


- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, ANZG (August 2018).
- Australian Standard AS 4482.1 (2005) *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds*.
- Canadian Council of Ministers of the Environment (CCME) *Environmental Quality Guidelines Summary Table*.
- Department of Planning & Environment, Resources & Energy (2017) *Geological Maps data base*.
- National Environment Protection Council (2013) *National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPM)* (as amended 2013).
- National Health and Medical Research Council (NHMRC) & Natural Resource Management Ministerial Council (NRMMC) *Australian Drinking Water Guidelines 2011, Version 3.5, Updated August 2018*
- New South Wales Department of Primary Industries (DPI) – *Office of Water geospatial database*.
- New South Wales Environmental Protection Environment Protection Authority (2017) *Contaminated Land management: Guidelines for the NSW Site Auditor Scheme (3rd Edition)*.
- New South Wales Environmental Protection Authority *Contaminated Land Management Register*. Accessed 9 September 2019
- New South Wales Environmental Protection Authority *Contaminated Sites List*. Accessed 9 September 2019
- New South Wales Environmental Protection Authority *Protection of the Environment Operations Public Register*. Accessed 9 September 2019
- New South Wales Acid Sulphate Soils Management Advisory Committee (1998) *Acid Sulphate Soil Assessment Guidelines*.
- Maitland City Council (2011), *Maitland City Council Environmental Plan 2011, Acid Sulfate Soils Map – Sheet ASS_004B*
- Maitland City Council (2011), *Maitland City Council Environmental Plan 2011, Land Zoning Map – Sheet LZN_004B*
- Department of Mineral Resources (1995) *Newcastle Coalfield Regional Geology 1:100,000 Geological Series Sheet 9231 Edition 1*.
- New South Wales Environmental Protection Authority (2011) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*.
- United States Environmental Protection Agency (2017) *Regional Screening Level Summary Table – June 2017*.

12. Appendices

Appendix I	Site Plans
Appendix II	Site Photographs
Appendix III	Historical Aerial Photographs
Appendix IV	Historical Titles
Appendix V	Bore Logs
Appendix VI	Analytical Results Tables
Appendix VII	NATA Accredited Laboratory Reports and Chain of Custody Documentation
Appendix VIII	EIL Calculations for Selected Metals
Appendix IX	Statistical Appraisal
Appendix X	PID Calibration Certificate





TITLE: Figure 1 – Site Locality Plan
SITE: 5 – 13 Louth Park Rd, South Maitland NSW
CLIENT: Stevens Group
JOB NUMBER: J41419
DATE: September 2019
REFERENCE: Six Maps

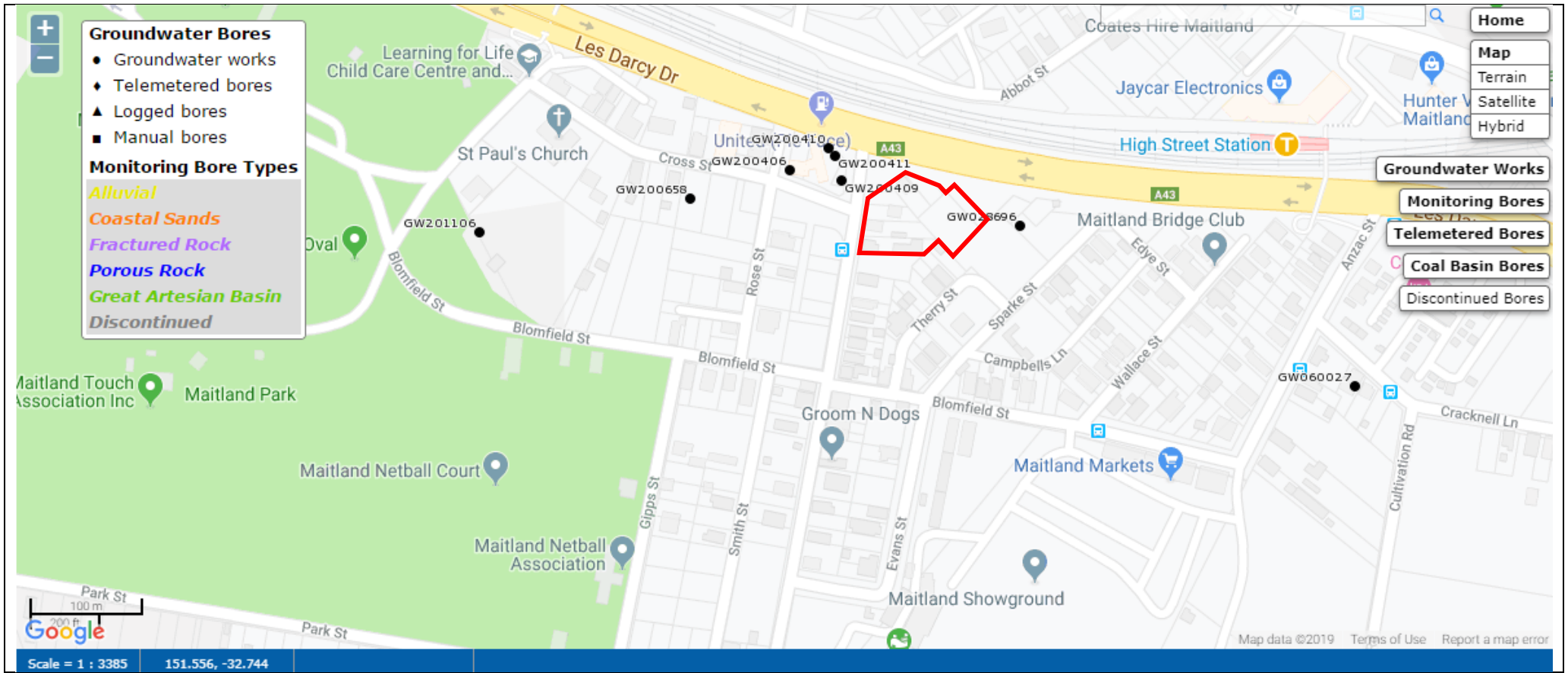
 Site location



TITLE: Figure 2 – Borehole Locations
SITE: 5 – 13 Louth Park Rd, South Maitland NSW
CLIENT: Stevens Group
JOB NUMBER: J41419
DATE: 05/09/19

LEGEND

-  Targeted Borehole
-  Site Boundary



TITLE: Figure 3 – Groundwater Well Locations
SITE: 5 – 13 Louth Park Rd, South Maitland NSW
CLIENT: Stevens Group
JOB NUMBER: J41419
DATE: 05/09/19

LEGEND
 — Site Boundary



Photo 1
Southwest to
Northeast perspective;
the site as viewed
opposite Louth Park
Rd.



Photo 2
West to East
perspective; the site
as viewed opposite
Louth Park Rd.



Photo 3
West to East
perspective; dwelling
at 9 Louth Park Rd.
Unoccupied and in
poor condition.
Potential ACM on
dwelling & debris at
front of dwelling.



Photo 4
North to South
perspective; north
wall of dwelling at 11
Louth Park Rd.
Tenanted and in
moderate condition.
Potential ACM on
dwelling.



Photo 5
West to East
perspective; shed at
rear of 9 Louth Park
Rd. Collapsed and in
very poor condition.
Potential ACM debris.



Photo 6
Southwest to
Northeast perspective;
borehole BH04 at rear
of 9 Louth Park Rd.



Photo 7
North to South
perspective; borehole
BH05 at vacant 7
Louth Park Rd.



Photo 8
Southeast to
Northwest
perspective; borehole
BH07 at rear yard of 5
Louth Park Rd.



Photo 9
Northeast to
Southwest
perspective; rear yard
of 5 Louth Park Rd.
Dwelling tenanted and
in moderate condition.
Potential ACM on
dwelling.



Photo 10
West to East
perspective; borehole
BH06 in rear yard of 5
Louth Park Rd.



Photo 11
East-Southeast to
West-Northwest
perspective; dwelling
at 11 Louth Park Rd.
Dwelling tenanted and
in moderate condition.
Potential ACM on
dwelling.



Photo 12
West-Northwest to
East-Southeast
perspective; borehole
BH03 at rear of 11
Louth Park Rd.
Light ash within soil
observed.



Photo 13
Northwest to
Southeast perspective;
dwelling at 13 Louth
Park Rd. Dwelling
tenanted and in good
condition. Potential
ACM on dwelling.



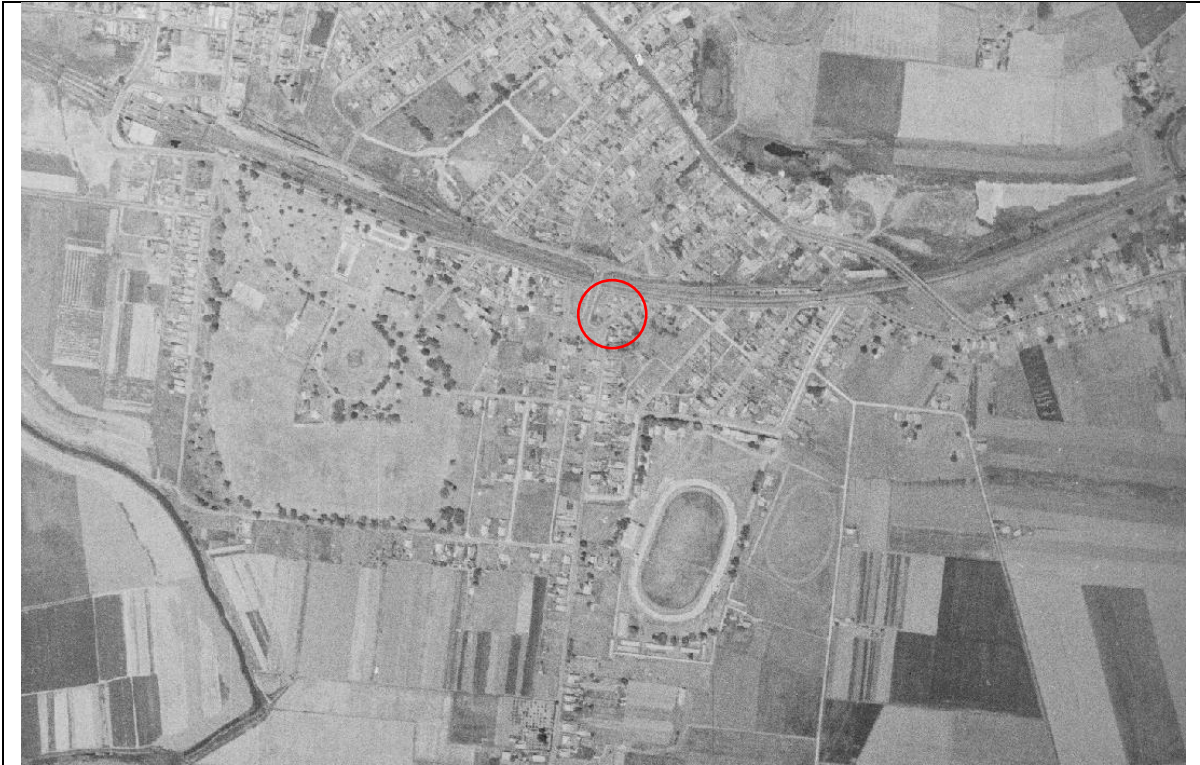
Photo 14
West to East
perspective; borehole
BH01 at front
yard/driveway of 13
Louth Park Rd.



Photo 15
South to North
perspective; borehole
BH08 in paddock at
rear of 11 Louth Park
Rd.



Photo 16
West to East
perspective; borehole
BH10 in paddock at
rear of 11 Louth Park
Rd. Debris within
borehole (metal,
fabric, glass) and light
ashy soils observed.



1954

(Source: NSW Land and Property Information)



1976

(Source: NSW Land and Property Information)



1993

(Source: NSW Land and Property Information)



23/09/2006

(Source: Google Earth Satellite Images)



24/08/2012

(Source: Google Earth Satellite Images)



11/10/2013

(Source: Google Earth Satellite Images)



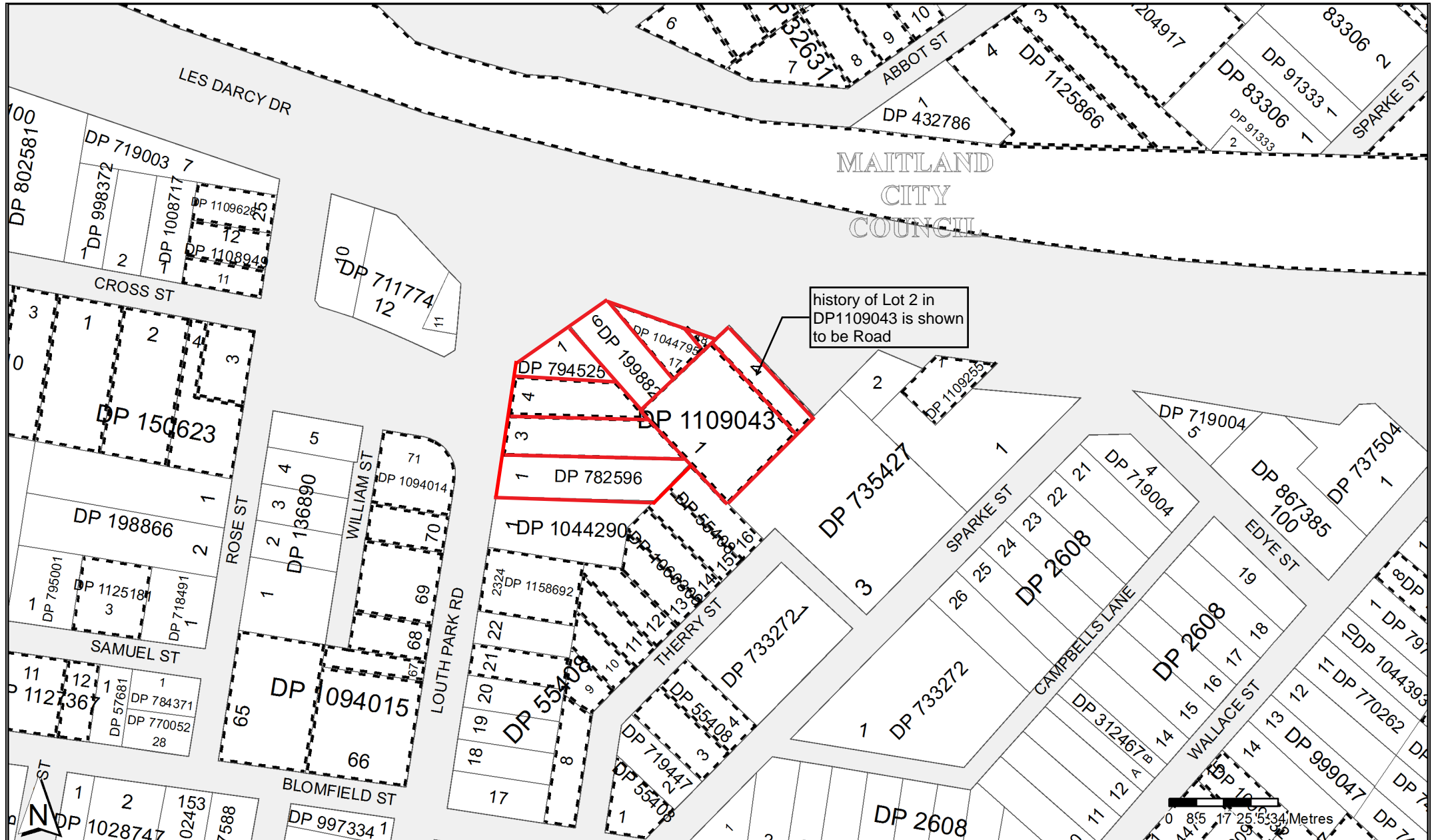
23/06/2016

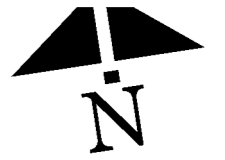
(Source: Google Earth Satellite Images)



27/08/2016

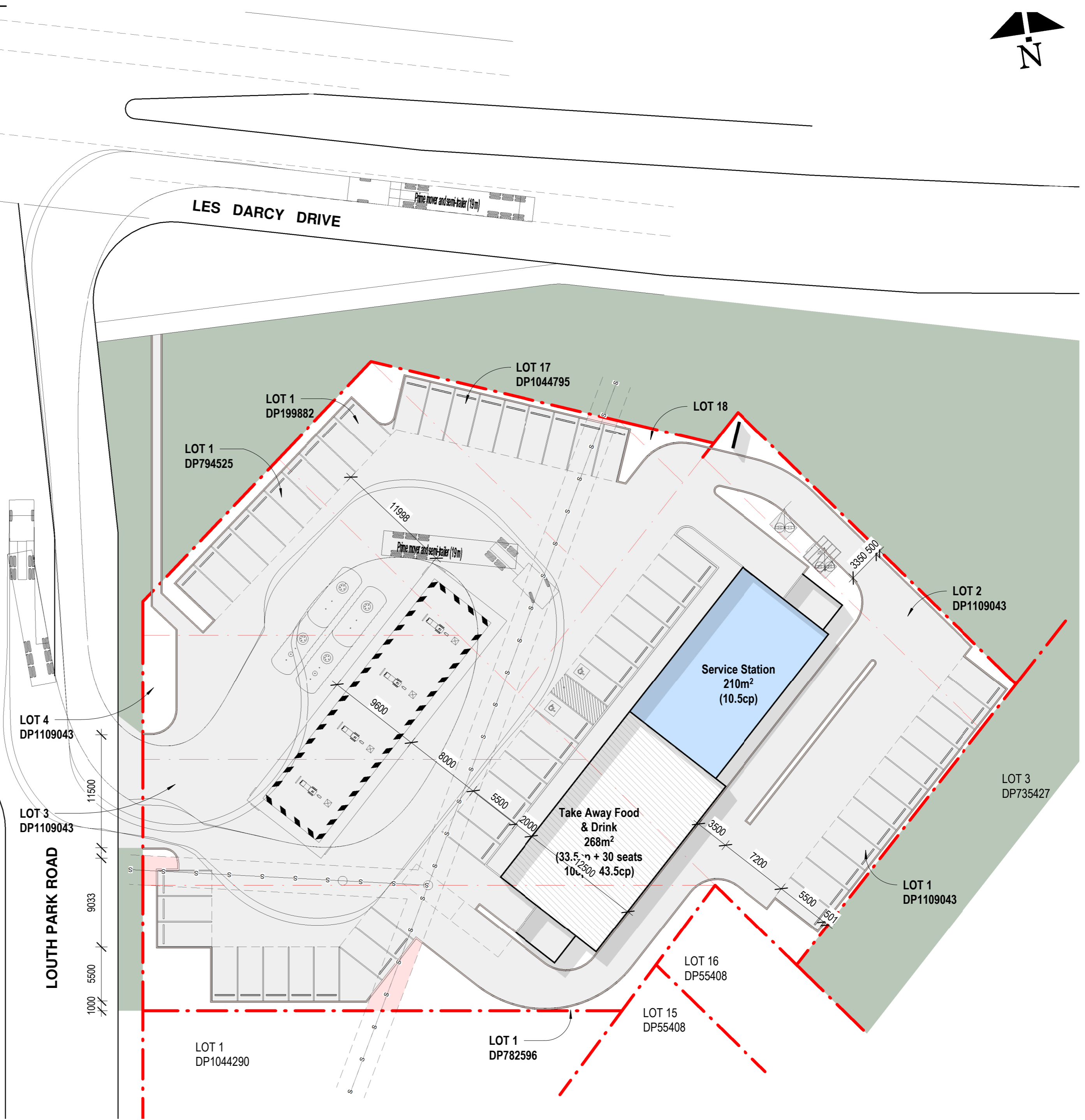
(Source: Google Earth Satellite Images)





Project: CONCEPT LAYOUT
Client: STEVENSGROUP
Lot: 1,2,3,4,6,17
No: 5-13
Street: LOUTH PARK ROAD
Suburb: SOUTH MAITLAND
DP: 782596,1109043,794525,199882,1044795,
Drawn by: MM
Checked by: WB
Job No: P758
Sheet No: 01
Sheet Size: A2

CONCEPT PLANS ONLY



External Concrete
3168m²

Rev	Description	Date
3	Client Revision	25.06.18
2	Client Revision	18.06.18
1	Client Review	05.06.18



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

4/9/2019 11:10AM

FOLIO: 7/199882

First Title(s): OLD SYSTEM

Prior Title(s): CA57769

Recorded	Number	Type of Instrument	C.T. Issue
18/8/1993	CA57769	CONVERSION ACTION	FOLIO CREATED EDITION 1
5/7/1996	2283319	DISCHARGE OF MORTGAGE	EDITION 2
28/8/2002	8906062	DEPARTMENTAL DEALING	
28/8/2002	DP1044795	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***



SEARCH DATE

4/9/2019 11:09AM

FOLIO: 17/1044795

First Title(s): OLD SYSTEM

Prior Title(s): 7/199882

Recorded	Number	Type of Instrument	C.T. Issue
28/8/2002	DP1044795	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
24/3/2010	AF191183	TRANSFER	EDITION 1
17/12/2015	AK75928	DEPARTMENTAL DEALING	
10/2/2016	AK48010	WITHDRAWN - APPLICATION FOR REPLACEMENT CERTIFICATE OF TITLE	
4/3/2016	AK264367	TRANSFER	EDITION 2

*** END OF SEARCH ***



Form: 01T
Release: 2
www.lpi.nsw.gov.au

TRANSFER

New South Wales
Real Property Act 1900

AF191183Q

PRIVACY NOTE: this information is legally required and will become part of the public record

STAMP DUTY

Office of State Revenue use only	Office of State Revenue NSW Treasury Client No: 114933643 3324 Duty: <u>EXEMPT</u> Trans No: <u>5647224</u> Asst details: <u>SECTION 68(1)</u>
----------------------------------	--

(A) ~~TORRENS TITLE~~
RELOADED

(B) **LODGED BY**
17 MAR 2010

TIME: 2:44

4/199882	17/1044795	OFFICE OF STATE REVENUE (N.S.W. TREASURY) 114933643 3324 CODES ALTERATION NOTED
Delivery Box 39U	Name, Address or DX and Telephone LPN: ESPREON PROPERTY SERVICES DX 885 SYDNEY 02 9210 0923 Reference: <u>Newcastle 55487812</u>	OFFICE OF STATE REVENUE (N.S.W. TREASURY) 114933643 3324 ALTERATION NOTED
(C) TRANSFEROR Robert James WATSON	<u>Garner</u> Robert James WATSON	OFFICE OF STATE REVENUE (N.S.W. TREASURY) 114933643 3324 ALTERATION NOTED

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of \$ Pursuant to Orders made of Australia on 21 January 2008 and as regards

(E) **ESTATE** the land specified above transfers to the transferee an estate in fee simple

(F) **SHARE TRANSFERRED** Whole

(G) **ENCUMBRANCES** (if applicable):

(H) **TRANSFeree**

ELizabeth Ann WATSON

(I) **TENANCY:**

(J) **DATE** 21-01-2008

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of witness: Fredrick Paul Stubbs
Name of witness: PAUL A STUBBS
Address of witness: 44 BELGRAVE ST KEMPSEY

Signature of transferor: Robert Watson

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Certified correct for the purposes of the Real Property Act 1900 by the transferee.

Signature of witness: Jennifer Mary Coyle
Name of witness: JENNY COYLE
Address of witness: 8/420 HIGH ST MAITLAND

Signature of transferee: Elizabeth Watson



FOLIO: 17/1044795

SEARCH DATE	TIME	EDITION NO	DATE
4/9/2019	11:07 AM	2	4/3/2016

LAND

LOT 17 IN DEPOSITED PLAN 1044795
AT SOUTH MAITLAND
LOCAL GOVERNMENT AREA MAITLAND
PARISH OF MAITLAND COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1044795

FIRST SCHEDULE

ROBERT PAUL BUNDER

(T AK264367)

SECOND SCHEDULE (2 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

4/9/2019 11:10AM

FOLIO: 7/199882

First Title(s): OLD SYSTEM

Prior Title(s): CA57769

Recorded	Number	Type of Instrument	C.T. Issue
18/8/1993	CA57769	CONVERSION ACTION	FOLIO CREATED EDITION 1
5/7/1996	2283319	DISCHARGE OF MORTGAGE	EDITION 2
28/8/2002	8906062	DEPARTMENTAL DEALING	
28/8/2002	DP1044795	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***



SEARCH DATE

4/9/2019 11:09AM

FOLIO: 18/1044795

First Title(s): OLD SYSTEM

Prior Title(s): 8/199882

Recorded	Number	Type of Instrument	C.T. Issue
28/8/2002	DP1044795	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
14/9/2015	AJ811575	DEPARTMENTAL DEALING	
4/2/2016	AK194446	TRANSFER WITHOUT MONETARY CONSIDERATION	EDITION 1
4/3/2016	AK264367	TRANSFER	EDITION 2

*** END OF SEARCH ***

Form: 01T
Licence: 05-11-638
Licensee: Softdocs
Enrights Solicitors

TRANSFER

New South Wales
Real Property Act 1900



AK194446S

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar to use the information provided in this form for the establishment and maintenance of the Real Property Act Register. Section 31B of the RP Act requires that the Register be made available to any person for search upon payment of a fee, if any.

STAMP DUTY

Office of State Revenue use only	Office of State Revenue NSW Treasury Client No: 5729416 Duty: <u>EXEMPT</u> Trans No: <u>8514148-872</u> Asst details: <u>S68(1)</u>
----------------------------------	--

(A) TORRENS TITLE

6/199882 and 18/1044795

(B) LODGED BY

Document Collection Box 35D	Name, Address or DX, Telephone, and Customer Account Number if any MORRIS, HAYES & EDGAR DX 420 SYDNEY PH: 9232-2411 AS AGENTS FOR Reference (optional): <u>201519 ENRIGHTS</u>	CODES T TW
---------------------------------------	--	--------------------------------

(C) TRANSFEROR

~~ELIZABETH ANN WATSON and ROBERT GARNER WATSON~~

OFFICE OF STATE REVENUE
(N.S.W.) CONSIDERATION
120350770
ESTATE, 3608
ALTERNATIVE SHARED
TRANSFERRED

The transferor acknowledges receipt of the consideration of \$ 1.00 and as regards the land specified above transfers to the transferee an estate in fee simple.

(G)

Encumbrances (if applicable):

(H) TRANSFEREE

ELIZABETH ANN WATSON

TENANCY:

(I)

DATE 21 / 11 / 15

(J) I certify I am an eligible witness and that the transferor signed this dealing in my presence.
[See note* below]

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

KERRY BARRASS
Signature of witness:
Kerry Barrass
Name of witness:
Address of witness:
102 Busland Drive
Yarravel
2040

Signature of transferor:
Robert Watson

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature: *[Signature]*

Signatory's name: Aidan John Williams
Capacity: Solicitor for the transferee

(K) The transferee's solicitor certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. 446658 Full Name: Aidan John Williams Signature: *[Signature]*



FOLIO: 18/1044795

SEARCH DATE	TIME	EDITION NO	DATE
4/9/2019	11:07 AM	2	4/3/2016

LAND

LOT 18 IN DEPOSITED PLAN 1044795
AT SOUTH MAITLAND
LOCAL GOVERNMENT AREA MAITLAND
PARISH OF MAITLAND COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1044795

FIRST SCHEDULE

ROBERT PAUL BUNDER (T AK264367)

SECOND SCHEDULE (2 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

4/9/2019 11:09AM

FOLIO: 6/199882

First Title(s): OLD SYSTEM

Prior Title(s): CA57769

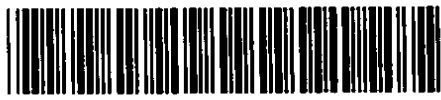
Recorded -----	Number -----	Type of Instrument -----	C.T. Issue -----
18/8/1993	CA57769	CONVERSION ACTION	FOLIO CREATED EDITION 1
5/7/1996	2283319	DISCHARGE OF MORTGAGE	EDITION 2
14/9/2015	AJ811575	DEPARTMENTAL DEALING	
4/2/2016	AK194446	TRANSFER WITHOUT MONETARY CONSIDERATION	EDITION 3
4/3/2016	AK264367	TRANSFER	EDITION 4

*** END OF SEARCH ***

Form: 01T
Licence: 05-11-638
Licensee: Softdocs
Enrights Solicitors

TRANSFER

New South Wales
Real Property Act 1900



AK194446S

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar to use the information provided in this form for the establishment and maintenance of the Real Property Act Register. Section 31B of the RP Act requires that the Register be made available to any person for search upon payment of a fee, if any.

STAMP DUTY

Office of State Revenue use only	Office of State Revenue NSW Treasury Client No: 5729416 Duty: <u>EXEMPT</u> Trans No: <u>8514148-872</u> Asst details: <u>S68(1)</u>
----------------------------------	--

(A) TORRENS TITLE

6/199882 and 18/1044795

(B) LODGED BY

Document Collection Box 35D	Name, Address or DX, Telephone, and Customer Account Number if any MORRIS, HAYES & EDGAR DX 420 SYDNEY PH: 9232-2411 AS AGENTS FOR Reference (optional): <u>201519 ENRIGHTS</u>	CODES T TW
---------------------------------------	--	---------------------------------------

(C) TRANSFEROR

~~ELIZABETH ANN WATSON and ROBERT GARNER WATSON~~

OFFICE OF STATE REVENUE
(N.S.W.) CONSIDERATION
120350770
ESTATE, 3608
ALTERNATIVE SHARED
TRANSFERRED

The transferor acknowledges receipt of the consideration of \$ 1.00 and as regards the land specified above transfers to the transferee an estate in fee simple.

(G)

Encumbrances (if applicable):

(H) TRANSFEREE

ELIZABETH ANN WATSON

TENANCY:

(I)

DATE 21 / 11 / 15

(J) I certify I am an eligible witness and that the transferor signed this dealing in my presence.
[See note* below]

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

KERRY BARRASS
Signature of witness:
Kerry Barrass
Name of witness:
Address of witness:
102 Busland Drive
Yarravel
2040

Signature of transferor:
Robert Watson

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature: *[Signature]*

Signatory's name: Aidan John Williams
Capacity: Solicitor for the transferee

(K) The transferee's solicitor certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. 446658 Full Name: Aidan John Williams Signature: *[Signature]*



FOLIO: 6/199882

SEARCH DATE	TIME	EDITION NO	DATE
4/9/2019	11:07 AM	4	4/3/2016

LAND

LOT 6 IN DEPOSITED PLAN 199882
AT MAITLAND
LOCAL GOVERNMENT AREA MAITLAND
PARISH OF MAITLAND COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP199882

FIRST SCHEDULE

ROBERT PAUL BUNDER (T AK264367)

SECOND SCHEDULE (2 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***



SEARCH DATE

4/9/2019 11:09AM

FOLIO: 1/794525

First Title(s): OLD SYSTEM

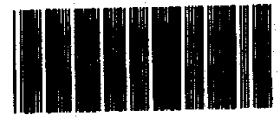
Prior Title(s): CA40377

Recorded	Number	Type of Instrument	C.T. Issue
5/9/1989	CA40377	CONVERSION ACTION	FOLIO CREATED EDITION 1
3/7/1991	Z758032	TRANSFER	EDITION 2
21/6/2001	7706249	TRANSFER	EDITION 3
21/6/2001	7706250	MORTGAGE	
31/1/2005	AB250456	DISCHARGE OF MORTGAGE	EDITION 4
12/7/2005	AB617013	TRANSFER	EDITION 5
12/7/2005	AB617014	MORTGAGE	
20/2/2013	AH564390	DISCHARGE OF MORTGAGE	EDITION 6
20/2/2013	AH564391	TRANSFER	
20/2/2013	AH564392	MORTGAGE	
2/9/2018	AN678864	DEPARTMENTAL DEALING	EDITION 7 CORD ISSUED

*** END OF SEARCH ***

RP 13

STAMP DUTY



Z
758032 F



OFFICE OF STATE REVENUE
(N.S.W. TREASURY)
ISSUED BY
\$1,000
CHIEF COMMISSIONER

B

TRANSFER
REAL PROPERTY ACT, 1900

T CB 1 of 1 X R /
\$ 44

DESCRIPTION OF LAND
Note (a)

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
Folio Identifier 1/794525	WHOLE	Parish of Maitland County of Northumberland

TRANSFEROR
Note (b)

ROBERT NOEL WILLIAMS AND LORRAINE JUNE WILLIAMS

ESTATE
Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of \$ 10,000.00 and transfers an estate in fee simple in the land above described to the TRANSFEREE

TRANSFEREE
Note (d)

PARATAT PTY LIMITED
as joint tenants/tenants in common

OFFICE USE ONLY
S

TENANCY
Note (e)

PRIOR ENCUMBRANCES
Note (f)

subject to the following PRIOR ENCUMBRANCES 1. Reservations and conditions if any contained in Crown Grant.
2. Qualified Title 3. Limited Title

DATE 1-3-1990

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION
Note (g)

Signed in my presence by the transferor who is personally known to me

Signature of Witness
SARIE WILLIAMS
Name of Witness (BLOCK LETTERS)
3 ADA STREET TELARAH
Address and occupation of Witness

Robert M. Williams
Lorraine J. Williams
Signature of Transferor

Note (g)

Signed in my presence by the transferee who is personally known to me

Signature of Witness
Name of Witness (BLOCK LETTERS)
Address and occupation of Witness

Signature of Transferee
S.S. BEAL

TO BE COMPLETED BY LODGING PARTY
Notes (h) and (i)

LODGED BY THOMAS KEITHON & SON, LAW STATIONERS, FIRST FLOOR, THE CENTREPOINT, SYDNEY. D.X. 435 PHONE 231 5733	LOCATION OF DOCUMENTS	
	CT	OTHER
		Herewith.
Ref: Delivery Box Number	33H 3EAL - PARATAT	In L.T.O. with
Produced by		
Checked EB 13-3 Passed Extra Fee	REGISTERED -19	Secondary Directions
Signed	- 3 JUL 1991	Delivery Directions

10

Form: 01T
Licence: 98M111
Edition: 0011

TRANSFER

7706249W

New South Wales
Real Property Act 1900



PRIVACY NOTE: this information is legally required and will

STAMP DUTY

Office of State Revenue use only

NEW SOUTH WALES DUTY
17-04-2001 0000589059-001
SECTION 80(1)-TRANSFER FIRST HOME PLUS
NO DUTY PAYABLE
CONTRACT CONSIDERATION \$ *****32,000.00

(A) TORRENS TITLE

If appropriate, specify the part transferred **Folio 1/794525**
Lot 1 DP 794525

(B) LODGED BY

Delivery Box	Name, Address or DX and Telephone BURKHART & COMPANY PTY LTD BOX 155S TEL: 9231 0122 FAX: 9262 1904	CODES T TW (Sheriff)
Reference (optional): Std / Murton		

(C) TRANSFEROR

PARATAT Pty Ltd **ACN 003 386 999**
003 386 623

(D) CONSIDERATION

The transferor acknowledges receipt of the consideration of \$ **32,000** and as regards

(E) ESTATE

the land specified above transfers to the transferee an estate in fee simple.

(F) SHARE TRANSFERRED

(G) ENCUMBRANCES

Encumbrances (if applicable): 1. 2. 3.

(H) TRANSFEE

Andrew John MURTON

TENANCY:

DATE

7 / 5 / 01
dd mm yyyy

(J) I certify that the transferor, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this transfer in my presence.

Signature of witness: **Executed for and on behalf of Paratata Pty Ltd by**

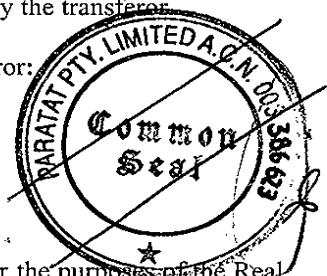
Name of witness:

Address of witness:

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of transferor:

Allen Clarke
Sole director/secretary



I certify that the transferee, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this transfer in my presence.

Certified correct for the purposes of the Real Property Act 1900 by the transferee.

Signature of witness: **S. Charles**

Name of witness: **Sidney Charles MURTON**

Address of witness: **199 Bridges Road New Lambton NSW 2305.**

Signature of transferee:

WA

If signed on the transferee's behalf by a solicitor or licensed conveyancer, insert the signatory's full name and capacity below:

Form: 01T
Licence: 01-05-025
Licensee: Burgess Foat

TRANSFER



New South Wales
Real Property Act 1900

AB617013Y

Section 93B of the Real Property Act 1900 (RP Act) requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY

Office of State Revenue use only
N13
VENDOR DUTY
ENDORSED
2697333

NSW Treasury
Client No: 5657113 765
Duty: Exempt Trans No: 2693047
Asst details: Emp Private Dwelling
blooms 30/5/2005

(A) TORRENS TITLE

If appropriate, specify the part transferred
Certificate of Title Folio Identifier 1/794525

(B) LODGED BY

Delivery Name, Address ^{THOMPSON} and Telephone...
Box LPN:
46X 123832N **LAWPOINT GALLOWAYS**
Phone: (02) 9233 1011
DX 340 SYDNEY
Reference (optional): 250322H RDJ

CODES
T
TW
(Sheriff)

(C) TRANSFEROR

ANDREW JOHN MURTON

(D) CONSIDERATION

The transferor acknowledges receipt of the consideration of \$132,500.00 and as regards

(E) ESTATE

The land specified above transfers to the transferee an estate in fee simple.

(F) SHARE

TRANSFERRED

(G)

Encumbrances (if applicable):

(H) TRANSFEREE

GUY BUNDER
TENANCY:

DATE

29 June 2005

(J) I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of witness:

S.C. Murton
Name of witness: Sidney C. Murton
Address of witness:

Signature of transferor:

A.J. Murton

5 Old Cessnock Rd
Mulbring NSW
Sidney Carl Murton

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature:

DJ
Signatory's name: Damian Burgess
Signatory's capacity: Solicitor for the Transferee



FOLIO: 1/794525

SEARCH DATE	TIME	EDITION NO	DATE
4/9/2019	11:07 AM	7	2/9/2018

NO CERTIFICATE OF TITLE HAS ISSUED FOR THE CURRENT EDITION OF THIS FOLIO.
CONTROL OF THE RIGHT TO DEAL IS HELD BY COMMONWEALTH BANK OF AUSTRALIA.

LAND

LOT 1 IN DEPOSITED PLAN 794525
AT MAITLAND
LOCAL GOVERNMENT AREA MAITLAND
PARISH OF MAITLAND COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP794525

FIRST SCHEDULE

GUY BUNDER
NIKIA BUNDER

AS TENANTS IN COMMON IN EQUAL SHARES (T AH564391)

SECOND SCHEDULE (3 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.
- 3 AH564392 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***



SEARCH DATE

4/9/2019 11:09AM

FOLIO: 1/1109043

First Title(s): OLD SYSTEM

Prior Title(s): BK 2712 NO 245

Recorded	Number	Type of Instrument	C.T. Issue
13/2/2007	DP1109043	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
13/2/2007	CA102079	CONVERSION ACTION	FOLIO CREATED CT NOT ISSUED
14/3/2007	AC993167	DEPARTMENTAL DEALING	EDITION 1
25/3/2019	AP140334	DEPARTMENTAL DEALING	
17/4/2019	AP196704	TRANSMISSION APPLICATION (EXECUTOR, ADMINISTRATOR, TRUSTEE)	
17/4/2019	AP196705	TRANSFER	EDITION 2
8/5/2019	AP238883	TRANSFER WITHOUT MONETARY CONSIDERATION	EDITION 3

*** END OF SEARCH ***



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

4/9/2019 11:09AM

FOLIO: 3/1109043

First Title(s): OLD SYSTEM

Prior Title(s): BK 2712 NO 245

Recorded	Number	Type of Instrument	C.T. Issue
13/2/2007	DP1109043	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
13/2/2007	CA102079	CONVERSION ACTION	FOLIO CREATED CT NOT ISSUED
14/3/2007	AC993167	DEPARTMENTAL DEALING	EDITION 1
25/3/2019	AP140334	DEPARTMENTAL DEALING	
17/4/2019	AP196704	TRANSMISSION APPLICATION (EXECUTOR, ADMINISTRATOR, TRUSTEE)	
17/4/2019	AP196705	TRANSFER	EDITION 2
8/5/2019	AP238883	TRANSFER WITHOUT MONETARY CONSIDERATION	EDITION 3

*** END OF SEARCH ***

System Document Identification

Form Number:01T-e
Template Number: T_nsw16
ELN Document ID:10370421
ELN NOS ID: 10370422

TRANSFER
New South Wales
Real Property Act 1900

Land Registry Document Identification

AP196705

Stamp Duty: 9570724-001

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

LODGED BY:

Responsible Subscriber: ARNOLD LAWYERS ABN 12568357018
Address: PO BOX 15
Maitland 2320
Telephone:
PEXA Subscriber Number: 24770
Customer Account Number: 503913V
Document Collection Box: 1W
Client Reference: Bunder & Ha

LAND TITLE REFERENCE

1/1109043
3/1109043

TRANSFEROR

SUSAN MARIA BUNDER
JENNIFER MARIA HARRISON

TRANSFeree

SUSAN MARIA BUNDER
Tenancy: Sole Proprietor

CONSIDERATION

The transferor acknowledges receipt of the consideration of \$160,000.00

ESTATE TRANSFERRED

FEE SIMPLE

The Transferor transfers to the Transferee the Estate specified in this Instrument and acknowledges receipt of any Consideration shown.

SIGNING FOR TRANSFEROR

I certify that:

1. The Certifier has taken reasonable steps to ensure that this Registry Instrument or Document is correct and compliant with relevant legislation and any Prescribed Requirement.
2. The Certifier has retained the evidence supporting this Registry Instrument or Document.
3. The Certifier holds a properly completed Client Authorisation for the Conveyancing Transaction including this Registry Instrument or Document.
4. The Certifier has taken reasonable steps to verify the identity of the transferor.

Party Represented by Subscriber:

SUSAN MARIA BUNDER
JENNIFER MARIA HARRISON

Signed By: Adam Barry Slattery
PEXA Signer Number:63796

Signer Capacity:Practitioner Certifier
Digital Signing Certificate Number:37153

Signed for Subscriber: ADAM BARRY SLATTERY ABN 12568357018
ARNOLD LAWYERS

Subscriber Capacity:Representative Subscriber

PEXA Subscriber Number:24770

Customer Account Number:503913

Date: 17/04/2019

SIGNING FOR TRANSFEREE

I certify that:

1. The Certifier has taken reasonable steps to ensure that this Registry Instrument or Document is correct and compliant with relevant legislation and any Prescribed Requirement.
2. The Certifier has retained the evidence supporting this Registry Instrument or Document.
3. The Certifier holds a properly completed Client Authorisation for the Conveyancing Transaction including this Registry Instrument or Document.
4. The Certifier has taken reasonable steps to verify the identity of the transferee.

Party Represented by Subscriber:

SUSAN MARIA BUNDER

Signed By: Adam Barry Slattery

Signer Capacity:Practitioner Certifier

PEXA Signer Number:63796

Digital Signing Certificate Number:37153

**Signed for
Subscriber:**

ADAM BARRY SLATTERY ABN 12568357018

ARNOLD LAWYERS

Subscriber Capacity:Representative Subscriber

PEXA Subscriber Number:24770

Customer Account Number:503913

Date: 17/04/2019



FOLIO: 1/1109043

SEARCH DATE	TIME	EDITION NO	DATE
4/9/2019	11:07 AM	3	8/5/2019

LAND

LOT 1 IN DEPOSITED PLAN 1109043
 AT SOUTH MAITLAND
 LOCAL GOVERNMENT AREA MAITLAND
 PARISH OF MAITLAND COUNTY OF NORTHUMBERLAND
 TITLE DIAGRAM DP1109043

FIRST SCHEDULE

ROBERT PAUL BUNDER
 SUSAN MARIA BUNDER
 AS JOINT TENANTS

(TZ AP238883)

SECOND SCHEDULE (2 NOTIFICATIONS)

- RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***



FOLIO: 3/1109043

SEARCH DATE	TIME	EDITION NO	DATE
4/9/2019	11:07 AM	3	8/5/2019

LAND

LOT 3 IN DEPOSITED PLAN 1109043
 AT SOUTH MAITLAND
 LOCAL GOVERNMENT AREA MAITLAND
 PARISH OF MAITLAND COUNTY OF NORTHUMBERLAND
 TITLE DIAGRAM DP1109043

FIRST SCHEDULE

ROBERT PAUL BUNDER
 SUSAN MARIA BUNDER

AS JOINT TENANTS

(TZ AP238883)

SECOND SCHEDULE (2 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

NSWLPI_: Title Search - 2/1109043

Order ID: 61021261
Matter: maitland
Date Ordered: 9/09/2019 4:25:20 PM
Status: Error
Supplier Reference:
Completed: N/A
Ordered By:
Comments:

Error Details

22: COMPUTER FOLIO NOT CREATED UNCONVERTIBLE OLD SYSTEM LAND. FEE IS COMPRISED WITHIN CONVEYANCE BK 97 NO 811. TITLE CREATION WILL REQUIRE A DEPOSITED PLAN OF SURVEY AND A PRIMARY APPLICATION BASED UPON ADVERSE POSSESSION.

hereby assured DO HEREBY CONVEY unto the said Purchaser in fee simple ALL THAT piece or parcel of land situate in West Maitland aforesaid containing by ad-measurement one rood and six perches more or less being part of Lots 11, 12 and 13 on the plan exhibited at sale of a portion of the land originally granted to O'Donnell as thirty three acres COMMENCING on a fenced line forming the eastern boundary of Lots, 6, 7, 8 and 10 on the said plan, One hundred and forty feet south thirty two degrees west from its intersection by the south side of Parallel Street and bounded thence on the north east by a reserved road Twenty feet in width bearing south easterly One hundred and thirty feet on the south east by a line bearing south westerly One hundred feet on the south west by a line bearing north westerly One hundred and thirty feet and on the north west by a line bearing north easterly One hundred feet to the point of commencement the said land being described as Lot 1 on the amended plan prepared by E.L. Maitland together with all houses outhouses buildings and erections thereon and all the rights members and appurtenances hereunto belonging and also ALL THAT piece or parcel of land situate in Louth Park Road (formerly Abbott Street)



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

4/9/2019 11:09AM

FOLIO: 4/1109043

First Title(s): OLD SYSTEM

Prior Title(s): BK 4458 NO 693

Recorded	Number	Type of Instrument	C.T. Issue
13/2/2007	DP1109043	DEPOSITED PLAN	LOT RECORDED FOLIO NOT CREATED
13/2/2007	CA104325	CONVERSION ACTION	FOLIO CREATED CT NOT ISSUED
14/5/2007	AD113539	DEPARTMENTAL DEALING	EDITION 1
20/2/2013	AH564389	DISCHARGE OF MORTGAGE	
20/2/2013	AH564391	TRANSFER	
20/2/2013	AH564392	MORTGAGE	EDITION 2
2/9/2018	AN678864	DEPARTMENTAL DEALING	EDITION 3 CORD ISSUED
28/5/2019	AP280914	DEPARTMENTAL DEALING	

*** END OF SEARCH ***



FOLIO: 4/1109043

SEARCH DATE	TIME	EDITION NO	DATE
4/9/2019	11:07 AM	3	2/9/2018

NO CERTIFICATE OF TITLE HAS ISSUED FOR THE CURRENT EDITION OF THIS FOLIO.
CONTROL OF THE RIGHT TO DEAL IS HELD BY COMMONWEALTH BANK OF AUSTRALIA.

LAND

LOT 4 IN DEPOSITED PLAN 1109043
AT SOUTH MAITLAND
LOCAL GOVERNMENT AREA MAITLAND
PARISH OF MAITLAND COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1109043

FIRST SCHEDULE

GUY BUNDER
NIKIA BUNDER

AS TENANTS IN COMMON IN EQUAL SHARES (T AH564391)

SECOND SCHEDULE (3 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.
- 3 AH564392 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***



SEARCH DATE

4/9/2019 11:09AM

FOLIO: 1/782596

First Title(s): OLD SYSTEM

Prior Title(s): CA43852

Recorded	Number	Type of Instrument	C.T. Issue
27/4/1990	CA43852	CONVERSION ACTION	FOLIO CREATED EDITION 1
20/6/1990	Z72800	CHANGE OF NAME	EDITION 2
29/11/2007	AD597966	TRANSMISSION APPLICATION	EDITION 3
16/7/2009	AE839432	TRANSFER	
16/7/2009	AE839433	MORTGAGE	EDITION 4
16/8/2013	AH953227	DISCHARGE OF MORTGAGE	
16/8/2013	AH953228	TRANSFER	
16/8/2013	AH953229	MORTGAGE	EDITION 5
18/3/2015	AJ336892	DISCHARGE OF MORTGAGE	
18/3/2015	AJ336893	TRANSFER	EDITION 6

*** END OF SEARCH ***

Form: 03TA
Release: 2.1
www.lands.nsw.gov.au

TRANSMISSION APPLICATION

New South Wales
Section 93 Real Property Act 1900



AD597966S

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 31B of the RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY

①

Office of State Revenue use only	Client No: 44088 221
	Duty: \$10.00 Trans No: 4713130
	Asst details: _____

(A) FOLIO OF THE REGISTER

1/782596

(B) REGISTERED DEALING

Number	Folio of the Register
--------	-----------------------

(C) LODGED BY

Document Collected Box 582W	Name, SERVICE FIRST REGISTRATION DX 189 SYDNEY LLPN123426A PH 9233 1314 FAX 9233 2878 Reference: TN-KOLASA	CODE TA
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(D) DECEASED REGISTERED PROPRIETOR

Hannelore KOLASA

(E) APPLICANT

Bernhard KOLASA

(F) I, the applicant, being entitled as Beneficiary of the will of the deceased registered proprietor (who died on 5 October 2007) pursuant to probate No. 119138107 granted on 12th NOVEMBER 2007 to Bernhard KOLASA (a certified copy of which is lodged herewith) apply to be registered as proprietor of the estate or interest of the deceased registered proprietor in the abovementioned folio of the Register.

DATE 26 NOVEMBER 2007

(G) Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature: *C Lawrence*

Signatory's name: Charmaine Lawrence
Signatory's capacity: Applicant's solicitor

(H) CONSENT OF EXECUTOR, ADMINISTRATOR OR TRUSTEE

I, _____ of the estate of the deceased registered proprietor, consent to this application.

Signature of witness: _____ Signature of _____
Name of witness: _____
Address of witness: _____

ALL HANDWRITING MUST BE IN BLOCK CAPITALS.

Office, use only
Evidence sighted/sighted and returned:

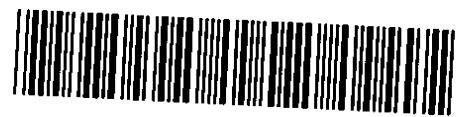
Copy p/bw Reg 95

29.11.07

0

Form: 01T
Release: 3.5
www.lands.nsw.gov.au

TRANSFER
New South Wales
Real Property Act 1900



AE839432N

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the use of this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY

Office of State Revenue use only	Office of State Revenue NSW Treasury Client No: 108239791 Duty: <u>exempt</u> Trans No: <u>5422270</u> Asst details: <u>FHP PRIVATE</u>	2714
----------------------------------	---	------

(A) **TORRENS TITLE**

1/782596	DWELLING
----------	----------

(B) **LODGED BY**

Document Collection Box <u>234</u>	Name, Address or DX, Telephone, and LLPN if any <u>CSB</u> <u>LLPN: 123835G</u>	Reference: <u>731997000</u>	CODES <u>T JT</u> <u>TJ TW</u>
---------------------------------------	---	-----------------------------	--------------------------------------

(C) **TRANSFEROR**

Bernhard Kolasa

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of \$ 160,000.00 and as regards

(E) **ESTATE** the above land transfers to the transferee an estate in fee simple

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFeree**

Ty Matthew Robson and Jodie Lea Robards

TENANCY: Joint Tenants

DATE 30/06/2009

(J) I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this instrument in my presence.

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of witness: [Signature]

Signature of transferor: [Signature]

Name of witness: PETER KIRKOP

Address of witness: 9 CHURCH ST
MAITLAND.

Certified correct for the purposes of the Real Property Act 1900 by the person whose signature appears below.

Signature: [Signature]

Signatory's name: Megan Jane Ferris
Signatory's capacity: transferee's licensed conveyancer

Form: 01T
Licence: 01-05-025
Licensee: LEAP Legal Software Pty Limited
Firm name: Greenhills Conveyancing

TRANSFER

New South Wales
Real Property Act 1900



AH953228Y

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the use of this form for the establishment and maintenance of the Real Property Register. The Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY

Office of State Revenue use only

Office of State Revenue	
NSW Treasury	
Client No: 98829742	2179
Duty: 110.00	Trans No: 2209954001
Asst details:	

(A) TORRENS TITLE

1/782596

(B) LODGED BY

Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any LLPN: 123846 B Reference: CHA/TAYLOR	BOX 155S LegalStream Tel: 92310122 Fax: 9233 6411	CODES T TW
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(C) TRANSFEROR

JODIE LEA ROBARDS and TY MATTHEW ROBSON

(D) CONSIDERATION

The transferor acknowledges receipt of the consideration of \$244,000.00 and as regards

(E) ESTATE

the abovementioned land transfers to the transferee an estate in fee simple

(F) SHARE

TRANSFERRED

(G)

Encumbrances (if applicable):

(H) TRANSFEREE

BEN PAUL TAYLOR

(I)

DATE

TENANCY:

(J) I certify I am an eligible witness and that the transferor signed this dealing in my presence.

[See note* below]

Certified correct for the purposes of the Real Property Act 1900 by the transferor.

Signature of witness: *Nicole Leiper*

Signature of transferor: *Jodie Robards*

Name of witness: *Nicole Leiper*

Address of witness: *9 Elgin Street*

Maitland NSW 2320.

Certified correct for the purposes of the Real Property Act 1900 on behalf of the transferee by the person whose signature appears below.

Signature: *Kylie Greenwood*

Signatory's name: *Kylie Greenwood*

Signatory's capacity: *Licensed Conveyancer for the Transferee*

(K) The transferee's licensed conveyancer certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. 466091 Full name: Kylie Greenwood Signature: *Kylie Greenwood*



FOLIO: 1/782596

SEARCH DATE	TIME	EDITION NO	DATE
4/9/2019	11:07 AM	6	18/3/2015

LAND

LOT 1 IN DEPOSITED PLAN 782596
 AT WEST MAITLAND
 LOCAL GOVERNMENT AREA MAITLAND
 PARISH OF MAITLAND COUNTY OF NORTHUMBERLAND
 TITLE DIAGRAM DP782596

FIRST SCHEDULE

ROBERT PAUL BUNDER

(T AJ336893)

SECOND SCHEDULE (3 NOTIFICATIONS)

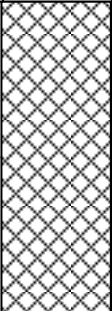
- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 QUALIFIED TITLE. CAUTION PURSUANT TO SECTION 28J(1) AND 28J(1A) OF THE REAL PROPERTY ACT, 1900. ENTERED 27.4.1990 BK 3794 NO 795
- 3 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

NOTATIONS


UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

SOIL BOREHOLE LOG: BH01**JOB NUMBER:** J41419**DATE:** 28/08/2019**CLIENT:** Stevens Group**LOGGED:** M Gosling**SITE ADDRESS:** 5 – 13 Louth Park Rd, South Maitland**DRILLER:** M Gosling**SURFACE TYPE:** Grass**DRILLING METHOD:** Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
0.1					
0.2		FILL – Dry, Brown, Dense, Silt/Gravel	0.0	BH01_0.2	No Obvious Odour
0.3		Borehole Terminated 0.2m BGL			
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1.0					

SOIL BOREHOLE LOG: BH02**JOB NUMBER:** J41419**DATE:** 28/08/2019**CLIENT:** Stevens Group**LOGGED:** M Gosling**SITE ADDRESS:** 5 – 13 Louth Park Rd, South Maitland**DRILLER:** M Gosling**SURFACE TYPE:** Grass**DRILLING METHOD:** Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
		FILL – Moist, Brown, Dense, Sand/Silt	0.0	BH02_0.05	No Obvious Odour
0.1		Borehole Terminated 0.05m BGL			
0.2					
0.3					
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1.0					

SOIL BOREHOLE LOG: BH03**JOB NUMBER:** J41419**DATE:** 28/08/2019**CLIENT:** Stevens Group**LOGGED:** M Gosling**SITE ADDRESS:** 5 – 13 Louth Park Rd, South Maitland**DRILLER:** M Gosling**SURFACE TYPE:** Grass**DRILLING METHOD:** Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
0.1		FILL – Moist, Brown, Dense, Silt/Sand	0.0	-	No Obvious Odour
0.2					
0.3					
0.4					
0.5		FILL – Moist, Brown/Grey, Dense, Silt/Clay/Gravel	0.0	BH03_0.5	No Obvious Odour Light ash
0.6		Borehole Terminated 0.5m BGL			
0.7					
0.8					
0.9					
1.0					

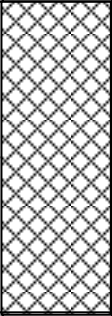
SOIL BOREHOLE LOG: BH04**JOB NUMBER:** J41419**DATE:** 28/08/2019**CLIENT:** Stevens Group**LOGGED:** M Gosling**SITE ADDRESS:** 5 – 13 Louth Park Rd, South Maitland**DRILLER:** M Gosling**SURFACE TYPE:** Grass**DRILLING METHOD:** Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
0.1					
0.2					
0.3					
0.4		FILL – Dry, Brown, Dense, Sand/Silt	0.0	BH04_0.4	No Obvious Odour
0.5		Borehole Terminated 0.4m BGL			
0.6					
0.7					
0.8					
0.9					
1.0					

SOIL BOREHOLE LOG: BH05**JOB NUMBER:** J41419**DATE:** 28/08/2019**CLIENT:** Stevens Group**LOGGED:** M Gosling**SITE ADDRESS:** 5 – 13 Louth Park Rd, South Maitland**DRILLER:** M Gosling**SURFACE TYPE:** Grass**DRILLING METHOD:** Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
0.1					
0.2		FILL – Dry, Brown, Dense, Sand/Silt	0.0	BH05_0.2	No Obvious Odour Minor Glass
0.3		Borehole Terminated 0.2m BGL			
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1.0					

SOIL BOREHOLE LOG: BH06**JOB NUMBER:** J41419**DATE:** 28/08/2019**CLIENT:** Stevens Group**LOGGED:** M Gosling**SITE ADDRESS:** 5 – 13 Louth Park Rd, South Maitland**DRILLER:** M Gosling**SURFACE TYPE:** Grass**DRILLING METHOD:** Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
0.1					
0.2		FILL – Dry, Brown, Dense, Sand/Silt	0.0	BH06_0.2	No Obvious Odour Concrete/tile fragments
0.3		Borehole Terminated 0.2m BGL			
0.4					
0.5					
0.6					
0.7					
0.8					
0.9					
1.0					

SOIL BOREHOLE LOG: BH07**JOB NUMBER:** J41419**DATE:** 28/08/2019**CLIENT:** Stevens Group**LOGGED:** M Gosling**SITE ADDRESS:** 5 – 13 Louth Park Rd, South Maitland**DRILLER:** M Gosling**SURFACE TYPE:** Grass**DRILLING METHOD:** Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
0.1					
0.2					
0.3		FILL – Moist, Brown, Dense, Sand/Silt/Clay	0.0	BH07_0.3	No Obvious Odour
0.4		Borehole Terminated 0.3m BGL			
0.5					
0.6					
0.7					
0.8					
0.9					
1.0					

SOIL BOREHOLE LOG: BH08**JOB NUMBER:** J41419**DATE:** 05/09/2019**CLIENT:** Stevens Group**LOGGED:** M Gosling**SITE ADDRESS:** 5 – 13 Louth Park Rd, South Maitland**DRILLER:** M Gosling**SURFACE TYPE:** Grass**DRILLING METHOD:** Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
0.1					
0.2					
0.3					
0.4		FILL – Moist, Brown, Dense, Sand/Silt/Clay	0.0	BH08_0.4	No Obvious Odour
0.5		Borehole Terminated 0.4m BGL			
0.6					
0.7					
0.8					
0.9					
1.0					

SOIL BOREHOLE LOG: BH09**JOB NUMBER:** J41419**DATE:** 05/09/2019**CLIENT:** Stevens Group**LOGGED:** M Gosling**SITE ADDRESS:** 5 – 13 Louth Park Rd, South Maitland**DRILLER:** M Gosling**SURFACE TYPE:** Grass**DRILLING METHOD:** Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
0.1					
0.2					
0.3					
0.4		FILL – Moist, Brown, Dense, Sand/Silt/Clay	0.0	BH09_0.5 DP_28819	No Obvious Odour Duplicate sample collected
0.5		Borehole Terminated 0.4m BGL			
0.6					
0.7					
0.8					
0.9					
1.0					

SOIL BOREHOLE LOG: BH10

JOB NUMBER: J41419

DATE: 05/09/2019



CLIENT: Stevens Group

LOGGED: M Gosling

SITE ADDRESS: 5 – 13 Louth Park Rd, South Maitland

DRILLER: M Gosling

SURFACE TYPE: Grass

DRILLING METHOD: Hand Auger

Depth (m)	Graphic	Soil Description	PID (ppm)	Field Sample #	Other Notes
0.0		Grass			
0.1					
0.2		FILL – Moist, Brown, Dense, Silt/Sand	0.0	-	No Obvious Odour
0.3					
0.4					
0.5					
0.6					
0.7		FILL – Moist, Brown, Dense, Silt/Sand/Clay	0.0	BH10_0.7	No Obvious Odour Debris (Glass Jar, Glass fragments, Fabric, Metal wire/fragments & Metal Horseshoe) Light ash
0.8		Borehole Terminated 0.7m BGL			
0.9					
1.0					

Analytical Results Table 1
Soil Results

Site: 5 - 13 Louth Park Rd, South Maitland NSW
Job No: J41419

Sample Identification	Sample Date	Laboratory Report Number	Description	Metals																	Anions	pH	CEC	Phenols			
				Arsenic	Beryllium	Boron	Cadmium	Chromium	Hexavalent chromium	Cobalt	Copper	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc				Cyanide	Calcium exchange capacity	Phenol	Pentachlorophenol
Ecological - Commercial/Industrial*				160	^8	^130	^22	320	^1.4	^300	320	1,800	^4,000	^24	^40	440	^2.9	^40	^300	870	^8	-	-	-	-	-	-
Human Health - Commercial/Industrial D				3,000	500	300,000	900	^1,800,000	3,600	4,000	240,000	1,500	60,000	730	^5,800	6,000	10,000	^5,800	^700,000	400,000	1,500	-	-	-	240,000	660	25,000
BH01_0.2	28-Aug-19	N19-Au43189	Fill - Silty SAND	5.5	-	-	< 0.4	20	-	-	27	470	-	0.1	< 5	23	< 2	< 0.2	13	160	-	-	-	-	-	-	-
BH02_0.05	28-Aug-19	N19-Au43190	Fill - Silty SAND	4.7	-	-	0.8	24	-	-	46	1000	-	0.2	< 5	25	< 2	0.3	19	350	-	6.3	6.8	-	-	-	-
BH03_0.5	28-Aug-19	N19-Au43191	Fill - Silty SAND	4.7	< 2	< 10	< 0.4	12	< 1	5.8	30	630	140	0.2	-	15	< 2	-	-	130	< 5	-	-	< 0.5	< 1	< 0.6	
BH04_0.4	28-Aug-19	N19-Au43192	Fill - Silty SAND	6.5	-	-	1.1	33	-	-	290	960	-	1.3	< 5	68	< 2	0.8	95	1000	-	-	-	-	-	-	
BH05_0.2	28-Aug-19	N19-Au43193	Fill - Silty SAND	16	-	-	1.6	30	-	-	94	1400	-	0.7	< 5	35	< 2	0.8	57	800	-	6.6	19	-	-	-	
BH06_0.2	28-Aug-19	N19-Au43194	Fill - Silty SAND	5.3	-	-	2	27	-	-	80	880	-	0.2	< 5	36	< 2	0.3	27	540	-	-	-	-	-	-	
BH07_0.3	28-Aug-19	N19-Au43195	Fill - Silty SAND	4.2	-	-	0.6	35	-	-	49	320	-	0.3	< 5	33	< 2	< 0.2	13	570	-	-	-	-	-	-	
BH08_0.4	05-Sep-19	N19-Se07023	Fill - Silty SAND	4.2	-	-	< 0.4	47	-	-	34	83	-	0.2	< 5	47	< 2	< 0.2	< 10	150	-	-	-	-	-	-	
BH09_0.5	05-Sep-19	N19-Se07024	Fill - Silty SAND	3.7	-	-	< 0.4	44	-	-	28	38	-	< 0.1	< 5	44	< 2	< 0.2	< 10	89	-	6.1	30	-	-	-	
DP_28819	05-Sep-19	N19-Se07022	Fill - Silty SAND	3.9	-	-	< 0.4	46	-	-	29	46	-	0.1	< 5	47	< 2	< 0.2	< 10	94	-	-	-	-	-	-	
BH10_0.7	05-Sep-19	N19-Se07025	Fill - Silty SAND	7.1	-	-	2.4	69	-	-	140	1500	-	0.3	< 5	58	< 2	0.6	38	2700	-	-	-	-	-	-	

NOTE: All criteria are adopted from NEPM (2013) and all values are reported in mg/kg, unless stated otherwise.

* EILs for metals (aged) were calculated using conservative soil properties (pH 4.5; CEC 5 cmol/kg; clay content 1 %) and Victorian low traffic ABC, unless stated otherwise.

OR

* Refer to Appendices for site-specific Ecological Investigation Level calculations for chromium, copper, nickel and zinc.

^ CCME Canadian Environmental Quality Guidelines Summary Table - Soil Quality Guidelines.

^^ Dragun (1998) *The Soil Chemistry of Hazardous Materials*, Table 3.1.

* US EPA Regional Screening Levels Traditional Summary Table, June 2017.

** Direct contact values from Friebel & Nadebaum (2011) *Health screening levels for petroleum hydrocarbons in soil and groundwater: summary*, CRC CARE Technical Report 10.

*** Standards Australia (2009) *AS2159-2009 Piling - Design and Installation*.

#Laboratory limit of reporting adopted in lieu of applicable guideline

Analytical Results Table 1
Soil Results

Site: 5 - 13 Louth Park Rd, South Maitland NSW
Job No: J41419

Sample Identification	Sample Date	Laboratory Report Number	Description	MAH				PAH				TRH (1999)		TRH				PCB		OCP						
				Benzene	Toluene	Ethylbenzene	Xylenes	Benz[a]pyrene	Benz[a]pyrene TEQ	Naphthalene	PAH (total)	TRH (C6-C9)	TRH (C10-C36)	TRH (C6-C10)	TRH - F1	TRH (C10-C16)	TRH - F2	TRH (C16-C34)	TRH (C34-C40)	PCB (total)	Aldrin + dieldrin	DDT	DDT + DDD + DDE	Chlordane (total)	Heptachlor	Endosulfan
Ecological - Commercial/Industrial*				75	135	165	180	1.4	-	370	-	-	-	-	215	-	170	1,700	3,300	-	-	640	-	-	-	-
Human Health - Commercial/Industrial D				**430	**99,000	**27,000	**81,000	-	40	**11,000	4,000	-	-	**26,000	-	**20,000	-	**27,000	**38,000	7	45	-	3,600	530	50	2,000
BH01_0.2	28-Aug-19	N19-Au43189	Fill - Silty SAND	-	-	-	-	8.9	14	< 0.5	114.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH02_0.05	28-Aug-19	N19-Au43190	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH03_0.5	28-Aug-19	N19-Au43191	Fill - Silty SAND	< 0.1	< 0.1	< 0.1	< 0.3	1.9	3	< 0.5	23	< 20	163	< 20	< 20	< 50	< 50	120	< 100	< 0.1	< 0.1	< 0.05	< 0.05	< 0.1	< 0.05	
BH04_0.4	28-Aug-19	N19-Au43192	Fill - Silty SAND	< 0.1	< 0.1	< 0.1	< 0.3	-	-	-	-	< 20	205	< 20	< 20	< 50	< 50	160	< 100	-	-	-	-	-	-	
BH05_0.2	28-Aug-19	N19-Au43193	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH06_0.2	28-Aug-19	N19-Au43194	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH07_0.3	28-Aug-19	N19-Au43195	Fill - Silty SAND	-	-	-	-	2.5	3.8	< 0.5	26.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH08_0.4	05-Sep-19	N19-Se07023	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH09_0.5	05-Sep-19	N19-Se07024	Fill - Silty SAND	< 0.1	< 0.1	< 0.1	< 0.3	1.1	1.9	< 0.5	12.8	< 20	< 50	< 20	< 20	< 50	< 50	< 100	< 100	-	-	-	-	-	-	
DP_28819	05-Sep-19	N19-Se07022	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10_0.7	05-Sep-19	N19-Se07025	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

NOTE: All criteria are adopted from NEPM (2013) and all values are reported in mg/kg, unless stated otherwise.

*EILs for metals (aged) were calculated using conservative soil properties (ph 4.5; CEC 5 cmol/kg; clay content 1 %) and Victorian low traffic ABC, unless stated otherwise.

OR

* Refer to Appendices for site-specific Ecological Investigation Level calculations for chromium, copper, nickel and zinc.

^ CCME Canadian Environmental Quality Guidelines Summary Table - Soil Quality Guidelines.

^^ Dragun (1998) *The Soil Chemistry of Hazardous Materials*, Table 3.1.

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#Laboratory limit of reporting adopted in lieu of applicable guideline

Analytical Results Table 1
Soil Results

Site: 5 - 13 Louth Park Rd, South Maitland NSW
Job No: J41419

Sample Identification	Sample Date	Laboratory Report Number	Description	OPP					Herbicides					Other Pesticides				
				Endrin	Hexachlorobenzene (HCB)	Methoxychlor	Mirex	Toxaphene	Chlorpyrifos	2,4,5-T	2,4-D	MCPA	MCPB	Mecoprop	Picloram	Atrazine	Bifenthrin	
Ecological - Commercial/Industrial[†]				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Human Health - Commercial/Industrial D				100	80	2,500	100	160	2,000	5,000	9,000	5,000	5,000	5,000	35,000	2,500	4,500	-
BH01_0.2	28-Aug-19	N19-Au43189	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH02_0.05	28-Aug-19	N19-Au43190	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH03_0.5	28-Aug-19	N19-Au43191	Fill - Silty SAND	< 0.05	< 0.05	< 0.05	< 0.05	< 1	< 0.2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.2	< 0.05	
BH04_0.4	28-Aug-19	N19-Au43192	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH05_0.2	28-Aug-19	N19-Au43193	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH06_0.2	28-Aug-19	N19-Au43194	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH07_0.3	28-Aug-19	N19-Au43195	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH08_0.4	05-Sep-19	N19-Se07023	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH09_0.5	05-Sep-19	N19-Se07024	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
DP_28819	05-Sep-19	N19-Se07022	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
BH10_0.7	05-Sep-19	N19-Se07025	Fill - Silty SAND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

NOTE: All criteria are adopted from NEPM (2013) and all values are reported in mg/kg, unless stated otherwise.

*EILs for metals (aged) were calculated using conservative soil properties (ph 4.5; CEC 5 cmol/kg; clay content 1 %) and Victorian low traffic ABC, unless stated otherwise.

OR

* Refer to Appendices for site-specific Ecological Investigation Level calculations for chromium, copper, nickel and zinc.

[†] CCME Canadian Environmental Quality Guidelines Summary Table - Soil Quality Guidelines.

^{^^} Dragun (1998) *The Soil Chemistry of Hazardous Materials*, Table 3.1.

* US EPA Regional Screening Levels Traditional Summary Table, June 2017.

** Direct contact values from Friebel & Nadebaum (2011) *Health screening levels for petroleum hydrocarbons in soil and groundwater: summary*, CRC CARE Technical Report 10.

*** Standards Australia (2009) *AS2159-2009 Piling - Design and Installation*.

#Laboratory limit of reporting adopted in lieu of applicable guideline

Analytical Results Table 2

Leachate Results

Site: 5 - 13 Louth Park Rd, South Maitland
Job No: J41419

Sample Identification	Description	PAH													PAH (total)
		Zinc	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	
Maintenance of Fresh Water Ecosystem		0.008	0.0005	0.0001	0.00005	0.00005	0.0002	-	0.001	0.003	0.00005	0.016	0.0006	0.000025	-
Australian Drinking Water Guidelines	Health Criteria	-	0.000012	0.00001	-	0.0003 ¹⁴	0.003 ¹⁴	0.000003 ¹⁴	0.08 ¹⁴	0.029 ¹⁴	0.000034 ¹⁴	-	-	0.012 ¹⁴	-
Australian Drinking Water Guidelines	Aesthetic Criteria	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Primary Contact Recreation		5	-	0.01	-	-	-	-	-	-	-	-	-	-	-
BH01_0.2	Leachate	0.34	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BH02_0.05	Leachate	0.86	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03_0.5	Leachate	0.59	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04_0.4	Leachate	2.1	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05_0.2	Leachate	1.7	-	-	-	-	-	-	-	-	-	-	-	-	-
BH06_0.2	Leachate	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-
BH07_0.3	Leachate	1.2	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
BH08_0.4	Leachate	0.28	-	-	-	-	-	-	-	-	-	-	-	-	-
BH09_0.5	Leachate	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10_0.7	Leachate	0.29	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

NOTE: All criteria and laboratory results are reported in mg/L unless stated otherwise
 (1) Adopted vapour intrusion health screening levels are in consideration of clay as the predominant soil texture and groundwater depths ranging between 4 and 8 mbgl

** Criteria values converted from nitrate as NO3 to nitrate as N using a factor of 0.2257 where applicable, and rounded.
 *** Criteria values converted from nitrite as NO2 to nitrite as N using a factor of 0.3040 where applicable, and rounded.
 ^ Criteria values converted from sulphate as SO4 to sulphate as S using a factor of 0.3333 where applicable, and rounded.

Analytical Results Table 3
Quality Control Results

Site: 5 - 13 Louth Park Rd, South Maitland
Job No: J41419

Sample Identification	Sample Date	Laboratory Report Number	Description	Metals																
				Arsenic	Beryllium	Boron	Cadmium	Chromium	Cobalt	Copper	Lead	Manganese	Mercury	Molybdenum	Nickel	Selenium	Silver	Tin	Zinc	
Blind Replicates																				
BH09_0.5	43713	N19-Se07024	Fill - Silty SAND	3.7	-	-	< 0.4	44	-	28	38	-	< 0.1	< 5	44	< 2	< 0.2	< 10	89	
DP_28819	43713	N19-Se07022	Fill - Silty SAND	3.9	-	-	< 0.4	46	-	29	46	-	0.1	< 5	47	< 2	< 0.2	< 10	94	
RPD				5.26	-	-	0.00	4.44	-	3.51	19.05	-	66.67	0.00	6.59	0.00	0.00	0.00	5.46	

NOTE: All criteria and laboratory results are reported in mg/kg or mg/L unless stated otherwise.

NA - Not Applicable since different detection limits reported between labs.

52.17 Calculating the RPD by halving the detection limit has reported an RPD to exceed the 50% limit referenced from AS4482,1 (2005).

82.35 RPD Exceeds 50% limit referenced from AS4482,1 (2005).

ESP Environmental
Unit 8, 2 Bolton Street
Sydenham
NSW 2044



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: **Michael Gosling**

Report **674016-S**
Project name **MAITLAND PSI**
Project ID **J41419**
Received Date **Aug 29, 2019**

Client Sample ID			BH01_0.2	BH02_0.05	BH03_0.5	BH04_0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N19-Au43189	N19-Au43190	N19-Au43191	N19-Au43192
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	< 20	< 20
TRH C10-C14	20	mg/kg	-	-	< 20	< 20
TRH C15-C28	50	mg/kg	-	-	110	130
TRH C29-C36	50	mg/kg	-	-	53	75
TRH C10-C36 (Total)	50	mg/kg	-	-	163	205
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	-	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	-	-	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	99	96
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	0.5	mg/kg	-	-	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)	50	mg/kg	-	-	< 50	< 50
TRH C6-C10	20	mg/kg	-	-	< 20	< 20
TRH C6-C10 less BTEX (F1)	20	mg/kg	-	-	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	14	-	2.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	14	-	2.8	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	14	-	3.0	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	0.9	-	< 0.5	-
Anthracene	0.5	mg/kg	1.6	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	7.7	-	1.5	-
Benzo(a)pyrene	0.5	mg/kg	8.9	-	1.9	-
Benzo(b&j)fluoranthene	0.5	mg/kg	8.2	-	1.2	-
Benzo(g,h,i)perylene	0.5	mg/kg	8.2	-	1.3	-
Benzo(k)fluoranthene	0.5	mg/kg	7.5	-	1.4	-
Chrysene	0.5	mg/kg	8.6	-	1.7	-
Dibenz(a,h)anthracene	0.5	mg/kg	2.1	-	< 0.5	-
Fluoranthene	0.5	mg/kg	23	-	5.0	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	6.4	-	1.9	-

Client Sample ID			BH01_0.2	BH02_0.05	BH03_0.5	BH04_0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N19-Au43189	N19-Au43190	N19-Au43191	N19-Au43192
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	8.4	-	2.0	-
Pyrene	0.5	mg/kg	23	-	5.1	-
Total PAH*	0.5	mg/kg	114.5	-	23	-
2-Fluorobiphenyl (surr.)	1	%	69	-	76	-
p-Terphenyl-d14 (surr.)	1	%	57	-	88	-
Organochlorine Pesticides						
Bifenthrin	0.05	mg/kg	-	-	< 0.05	-
Organophosphorus Pesticides						
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	-
Total PCB*	0.1	mg/kg	-	-	< 0.1	-
Dibutylchlorendate (surr.)	1	%	-	-	83	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	81	-
Triazines						
Atrazine	0.2	mg/kg	-	-	< 0.2	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	-	< 50	< 50
TRH >C16-C34	100	mg/kg	-	-	120	160
TRH >C34-C40	100	mg/kg	-	-	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	-	-	120	160
NEPM 2013 Acid Herbicides						
Picloram	0.5	mg/kg	-	-	< 0.5	-
2,4-D	0.5	mg/kg	-	-	< 0.5	-
2,4,5-T	0.5	mg/kg	-	-	< 0.5	-
MCPA	0.5	mg/kg	-	-	< 0.5	-
MCPB	0.5	mg/kg	-	-	< 0.5	-
Mecoprop	0.5	mg/kg	-	-	< 0.5	-
Warfarin (surr.)	1	%	-	-	100	-
NEPM 2013 Organochlorine Pesticides						
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Mirex	0.01	mg/kg	-	-	< 0.01	-
4,4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4,4'-DDT	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-

Client Sample ID			BH01_0.2	BH02_0.05	BH03_0.5	BH04_0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N19-Au43189	N19-Au43190	N19-Au43191	N19-Au43192
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit				
NEPM 2013 Organochlorine Pesticides						
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.05	mg/kg	-	-	< 0.05	-
Toxaphene	1	mg/kg	-	-	< 1	-
Dibutylchloroendate (surr.)	1	%	-	-	83	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	81	-
NEPM 2013 Phenols						
2-Methylphenol (o-Cresol)	0.2	mg/kg	-	-	< 0.2	-
3&4-Methylphenol (m&p-Cresol)	0.4	mg/kg	-	-	< 0.4	-
Pentachlorophenol	1	mg/kg	-	-	< 1	-
Phenol	0.5	mg/kg	-	-	< 0.5	-
Phenol-d6 (surr.)	1	%	-	-	73	-
Chromium (hexavalent)	1	mg/kg	-	-	< 1	-
Conductivity (1:5 aqueous extract at 25°C as rec.)	10	uS/cm	-	31	-	-
Cyanide (free)	5	mg/kg	-	-	< 5	-
pH (1:5 Aqueous extract at 25°C as rec.)	0.1	pH Units	-	6.3	-	-
% Moisture	1	%	6.2	4.4	17	18
Heavy Metals						
Arsenic	2	mg/kg	5.5	4.7	4.7	6.5
Beryllium	2	mg/kg	-	-	< 2	-
Boron	10	mg/kg	-	-	< 10	-
Cadmium	0.4	mg/kg	< 0.4	0.8	< 0.4	1.1
Chromium	5	mg/kg	20	24	12	33
Cobalt	5	mg/kg	-	-	5.8	-
Copper	5	mg/kg	27	46	30	290
Lead	5	mg/kg	470	1000	630	960
Manganese	5	mg/kg	-	-	140	-
Mercury	0.1	mg/kg	0.1	0.2	0.2	1.3
Molybdenum	5	mg/kg	< 5	< 5	-	< 5
Nickel	5	mg/kg	23	25	15	68
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	0.2	mg/kg	< 0.2	0.3	-	0.8
Tin	10	mg/kg	13	19	-	95
Zinc	5	mg/kg	160	350	130	1000
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	6.8	-	-

Client Sample ID			BH05_0.2	BH06_0.2	BH07_0.3
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			N19-Au43193	N19-Au43194	N19-Au43195
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	3.3
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	3.5
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	3.8
Acenaphthene	0.5	mg/kg	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	< 0.5

Client Sample ID			BH05_0.2	BH06_0.2	BH07_0.3
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			N19-Au43193	N19-Au43194	N19-Au43195
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Anthracene	0.5	mg/kg	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	1.9
Benzo(a)pyrene	0.5	mg/kg	-	-	2.5
Benzo(b&j)fluoranthene	0.5	mg/kg	-	-	2.1
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	2.0
Benzo(k)fluoranthene	0.5	mg/kg	-	-	1.7
Chrysene	0.5	mg/kg	-	-	2.2
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	< 0.5
Fluoranthene	0.5	mg/kg	-	-	5.4
Fluorene	0.5	mg/kg	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	1.7
Naphthalene	0.5	mg/kg	-	-	< 0.5
Phenanthrene	0.5	mg/kg	-	-	1.9
Pyrene	0.5	mg/kg	-	-	5.5
Total PAH*	0.5	mg/kg	-	-	26.9
2-Fluorobiphenyl (surr.)	1	%	-	-	63
p-Terphenyl-d14 (surr.)	1	%	-	-	55
Heavy Metals					
Arsenic	2	mg/kg	16	5.3	4.2
Cadmium	0.4	mg/kg	1.6	2.0	0.6
Chromium	5	mg/kg	30	27	35
Copper	5	mg/kg	94	80	49
Lead	5	mg/kg	1400	880	320
Mercury	0.1	mg/kg	0.7	0.2	0.3
Molybdenum	5	mg/kg	< 5	< 5	< 5
Nickel	5	mg/kg	35	36	33
Selenium	2	mg/kg	< 2	< 2	< 2
Silver	0.2	mg/kg	0.8	0.3	< 0.2
Tin	10	mg/kg	57	27	13
Zinc	5	mg/kg	800	540	570
Cation Exchange Capacity					
Cation Exchange Capacity	0.05	meq/100g	19	-	-

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 03, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 03, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 03, 2019	
NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding Methyl Mercury/PBDE			
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 03, 2019	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Sep 03, 2019	14 Days
Organochlorine Pesticides - Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8270)	Melbourne	Sep 03, 2019	14 Days
Organophosphorus Pesticides - Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS (USEPA 8081)	Melbourne	Sep 03, 2019	14 Days
Polychlorinated Biphenyls - Method: LTM-ORG-2220 OCP & PCB in Soil and Water (USEPA 8082)	Melbourne	Sep 03, 2019	28 Days
Triazines - Method: LTM-ORG-2080	Melbourne	Sep 03, 2019	14 Days
NEPM 2013 Acid Herbicides - Method: MGT 530	Melbourne	Sep 03, 2019	14 Days
NEPM 2013 Organochlorine Pesticides - Method: USEPA 8081 Organochlorine Pesticides	Melbourne	Sep 03, 2019	14 Days
NEPM 2013 Phenols - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Sep 03, 2019	14 Days
Chromium (hexavalent) - Method: APHA 3500-Cr Hexavalent Chromium- (Extraction:- USEPA3060)	Melbourne	Sep 03, 2019	28 Days
Cyanide (free) - Method: LTM-INO-4020 Total Free WAD Cyanide by CFA	Melbourne	Sep 05, 2019	14 Days
NEPM 2013 Metals : Metals M12 - Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)	Melbourne	Sep 03, 2019	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Sep 03, 2019	180 Days
Metals IWRG 621 : Metals M12 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Sep 03, 2019	28 Days
Conductivity (1:5 aqueous extract at 25°C as rec.) - Method: LTM-INO-4030 Conductivity	Melbourne	Sep 03, 2019	7 Days
Cation Exchange Capacity - Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage	Melbourne	Sep 05, 2019	180 Days
pH (1:5 Aqueous extract at 25°C as rec.) - Method: LTM-GEN-7090 pH in soil by ISE	Melbourne	Sep 03, 2019	7 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Aug 29, 2019	14 Days

Company Name: ESP Laboratories NSW	Order No.:	Received: Aug 29, 2019 3:00 PM
Address: Unit 8, 2 Bolton Street Sydenham NSW 2044	Report #: 674016	Due: Sep 5, 2019
Project Name: MAITLAND PSI	Phone: 02 9519 2125	Priority: 5 Day
Project ID: J41419	Fax: 02 9554 7033	Contact Name: Michael Gosling

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals IWRG 621 : Metals M12	BTEX	Moisture Set	Cation Exchange Capacity	NEPM Screen Table 1(A) HIL's for Soil Contaminants - Basic Suite - Excluding	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	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_0.2	Aug 28, 2019		Soil	N19-Au43189		X	X	X				
2	BH02_0.05	Aug 28, 2019		Soil	N19-Au43190	X		X	X	X			
3	BH03_0.5	Aug 28, 2019		Soil	N19-Au43191				X		X		
4	BH04_0.4	Aug 28, 2019		Soil	N19-Au43192			X	X	X			X
5	BH05_0.2	Aug 28, 2019		Soil	N19-Au43193	X		X	X	X			
6	BH06_0.2	Aug 28, 2019		Soil	N19-Au43194			X	X				
7	BH07_0.3	Aug 28, 2019		Soil	N19-Au43195		X	X	X				
Test Counts						2	2	6	1	7	2	1	1

Internal Quality Control Review and Glossary
General

- 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.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- 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

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- 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	
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							
Bifenthrin	mg/kg	< 0.05			0.05	Pass	
Method Blank							
Organophosphorus Pesticides							
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Triazines							
Atrazine	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
NEPM 2013 Acid Herbicides							
Picloram	mg/kg	< 0.5			0.5	Pass	
2,4-D	mg/kg	< 0.5			0.5	Pass	
2,4,5-T	mg/kg	< 0.5			0.5	Pass	
MCPA	mg/kg	< 0.5			0.5	Pass	
MCPB	mg/kg	< 0.5			0.5	Pass	
Mecoprop	mg/kg	< 0.5			0.5	Pass	
Method Blank							
NEPM 2013 Organochlorine Pesticides							
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Mirex	mg/kg	< 0.01			0.01	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	
Aldrin	mg/kg	< 0.05			0.05	Pass	
Chlordanes - Total	mg/kg	< 0.1			0.1	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	
Endrin	mg/kg	< 0.05			0.05	Pass	
Heptachlor	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							
NEPM 2013 Phenols							
2-Methylphenol (o-Cresol)	mg/kg	< 0.2			0.2	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/kg	< 0.4			0.4	Pass	
Pentachlorophenol	mg/kg	< 1			1	Pass	
Phenol	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Chromium (hexavalent)	mg/kg	< 1			1	Pass	
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	Pass	
Cyanide (free)	mg/kg	< 5			5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Beryllium	mg/kg	< 2			2	Pass	
Boron	mg/kg	< 10			10	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Cobalt	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Manganese	mg/kg	< 5			5	Pass	

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Mercury	mg/kg	< 0.1		0.1	Pass	
Molybdenum	mg/kg	< 5		5	Pass	
Nickel	mg/kg	< 5		5	Pass	
Selenium	mg/kg	< 2		2	Pass	
Silver	mg/kg	< 0.2		0.2	Pass	
Tin	mg/kg	< 10		10	Pass	
Zinc	mg/kg	< 5		5	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	%	122		70-130	Pass	
TRH C10-C14	%	78		70-130	Pass	
LCS - % Recovery						
BTEX						
Benzene	%	100		70-130	Pass	
Toluene	%	108		70-130	Pass	
Ethylbenzene	%	105		70-130	Pass	
m&p-Xylenes	%	105		70-130	Pass	
Xylenes - Total	%	106		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	%	110		70-130	Pass	
TRH C6-C10	%	107		70-130	Pass	
LCS - % Recovery						
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	%	89		70-130	Pass	
Acenaphthylene	%	91		70-130	Pass	
Anthracene	%	95		70-130	Pass	
Benz(a)anthracene	%	81		70-130	Pass	
Benzo(a)pyrene	%	83		70-130	Pass	
Benzo(b&j)fluoranthene	%	81		70-130	Pass	
Benzo(g,h,i)perylene	%	93		70-130	Pass	
Benzo(k)fluoranthene	%	88		70-130	Pass	
Chrysene	%	95		70-130	Pass	
Dibenz(a,h)anthracene	%	84		70-130	Pass	
Fluoranthene	%	90		70-130	Pass	
Fluorene	%	93		70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	87		70-130	Pass	
Naphthalene	%	89		70-130	Pass	
Phenanthrene	%	87		70-130	Pass	
Pyrene	%	91		70-130	Pass	
LCS - % Recovery						
Organochlorine Pesticides						
Bifenthrin	%	70		70-130	Pass	
LCS - % Recovery						
Polychlorinated Biphenyls						
Aroclor-1260	%	93		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	%	74		70-130	Pass	
LCS - % Recovery						
NEPM 2013 Acid Herbicides						
Picloram	%	105		70-130	Pass	
2,4-D	%	75		70-130	Pass	
2,4,5-T	%	73		70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code	
MCPA	%	75			70-130	Pass		
MCPB	%	74			70-130	Pass		
Mecoprop	%	96			70-130	Pass		
LCS - % Recovery								
NEPM 2013 Organochlorine Pesticides								
Endosulfan sulphate	%	82			70-130	Pass		
Mirex	%	112			70-130	Pass		
4.4'-DDD	%	123			70-130	Pass		
4.4'-DDE	%	117			70-130	Pass		
4.4'-DDT	%	84			70-130	Pass		
Aldrin	%	108			70-130	Pass		
Chlordanes - Total	%	112			70-130	Pass		
Dieldrin	%	123			70-130	Pass		
Endosulfan I	%	99			70-130	Pass		
Endosulfan II	%	108			70-130	Pass		
Endrin	%	91			70-130	Pass		
Heptachlor	%	94			70-130	Pass		
Hexachlorobenzene	%	120			70-130	Pass		
Methoxychlor	%	72			70-130	Pass		
LCS - % Recovery								
NEPM 2013 Phenols								
2-Methylphenol (o-Cresol)	%	108			30-130	Pass		
3&4-Methylphenol (m&p-Cresol)	%	112			30-130	Pass		
Pentachlorophenol	%	91			30-130	Pass		
Phenol	%	106			30-130	Pass		
LCS - % Recovery								
Chromium (hexavalent)	%	99			70-130	Pass		
LCS - % Recovery								
Heavy Metals								
Arsenic	%	117			80-120	Pass		
Beryllium	%	107			80-120	Pass		
Boron	%	107			80-120	Pass		
Cadmium	%	103			80-120	Pass		
Chromium	%	117			80-120	Pass		
Cobalt	%	118			80-120	Pass		
Copper	%	119			80-120	Pass		
Lead	%	120			80-120	Pass		
Manganese	%	118			80-120	Pass		
Mercury	%	110			75-125	Pass		
Molybdenum	%	118			80-120	Pass		
Nickel	%	117			80-120	Pass		
Selenium	%	107			80-120	Pass		
Silver	%	104			80-120	Pass		
Tin	%	118			80-120	Pass		
Zinc	%	116			80-120	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	M19-Se00074	NCP	%	93		70-130	Pass	
Acenaphthylene	M19-Se00074	NCP	%	99		70-130	Pass	
Anthracene	M19-Se00074	NCP	%	97		70-130	Pass	
Benz(a)anthracene	M19-Se00074	NCP	%	106		70-130	Pass	
Benzo(a)pyrene	M19-Se00074	NCP	%	110		70-130	Pass	
Benzo(b&j)fluoranthene	M19-Se00074	NCP	%	106		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Benzo(g,h,i)perylene	M19-Se00074	NCP	%	112		70-130	Pass	
Benzo(k)fluoranthene	M19-Se00074	NCP	%	104		70-130	Pass	
Chrysene	M19-Se00074	NCP	%	117		70-130	Pass	
Dibenz(a,h)anthracene	M19-Se00074	NCP	%	100		70-130	Pass	
Fluoranthene	M19-Se00074	NCP	%	107		70-130	Pass	
Fluorene	M19-Se00074	NCP	%	96		70-130	Pass	
Indeno(1,2,3-cd)pyrene	M19-Se00074	NCP	%	104		70-130	Pass	
Naphthalene	M19-Se00074	NCP	%	94		70-130	Pass	
Phenanthrene	M19-Se00074	NCP	%	90		70-130	Pass	
Pyrene	M19-Se00074	NCP	%	109		70-130	Pass	
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S19-Au43410	NCP	%	103		75-125	Pass	
Cadmium	S19-Au43410	NCP	%	84		75-125	Pass	
Chromium	S19-Au43410	NCP	%	102		75-125	Pass	
Copper	S19-Au43410	NCP	%	104		75-125	Pass	
Lead	S19-Au43410	NCP	%	107		75-125	Pass	
Mercury	S19-Au43410	NCP	%	99		70-130	Pass	
Molybdenum	S19-Au43410	NCP	%	105		75-125	Pass	
Nickel	S19-Au43410	NCP	%	101		75-125	Pass	
Selenium	S19-Au43410	NCP	%	107		75-125	Pass	
Silver	S19-Au43410	NCP	%	84		75-125	Pass	
Tin	S19-Au43410	NCP	%	105		75-125	Pass	
Zinc	S19-Au43410	NCP	%	94		75-125	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	M19-Au44053	NCP	%	86		70-130	Pass	
TRH C10-C14	M19-Au43346	NCP	%	90		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	M19-Au44053	NCP	%	86		70-130	Pass	
Toluene	M19-Au44053	NCP	%	93		70-130	Pass	
Ethylbenzene	M19-Au44053	NCP	%	93		70-130	Pass	
m&p-Xylenes	M19-Au44053	NCP	%	96		70-130	Pass	
o-Xylene	M19-Au44053	NCP	%	99		70-130	Pass	
Xylenes - Total	M19-Au44053	NCP	%	97		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	M19-Au44053	NCP	%	84		70-130	Pass	
TRH C6-C10	M19-Au44053	NCP	%	76		70-130	Pass	
Spike - % Recovery								
Polychlorinated Biphenyls				Result 1				
Aroclor-1016	M19-Au43206	NCP	%	77		70-130	Pass	
Aroclor-1260	M19-Au43206	NCP	%	101		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
TRH >C10-C16	M19-Au43346	NCP	%	82		70-130	Pass	
Spike - % Recovery								
NEPM 2013 Acid Herbicides				Result 1				
Picloram	B19-Se00585	NCP	%	103		70-130	Pass	
2,4-D	B19-Se00585	NCP	%	76		70-130	Pass	
MCPA	B19-Se00585	NCP	%	74		70-130	Pass	
MCPB	B19-Se00585	NCP	%	73		70-130	Pass	
Spike - % Recovery								

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
NEPM 2013 Phenols				Result 1					
2-Methylphenol (o-Cresol)	M19-Au43205	NCP	%	99			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	M19-Au43205	NCP	%	107			30-130	Pass	
Pentachlorophenol	M19-Au43205	NCP	%	47			30-130	Pass	
Phenol	M19-Au43205	NCP	%	98			30-130	Pass	
Spike - % Recovery				Result 1					
Chromium (hexavalent)	M19-Au41224	NCP	%	116			70-130	Pass	
Spike - % Recovery				Result 1					
Heavy Metals				Result 1					
Beryllium	S19-Au43410	NCP	%	93			75-125	Pass	
Boron	S19-Au43410	NCP	%	87			75-125	Pass	
Cobalt	S19-Au43410	NCP	%	103			75-125	Pass	
Manganese	S19-Au43410	NCP	%	102			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g,h,i)perylene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a,h)anthracene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1,2,3-cd)pyrene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M19-Se00073	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B19-Au43182	NCP	%	18	19	4.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S19-Au43410	NCP	mg/kg	3.5	3.5	1.0	30%	Pass	
Cadmium	S19-Au43410	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S19-Au43410	NCP	mg/kg	5.6	5.7	3.0	30%	Pass	
Copper	S19-Au43410	NCP	mg/kg	5.5	5.5	<1	30%	Pass	
Lead	S19-Au43410	NCP	mg/kg	19	19	1.0	30%	Pass	
Mercury	S19-Au43410	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	S19-Au43410	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	S19-Au43410	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Selenium	S19-Au43410	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	S19-Au43410	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	S19-Au43410	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	S19-Au43410	NCP	mg/kg	34	35	2.0	30%	Pass	

Duplicate								
				Result 1	Result 2	RPD		
Conductivity (1:5 aqueous extract at 25°C as rec.)	S19-JI49770	NCP	uS/cm	45	39	14	30%	Pass
pH (1:5 Aqueous extract at 25°C as rec.)	S19-JI49770	NCP	pH Units	7.3	7.1	pass	30%	Pass
Duplicate								
Cation Exchange Capacity				Result 1	Result 2	RPD		
Cation Exchange Capacity	S19-Se03124	NCP	meq/100g	12	11	6.0	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD		
TRH C6-C9	S19-Au43408	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C10-C14	S19-Au42786	NCP	mg/kg	< 20	< 20	<1	30%	Pass
TRH C15-C28	S19-Au42786	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH C29-C36	S19-Au42786	NCP	mg/kg	110	110	4.0	30%	Pass
Duplicate								
BTEX				Result 1	Result 2	RPD		
Benzene	S19-Au43408	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Toluene	S19-Au43408	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Ethylbenzene	S19-Au43408	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
m&p-Xylenes	S19-Au43408	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
o-Xylene	S19-Au43408	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Xylenes - Total	S19-Au43408	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
Naphthalene	S19-Au43408	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
TRH C6-C10	S19-Au43408	NCP	mg/kg	< 20	< 20	<1	30%	Pass
Duplicate								
Organochlorine Pesticides				Result 1	Result 2	RPD		
Bifenthrin	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Chlorpyrifos	M19-Au43205	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Triazines				Result 1	Result 2	RPD		
Atrazine	M19-Au43205	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD		
TRH >C10-C16	S19-Au42786	NCP	mg/kg	< 50	< 50	<1	30%	Pass
TRH >C16-C34	S19-Au42786	NCP	mg/kg	110		2.0	30%	Pass
TRH >C34-C40	S19-Au42786	NCP	mg/kg	120		11	30%	Pass
Duplicate								
NEPM 2013 Acid Herbicides				Result 1	Result 2	RPD		
Picloram	B19-Se00584	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2,4-D	B19-Se00584	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
2,4,5-T	B19-Se00584	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPA	B19-Se00584	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
MCPB	B19-Se00584	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Mecoprop	B19-Se00584	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
NEPM 2013 Organochlorine Pesticides				Result 1	Result 2	RPD		
Endosulfan sulphate	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Mirex	M19-Au43205	NCP	mg/kg	< 0.01	< 0.01	<1	30%	Pass
4,4'-DDD	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDE	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
4,4'-DDT	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Aldrin	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass

Duplicate								
NEPM 2013 Organochlorine Pesticides				Result 1	Result 2	RPD		
Chlordanes - Total	M19-Au43205	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Dieldrin	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan I	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endosulfan II	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Endrin	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Heptachlor	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Hexachlorobenzene	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Methoxychlor	M19-Au43205	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Duplicate								
NEPM 2013 Phenols				Result 1	Result 2	RPD		
2-Methylphenol (o-Cresol)	M19-Au43205	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
3&4-Methylphenol (m&p-Cresol)	M19-Au43205	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass
Pentachlorophenol	M19-Au43205	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Phenol	M19-Au43205	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
				Result 1	Result 2	RPD		
Chromium (hexavalent)	M19-Au45045	NCP	mg/kg	< 1	< 1	<1	30%	Pass
Duplicate								
Heavy Metals				Result 1	Result 2	RPD		
Beryllium	M19-Au43426	NCP	mg/kg	< 2	< 2	<1	30%	Pass
Boron	M19-Au43426	NCP	mg/kg	< 10	< 10	<1	30%	Pass
Cobalt	M19-Au43426	NCP	mg/kg	27	28	4.0	30%	Pass
Manganese	M19-Au43426	NCP	mg/kg	480	550	14	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

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)
Julie Kay	Senior Analyst-Inorganic (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](#).

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CHAIN OF CUSTODY RECORD

ASN 50 005 008 521

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1 of 2

Company	ESP - Environmental & Safety Professionals	Project No	J49419	Project Manager	M Hosling
Address	5 Newton street Broadmeadow NSW 2292	Project Name	Maitland PSI	Report Format	
Contact Name		Analysis	(Note: Where metals are requested, please specify "Total" or "Filtered")		
Phone No	(02) 4961 0790		R20	PAH	M12
Special Direction			PH	CEC	TRH
Purchase Order			BTEX		
Quote ID No					

No	Client Sample ID	Date	Matrix	Signature	Date	Time	Temperature
1	BH01-0.2	28/8/19	Solid	[Signature]	29/8	3pm	67406
2	BH02-0.05						
3	BH03-0.5						
4	BH04-0.4						
5	BH05-0.2						
6	BH06-0.2						
7	BH07-0.3						
8	BH08-						
9	BH09-						
10	BH10-						

Requisitioned by	M Hosling	Date	29/8/19
Email for Results	myosling@espls.com.au	Containers	1L Plastic 250mL Plastic 125mL Plastic 200mL Amber Glass 40mL Vial 125mL Amber Glass Jar
Turn Around Requirements	<input type="checkbox"/> Overnight (9am) <input type="checkbox"/> 1 Day* <input type="checkbox"/> 2 Day* <input type="checkbox"/> 3 Day* <input checked="" type="checkbox"/> 5 Day* <input type="checkbox"/> Other ()	Signature	[Signature]
Sample Comments / DG Hazard Warning		Date	

ESP Environmental
Unit 8, 2 Bolton Street
Sydenham
NSW 2044



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: **Michael Gosling**

Report **675269-S**
Project name **MAITLAND PSI**
Project ID **J41419**
Received Date **Sep 05, 2019**

Client Sample ID			DP_28819	BH08_0.4	BH09_0.5	BH10_0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N19-Se07022	N19-Se07023	N19-Se07024	N19-Se07025
Date Sampled			Sep 05, 2019	Sep 05, 2019	Sep 05, 2019	Sep 05, 2019
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	-
TRH C10-C14	20	mg/kg	-	< 20	-	-
TRH C15-C28	50	mg/kg	-	< 50	-	-
TRH C29-C36	50	mg/kg	-	< 50	-	-
TRH C10-C36 (Total)	50	mg/kg	-	< 50	-	-
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	-
Toluene	0.1	mg/kg	-	< 0.1	-	-
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	-
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	-
o-Xylene	0.1	mg/kg	-	< 0.1	-	-
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	-
4-Bromofluorobenzene (surr.)	1	%	-	112	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	0.5	mg/kg	-	< 0.5	-	-
TRH >C10-C16 less Naphthalene (F2)	50	mg/kg	-	< 50	-	-
TRH C6-C10	20	mg/kg	-	< 20	-	-
TRH C6-C10 less BTEX (F1)	20	mg/kg	-	< 20	-	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	-	1.4
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	-	1.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	-	1.9
Acenaphthene	0.5	mg/kg	-	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	-	< 0.5
Anthracene	0.5	mg/kg	-	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	-	0.8
Benzo(a)pyrene	0.5	mg/kg	-	-	-	1.1
Benzo(b&j)fluoranthene	0.5	mg/kg	-	-	-	0.7
Benzo(g,h,i)perylene	0.5	mg/kg	-	-	-	0.7
Benzo(k)fluoranthene	0.5	mg/kg	-	-	-	0.9
Chrysene	0.5	mg/kg	-	-	-	1.1
Dibenz(a,h)anthracene	0.5	mg/kg	-	-	-	< 0.5
Fluoranthene	0.5	mg/kg	-	-	-	3.3
Fluorene	0.5	mg/kg	-	-	-	< 0.5
Indeno(1,2,3-cd)pyrene	0.5	mg/kg	-	-	-	< 0.5

Client Sample ID			DP_28819	BH08_0.4	BH09_0.5	BH10_0.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			N19-Se07022	N19-Se07023	N19-Se07024	N19-Se07025
Date Sampled			Sep 05, 2019	Sep 05, 2019	Sep 05, 2019	Sep 05, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	-	-	-	< 0.5
Phenanthrene	0.5	mg/kg	-	-	-	0.8
Pyrene	0.5	mg/kg	-	-	-	3.4
Total PAH*	0.5	mg/kg	-	-	-	12.8
2-Fluorobiphenyl (surr.)	1	%	-	-	-	82
p-Terphenyl-d14 (surr.)	1	%	-	-	-	110
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	-
TRH >C16-C34	100	mg/kg	-	< 100	-	-
TRH >C34-C40	100	mg/kg	-	< 100	-	-
TRH >C10-C40 (total)*	100	mg/kg	-	< 100	-	-
Conductivity (1:5 aqueous extract at 25°C as rec.)						
	10	uS/cm	-	-	50	-
pH (1:5 Aqueous extract at 25°C as rec.)						
	0.1	pH Units	-	-	6.1	-
% Moisture						
	1	%	19	21	20	22
Heavy Metals						
Arsenic	2	mg/kg	3.9	4.2	3.7	7.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	2.4
Chromium	5	mg/kg	46	47	44	69
Copper	5	mg/kg	29	34	28	140
Lead	5	mg/kg	46	83	38	1500
Mercury	0.1	mg/kg	0.1	0.2	< 0.1	0.3
Molybdenum	5	mg/kg	< 5	< 5	< 5	< 5
Nickel	5	mg/kg	47	47	44	58
Selenium	2	mg/kg	< 2	< 2	< 2	< 2
Silver	0.2	mg/kg	< 0.2	< 0.2	< 0.2	0.6
Tin	10	mg/kg	< 10	< 10	< 10	38
Zinc	5	mg/kg	94	150	89	2700
Cation Exchange Capacity						
Cation Exchange Capacity	0.05	meq/100g	-	-	30	-

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 06, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 06, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 06, 2019	
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 06, 2019	14 Days
Polycyclic Aromatic Hydrocarbons - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Sep 06, 2019	14 Days
pH (1:5 Aqueous extract at 25°C as rec.) - Method: LTM-GEN-7090 pH in soil by ISE	Melbourne	Sep 06, 2019	7 Days
Metals IWRG 621 : Metals M12 - Method:	Melbourne	Sep 06, 2019	28 Days
Conductivity (1:5 aqueous extract at 25°C as rec.) - Method: LTM-INO-4030 Conductivity	Melbourne	Sep 06, 2019	7 Days
Cation Exchange Capacity - Method: LTM-MET-3060 Cation Exchange Capacity by bases & Exchangeable Sodium Percentage	Melbourne	Sep 09, 2019	180 Days
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Sep 05, 2019	14 Days

Company Name: ESP Laboratories NSW	Order No.:	Received: Sep 5, 2019 11:07 AM
Address: Unit 8, 2 Bolton Street Sydenham NSW 2044	Report #: 675269	Due: Sep 12, 2019
Project Name: MAITLAND PSI	Phone: 02 9519 2125	Priority: 5 Day
Project ID: J41419	Fax: 02 9554 7033	Contact Name: Michael Gosling

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						pH (1:5 Aqueous extract at 25°C as rec.)	Polycyclic Aromatic Hydrocarbons	Metals (WFRG 621 : Metals M12)	BTEX	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	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	DP_28819	Sep 05, 2019		Soil	N19-Se07022			X		X		
2	BH08_0.4	Sep 05, 2019		Soil	N19-Se07023			X	X	X		X
3	BH09_0.5	Sep 05, 2019		Soil	N19-Se07024	X		X		X	X	
4	BH10_0.7	Sep 05, 2019		Soil	N19-Se07025		X	X		X		
Test Counts						1	1	4	1	4	1	1

Internal Quality Control Review and Glossary
General

- 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.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- 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

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- 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	
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							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
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							
Conductivity (1:5 aqueous extract at 25°C as rec.)	uS/cm	< 10			10	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	
Molybdenum	mg/kg	< 5			5	Pass	

Test	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Nickel	mg/kg	< 5		5	Pass	
Selenium	mg/kg	< 2		2	Pass	
Silver	mg/kg	< 0.2		0.2	Pass	
Tin	mg/kg	< 10		10	Pass	
Zinc	mg/kg	< 5		5	Pass	
Method Blank						
Cation Exchange Capacity						
Cation Exchange Capacity	meq/100g	< 0.05		0.05	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	%	98		70-130	Pass	
TRH C10-C14	%	89		70-130	Pass	
LCS - % Recovery						
BTEX						
Benzene	%	99		70-130	Pass	
Toluene	%	111		70-130	Pass	
Ethylbenzene	%	116		70-130	Pass	
m&p-Xylenes	%	98		70-130	Pass	
Xylenes - Total	%	98		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene	%	95		70-130	Pass	
TRH C6-C10	%	94		70-130	Pass	
LCS - % Recovery						
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	%	114		70-130	Pass	
Acenaphthylene	%	119		70-130	Pass	
Anthracene	%	110		70-130	Pass	
Benz(a)anthracene	%	102		70-130	Pass	
Benzo(a)pyrene	%	108		70-130	Pass	
Benzo(b&j)fluoranthene	%	130		70-130	Pass	
Benzo(g,h,i)perylene	%	90		70-130	Pass	
Benzo(k)fluoranthene	%	127		70-130	Pass	
Chrysene	%	126		70-130	Pass	
Dibenz(a,h)anthracene	%	102		70-130	Pass	
Fluoranthene	%	130		70-130	Pass	
Fluorene	%	111		70-130	Pass	
Indeno(1,2,3-cd)pyrene	%	90		70-130	Pass	
Naphthalene	%	124		70-130	Pass	
Phenanthrene	%	105		70-130	Pass	
Pyrene	%	124		70-130	Pass	
LCS - % Recovery						
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	%	84		70-130	Pass	
LCS - % Recovery						
Heavy Metals						
Arsenic	%	111		80-120	Pass	
Cadmium	%	91		80-120	Pass	
Chromium	%	112		80-120	Pass	
Copper	%	106		80-120	Pass	
Lead	%	112		80-120	Pass	
Mercury	%	96		75-125	Pass	
Molybdenum	%	109		80-120	Pass	
Nickel	%	108		80-120	Pass	

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Selenium			%	111		80-120	Pass	
Silver			%	85		80-120	Pass	
Tin			%	111		80-120	Pass	
Zinc			%	111		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Heavy Metals				Result 1				
Arsenic	S19-Se07908	NCP	%	89		75-125	Pass	
Cadmium	S19-Se07908	NCP	%	94		75-125	Pass	
Chromium	S19-Se07908	NCP	%	89		75-125	Pass	
Copper	S19-Se07908	NCP	%	88		75-125	Pass	
Lead	S19-Se07908	NCP	%	102		75-125	Pass	
Mercury	S19-Se07908	NCP	%	105		70-130	Pass	
Molybdenum	S19-Se07908	NCP	%	88		75-125	Pass	
Nickel	S19-Se07908	NCP	%	86		75-125	Pass	
Selenium	S19-Se07908	NCP	%	89		75-125	Pass	
Silver	S19-Se07908	NCP	%	83		75-125	Pass	
Tin	S19-Se07908	NCP	%	89		75-125	Pass	
Zinc	S19-Se07908	NCP	%	93		75-125	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1				
TRH C6-C9	M19-Se08379	NCP	%	100		70-130	Pass	
TRH C10-C14	M19-Se05415	NCP	%	77		70-130	Pass	
Spike - % Recovery								
BTEX				Result 1				
Benzene	M19-Se08379	NCP	%	103		70-130	Pass	
Toluene	M19-Se08379	NCP	%	94		70-130	Pass	
Ethylbenzene	M19-Se08379	NCP	%	99		70-130	Pass	
m&p-Xylenes	M19-Se08379	NCP	%	85		70-130	Pass	
o-Xylene	M19-Se08379	NCP	%	85		70-130	Pass	
Xylenes - Total	M19-Se08379	NCP	%	85		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
Naphthalene	M19-Se08379	NCP	%	95		70-130	Pass	
TRH C6-C10	M19-Se08379	NCP	%	97		70-130	Pass	
Spike - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1				
TRH >C10-C16	M19-Se05415	NCP	%	72		70-130	Pass	
Spike - % Recovery								
Polycyclic Aromatic Hydrocarbons				Result 1				
Acenaphthene	S19-Se07268	NCP	%	105		70-130	Pass	
Acenaphthylene	S19-Se07268	NCP	%	108		70-130	Pass	
Anthracene	S19-Se07268	NCP	%	104		70-130	Pass	
Benz(a)anthracene	S19-Se07268	NCP	%	93		70-130	Pass	
Benzo(a)pyrene	S19-Se07268	NCP	%	101		70-130	Pass	
Benzo(b&j)fluoranthene	S19-Se07268	NCP	%	119		70-130	Pass	
Benzo(g,h,i)perylene	S19-Se07268	NCP	%	89		70-130	Pass	
Benzo(k)fluoranthene	S19-Se07268	NCP	%	118		70-130	Pass	
Chrysene	S19-Se07268	NCP	%	119		70-130	Pass	
Dibenz(a,h)anthracene	S19-Se07268	NCP	%	96		70-130	Pass	
Fluoranthene	S19-Se07268	NCP	%	123		70-130	Pass	
Fluorene	S19-Se07268	NCP	%	102		70-130	Pass	
Indeno(1,2,3-cd)pyrene	S19-Se07268	NCP	%	90		70-130	Pass	
Naphthalene	S19-Se07268	NCP	%	114		70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phenanthrene	S19-Se07268	NCP	%	96			70-130	Pass	
Pyrene	S19-Se07268	NCP	%	124			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-Se06469	NCP	%	57	56	2.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Se08714	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M19-Se08714	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M19-Se08714	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Copper	M19-Se08714	NCP	mg/kg	21	21	<1	30%	Pass	
Lead	M19-Se08714	NCP	mg/kg	7.2	7.4	2.0	30%	Pass	
Mercury	M19-Se08714	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Molybdenum	M19-Se08714	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Nickel	M19-Se08714	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Selenium	M19-Se08714	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Silver	M19-Se08714	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tin	M19-Se08714	NCP	mg/kg	< 10	< 10	<1	30%	Pass	
Zinc	M19-Se08714	NCP	mg/kg	32	32	1.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M19-Se08378	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M19-Se09959	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M19-Se09959	NCP	mg/kg	140	160	14	30%	Pass	
TRH C29-C36	M19-Se09959	NCP	mg/kg	140	190	29	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M19-Se08378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M19-Se08378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M19-Se08378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M19-Se08378	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M19-Se08378	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M19-Se08378	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M19-Se08378	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M19-Se08378	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	M19-Se09959	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M19-Se09959	NCP	mg/kg	220	270	20	30%	Pass	
TRH >C34-C40	M19-Se09959	NCP	mg/kg	150	230	44	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
Conductivity (1:5 aqueous extract at 25°C as rec.)	N19-Se07024	CP	uS/cm	50	52	3.5	30%	Pass	
pH (1:5 Aqueous extract at 25°C as rec.)	N19-Se07024	CP	pH Units	6.1	6.1	pass	30%	Pass	
Duplicate									
Cation Exchange Capacity				Result 1	Result 2	RPD			
Cation Exchange Capacity	M19-Se07914	NCP	meq/100g	13	14	6.0	30%	Pass	

Duplicate								
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD		
Acenaphthene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Acenaphthylene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Anthracene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benz(a)anthracene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(a)pyrene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(b&j)fluoranthene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(g,h,i)perylene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzo(k)fluoranthene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Chrysene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Dibenz(a,h)anthracene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluoranthene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Fluorene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Indeno(1,2,3-cd)pyrene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Naphthalene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Phenanthrene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pyrene	M19-Se08592	NCP	mg/kg	< 0.5	< 0.5	<1	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
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

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)
Julie Kay	Senior Analyst-Inorganic (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](#).

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CHAIN OF CUSTODY RECORD

ABN 50 005 085 921

Sydney Laboratory
Unit F3 Bld F 16 Mars Rd Lane Cove NSW 2086
02 9900 9600 EnviroSamplesNSW@urorlabs.com

Brisbane Laboratory
Unit 1 21 Smallwood Pl, Murrumbidgee QLD 4172
07 3902 4600 EnviroSamplesQLD@urorlabs.com

Perth Laboratory
Unit 2 911 Leach Highway, Kewdale WA 6105
08 9251 9500 EnviroSamplesWA@urorlabs.com

Melbourne Laboratory
2 Kingston Town Centre, Camberley VIC 3186
03 8664 5000 EnviroSamplesVIC@urorlabs.com

[Handwritten signature]

Company ESP - Environmental & Safety Professionals
Address 5 Newton street
Broadmeadow NSW 2292
Contact Name
Phone No (02) 4961 0790
Special Direction
Purchase Order
Quote ID No

Project No J41419
Project Name Matland PSI
Report Format M Coasting

Analysis
(Note: Where metals are requested, please specify "Total" or "Filtered")

Matrix	Mn	PAH	pH	CEC	TRH	BTEX
Mn	X					
PAH		X				
pH			X			
CEC				X		
TRH					X	
BTEX						X

No	Client Sample ID	Date	Matrix	Analysis	Signature	Date	Time	Temperature	Report No
1	DP_28819	5/9/19	Solid	X	[Signature]	5/9	11:07	10°C	675269
2	BH08-0.4	5/9/19		X	[Signature]				
3	BH09-0.5			X	[Signature]				
4	BH10-0.7			X	[Signature]				
5									
6									
7									
8									
9									
10									
Total Counts									

Method of Shipment Courier # Hand Delivered Postal

Laboratory Use Only
Received By [Signature] **Received By** [Signature]
SYD LBNL | MEL | PER | ADL | NEW | DAR
Signature [Signature] **Signature** [Signature]
Date 5/9 **Date** [Date]
Time 11:07 **Time** [Time]
Temperature 10°C **Temperature** [Temperature]
Report No 675269

Requisitioned by M Coasting
Containers 1L Plastic, 250mL Plastic, 125mL Plastic, 200mL Amber Glass, 40mL vial, 125mL Amber Glass, Jar, Other ()
Turn Around Requirements Overnight (5am)*, 1 Day*, 2 Day*, 3 Day*, 5 Day*
Sample Comments / DQ Hazard Warning
Email for Results mcoasting@espleabs.com.au
Date 5/9/19

ESP Environmental
Unit 8, 2 Bolton Street
Sydenham
NSW 2044



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: **Victor Arias**

Report **676767-S**
Project name **MAITLAND PSI**
Project ID **J41419**
Received Date **Sep 12, 2019**

Client Sample ID			BH10_0.7
Sample Matrix			Soil
Eurofins Sample No.			M19-Se20380
Date Sampled			Aug 28, 2019
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	53
TRH C29-C36	50	mg/kg	77
TRH C10-C36 (Total)	50	mg/kg	130
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	72
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	100
% Moisture	1	%	22

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 B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 13, 2019	14 Days
BTEX - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 13, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 13, 2019	14 Days
Total Recoverable Hydrocarbons - 2013 NEPM Fractions - Method: LTM-ORG-2010 TRH C6-C40	Melbourne	Sep 13, 2019	
% Moisture - Method: LTM-GEN-7080 Moisture	Melbourne	Sep 12, 2019	14 Days

Company Name: ESP Laboratories NSW	Order No.:	Received: Sep 12, 2019 3:39 PM
Address: Unit 8, 2 Bolton Street Sydenham NSW 2044	Report #: 676767	Due: Sep 19, 2019
Project Name: MAITLAND PSI	Phone: 02 9519 2125	Priority: 5 Day
Project ID: J41419	Fax: 02 9554 7033	Contact Name: Victor Arias

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Copper	Lead	Zinc	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals IWRG 621 : Metals M12	Moisture Set	Eurofins mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	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_0.2	Aug 28, 2019		US Leachate	M19-Se20369				X	X			
2	BH07_0.3	Aug 28, 2019		US Leachate	M19-Se20370				X	X			
3	BH01_0.2	Aug 28, 2019		US Leachate	M19-Se20371	X	X	X		X			
4	BH02_0.05	Aug 28, 2019		US Leachate	M19-Se20372	X	X	X		X			
5	BH03_0.5	Aug 28, 2019		US Leachate	M19-Se20373	X	X	X		X			
6	BH04_0.4	Aug 28, 2019		US Leachate	M19-Se20374	X	X	X		X			
7	BH05_0.2	Aug 28, 2019		US Leachate	M19-Se20375	X	X	X		X			
8	BH06_0.2	Aug 28, 2019		US Leachate	M19-Se20376	X	X	X		X			
9	BH07_0.3	Aug 28, 2019		US Leachate	M19-Se20377	X	X	X		X			

Company Name: ESP Laboratories NSW	Order No.:	Received: Sep 12, 2019 3:39 PM
Address: Unit 8, 2 Bolton Street Sydenham NSW 2044	Report #: 676767	Due: Sep 19, 2019
Project Name: MAITLAND PSI	Phone: 02 9519 2125	Priority: 5 Day
Project ID: J41419	Fax: 02 9554 7033	Contact Name: Victor Arias

Eurofins Analytical Services Manager : Andrew Black

Sample Detail				Copper	Lead	Zinc	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals IWRG 621 : Metals M12	Moisture Set	Eurofins mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
10	BH10_0.7	Aug 28, 2019	US Leachate	M19-Se20378			X	X	X		
11	BH08_0.4	Aug 28, 2019	US Leachate	M19-Se20379		X		X			
12	BH10_0.7	Aug 28, 2019	Soil	M19-Se20380					X	X	
Test Counts				7	7	8	3	11	1	1	1

Internal Quality Control Review and Glossary

General

- 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.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- 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

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- 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		
LCS - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions								
TRH C6-C9	%	94			70-130	Pass		
TRH C10-C14	%	74			70-130	Pass		
LCS - % Recovery								
BTEX								
Benzene	%	100			70-130	Pass		
Toluene	%	103			70-130	Pass		
Ethylbenzene	%	91			70-130	Pass		
m&p-Xylenes	%	103			70-130	Pass		
Xylenes - Total	%	96			70-130	Pass		
LCS - % Recovery								
Total Recoverable Hydrocarbons - 2013 NEPM Fractions								
Naphthalene	%	107			70-130	Pass		
TRH C6-C10	%	97			70-130	Pass		
TRH >C10-C16	%	70			70-130	Pass		
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery								
Total Recoverable Hydrocarbons - 1999 NEPM Fractions								
TRH C6-C9	M19-Se19538	NCP	%	94		70-130	Pass	
TRH C10-C14	M19-Se18022	NCP	%	101		70-130	Pass	
Spike - % Recovery								
BTEX								
Benzene	M19-Se19538	NCP	%	91		70-130	Pass	
Toluene	M19-Se19538	NCP	%	114		70-130	Pass	
Ethylbenzene	M19-Se19538	NCP	%	97		70-130	Pass	
m&p-Xylenes	M19-Se19538	NCP	%	82		70-130	Pass	
o-Xylene	M19-Se19538	NCP	%	80		70-130	Pass	
Xylenes - Total	M19-Se19538	NCP	%	82		70-130	Pass	
Spike - % Recovery								

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M19-Se19538	NCP	%	96			70-130	Pass	
TRH C6-C10	M19-Se19538	NCP	%	124			70-130	Pass	
TRH >C10-C16	M19-Se18022	NCP	%	96			70-130	Pass	
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-Se19287	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M19-Se19287	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M19-Se19287	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M19-Se19287	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M19-Se19287	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	M19-Se19287	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	M19-Se19287	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	M19-Se19287	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	M19-Se19287	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	M19-Se19287	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M19-Se19287	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M19-Se19287	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M19-Se19287	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M19-Se19287	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M19-Se19287	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M19-Se20380	CP	%	22	22	2.0	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.

Authorised By

Andrew Black	Analytical Services Manager
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](#).

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ESP Environmental
Unit 8, 2 Bolton Street
Sydenham
NSW 2044



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: **Victor Arias**

Report **676767-L**
Project name **MAITLAND PSI**
Project ID **J41419**
Received Date **Sep 12, 2019**

Client Sample ID			BH01_0.2	BH07_0.3	BH01_0.2	BH02_0.05
Sample Matrix			US Leachate	US Leachate	US Leachate	US Leachate
Eurofins Sample No.			M19-Se20369	M19-Se20370	M19-Se20371	M19-Se20372
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	-	-
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	-	-
Anthracene	0.001	mg/L	< 0.001	< 0.001	-	-
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(b&j)fluoranthene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(g,h,i)perylene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	-	-
Chrysene	0.001	mg/L	< 0.001	< 0.001	-	-
Dibenz(a,h)anthracene	0.001	mg/L	< 0.001	< 0.001	-	-
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	-	-
Fluorene	0.001	mg/L	< 0.001	< 0.001	-	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Naphthalene	0.001	mg/L	< 0.001	< 0.001	-	-
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	-	-
Pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Total PAH*	0.001	mg/L	< 0.001	< 0.001	-	-
2-Fluorobiphenyl (surr.)	1	%	67	73	-	-
p-Terphenyl-d14 (surr.)	1	%	54	50	-	-
Heavy Metals						
Copper	0.01	mg/L	-	-	< 0.01	< 0.01
Lead	0.01	mg/L	-	-	0.03	0.21
Zinc	0.01	mg/L	-	-	0.34	0.86
USA Leaching Procedure						
Leachate Fluid		comment	1.0	1.0	1.0	1.0
pH (initial)	0.1	pH Units	6.5	6.4	6.4	6.5
pH (Leachate fluid)	0.1	pH Units	5.1	5.1	5.1	5.1
pH (off)	0.1	pH Units	5.1	5.1	5.1	5.0
pH (USA HCl addition)	0.1	pH Units	1.6	1.6	1.7	1.6

Client Sample ID			BH03_0.5	BH04_0.4	BH05_0.2	BH06_0.2
Sample Matrix			US Leachate	US Leachate	US Leachate	US Leachate
Eurofins Sample No.			M19-Se20373	M19-Se20374	M19-Se20375	M19-Se20376
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit				
Heavy Metals						
Copper	0.01	mg/L	< 0.01	< 0.01	0.02	0.04
Lead	0.01	mg/L	0.48	0.13	0.13	0.08
Zinc	0.01	mg/L	0.59	2.1	1.7	1.4
USA Leaching Procedure						
Leachate Fluid		comment	1.0	1.0	1.0	1.0
pH (initial)	0.1	pH Units	6.4	6.7	6.6	6.6
pH (Leachate fluid)	0.1	pH Units	5.1	5.1	5.1	5.1
pH (off)	0.1	pH Units	5.0	5.1	5.1	5.1
pH (USA HCl addition)	0.1	pH Units	1.5	1.6	1.6	1.5

Client Sample ID			BH07_0.3	BH10_0.7	BH08_0.4
Sample Matrix			US Leachate	US Leachate	US Leachate
Eurofins Sample No.			M19-Se20377	M19-Se20378	M19-Se20379
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.001	mg/L	-	< 0.001	-
Acenaphthylene	0.001	mg/L	-	< 0.001	-
Anthracene	0.001	mg/L	-	< 0.001	-
Benzo(a)anthracene	0.001	mg/L	-	< 0.001	-
Benzo(a)pyrene	0.001	mg/L	-	< 0.001	-
Benzo(b&j)fluoranthene	0.001	mg/L	-	< 0.001	-
Benzo(g,h,i)perylene	0.001	mg/L	-	< 0.001	-
Benzo(k)fluoranthene	0.001	mg/L	-	< 0.001	-
Chrysene	0.001	mg/L	-	< 0.001	-
Dibenz(a,h)anthracene	0.001	mg/L	-	< 0.001	-
Fluoranthene	0.001	mg/L	-	< 0.001	-
Fluorene	0.001	mg/L	-	< 0.001	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	-	< 0.001	-
Naphthalene	0.001	mg/L	-	< 0.001	-
Phenanthrene	0.001	mg/L	-	< 0.001	-
Pyrene	0.001	mg/L	-	< 0.001	-
Total PAH*	0.001	mg/L	-	< 0.001	-
2-Fluorobiphenyl (surr.)	1	%	-	70	-
p-Terphenyl-d14 (surr.)	1	%	-	71	-
Heavy Metals					
Arsenic	0.01	mg/L	-	< 0.01	-
Cadmium	0.005	mg/L	-	< 0.005	-
Chromium	0.01	mg/L	-	< 0.01	-
Copper	0.01	mg/L	< 0.01	< 0.01	-
Lead	0.01	mg/L	0.04	< 0.01	-
Mercury	0.001	mg/L	-	< 0.001	-
Molybdenum	0.01	mg/L	-	< 0.01	-
Nickel	0.01	mg/L	-	0.02	-
Selenium	0.05	mg/L	-	< 0.05	-
Silver	0.05	mg/L	-	< 0.05	-
Tin	0.2	mg/L	-	< 0.2	-
Zinc	0.01	mg/L	1.2	0.29	0.28

Client Sample ID			BH07_0.3	BH10_0.7	BH08_0.4
Sample Matrix			US Leachate	US Leachate	US Leachate
Eurofins Sample No.			M19-Se20377	M19-Se20378	M19-Se20379
Date Sampled			Aug 28, 2019	Aug 28, 2019	Aug 28, 2019
Test/Reference	LOR	Unit			
USA Leaching Procedure					
Leachate Fluid		comment	1.0	1.0	1.0
pH (initial)	0.1	pH Units	6.8	6.4	6.9
pH (Leachate fluid)	0.1	pH Units	5.1	5.1	5.1
pH (off)	0.1	pH Units	5.1	6.0	5.1
pH (USA HCl addition)	0.1	pH Units	1.5	1.6	1.5

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 - Method: LTM-ORG-2130 PAH and Phenols in Soil and Water	Melbourne	Sep 13, 2019	7 Days
Metals IWRG 621 : Metals M12 - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Sep 13, 2019	28 Days
Heavy Metals - Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS	Melbourne	Sep 13, 2019	180 Days

Company Name: ESP Laboratories NSW	Order No.:	Received: Sep 12, 2019 3:39 PM
Address: Unit 8, 2 Bolton Street Sydenham NSW 2044	Report #: 676767	Due: Sep 19, 2019
Project Name: MAITLAND PSI	Phone: 02 9519 2125	Priority: 5 Day
Project ID: J41419	Fax: 02 9554 7033	Contact Name: Victor Arias

Eurofins Analytical Services Manager : Andrew Black

Sample Detail						Copper	Lead	Zinc	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals IWRG 621 : Metals M12	Moisture Set	Eurofins mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	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_0.2	Aug 28, 2019		US Leachate	M19-Se20369				X	X			
2	BH07_0.3	Aug 28, 2019		US Leachate	M19-Se20370				X	X			
3	BH01_0.2	Aug 28, 2019		US Leachate	M19-Se20371	X	X	X		X			
4	BH02_0.05	Aug 28, 2019		US Leachate	M19-Se20372	X	X	X		X			
5	BH03_0.5	Aug 28, 2019		US Leachate	M19-Se20373	X	X	X		X			
6	BH04_0.4	Aug 28, 2019		US Leachate	M19-Se20374	X	X	X		X			
7	BH05_0.2	Aug 28, 2019		US Leachate	M19-Se20375	X	X	X		X			
8	BH06_0.2	Aug 28, 2019		US Leachate	M19-Se20376	X	X	X		X			
9	BH07_0.3	Aug 28, 2019		US Leachate	M19-Se20377	X	X	X		X			

Company Name: ESP Laboratories NSW	Order No.:	Received: Sep 12, 2019 3:39 PM
Address: Unit 8, 2 Bolton Street Sydenham NSW 2044	Report #: 676767	Due: Sep 19, 2019
	Phone: 02 9519 2125	Priority: 5 Day
	Fax: 02 9554 7033	Contact Name: Victor Arias
Project Name: MAITLAND PSI		
Project ID: J41419		

Eurofins Analytical Services Manager : Andrew Black

Sample Detail				Copper	Lead	Zinc	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals IWRG 621 : Metals M12	Moisture Set	Eurofins mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271				X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217											
Brisbane Laboratory - NATA Site # 20794											
Perth Laboratory - NATA Site # 23736											
10	BH10_0.7	Aug 28, 2019	US Leachate	M19-Se20378			X	X	X		
11	BH08_0.4	Aug 28, 2019	US Leachate	M19-Se20379		X		X			
12	BH10_0.7	Aug 28, 2019	Soil	M19-Se20380						X	X
Test Counts				7	7	8	3	11	1	1	1

Internal Quality Control Review and Glossary
General

- 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.
- All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
- All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
- Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
- Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
- SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- Samples were analysed on an 'as received' basis.
- Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
- 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

- 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.
- 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.
- Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
- Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
- 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.
- 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.
- Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
- For Matrix Spikes and LCS results a dash " - " in the report means that the specific analyte was not added to the QC sample.
- 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/L	< 0.01		0.01	Pass	
Cadmium				mg/L	< 0.005		0.005	Pass	
Chromium				mg/L	< 0.01		0.01	Pass	
Copper				mg/L	< 0.01		0.01	Pass	
Lead				mg/L	< 0.01		0.01	Pass	
Mercury				mg/L	< 0.001		0.001	Pass	
Molybdenum				mg/L	< 0.01		0.01	Pass	
Nickel				mg/L	< 0.01		0.01	Pass	
Selenium				mg/L	< 0.05		0.05	Pass	
Silver				mg/L	< 0.05		0.05	Pass	
Tin				mg/L	< 0.2		0.2	Pass	
Zinc				mg/L	< 0.01		0.01	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons									
					Result 1				
Acenaphthene	M19-Se10098	NCP	%	97			70-130	Pass	
Acenaphthylene	M19-Se10098	NCP	%	96			70-130	Pass	
Anthracene	M19-Se10098	NCP	%	80			70-130	Pass	
Benz(a)anthracene	M19-Se10098	NCP	%	98			70-130	Pass	
Benzo(a)pyrene	M19-Se10098	NCP	%	116			70-130	Pass	
Benzo(b&j)fluoranthene	M19-Se10098	NCP	%	103			70-130	Pass	
Benzo(g,h,i)perylene	M19-Se10098	NCP	%	75			70-130	Pass	
Benzo(k)fluoranthene	M19-Se10098	NCP	%	111			70-130	Pass	
Chrysene	M19-Se10098	NCP	%	115			70-130	Pass	
Dibenz(a,h)anthracene	M19-Se10098	NCP	%	83			70-130	Pass	
Fluoranthene	M19-Se10098	NCP	%	101			70-130	Pass	
Fluorene	M19-Se10098	NCP	%	102			70-130	Pass	
Indeno(1,2,3-cd)pyrene	M19-Se10098	NCP	%	78			70-130	Pass	
Naphthalene	M19-Se10098	NCP	%	88			70-130	Pass	
Phenanthrene	M19-Se10098	NCP	%	101			70-130	Pass	
Pyrene	M19-Se10098	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Heavy Metals									
					Result 1				
Copper	M19-Se20371	CP	%	95			75-125	Pass	
Lead	M19-Se20371	CP	%	99			75-125	Pass	
Zinc	M19-Se20371	CP	%	117			75-125	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons									
					Result 1	Result 2	RPD		
Acenaphthene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g,h,i)perylene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a,h)anthracene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Fluoranthene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M19-Se10097	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Copper	M19-Se20371	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Lead	M19-Se20371	CP	mg/L	0.03	0.03	6.0	30%	Pass	
Zinc	M19-Se20371	CP	mg/L	0.34	0.34	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M19-Se20195	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Cadmium	M19-Se20195	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Chromium	M19-Se20195	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Mercury	M19-Se20195	NCP	mg/L	0.002	< 0.001	86	30%	Fail	Q08
Molybdenum	M19-Se20195	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Nickel	M19-Se20195	NCP	mg/L	0.15	0.13	12	30%	Pass	
Selenium	M19-Se20195	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Silver	M19-Se20195	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Tin	M19-Se20195	NCP	mg/L	< 0.05	< 0.05	<1	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
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)
Joseph Edouard	Senior Analyst-Organic (VIC)

- 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](#).

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Enviro Sample Vic

From: Andrew Black
Sent: Thursday, 12 September 2019 3:45 PM
To: Enviro Sample Vic
Subject: 5 DAY TAT ADDITIONAL: FW: Eurofins Test Results - Report 674016 : Site MAITLAND PSI (J41419)

5 DAY TAT additional testing thanks team

From: Victor Arias [mailto:varias@esplabs.com.au]
Sent: Thursday, 12 September 2019 3:39 PM
To: Andrew Black
Subject: RE: Eurofins Test Results - Report 674016 : Site MAITLAND PSI (J41419)

David Joseph

EXTERNAL EMAIL*

676767

Hi Andrew,

Could you request the lab the following analysis:

1. **Leaching test (TCLP)** for Report 674016-S as follows:
 - PAH → samples BH01_0.2; BH07_0.3
 - Lead, Zinc & Copper → BH01_0.2; BH02_0.05; BH03_0.5; BH04_0.4; BH05_0.2; BH06_0.2; BH07_0.3
2. **Leaching test (TCLP)** for Report 675269-S
 - PAH & M12 → Sample BH10_0.7
 - Zinc → sample BH08_0.4
3. **Soil testing** for Report 675269-S
 - TRH & BTEXN (suite B1) → sample BH10_0.7

These samples are from the same location so please process as one.

Thanks.

PS: please send me a copy of report 675269-S as I have only found it in online results.

Cheers,



Dr. Victor Arias | NSW Environmental Department Head

ESP – Environmental & Safety Professionals



5 Newton street | Broadmeadow | NSW 2292
Phone: 02 4961 0790 | Mobile: 0425 833 133
Email: varias@esplabs.com.au
Web: environet.com.au

Au4389-91214
Au43195-91214
Au43190-91214
Au43191-91214
Au43192-91214
Au43193-91214
Au43194-91214
Seo7025-91302
Seo7023- ↓

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ScannedByWebsenseForEurofins

Ecological Investigation Level Calculation Spreadsheet - Copper

Inputs	
Select contaminant from list below	
Cu	
Below needed to calculate fresh and aged ACLs	
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)	
18.6	
Enter soil pH (calcium chloride method) (values from 1 to 14)	
6.3	
Enter organic carbon content (%OC) (values from 0 to 50%)	
1	
Below needed to calculate fresh and aged ABCs	
Measured background concentration (mg/kg). Leave blank if no measured value	
or for fresh ABCs only	
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration	
or for aged ABCs only	
Enter State (or closest State)	
NSW	
Enter traffic volume (high or low)	
low	
Estimated ABC (aged)*	
20	

Outputs		
Land use	Cu soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	90
Urban residential and open public spaces	#NUM!	230
Commercial and industrial	#NUM!	320

*Estimated ambient background concentrations (ABC) for aged contamination adopted from Table 58, Schedule B5c of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (as amended 2013).

Ecological Investigation Level Calculation Spreadsheet - Copper

Inputs	
Select contaminant from list below	
Ni	
Below needed to calculate fresh and aged ACLs	
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)	
18.6	
Below needed to calculate fresh and aged ABCs	
Measured background concentration (mg/kg). Leave blank if no measured value	
or for fresh ABCs only	
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration	
or for aged ABCs only	
Enter State (or closest State)	
NSW	
Enter traffic volume (high or low)	
low	
Estimated ABC (aged)*	
20	

Outputs		
Land use	Ni soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	50
Urban residential and open public spaces	#NUM!	260
Commercial and industrial	#NUM!	440

*Estimated ambient background concentrations (ABC) for aged contamination adopted from Table 58, Schedule B5c of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (as amended 2013).

Ecological Investigation Level Calculation Spreadsheet - Copper

Inputs	
Select contaminant from list below	
Zn	
Below needed to calculate fresh and aged ACLs	
Enter cation exchange capacity (silver thiourea method) (values from 0 to 100 cmolc/kg dwt)	
18.6	
Enter soil pH (calcium chloride method) (values from 1 to 14)	
6.3	
Below needed to calculate fresh and aged ABCs	
Measured background concentration (mg/kg). Leave blank if no measured value	
or for fresh ABCs only	
Enter iron content (aqua regia method) (values from 0 to 50%) to obtain estimate of background concentration	
or for aged ABCs only	
Enter State (or closest State)	
NSW	
Enter traffic volume (high or low)	
low	
Estimated ABC (aged)*	
20	

Outputs		
Land use	Zn soil-specific EILs (mg contaminant/kg dry soil)	
	Fresh	Aged
National parks and areas of high conservation value	#NUM!	190
Urban residential and open public spaces	#NUM!	590
Commercial and industrial	#NUM!	870

*Estimated ambient background concentrations (ABC) for aged contamination adopted from Table 58, Schedule B5c of the *National Environmental Protection (Assessment of Site Contamination) Measure 1999* (as amended 2013).

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.117/09/2019 1:09:47 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Zinc

General Statistics

Total Number of Observations	11	Number of Distinct Observations	11
		Number of Missing Observations	1
Minimum	89	Mean	598.5
Maximum	2700	Median	350
SD	762.3	Std. Error of Mean	229.8
Coefficient of Variation	1.274	Skewness	2.428

Normal GOF Test

Shapiro Wilk Test Statistic	0.689	Shapiro Wilk GOF Test
5% Shapiro Wilk Critical Value	0.85	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.252	Lilliefors GOF Test
5% Lilliefors Critical Value	0.251	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	1015	95% Adjusted-CLT UCL (Chen-1995)	1156
		95% Modified-t UCL (Johnson-1978)	1043

Gamma GOF Test

A-D Test Statistic	0.489	Anderson-Darling Gamma GOF Test
5% A-D Critical Value	0.752	Detected data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.219	Kolmogorov-Smirnov Gamma GOF Test
5% K-S Critical Value	0.262	Detected data appear Gamma Distributed at 5% Significance Level

Detected data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.998	k star (bias corrected MLE)	0.786
Theta hat (MLE)	599.7	Theta star (bias corrected MLE)	761
nu hat (MLE)	21.95	nu star (bias corrected)	17.3
MLE Mean (bias corrected)	598.5	MLE Sd (bias corrected)	674.9
		Approximate Chi Square Value (0.05)	8.887
Adjusted Level of Significance	0.0278	Adjusted Chi Square Value	7.922

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	1165	95% Adjusted Gamma UCL (use when n<50)	1307
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Lognormal GOF Test

Shapiro Wilk Test Statistic	0.931	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.85	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.203	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.251	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			
Lognormal Statistics			
Minimum of Logged Data	4.489	Mean of logged Data	5.816
Maximum of Logged Data	7.901	SD of logged Data	1.108
Assuming Lognormal Distribution			
95% H-UCL	1910	90% Chebyshev (MVUE) UCL	1185
95% Chebyshev (MVUE) UCL	1462	97.5% Chebyshev (MVUE) UCL	1847
99% Chebyshev (MVUE) UCL	2603		
Nonparametric Distribution Free UCL Statistics			
Data appear to follow a Discernible Distribution at 5% Significance Level			
Nonparametric Distribution Free UCLs			
95% CLT UCL	976.5	95% Jackknife UCL	1015
95% Standard Bootstrap UCL	958.6	95% Bootstrap-t UCL	1545
95% Hall's Bootstrap UCL	2465	95% Percentile Bootstrap UCL	1019
95% BCA Bootstrap UCL	1149		
90% Chebyshev(Mean, Sd) UCL	1288	95% Chebyshev(Mean, Sd) UCL	1600
97.5% Chebyshev(Mean, Sd) UCL	2034	99% Chebyshev(Mean, Sd) UCL	2885
Suggested UCL to Use			
95% Adjusted Gamma UCL	1307		
<p>Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.</p> <p>Recommendations are based upon data size, data distribution, and skewness.</p> <p>These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).</p> <p>However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.</p>			

Equipment Calibration Form

MiniRAE 3000 PID



Enqip #: 501136
Company: ESP Environmental & Safety
Consultant: Dr. Victor Arias
PO#: PO-0029

Equipment calibrated/checked by Technician: ~~Andrea Hill~~ *JARRIN ARFAUR*

UNIT IDENTIFICATION	
Model Number	PGM 7320
Serial Number	592-910882
Unit Type	MiniRAE PID

INSPECTION RECORD / CONDITION REPORT				
Inlet Flow Adequate/Clear	<input checked="" type="checkbox"/>	Pump 502		<input checked="" type="checkbox"/>
Alarm limits	High	100 ppm	Low	25 ppm

CALIBRATION DETAILS			
Sensor	Span Gas	Value	Reading
PID	Isobutylene	100 ppm	99.9 ppm
	Air	0 ppm	0 ppm
Calibration Successful	<input checked="" type="checkbox"/>		

QC Signature *[Signature]*

Calibration date: 09/04/19

