PULVER COOPER AND BLACKLEY PTY LTD

Preliminary Site Investigation - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW

MAY 2017

WSP | PARSONS BRINCKERHOFF

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Pulver Cooper and Blackley Pty Ltd

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ABBREVIATIONS

ACM	Asbestos containing materials
ASS	Acid sulfate soils
BTEX	Benzene, toluene, ethylbenzene and xylene
CEC	Cation exchange capacity
DP	Deposited plan
DQI	Data quality indicators
DQO	Data quality objectives
DSI	Detailed site investigation
EPA	Environmental Protection Authority
ESL	Ecological screening level
HIL	Health investigation level
HSL	Health screening level
LEP	Local environmental plan
LOR	Limit of reporting
mAHD	metres relative to Australian Height Datum
mBGL	metres below ground level
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NL	Not limiting
PAHs	Polycyclic aromatics hydrocarbons
PID	Photo-ionisation detector
LOR	Practical quantitation limit
PSI	Preliminary site investigation
QA/QC	Quality assurance and quality control
RPD	Relative percentage difference
SMF	Synthetic mineral fibre
TRH	Total recoverable hydrocarbon

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INTRODUCTION

WSP Australia Pty Ltd (WSP), formerly Parsons Brinckerhoff Australia Pty Ltd, was engaged by Pulver Cooper and Blackley Pty Ltd to conduct a preliminary site investigation (PSI), for 40 Rayford Street, Warners Bay NSW (Property 1) and 19 Daydawn Avenue, Warners Bay NSW (Property 2). Properties 1 and 2 are collectively referred to as the site.

Preliminary advice from Lake Macquarie City Council supplied to Pulver Cooper and Blackley identified the site as adjoining the Pasminco lead contamination grid and the requirement for a Phase 1 contamination investigation, otherwise known as a PSI, to assess the potential contamination status of the site (if any) and suitability of the site for the proposed future zoning.

The purpose of the PSI was to establish and document the site's current contamination status prior to an application to allow rezoning of the site for residential purposes.

SCOPE OF WORKS

The scope of works comprised a PSI comprising a desktop review of physical and historical site setting, supplemented by a limited intrusive (soil) investigation. The scope of site works for the limited intrusive investigation comprised soil sampling from 14 soil bores (SB01 to SB14) and one sediment sample (SED1) within Property 1 and 10 soil bores (SB15 to SB24) within Property 2. The maximum depth of the investigation was 1.2 metres below ground level (mBGL).

RESULTS

The findings and observations of the PSI are summarised below:

- the site has a total area of approximately 8.06 hectares (ha), comprising 5.3 ha as Property 1 and 2.76 ha as Property 2
- property 1 (40 Rayford Street, Warners Bay NSW) is currently utilised for residential purposes and horse agistment. The southern portion of the property contains dense native vegetation. The property contains a single dwelling and multiple small sheds/structure. Multiple small waste piles were identified across the property, observed to comprise predominantly discarded household items
- property 2 (19 Daydawn Avenue, Warners Bay NSW) is currently vacant.
- the geological amps indicate the site is situated on Permian aged deposits from the Newcastle Coal Measures, comprising conglomerate, sandstone, tuff, shale and coal
- acid sulfate soil maps indicate a portion of the site in the south-east is recorded as soil Class 5 as per the *Lake Macquarie Local Environmental Plan 2014*. Works within 500 metres of adjacent Class 1, 2, 3, or 4 land that is below 5 metres Australian Height Datum (AHD) or by which the watertable is likely to be lowered below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land, present an environmental risk for soils within this class
- the site is predominantly surrounded by residential properties to the east and south. Notable current or historical landuses surrounding the site include Speers Point Quarry (located approximately 600 m north-west) and the Pasminco Cockle Creek Smelter (located approximately 1.7 m north)
- desktop searches indicate historical land use at the site consisted of agricultural (including market gardening) and residential, from the early 1900s to date. The aerial photographs show marginal changes on the site from 1954 to its current status

- regulatory searches for the site and surrounding area indicate that there are notified contaminated properties within a 2 kilometre radius of the site, notably the Pasminco Cockle Creek Smelter
- the site is located adjacent to the Pasminco Lead Contamination Survey Grid, an area used to identify properties potentially impacted from fallout from the historical operation of the Pasminco Cockle Creek Smelter
- residential development has dominated changes to the immediate surroundings of the site between 1954 and the present, based on aerial photographs reviewed
- asbestos containing material (ACM) was identified to be present within the building materials used in the chicken coup in the centre of Property 1. This material should be appropriately documented and managed during any demolition process.

The findings and observations of the intrusive investigation is summarised below:

- the site stratigraphy comprises fill/reworked natural material from 0.2 to 1.0+ metres depth overlying natural mottled grey to orange silty sand or sandy clays. Approximately eight soil bores terminated in fill and the full potential depth and composition of fill cannot be ascertained. The fill encountered comprised reworked natural gravelly sands and clays
- soil analytical results were reported below the laboratory limits of reporting and/or below the site assessment criteria for all samples collected. Some analytes were detected below the assessment criteria:
  - trace concentrations of PAHs were reported in sample SB7 collected at a depth of 0.2 mBGL. PAHs (sum of total) was reported at 2.0 mg/kg well below the adopted health investigation level (HIL) of 300 mg/kg.SB7 was located adjacent to a storage shed to the south of the dwelling
  - selected metals reported in all samples. The reported concentrations of metals are considered to be consistent with background concentrations and not significant
  - lead was reported at a maximum concentration of 89 mg/kg in SB14 at a depth of 0.2 mBGL, well below the adopted HIL of 300 mg/kg.
- Based on the results of the PSI and intrusive investigation the potential for contamination of groundwater from historical use of the site and surrounding area is considered low.

CONCLUSION AND RECOMMENDATIONS

The results of the PSI indicate that historical use of the site and surrounding area is unlikely to have resulted in the presence of significant contamination at the site. The limited soil boring and laboratory testing program supported the findings of the PSI. All soil laboratory results were within residential thresholds.

Based on the results of the investigation, it is concluded that, from a contamination perspective, the site is suitable for residential use.

The following should be managed appropriately during the demolition of current site infrastructure, prior to re-development:

- it would be considered prudent that a hazardous materials survey of the waste stockpiles be completed prior to demolition to confirm the absence of hazardous building materials, and allow appropriate management (if required)
- a licensed Class B (non-friable) asbestos removalist should be engaged for the removal of any ACM. Removal works must be undertaken in accordance with SafeWork Australia (2011) – *Code of Practice: How to Safely Remove Asbestos*

These conclusions are based on the findings of the PSI and limited intrusive investigation. The conclusions rely on observations of materials encountered at the locations drilled and to the depth tested (~1 m below ground level). Due to limited depth of the investigation and/or subsurface constraints a number of locations were terminated in fill/reworked natural material, limiting knowledge of the full depth and composition of the fill at the site. If unusual materials, such as those with unexpected colours, odours, presence of fibres or strange anthropogenic inclusions are uncovered during future development works these should be assessed by an environmental consultant and managed appropriately.

1 INTRODUCTION

1.1 Background

WSP Australia Pty Ltd (WSP), formerly Parsons Brinckerhoff Australia Pty Ltd, was engaged by Pulver Cooper and Blackley Pty Ltd to conduct a preliminary site investigation (PSI), for two adjacent properties (collectively referred to as the site) identified as:

- Property 1 – part 40 Rayford Street, Warners Bay NSW
- Property 2 - 19 Daydawn Avenue, Warners Bay NSW.

Properties 1 and 2 are collectively referred to as the site. The location of the site and site layout are shown in Figure 1 and Figure 2, Appendix A, respectively.

Preliminary advice from Lake Macquarie City Council supplied to Pulver Cooper and Blackley identified the site as adjoining the Pasminco lead contamination grid and advised a Phase 1 contamination investigation, otherwise known as a PSI, was required to assess the potential contamination status of the site (if any) and suitability of the site for the proposed future zoning.

The purpose of the PSI was to establish and document the site's current contamination status prior to an application to allow rezoning of the site for residential purposes.

1.2 Objectives

The overarching objective of this project is to complete a PSI for the site in accordance with relevant legislation, guidelines, standards and approvals, particularly State Environmental Planning Policy No 55-Remediation of Land (SEPP 55) and contaminated lands guidelines made or approved by the NSW Environmental Protection Authority (EPA). The specific objectives were to:

- identify current and historical land uses which may have potentially caused site contamination
- undertake a preliminary assessment of potential contamination sources, exposure pathways and potential receptors
- undertake preliminary intrusive investigations to confirm whether potentially contaminating activities on the site or surrounds have caused site contamination and assess the associated risk to sensitive receptors
- provide a preliminary assessment of the potential risk profile of the site from current and/or historical potentially contaminating activities with consideration to the proposed future residential land use.

1.3 Scope of works

The following scope of works was completed as part of PSI:

- fieldwork preliminaries (including preparation of a health, safety and environment plan (HESP))
- completion of a desktop study to review background site and regional information from:
  - regulatory notices or records relating to potential contamination on the site issued by the NSW EPA
  - Section 149 certificates
  - historical aerial photographs for site surrounds

- historical title records
- SafeWork NSW dangerous goods records
- physical site setting information including topography, geology, hydrology, hydrogeology, and potential sensitive receptors on or in the vicinity of the site

→ completion of a site walkover to assess whether evidence of potential sources of contamination and the risk to the site from surrounding properties

→ completion of a limited intrusive investigation comprising:

- service location prior to intrusive investigation
- intrusive investigations, including advancement of 14 soil bores and collection of one sediment sample from a dam within Property 1 and 10 soil bores within Property 2
- laboratory analyses of selected soil samples for potential contaminants of concern

→ preparation of this PSI report, including:

- site description, geology and/or hydrogeological information
- a summary of the results of desktop searches
- a summary of field observations
- discussion and interpretation of the results
- any recommendations, including management options.

2 SITE CHARACTERISTICS

2.1 Site location

The site is located at 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW. Site details are presented in Table 2.1 below.

Table 2.1 Site details

Address	40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW
Legal identification	Part Lot 6 of Deposited Plan (DP) 814499, and Lot 100 of DP 1173625
Local government area	Lake Macquarie City Council
Zoning	Part E2 – Environmental Conservation and Part R2 – Low Density Residential under the *Lake Macquarie Local Environmental Plan 2014* (LEP)
Current land use	Rural residential/vacant
Proposed land use	Residential
Site area	Total of 8.06 hectares (ha), comprising 5.3 ha as Property 1 and 2.76 ha as Property 2
Surrounding land uses	→ north – environmental conservation area → south – residential, followed by Warners Bay → east – residential → west – environmental conservation area.

A site locality plan and site layout plan are presented as Figure 1 and Figure, in Appendix A, respectively.

A photographic log is provided in Appendix B.

2.2 Site walkover

The site walkovers were completed by a WSP Environmental Scientist on 2 February 2017 and 3 May 2017.

The site is located within Warners Bay. Environmental conservation area, including Munibung Hill, adjoins the site to the north and west. The surrounding area to the east and south is generally characterised by residential properties, with Warners Bay located approximately 500 m south of the site. Warners Bay Hospital and Biddabah Public School are located approximately 20 0m and 300 m east of the site respectively.

→ **Property 1 - 40 Rayford Street, Warners Bay NSW**

Access to the property is from Rayford Street and Winterlake Road. A single dwelling is present in the southern portion of the property which was occupied at the time of the site walkover. Other structures present on the property include a chicken coup and attached storage shelter to the north of the dwelling as well as other small sheds the south of the dwelling.

The current occupant (Nigel Blundell) reported the property is used predominantly for residential purposes, with the eastern portion of the property divided into paddocks for horse agistment. A number of beehives are also kept to the north of the dwelling. Prior use of the property was reported to be a

peach farm, which had ceased operations between 5 and 10 years ago. No chemical storage was reported to be currently undertaken at the property, however an unknown quantity of copper sulfate was reported to be historically stored for use across the property as a pesticide.

The topography of the property is undulating, and predominantly slopes to the east where the property plateaus on the eastern boundary. The property is located on the eastern edge of Munibung Hill. The majority of the property has been cleared and is grassed. Patches of remnant vegetation and/or regrowth are present across the property. The southern portion of the property contains dense native vegetation. A dam is present in the centre of the property.

Evidence of earthworks was identified across the majority of the property, including potential cut and fill of portions of the eastern slope. Earthworks are inferred to have been historically undertaken for the creation of access tracks and levelling of cultivated areas associated with peach farming. The lateral and vertical extend of these earthworks was not able to be confirmed during the investigation.

Fill was reported to have been imported south-east of the dam, for the purpose of filling in the dam which was not completed. The fill was reported to have been sourced from a landscaping business.

Several small waste piles, consisting predominantly of discarded household items, were located around the property, most of which in close proximity to the dwelling. Potentially hazardous materials were not identified, with the exception of a small pile of fibre-cement sheeting in the northern portion of the property. A sample collected from this material (FRAG_1) confirmed it did not comprise asbestos containing material (ACM).

A groundwater monitoring well was identified in the northern portion of the property. The well was padlocked and could not be accessed. It is inferred the well is used for monitoring purposes, however further information was not available at the time of writing. It is considered likely that this well is associated with monitoring programs for either Speers Point Quarry (located 600 m north-west) or Pasminco Cockle Creek Smelter (located 1.7 km north), however this was not able to be confirmed.

- **Property 2 - 19 Daydawn Avenue, Warners Bay NSW**

Access to the property is derived from Daydawn Avenue. The property is vacant, with a number of beehives in the central-eastern portion of the property appearing to be the only established use of the property.

The current occupant of 40 Rayford Street (Nigel Blundell) reported that, excluding beekeeping, the property is not currently used for any specific purpose and historic use of the site has been limited to minor horse agistment.

The property was predominantly covered with grass which appeared to be regularly maintained. The topography of the property as terraced, sloping from west to east. It remains unclear to what extent topography of the property has been improved through historical earthworks. The slope of the western portion of the property increases significantly and contains native vegetation. Access to this area was not possible during the investigation, however no current or historical landuse appears to have occurred in this area.

A survey point was identified on the eastern portion of the property.

Several minor access tracks traverse the property from Daydawn Avenue, to 40 Rayford Street, Warners Bay to the north and 25 Rani Close, Speers Point to the south.

No further infrastructure was identified on the property.

2.3 Physical setting

Table 2.2 Physical site setting

Topography	The site in undulating, with the predominant slope to the east. The site's elevation varies between approximately 30 m Australian Height Datum (AHD) in the eastern portion of the site and 100 m AHD in the west (source: Land and Property Information NSW).
Geology	According to the Newcastle 1:250,000 Geological Series Sheet SI 56-2, the site is located on Permian aged deposits from the Newcastle Coal Measures, comprising conglomerate, sandstone, tuff, shale and coal.
Hydrogeology	The nearest major surface water body is Warners Bay, located approximately 450 m south of the site. The depth to groundwater at the site is not known.
Groundwater database search	A search of the NSW Office of Water groundwater database (http://allwaterdata.water.nsw.gov.au/water.stm) completed on 10 May 2017 indicated that there was one registered bore within a 2 kilometre (km) radius of the site. The bore was situated approximately 2 km east of the site. The bore was deep (greater than 25 metres total depth) and used for drainage purposes.
Acid sulfate soils	A search of the Australian Soil Resource Information System (ASRIS) (http://www.asris.csiro.au/mapping/viewer.htm) conducted on 10 May 2017 indicated that the site is located within an area recorded as "B4 - low probability of occurrence / very low confidence" for acid sulfate soils. The south-eastern portion of the site is recorded as soil Class 5 as per the Lake Macquarie Local Environmental Plan 2014. This class relates to works within 500 metres of adjacent Class 1, 2, 3, or 4 land that is below 5 metres AHD.
Sensitive receptors	Sensitive receptors identified include: → current and future on-site residents → local surrounding residential properties and commercial premises, including Biddabah Public School to the east of the site → aquatic ecosystems and recreational users of the Warners Bay, located approximately 500 m to the east

3 PRELIMINARY SITE INVESTIGATION

The purpose of this section is to summarise various available desktop resources to assess if the history of the site or surrounds presents a risk of contamination being present on the site.

3.1 Government database searches

A review of publically available government databases was completed by WSP on 10 May 2017. In part we have relied on the Lotsearch Environmental Risk and Planning Report (Appendix C). The results are summarised below.

3.1.1 Contaminated Land Management Act 1997 search

The NSW EPA's contaminated land record (http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx), made under the *Contaminated Land Management Act 1997* NSW (CLM Act) listed one site in the surrounding area; Pasminco Cockle Creek Smelter (1.7 km north of the site) - Contamination currently regulated under the CLM Act (four current and three former notices). The Pasminco Cockle Creek Smelter is considered to have potentially impacted the site. This registered contaminated site is discussed further in Section 3.3.

3.1.2 Protection of the Environment Operations Act 1997 search

A search for licences on the NSW EPA *Protection of the Environment Operations Act 1997* (NSW) public register (http://www.epa.nsw.gov.au/prpoeoapp/) indicated that the following current or pending environmental protection licences (EPLs) were held within a 2 km radius of the site outlined in Table 3.1 and Table 3.2 below.

Table 3.1 Licensed sites within a 2 km radius of the site

EPL	ORANISATION	NAME	ACTIVITY	DISTANCE
6332	Lake Macquarie City Council	-	Other activities	130 m west
5042	Pasminco Cockle Creek Smelter Pty Limited	Pasminco Cockle Creek Smelter & Incitec Fertilizers	Waste disposal by application to land	1.7 km north
5042	Pasminco Cockle Creek Smelter Pty Limited	Pasminco Cockle Creek Smelter & Incitec Fertilizers	Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste	1.7 km north

Table 3.2 Former Environmental Protection Licences (EPL) within a 2 km radius of the site

LICENCE	ORANISATION	NAME / LOCATION	ACTIVITY (STATUS)	DISTANCE
11728	HCOA Operations (Australia) Pty Limited	Warners Bay Private Hospital	Hazardous, Industrial or Group A Waste Generation or Storage (delicensed)	144 m east
5225	Buttai Gravel Pty Ltd	Speers Point Quarry, Hopkins Street, Speers Point	Crushing, grinding or separating (former)	600 m north-west
5225	Buttai Gravel Pty Ltd	Speers Point Quarry, Hopkins Street, Speers Point	Land-based extractive activity	600 m north-west
6630	Sydney Weed & Pest Management Pty Ltd	Waterways throughout NSW - Prospect, NSW, 2148	Other Activities/Non-Scheduled Activity - Application of Herbicides	130 m
4653	Luhrmann Environment Management Pty Ltd	Waterways throughout NSW	Other Activities/Non-Scheduled Activity - Application of Herbicides	130 m
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Other Activities/Non-Scheduled Activity - Application of Herbicides	130 m

3.1.3 SafeWork NSW dangerous goods search

A search of SafeWork NSW dangerous goods search records was completed but had not been received at the time of writing.

Given the context of the site, it is considered unlikely that the storage of significant quantities of dangerous goods would have occurred.

3.1.4 Section 149 planning certificates

A Section 149 Planning Certificate for Property 2 (19 Daydawn) Street was not available at the time of writing.

The following information in regards to environmental planning matters was obtained from the Section 149 Planning Certificates that apply to 40 Rayford Street, Warners Bay:

- the land does not include or comprise critical habitat
- the land is within a heritage conservation area, an item of Aboriginal heritage, listed within the Aboriginal Heritage Information Management System (AHIMS) may affect the land
- the land is within a proclaimed mine subsidence district
- policies on hazard risk restrictions relating to the site include:
  - acid sulfate soils – works carried out on the land must be undertaken in accordance with Lake Macquarie Development Control Plan (2014)
  - land contamination – Council does not have land contamination information/records in relation to this property.

A copy of the certificate is provided in Appendix E.

3.2 Site history information

3.2.1 Historical title deeds

The results of the historical title search are provided in Appendix D and have been summarised below.

Based on the list of historical owners, the site appears to have been used for residential and/or agricultural purposes since 1905.

Historical titles for Lot 6 DP 814499 and Lot 100 DP 1173625 are summarised in Table 3.3 and Table 3.4 below.

Table 3.3 Historical Title Summary (Lot 6 DP 814499)

YEAR	PROPRIETOR
Lot 6 DP 814499	
1997 – to date	Eric James Williams (junior) Kenneth John Williams Fay Blundell
1995 to 1997	Eric James Williams (jnr) Kenneth John Williams Fay Blundell
1992 – 1995	Eric James Williams, farmer
Lot 20 DP 258986	
1988 - 1922	Eric James Williams, farmer
Lot 20 DP 258986 – CTVol 13944 Fol 100	
1979 - 1988	Eric James Williams, farmer
Lot 11 DP 249244 – CTVol 12726 Fol 49	
1975 - 1979	Eric James Williams, farmer
Lot 50 DP 566559 – CTVol 12321 Fol 212	
1974 - 1975	Eric James Williams, farmer
Part Lot 11 Section T DP 5355 – Area 8 Acres 0 Roods 38 ½ Perches – CTVol 7590 Fol 3)	
1958 – 1974	Eric James Williams, orchardist
Lot 11 Section T DP 5355 – Area 10 Acres 2 Rood 15 ½ Perches – CTVol 6638 Fol 173	
1953 – 1958	Elizabeth Allan Brownlee, wife of school teacher
Lot 11 Section T DP 5355 – Area 10 Acres 3 Roods 21 ½ Perches - CT Vol 2264 Fol 52	
1944 – 1953	Elizabeth Allan Brownlee, wife of school teacher
1925 – 1944	Harold Douglas Grant, grocer

YEAR	PROPRIETOR
1923 – 1925	Elizabeth Bist, wife of labourer
1919 – 1923	Alfred James Leslie Bist, orchardist
1917 – 1919	Leslie Arthur Fitness, engine driver Eva May Fitness, his wife
1912 – 1917	Charles Farrell, miner
Part Portion 10 Parish Kahibah & other lands – Area 1143 Acres 1 Rood 12 ¾ Perches – CTVol 1949 Fol 85	
1909 – 1912	Sir James Reading Fairfax, knight
Part Portion 10 Parish Kahibah & other lands – Area 1174 Acres 1 Rood 1 Perches – CTVol 1644 Fol 241	
1905 – 1909	Sir James Reading Fairfax, knight
Part Lot 5 DP 244868 – CTVol 12152 Fol 158	
1973 – 1974	Eric James Williams, farmer
Part Lot 28 DP 242069 – CTVol 11772 Fol 207	
1972 – 1973	Eric James Williams, farmer
Lot 12 Section T DP 5355 – Area 10 Acres 2 Roods 18 ½ Perches – CTVol 2423 Fol 41	
1939 – 1972	Eric James Williams, farmer
1926 – 1939	Harold Douglas Grant, grocer
1923 – 1926	Elizabeth Birt, wife of labourer
1915 – 1923	Alfred James Leslie Birt, railway officer
1913 – 1915	Charles Farrell, miner
Part Portion 10 Parish Kahibah & other lands – Area 1143 Acres 1 Rood 12 ¾ Perches – CTVol 1949 Fol 85	
1909 – 1913	Sir James Reading Fairfax, knight
Part Portion 10 Parish Kahibah & other lands – Area 1174 Acres 1 Rood 1 Perches – CTVol 1644 Fol 241	
1905 – 1909	Sir James Reading Fairfax, knight
Lots 13 & Part Lot 14 DP 5355 – Area 19 Acres 2 Roods 24 Perches – CTVol 8405 Fol 136	
1963 – 1972	Eric James Williams, farmer
1962 – 1963	Balys Zakarauskas, labourer
Lots 13 & 14 Section T DP 5355 – Area 21 Acres 2 Rood 24 Perches – CTVol 2050 Fol 86	
1919 – 1962	Andrew James Meiklejohn, orchardist
1916 – 1919	Hilda Beatrice Smith, wife of John William Smith, hotel keeper
1910 – 1916	John William Smith, hotel keeper
Part Portion 10 Parish Kahibah & other lands – Area 1143 Acres 1 Rood 12 ¾ Perches – CTVol 1949 Fol 85	

YEAR	PROPRIETOR
1909 – 1910	Sir James Reading Fairfax, knight
Part Portion 10 Parish Kahibah & other lands – Area 1174 Acres 1 Rood 1 Perches – CTVol 1644 Fol 241	
1905 – 1909	Sir James Reading Fairfax, knight

Table 3.4 Historical Title Summary (Lot 100 DP 1173625)

YEAR	PROPRIETOR
Lot 100 DP 1173625	
2012 – to date	Nigel Andrew Blundell
2012 – 2012	Peter Charles Hicks Gregory John Elsworthy
Lot 10 DP 651218	
2012 – 2012	Peter Charles Hicks Gregory John Elsworthy Judith Anne Lamb
1992 – 2012	Winifred Joy Williams Judith Anne Lamb
Part Lot 10 Section T DP 5355 – CT Vol 10206 Fol 60	
1986 – 1992	Winifred Joy Williams Judith Anne Lamb
1985 – 1986	Penny Williams Jeffrey John Williams Judith Anne Lamb
1966 – 1985	Edna May Cornford, widow
1966 – 1966	Clarence George Cornford, orchardist Edna May Cornford, his wife
Lot 10 Section T DP 5355 – Area 10 Acres 2 Roods 34 ½ Perches – CTVol 2264 Fol 47	
1938 – 1966	Clarence George Cornford, orchardist Edna May Cornford, his wife
1936 – 1938	Annie Odgers, widow
1912 – 1936	William Henry Odgers, miner

3.2.2 Historical aerial photographs

A review of historical aerial photography covering the site and surrounding area was undertaken with a summary of the observed land use changes described in Table 3.5. Historical aerial photographs are provided in Appendix C.

Table 3.5 Historical aerial photograph review

YEAR	ON-SITE LAND USES		Surroundings
	Property 1 - 40 Rayford Street	Property 2 - 19 Daydawn Avenue	
1954	The site is predominantly cleared of vegetation and appears to be used for grazing/cropping. There does not appear to be any structures present on the site. A dam appears to be present in the centre of the property. The southern portion of the property appears to be covered with trees. A dam is also visible on the slightly overlapping the eastern boundary of the property.	The site is predominantly cleared of vegetation, excluding the western portion of the property. Some evidence of cropping is visible in the central portion of the property.	Fairfax Road is present to the east of the site. Rayford Street is not visible. The land to the east of the site contains sparse residential properties. West of the site contains predominantly cleared, prior to native bushland. The edge of Speers Point Quarry is visible north-west of the site.
1965	There are no significant changes visible.	There are no significant changes visible.	The surrounding area is predominantly consistent with the previous aerial photograph. Further residential development has occurred to the east of the site.
1976	A dwelling is now visible in the southern portion of the property, with a driveway leading from Rayford Street to the east. The dam previously located on the eastern boundary of the property is no longer visible, with residential developments located along the sites eastern boundary.	There are no significant changes visible.	Further residential development (and associated road layout) has occurred to the east of the site. Warners Bay Hospital appears to have been partially constructed approximately 200 m east of the site. Rayford Street and Winterlake road are partially visible.
1983	There are no significant changes visible. The chicken coup/storage shelter is visible to the north of the dwelling. Some trees have regrown across the property.	There are no significant changes visible.	The surrounding area is predominantly consistent with the previous aerial photograph, with further residential development occurring to the east and south-east of the site. Rayford Street appears to be consistent with its current layout.
1993	A portion of the property to the east of the dwelling appears to be utilised as a market garden.	There are no significant changes visible.	Residential development to the east of the site has intensified, with no other significant changes to the surrounding area.
2005	Further sparse regrowth of trees as occurred across the property. The market garden appears to have become disused.	Maintenance of cleared vegetation appears to have ceased, with regrowth of scrub visible across the property. There are no other significant changes visible.	The surrounding area is predominantly consistent with the previous aerial photograph. A dwelling has been constructed adjacent to the southern boundary of the site.

YEAR	ON-SITE LAND USES		Surroundings
	Property 1 - 40 Rayford Street	Property 2 - 19 Daydawn Avenue	
2010	There are no significant changes visible.	There are no significant changes visible.	The surrounding area is predominantly consistent with the previous aerial photograph.
2014	There are no significant changes visible.	The property appears to be maintained, and predominantly surfaced with grass. Minor scrub/vegetation regrowth present in recent aerial imagery is no longer present.	The surrounding area is predominantly consistent with the previous aerial photograph.

3.3 Pasminco Cockle Creek Smelter

The Pasminco Cockle Creek Smelter (located approximately 1.7 km north of the site) operated as a lead and zinc smelter from circa 1897 until its closure in 2003. The NSW EPA declared the site a remediation site in 2002, and subsequently issued a remediation order in July 2003.

Atmospheric deposition of lead dust generated by the Pasminco Cockle Creek Smelter is known to have impacted soils in the surrounding area. A Lead Abatement Strategy (LAS) was developed in conjunction with regulatory authorities to manage areas containing elevated concentrations of lead in soil in the surrounding area. The LAS was completed in 2013.

The LAS included a Lead Contamination Survey Grid (LCSG) of properties considered to potentially contain soils impacts from the deposition of lead dust. The site is located approximately 500 m east of the LCSG.

In accordance with the CLM Act, SEPP 55 and the *Environmental Planning and Assessment Act 1979*, Lake Macquarie City Council have an obligation to advise potential purchases or landowners of contamination or potential contamination and consider the risks to public health or the environment, as a result of contaminated land on or adjacent to the site when assessing development.

3.4 Summary of site history

Aerial photographs and historical title records indicate that the site was historically partially used for residential and agricultural (orchard and market garden) purposes. The aerial photographs show the site was used for agricultural purposes until the early 2000s when this practice appears to have ceased. The historical title certificates dating from 1905 indicate the land has been used for residential and farming activities.

Intensifying residential development has occurred in the immediate surroundings east of the site. Little or no change has occurred to the surrounding area west of the site.

Potentially contaminating activities which have occurred in the surrounding area include Speers Point Quarry (located 600 m north-west) and Pasminco Cockle Creek Smelter (located 1.7 km north).

4 SAMPLING AND ANALYSIS PLAN

In order to ascertain if the identified historical onsite and offsite potential contaminating activities have affected the site a program of soil testing was carried out. The following sections outlines the sampling plan and protocol followed for the investigation works. Results of the study are presented in Section 6.

4.1 Sampling plan and rationale

Sampling locations were placed in an approximate grid pattern for site coverage and targeting potential sources of contamination, in accordance with the NSW EPA (1995) *Sampling Design Guidelines*, although it is noted that due to the preliminary nature of the investigation, sampling densities were less than those specified in the NSW EPA (1995) *Sampling Design Guidelines.* Final locations also took into consideration the presence of underground and aboveground services and the physical limitations of subsurface conditions such as structures and concrete hardstand. Sampling rationale is summarised in Table 4.1.

Soil samples were generally collected from the near surface (between 0.1 and 0.3 m below ground level (mBGL), 0.5 mBGL, 1.0 mBGL and nominal 1.0 m intervals to termination.

Table 4.1 Sampling rationale

SAMPLING LOCATION	RATIONALE
40 Rayford Street	
SB1	Agricultural use/general site coverage
SB2	Agricultural use/general site coverage
SB3	Agricultural use/general site coverage
SB4	Agricultural use/general site coverage
SB5	Area of imported fill
SB6	Targeting the chicken coup/storage shelter
SB7	Targeting the storage shed
SB8	Agricultural use/general site coverage
SB9	Agricultural use/general site coverage
SB10	Agricultural use/general site coverage
SB11	Targeting the former dam location
SB12	Agricultural use/general site coverage
SB13	Agricultural use/general site coverage
SB14	Agricultural use/general site coverage
SED1	Targeting dam sediment
19 Daydawn Avenue	
SB15	Agricultural use/general site coverage

SAMPLING LOCATION	RATIONALE
SB16	Agricultural use/general site coverage
SB17	Agricultural use/general site coverage
SB18	Agricultural use/general site coverage
SB19	Agricultural use/general site coverage
SB20	Agricultural use/general site coverage
SB21	Targeting drainage line
SB22	Agricultural use/general site coverage
SB23	Agricultural use/general site coverage
SB24	Agricultural use/general site coverage

Samples were analysed for selected contaminants of concern identified for the site based on the site history, including total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc), organochlorine pesticides (OCPs), organophosphate pesticides (OPP) and asbestos.

4.2 Fieldwork methodology

Fieldwork was undertaken on 2 February 2017 (Property 1) and 3 May 2017 (Property 2).

4.2.1 Preliminaries

All works were undertaken in accordance with WSP policy, and the site HESP and safe work method statements (SWMS) prepared for the site.

All site locations were cleared by a suitably qualified service locator prior to the commencement of intrusive works, utilising Dial Before You Dig plans provided by asset owners.

4.2.2 Fieldworks methodology

The fieldworks methodologies adopted during the DSI were consistent with WSP standard field procedures. These have been summarised in Table 4.2.

Table 4.2 Field methodologies

TASK	DETAILS
Service clearance	All investigation locations were checked for the presence of buried services by an experienced service locator and cross checked with the Dial Before You Dig plans obtained from all asset owners.
Drilling method	All bores were advanced by non-destructive digging (hand auger) to a maximum depth of 1.2 mBGL. Selected soil bores terminated at hand auger refusal.
Soil logging	Soil logging was completed based on field interpretation and was generally consistent with the Unified Soil Classification System (USCS) and Australian standard (AS) 1726-1993.
Soil bore backfilling	All soil bores were backfilled with excess soils and re-compacted to the surrounding level to prevent a trip hazard occurring.

TASK	DETAILS
Soil sampling method	Soil samples were collected from soil removed by the hand auger using disposable nitrile gloves. Re-useable equipment was washed using a Decon-90/tap water solution and rinsed with deionised water between locations to minimise the potential for cross-contamination. All samples collected were placed in dedicated laboratory supplied containers with Teflon lined lids. Soil samples were generally collected from the following depths: → Near surface (between 0.1 and 0.3 mBGL) → 0.5-0.6 mBGL → 0.9 mBGL Sample depths were also selected to target changes in lithology or evidence of potential contamination. All soil samples collected during the works were screened with a calibrated photo-ionisation detector (PID) to assess if volatile organic compounds (VOCs) were present.
Sample preservation	Samples were stored in an insulated cooler box with ice immediately after sampling. Samples were kept chilled prior to and during delivery to the selected National Association of Testing Authorities (NATA) accredited laboratory via a courier under appropriate 'chain of custody' documentation.
Quality assurance/quality control (QA/QC)	Intra- and inter-laboratory duplicate samples were collected in the field at the rate of 1 in 20 primary samples. One trip blank were carried with the samples per sampling event to assess the potential for volatile cross-contamination and loss.
Waste disposal	Excess soil cuttings were used as backfill. All general waste generated during the sampling works was removed from the site for disposal to landfill.

4.3 Laboratory analysis

SGS was the primary laboratory for the soil sample analysis, with ALS utilised as a secondary laboratory. Both SGS and ALS are NATA accredited for the soil analyses conducted with the exception of asbestos quantification, for which no NATA-approved methodology currently exists.

One intra-laboratory and one inter-laboratory duplicate samples were collected and analysed.

A summary of samples and analyses is presented in Table 4.3.

Table 4.3 Laboratory analyses summary

ANALYTE	PRIMARY SAMPLES ANALYSED	DUPLICATES (INTRA- AND INTER-LABORATORY)
Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc)	26	2
TRH, BTEX and PAHs	16	2
Organochlorine and organophosphorus pesticides	10	-
Asbestos	10	-
Soil parameters – Cation exchange coefficient (CEC), clay content, pH, iron and total organic carbon (TOC)	2	-

5 SOIL ASSESSMENT CRITERIA

To assess the contamination status, the NSW EPA refers to *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPM; as amended 2013), specifically Schedule B1, Investigation Levels for Soil. Schedule B1 provides a framework for the use of investigation and screening levels based on a matrix of human health and ecological risks.

5.1 Health based criteria

Schedule B1 of the NEPM (2013) defines health investigation levels (HILs) that have been developed for a broad range of metals and organic contaminants in soil. HILs are scientifically based, generic assessment criteria designed to be used in the first stage (Tier 1 or 'screening') of an assessment of potential risks to human health from chronic exposure to contaminants. The HILs are applicable to all soil types and have been developed for four generic land use settings:

- HIL A: Residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), also includes children's day care centres, preschools and primary schools).
- HIL B: Residential with minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise buildings and flats.
- HIL C: Public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary school fields and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate.
- HIL D: Commercial/industrial such as shops, offices, factories and industrial sites.

Taking into consideration the objectives and purpose of the investigation, it is considered appropriate to assess the site based on the intended residential use. Screening criteria for residential purposes (HIL A) have been adopted. The HIL assessment criteria have been summarised in Table 5.1.

Table 5.1 Soil Health Investigation Levels (HILs)

ANALYTE	HIL A, RESIDENTIAL WITH GARDEN/ACCESSIBLE SOIL[1] (mg/kg)
Arsenic	100
Cadmium	20
Chromium (III)	100
Copper	6,000
Lead	300
Mercury	40
Nickel	400
Zinc	7,400
Benzo(a)pyrene toxic equivalence quotient (BaP TEQ)	3
Total PAHs	300

ANALYTE	HIL A, RESIDENTIAL WITH GARDEN/ACCESSIBLE SOIL[1] (mg/kg)
Phenol	3,000
Pentachlorophenol	100
Total PCBs	1
DDT + DDE+DDD	240
Aldrin and dieldrin	6
Chlordane	50
Endosulfan	270
Endrin	10
HCB	10
Heptachlor	6
Methoxychlor	300

Notes:
1 NEPM (2013) Schedule B1 Health Investigation Levels for Soil

Health screening levels (HSLs) are applicable to the assessment of vapour intrusion risks arising from petroleum hydrocarbons in contaminated soil. The adopted carbon fraction ranges for the HSLs are based on TRH concentrations after subtraction of BTEX compounds and naphthalene. HSLs are also available for a range of uses from residential to commercial/industrial. HSL A/B (residential) criteria were adopted.

The HSLs methodology provides for a greater range of site circumstances including the depth of contamination and soil texture. These HSLs have been developed for sand, silt and clay soils based on soil texture classifications. Where there is reasonable doubt as to the appropriate soil texture to select, either a conservative selection should be made (i.e. select coarsest applicable grain size such as sand) or laboratory analysis carried out to determine particle size and hence soil texture sub-class. For the purposes of this preliminary investigation, the most conservative approach will be selected and the adopted assessment criteria will be based on a subsurface profile comprising sand, although it noted that the application of less conservative soil textures (silt or clay) may be suitable for the site. The HSLs have been incorporated in Schedule B1 in the context of a wider site assessment framework for petroleum hydrocarbon contamination.

The adopted petroleum assessment criteria for soil have been provided in Table 5.2.

Table 5.2 Soil HSLs for vapour intrusion for residential land use (mg/kg)

ANALYTE	HSL A/B RESIDENTIAL USE IN SAND[1,2] (mg/kg) 0 to <1 m
F1: TRH C_6-C_{10} less BTEX	45
F2: TRH >C_{10}-C_{16} less naphthalene	110
Benzene	0.5
Toluene	160
Ethylbenzene	55
Xylenes	40
Naphthalene	3

1. NEPM (2013) Schedule B1, Table 1A(3) Soil HSLs for vapour intrusion.
2. Soil type of sand is adopted here as a conservative approach.
3. NL – not limiting i.e. the soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario
4. HSL adjusted by a factor of 4 for comparison of composite samples.

NEPM (2013) also provides HSLs for asbestos in soil and are based on land use and asbestos type. The adopted assessment criteria for asbestos is summarised in Table 5.3.

Table 5.3 Soil HSLs for asbestos for commercial/industrial land use

ANALYTE	HSL A, RESIDENTIAL WITH GARDEN/ ACCESSIBLE SOIL (mg/kg)[1]
Bonded asbestos in soil (>7mm ACM)	0.01 (%w/w)
Friable asbestos and asbestos fines in soil (<7mm)	0.001 (%w/w)
Surface lying asbestos (all forms)	None visible

(1) NEPM (2013) Schedule B1 Health Screening Levels for Asbestos Contamination in Soil
(2) ACM – asbestos-containing material

5.2 Ecological based criteria

5.2.1 Ecological investigation levels

The NEPM (2013) also provides ecological investigation levels (EILs), which were developed for metals, naphthalene and pesticides. The EILs take into consideration the physiochemical properties of soil and contaminants and the capacity of the local ecosystem to accommodate increased in the contaminant levels. The EILs are derived using the following equation:

EIL=added contaminant limit (ACL) + ambient background concentration (ABC)

The ABC is the background contaminant level and requires measurement at appropriate reference points at the site. The ACL, which is provided in the NEPM (2013), is the maximum contaminant concentrations added to the naturally occurring background level, after which may result an adverse effect on plant health.

Tables 1B(4) and 1B(5) of the NEPM (2013) provide generic EILs for aged arsenic and lead, and fresh DDT and naphthalene in soils (irrespective of their physiochemical properties). Aged values are applicable for contamination present in soil for at least two years. EILs are provided for various land uses including ‘areas

of ecological significance', 'urban residential and open space', and 'commercial and industrial'. The 'urban residential and open space' land use EILs have been considered for this investigation.

Site-specific EILs for chromium (III), copper, nickel and zinc have been calculated using the CSIRO Ecological Investigation Level Calculation Spreadsheet provided online in the ASC NEPM Toolbox (http://www.scew.gov.au/node/941). These calculations require an understanding of the CEC, clay content, pH and TOC of the residual soil at the site.

Soil was analysed for pH, CEC, TOC and clay content from 0.9 mBGL in location SB14 and SB18.

The results from SB14 at 0.9 mBGL were adopted for the calculation of EILs:

- a pH of 5.4
- a CEC of 11 cmolc/kg dwt
- a TOC of 0.17 % w/w
- a clay content of 36 %.

To calculate aged ABCs, the spreadsheet requires the state and traffic volume to also be entered. These were entered as 'NSW' and 'high' respectively.

Table 5.4 below outlines the EILs (generic and derived) for this investigation.

Table 5.4 Generic and calculated EIL concentrations

ANALYTE	NEPM (2013) EILs (mg/kg) URBAN RESIDENTIAL AND PUBLIC OPEN SPACE
Arsenic[1]	100
Chromium (III)[2]	620
Copper[2]	50
DDT[1]	180
Lead[3]	1,100
Nickel[2]	180
Zinc[2]	370
Naphthalene[1]	170

(1) NEPM (2013) Schedule B1 Table 1B(5) Generic EILs for aged arsenic, DDT, lead and naphthalene in soils irrespective of their physicochemical properties
(2) Calculated using the CSIRO Ecological Investigation Level Calculation Spreadsheet
(3) NEPM (2013) Schedule B1 Table 1B(4) Generic added contaminant limits for lead in soils irrespective of their physicochemical properties

5.2.2 Ecological screening levels

The NEPM (2013) provides ecological screening levels (ESLs) for TRH, BTEX compounds and PAHs for use as an initial screening risk assessment to determine whether laboratory analysed concentrations of contaminants potentially pose a risk to plant growth. For the purpose of this investigation, ESLs for urban residential and public open space land uses with coarse-grained soil textures have been considered. These are outlined in Table 5.5.

Table 5.5 Soil assessment criteria - ESLs

ANALYTE	ESLs (mg/kg DRY SOIL) COARSE GRAINED SOIL[1] Commercial and industrial
TRH C_6-C_{10} minus BTEX (F1)	180
TRH >C_{10}-C_{16} minus naphthalene (F2)	120
TRH >C_{16}-C_{34} (F3)	300
TRH >C_{34}-C_{40} (F4)	2,800
Benzene	50
Toluene	85
Ethylbenzene	70
Xylene (total)	105
Benzo(a)pyrene	0.7

(1) NEPM (2013) Schedule B1 Table 1B(6) ESLs for TPH Fractions F1 to F4, BTEX and benzo(a)pyrene in soil.

6 RESULTS

6.1 Soil

6.1.1 Subsurface conditions

Soil bore logs are included in Appendix F, which should be referred to for more specific information.

A summary of the subsurface conditions encountered at each property is provided in the following sections.

6.1.1.1 PROPERTY 1 – 40 RAYFORD ST, WARNERS BAY

The stratigraphy within Property 2 (SB01 to SB14) comprises fill from 0.2 to 1.0+ metres depth overlying natural mottled grey to orange silty sand or sandy clays. Seven soil bores terminated in fill and the full potential depth and composition of fill cannot be ascertained. The fill encountered appeared to comprise reworked natural gravelly sands and clays.

A summary of the typical subsurface geological profile encountered at Property 1 is presented in Table 6.1.

Table 6.1 Subsurface conditions

DEPTH (mBGL)	GENERAL SOIL DESCRIPTION
0.0 to 0.8	Fill: silty, gravelly sand, loose, brown to grey, dry.
0.8 to termination (maximum of 1.0)	Sandy, silty clay: friable, mottled grey and orange, with some fine to medium gravel.

6.1.1.2 PROPERTY 2 – 19 DAYDAWN AVENUE, WARNERS BAY

The stratigraphy within Property 2 (SB15 to SB24) comprises fill from 0.4 to 1.2+ metres depth overlying natural light brown to mottled grey to orange sandy clays. Natural sandy clays were observed to be potentially reworked in multiple locations to termination depths, although this was not confirmed. One soil bore (SB24, located in the eastern portion of the property) terminated in fill and the full potential depth and composition of fill cannot be ascertained. The fill encountered appeared to comprise gravelly sand.

A summary of the typical subsurface geological profile encountered at Property 2 is presented in Table 6.2.

Table 6.2 Subsurface conditions

DEPTH (mBGL)	GENERAL SOIL DESCRIPTION
0.0 to 0.4	Fill: gravelly sand, loose, grey brown, dry.
0.8 to termination (maximum of 1.2)	Sandy clay: low plasticity, mottled grey and orange, with some fine to medium grained gravel.

6.1.2 Field screening

PID screening did not indicate the presence of significant quantities of VOCs, with maximum readings of 0.5 ppm (SB5). No visual or olfactory indications of contamination were identified during fieldworks.

6.1.3 Soil analytical results

Soil analytical results are summarised in Table 1, Appendix G.

The analytical results for all contaminants of concern were reported below the adopted assessment criteria for all samples. The majority of results were below laboratory limits of reporting (LORs). Notable contaminants reported in samples above the laboratory LORs are summarised below:

- PAHs were reported in sample SB7 collected at a depth of 0.2 mBGL. Benzo(a)pyrene was reported at 0.2 mg/kg and total PAHs at 2 mg/kg. Both these results are less than their respective health and ecological criteria.
- Selected metals were reported in all samples. All heavy metals results were less than their respective health or ecological criteria.

6.1.4 Hazardous Materials

Samples of potential asbestos containing material (ACM) were collected at two (2) locations within Property 2.

- Frag_1 was collected from a small pile of waste building material identified within the vicinity of SB1. Frag_1 was reported as negative for asbestos.
- Frag_2 was collected from the wall of the chicken coup, adjacent to SB6. Frag_2 was reported as positive for chrysotile asbestos.

7 QUALITY ASSURANCE/QUALITY CONTROL

The data quality indicators (DQIs) for the investigation are presented in Table 7.1 and Table 7.2.

Analytical results for QA/QC field samples are included as Table 2 to Table 3 in Appendix G.

Table 7.1 DQI performance

DQI	ITEM	CONFORMANCE
Completeness (a measure of the amount of useable data from a data collection activity)	All critical locations sampled	Yes
	WSP documented procedures which are based on accepted industry standard practices complied with	Yes
	Experienced sampler	Yes
	Correct documentation	Yes
Comparability (the confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event)	Same standard operating procedures (SOPs) used on each occasion	Yes
	Experienced sampler	Yes
	Climatic conditions (temperature, rainfall, etc.)	Yes
	Same type of samples collected	Yes
Representativeness (the confidence (expressed qualitatively) that data are representative of each media present on the site)	Appropriate media sampled according to proposal	Yes
	All media identified in proposal sampled	Yes
Precision (a quantitative measure of the variability (or reproducibility) of data)	SOPs appropriate and complied with	Yes
	Duplicate samples analysed	Yes
Accuracy (bias) (a quantitative measure of the closeness of reported data to the true value)	SOPs appropriate and complied with	Yes
	Trip blank results below LORs	Yes

Table 7.2 Laboratory DQIs

DQI	ITEM	CONFORMANCE
Completeness	All critical locations sampled	Yes
	All contaminants of concern analysed	Yes
	Appropriate methods and LORs	Yes
	Sample documentation complete	Yes
	Sample holding times complied with	Yes
Comparability	Sample analytical method used	Yes
	Sample LORs (justify or quantify if different)	Yes
	Same laboratories (justify or quantify if different)	NA
	Same units (justify or quantify if different)	Yes
Representativeness	All relevant samples analysed	Yes
Precision	Analysis of laboratory duplicates	Partial, results are considered to be acceptable and representative of site conditions
	Analysis of field duplicates	Partial, results discussed in Section 8.1.1
	Analysis of laboratory prepared volatile trip spikes	N/A
Accuracy (bias)	Analysis of rinsate and trip blanks	Yes, results indicate cross-contamination was unlikely and decontamination procedures were adequate
	Analysis of reagent blanks	Yes, refer to laboratory certificates of analysis
	Analysis of method blanks	
	Analysis of matrix spikes and matrix spikes duplicates	
	Analysis of surrogate spikes and laboratory-prepared spikes	
	Analysis of reference materials/control samples	

7.1.1 Field duplicates

The purpose of duplicate samples are to estimate the variability of a given characteristic or contaminant associated with a population. One pair of intra- and inter-laboratory duplicate soil samples were collected for analysis. Duplicate samples were labelled so as to conceal their relationship to the primary sample from the laboratory.

Field duplicate soil samples were collected from soil immediately adjacent to the primary sample by placing approximately equal portions of the primary sample into multiple sample jars.

The field QA/QC sampling program comprised two duplicates and triplicate pairs sent to the primary laboratory and secondary laboratory. Due to a chain of custody error, one triplicate sample (TRIP1) was analysed by the primary laboratory, however this minor error is not considered likely to have impacted the outcome of this investigation

Relative percentage differences (RPDs) were calculated for the primary and duplicate samples for assessment of the data quality, in particular for assessment of the reproducibility of the analytical data measurements or 'precision' given the adopted field and laboratory methods. The RPDs were calculated using the formula below.

$$RPD\% = \frac{|Ro - Rd|}{|(Ro + Rd)/2|} \times 100\%$$

Where Ro is the primary sample and Rd is the duplicate.

The RPD values were compared to the 30% - 50% RPD acceptance criterion outlined in NEPM (2013). RPDs for results less than the laboratory LORs were not calculated. In instances where results were greater than the LOR for the one sample, but below LOR for the corresponding primary or duplicate sample, a result equal to the LOR value was adopted where necessary in order to make a calculation possible. LOR results were acceptable, with the exception of some metals (cadmium, chromium, copper, lead and zinc). Multiple exceedances for PAHs were also reported between primary sample (SB7_0.2), intra-laboratory duplicate (DUP2) and inter-laboratory duplicate (TRIP2).

The RPD exceedances for metals are likely due to sample heterogeneity, which is common in soil samples, and subtle differences in methods between the labs. The RPD exceedances for PAHS were due to concentrations reported close to the LOR for the primary sample, but below LOR for the corresponding primary or duplicate sample. The highest value from the primary sample and intra- and inter-laboratory duplicates was compared to the soil assessment criteria, and no exceedances were present. The variation is not considered to affect the outcome of this investigation.

7.2 Summary of QA/QC

The sampling methods (including sample preservation, transport and decontamination procedures) and laboratory methods followed during the investigation were consistent with WSP's protocols. It is considered that the data quality is adequate for the purpose of the study.

8 DISCUSSION

8.1 Preliminary site investigation

A search of government databases identified current and former EPLs in the surrounding area, including Speers Point Quarry (located 600 m north of the site) and the former Pasminco Cockle Creek Smelter (located 1.7 km north). The site is located adjacent to the Pasminco Lead Contamination Survey Grid, an area used to identify properties potentially affected from deposition of atmospheric lead containing dust originating from the Pasminco Cockle Creek Smelter.

The topography of the site is undulating, with the main slope falling to the east.

Further information specific to Property 1 and Property 2 is summarised in the following sections.

8.1.1 Property 1 – 40 Rayford Street, Warners Bay NSW

Based on the desktop study and site inspection, Property 1 has been used for agricultural and/or residential purposes since at least the early 1900s, including a peach farm. Pesticides were reported have been historically used at the site, including copper sulfate. Recent use of Property 1 has been limited to residential purposes and horse agistment.

Evidence of potential earthworks were identified, inferred to have occurred for the creation of access tracks and cultivated areas. Fill was reported to have been imported to a portion of the centre of Property 1, which was intended to fill in a dam, however this work has not been completed to date.

Small waste piles were identified in multiple locations across Property 1 and were observed to contain predominantly discarded household items, with no potentially hazardous materials identified.

A groundwater monitoring well was identified in the northern portion, the monitoring well was locked and could not be accessed.

8.1.2 Property 2 – 19 Daydawn Avenue, Warners Bay NSW

Based on the desktop study and site inspection, Property 2 has not been developed. Vegetation appears to have predominantly been removed from the site prior to 1954, after which no significant changes or development of the site appear to have occurred.

There has been no significant recent use of Property 2. The property was observed to be grassed and appeared to be regularly maintained. Beehives appeared to be the only use of the site.

The slope of the western portion of Property 2 increases significantly and was not able to be accessed. This portion of the site contains native vegetation and is not considered likely to have been utilised for any purpose.

8.2 Soil Investigation

The concentrations of all contaminants of concern were reported below the laboratory LOR and/or adopted assessment criteria for all samples collected. Detectable concentrations were identified for some analytes:

- PAHs were reported in sample SB7 collected at a depth of 0.2 m BGL. Total PAHs was reported at 2.0 mg/kg, well below the adopted HIL (300 mg/kg). SB7 was located adjacent to a storage shed to the south of the dwelling within Property 1.

- Selected metals were reported in all samples. The reported concentrations of metals are considered to be consistent with background concentrations and not significant. Lead was reported at a maximum concentration of 89 mg/kg in SB14 at a depth of 0.2 mBGL, well below the adopted HIL (300 mg/kg).

The results of the soil investigation indicate that historical use of the site and surrounding area (including the Pasminco Cockle Creek Smelter) has not resulted in significant contamination of soils at the site.

The potential for contamination of groundwater from historical use of the site and surrounding area is considered low.

8.3 Hazardous materials

Hazardous materials were identified within Property 1 in the form of non-friable ACM within the walls of the chicken coup (FRAG_2). This material was observed to be in generally poor condition, with broken edges.

A licensed Class B (non-friable) asbestos removalist should be engaged for the removal of all ACM prior to general demolition works. Removal works must be undertaken in accordance with SafeWork Australia (2011) – Code of Practice: How to Safely Remove Asbestos.

9 CONCLUSIONS AND RECOMMENDATIONS

WSP was engaged to conduct a PSI, for 40 Rayford Street, Warners Bay NSW (Property 1) and 19 Daydawn Avenue, Warners Bay NSW (Property 2). The results of the PSI indicate that historical use of the site and surrounding area has not resulted in the presence of significant contamination at the site. The limited soil boring and laboratory testing program supported the findings of the PSI. All soil laboratory results were within residential thresholds.

Based on the results of the investigation, it is concluded that, from a contamination perspective, the site is suitable for residential use.

The following should be managed appropriately during the demolition of current site infrastructure, prior to re-development:

- It would be considered prudent that a hazardous materials survey of the waste piles be completed prior to demolition to confirm the absence of hazardous building materials, and allow appropriate management (if required).
- A licensed Class B (non-friable) asbestos removalist should be engaged for the removal of identified ACM. Removal works must be undertaken in accordance with SafeWork Australia (2011) – Code of Practice: How to Safely Remove Asbestos.

These conclusions are based on the findings of the PSI and limited intrusive investigation. The conclusions rely on observations of materials encountered at the locations drilled and to the depth tested (~1 mBGL depth). Due to limited depth of the investigation and/or subsurface constraints a number of locations were terminated in fill/reworked natural material, limiting knowledge of the full depth and composition of the fill at the site. If unusual materials, such as those with unexpected colours, odours, presence of fibres or strange anthropogenic inclusions are uncovered during future development works these should be assessed by an environmental consultant and managed appropriately.

10 REPORT LIMITATIONS

SCOPE OF SERVICES

This environmental site assessment report (the report) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and WSP | Parsons Brinckerhoff (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

RELIANCE ON DATA

In preparing the report, WSP | Parsons Brinckerhoff has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, WSP | Parsons Brinckerhoff has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WSP | Parsons Brinckerhoff will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP | Parsons Brinckerhoff.

ENVIRONMENTAL CONCLUSIONS

In accordance with the scope of services, WSP | Parsons Brinckerhoff has relied upon the data and has not conducted any environmental field monitoring or testing in the preparation of the report. The conclusions are based upon the data and visual observations and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Within the limitations imposed by the scope of services, the assessment of the site and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

REPORT FOR BENEFIT OF CLIENT

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

OTHER LIMITATIONS

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

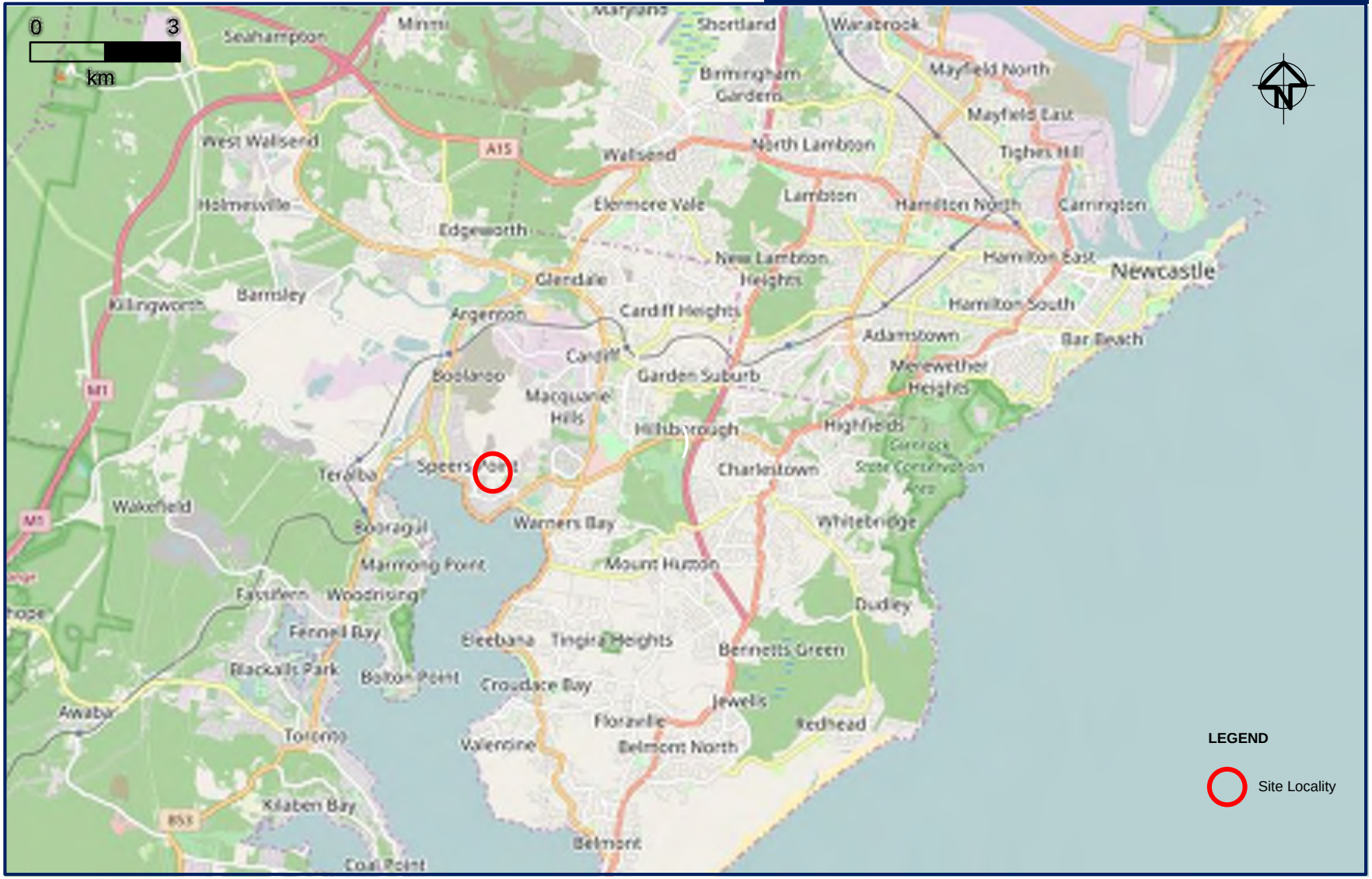
The scope of services did not include any assessment of the title to nor ownership of the properties, buildings and structures referred to in the report, nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

11 REFERENCES

- Australian Standard AS4482.1, 2005, Guide to the investigation and sampling of sites with potentially contaminated soil – Part 1: Non-volatile and semi-volatile compounds
- Australian Soil Resource Information System (ASRIS) - http://www.asris.csiro.au/index.html
- National Environment Protection Council, 2013 National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013
- Newcastle 1:100,000 Geological Series Sheets 9232 (1976)
- Newcastle 1:250,000 Geological Series Sheets S156-2 (Edition 1, 1966)
- Newcastle Council, 2016, Acid Sulfate Soils (www.newcastle.nsw.gov.au/Business/Regulations/Health-safety/Acid-Sulfate-Soils)
- NSW DUAP and EPA, 1998 *Managing Land Contamination, Planning Guidelines State Environmental Planning Policy No 55 – Remediation of Land*
- NSW Environment and Heritage, 2016 eSPADE (www.environment.nsw.gov.au/eSpadeWebApp/)
- NSW EPA, 1995 Contaminated Sites: Sampling Design Guidelines
- NSW EPA, 2006 *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme, 2nd Edition*
- NSW EPA, 20014 *Waste Classification Guidelines Part 1: Classifying Waste*
- NSW EPA, 2011 Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites
- NSW Government, 1997 The Protection of the Environment Operations Act
- NSW Government, 1997, Contaminated Land Management Act
- WSP | Parsons Brinckerhoff, 2017, *Preliminary Site Investigation - Area of Subdivision, 40 Rayford St, Warners Bay NSW*.

Appendix A

SITE FIGURES



Base map source: OpenStreetMap

Figure 1 site locality plan
Pulver Cooper & Blackley Pty Ltd
40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW

Base map source: NSW LPI

Figure 2a site plan
Pulver Cooper & Blackley Pty Ltd
40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW

Base map source: NSW LPI

Figure 3a sampling plan – 40 Rayford Street, Warners Bay NSW
Pulver Cooper & Blackley Pty Ltd
40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW

Base map source: NSW LPI

Figure 3b sampling plan – 19 Daydawn Avenue, Warners Bay NSW
Pulver Cooper & Blackley Pty Ltd
40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW

Appendix B

SITE PHOTOGRAPHS

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
1	02/02/2017

Description

Entrance to 40 Rayford St, Warners Bay. Facing north-west.

Photo No.	**Date**
2	02/02/2017

Description

Front of dwelling, facing south-west.

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
3	02/02/2017

Description

Storage shelter, facing north east.

Photo No.	**Date**
4	02/02/2017

Description

Chicken coup, facing north-west. Frag_1 was collected from the wall of the chicken coup and confirmed to contain asbestos containing material (ACM).
SB6 was advanced next to the structure.

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
5	02/02/2017

Description

ACM wall of the chicken coup, and location of FRAG_1

Photo No.	**Date**
6	02/02/2017

Description

Area reported to be imported fill, facing south.
SB5 was advanced in this location.
Beekeeping hives are also visible in the background of the photo.

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
7	02/02/2017

Description

View of the site from Winterlake Road, facing south.
The fences are associated with horse agistment.

Photo No.	**Date**
8	02/02/2017

Description

View from the north-west portion of the site, facing east. A groundwater monitoring well (unknown purpose) is visible in the foreground of the photograph.

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
9	02/02/2017

Description

View from the approximate centre of the site, facing south-east.
The dam is visible in the middle of the photograph.

Photo No.	**Date**
10	02/02/2017

Description

View of the dam, facing west.
Approximate location of SED1.

WSP | PARSONS BRINCKERHOFF	**PHOTOGRAPHIC LOG**

Client Name	**Site Location**	**Project No.**
Pulver Cooper and Blackley Pty Ltd	40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	2270457A

Photo No.	**Date**
11	02/02/2017

Description

View of the dwelling, facing south-west.

Photo No.	**Date**
12	02/02/2017

Description

View of dense vegetation in the southern portion of the site , facing south-east.

Photograph was taken from the approximate location of SB8.

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
13	02/02/2017

Description

Dilapidated structure, and waste piles to the south of the dwelling, facing north-east. SB7 was collected at this location.

Photo No.	**Date**
14	02/02/2017

Description

Typical view of the southern portion of the site, showing dense vegetation.

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
15	03/05/2017

Description

Entrance to Property 2 from Daydawn Avenue, facing west.

Photo No.	**Date**
16	03/05/2017

Description

View of Property 2, facing west. Beehives are visible in the rear of the photograph.

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
17	03/05/2017

Description

View of the eastern portion of Property 2, facing south.

Photo No.	**Date**
18	03/05/2017

Description

View of the beehives within the eastern portion of Property 2, facing east.

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
19	03/05/2017

Description

View of the central portion of Property 2, facing south-east.

Photo No.	**Date**
20	03/05/2017

Description

View of the central portion of Property 2, facing north-east.

WSP PARSONS BRINCKERHOFF	PHOTOGRAPHIC LOG	
Client Name Pulver Cooper and Blackley Pty Ltd	**Site Location** 40 Rayford Street and 19 Daydawn Avenue, Warners Bay NSW	**Project No.** 2270457A

Photo No.	**Date**
21	03/05/2017

Description

View of the western portion of Property 2, facing west.

Appendix C

LOTSEARCH REPORT

Lotsearch

Environmental Risk and Planning Report

19 Daydawn Avenue, Warners Bay, NSW 2282

Report Buffer: 1000m

Report Date: 29 Apr 2017 14:15:10

Table of Contents

Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a code is given under the field heading “LC” or “LocConf”. These codes lookup to the following location confidences:

LC Code	Location Confidence
1	Georeferenced to the site location / premise or part of site
2	Georeferenced with the confidence of the general/approximate area
3	Georeferenced to the road or rail
4	Georeferenced to the road intersection
5	Feature is a buffered point
6	Land adjacent to Georeferenced Site
7	Georeferenced to a network of features

Dataset Listing

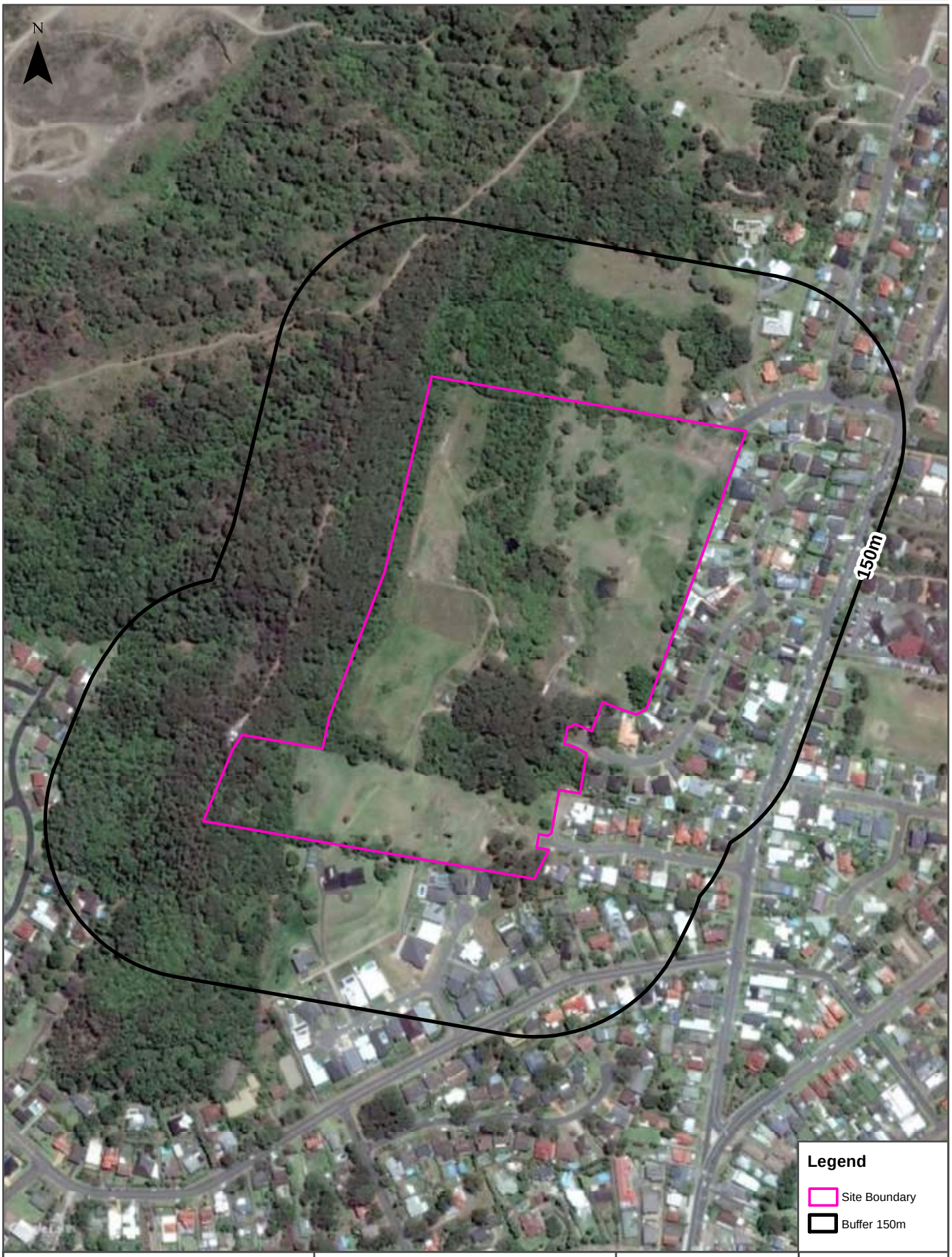
Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	Land and Property Information	29/04/2017	29/04/2017	Daily	-	-	-
Topographic Data	Land and Property Information	10/04/2015	01/04/2015	As required	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	20/04/2017	05/04/2017	Monthly	0	0	1
Contaminated Land: Records of Notice	Environment Protection Authority	08/04/2017	08/04/2017	Monthly	0	0	1
Former Gasworks	Environment Protection Authority	08/04/2017	16/01/2017	Monthly	0	0	0
National Waste Management Site Database	Geoscience Australia	07/03/2017	15/11/2012	Quarterly	0	0	0
EPA PFAS Investigation Program	Environment Protection Authority	19/04/2017	19/04/2017	Monthly	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	07/04/2017	07/04/2017	Monthly	0	0	3
Delicensed POEO Activities still Regulated by the EPA	Environment Protection Authority	07/04/2017	07/04/2017	Monthly	0	0	1
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	07/04/2017	07/04/2017	Monthly	0	2	5
UPSS Environmentally Sensitive Zones	Department of Environment, Climate Change and Water (NSW)	14/04/2015	12/01/2010	As required	1	1	1
Points of Interest	Land and Property Information	01/02/2017	01/02/2017	Annually	0	1	20
Tanks (Areas)	Land and Property Information	01/02/2017	01/02/2017	Annually	0	0	0
Tanks (Points)	Land and Property Information	01/02/2017	01/02/2017	Annually	0	0	0
Major Easements	Land and Property Information	01/02/2017	01/02/2017	As required	0	0	2
State Forest	Land and Property Information	01/02/2017	29/06/2016	As required	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment and Heritage	01/02/2017	31/12/2016	Annually	0	0	0
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1	1	1
Groundwater Boreholes	NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation; Commonwealth of Australia (Bureau of Meteorology) 2015	21/03/2016	01/12/2015	Annually	0	0	1
Geological Units 1:250,000	NSW Department of Industry, Resources & Energy	20/08/2014		None planned	1	-	3
Geological Structures 1:250,000	NSW Department of Industry, Resources & Energy	20/08/2014		None planned	0	-	4
Naturally Occurring Asbestos Potential	NSW Department of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	0	0	0
Soil Landscapes	NSW Office of Environment and Heritage	12/08/2014		None planned	3	-	6
Standard Local Environmental Plan Acid Sulfate Soils	NSW Planning and Environment	07/10/2016	07/10/2016	As required	1	-	-
Dryland Salinity Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	0	0	0
Mining Subsidence Districts	Land and Property Information	31/08/2016	31/08/2016	As required	1	1	1
SEPP 14 - Coastal Wetlands	NSW Planning and Environment	17/12/2015	24/10/2008	Annually	0	0	0
SEPP 26 - Littoral Rainforest	NSW Planning and Environment	17/12/2015	05/02/1988	Annually	0	0	0
SEPP 71 - Coastal Protection	NSW Planning and Environment	17/12/2015	01/08/2003	Annually	1	1	1
SEPP Major Developments 2005	NSW Planning and Environment	09/03/2013	25/05/2005	Under Review	0	0	0
SEPP Strategic Land Use Areas	NSW Planning and Environment	06/07/2016	28/01/2014	Annually	0	0	0
Local Environmental Plan - Land Zoning	NSW Planning and Environment	21/04/2017	13/04/2017	Quarterly	2	2	34
Local Environmental Plan - Minimum Subdivision Lot Size	NSW Planning and Environment	21/04/2017	13/04/2017	Quarterly	2	-	-

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Local Environmental Plan - Height of Building	NSW Planning and Environment	20/04/2017	13/04/2017	Quarterly	2	-	-
Local Environmental Plan - Floor Space Ratio	NSW Planning and Environment	20/04/2017	07/04/2017	Quarterly	0	-	-
Local Environmental Plan - Land Application	NSW Planning and Environment	20/04/2017	03/03/2017	Quarterly	1	-	-
Local Environmental Plan - Land Reservation Acquisition	NSW Planning and Environment	20/04/2017	13/04/2017	Quarterly	0	-	-
State Heritage Items	NSW Office of Environment and Heritage	20/04/2017	30/09/2016	Quarterly	0	0	0
Local Heritage Items	NSW Planning and Environment	20/04/2017	13/04/2017	Monthly	0	1	15
Bush Fire Prone Land	NSW Rural Fire Service	28/03/2017	17/02/2017	Quarterly	3	3	3
Lower Hunter and Central Coast Regional Vegetation Survey	NSW Office of Environment and Heritage	28/02/2015	16/11/2009	As required	1	2	13
RAMSAR Wetlands	Commonwealth of Australia Department of the Environment	08/10/2014	24/06/2011	As required	0	0	0
ATLAS of NSW Wildlife	NSW Office of Environment and Heritage	29/04/2017	29/04/2017	Daily	-	-	-

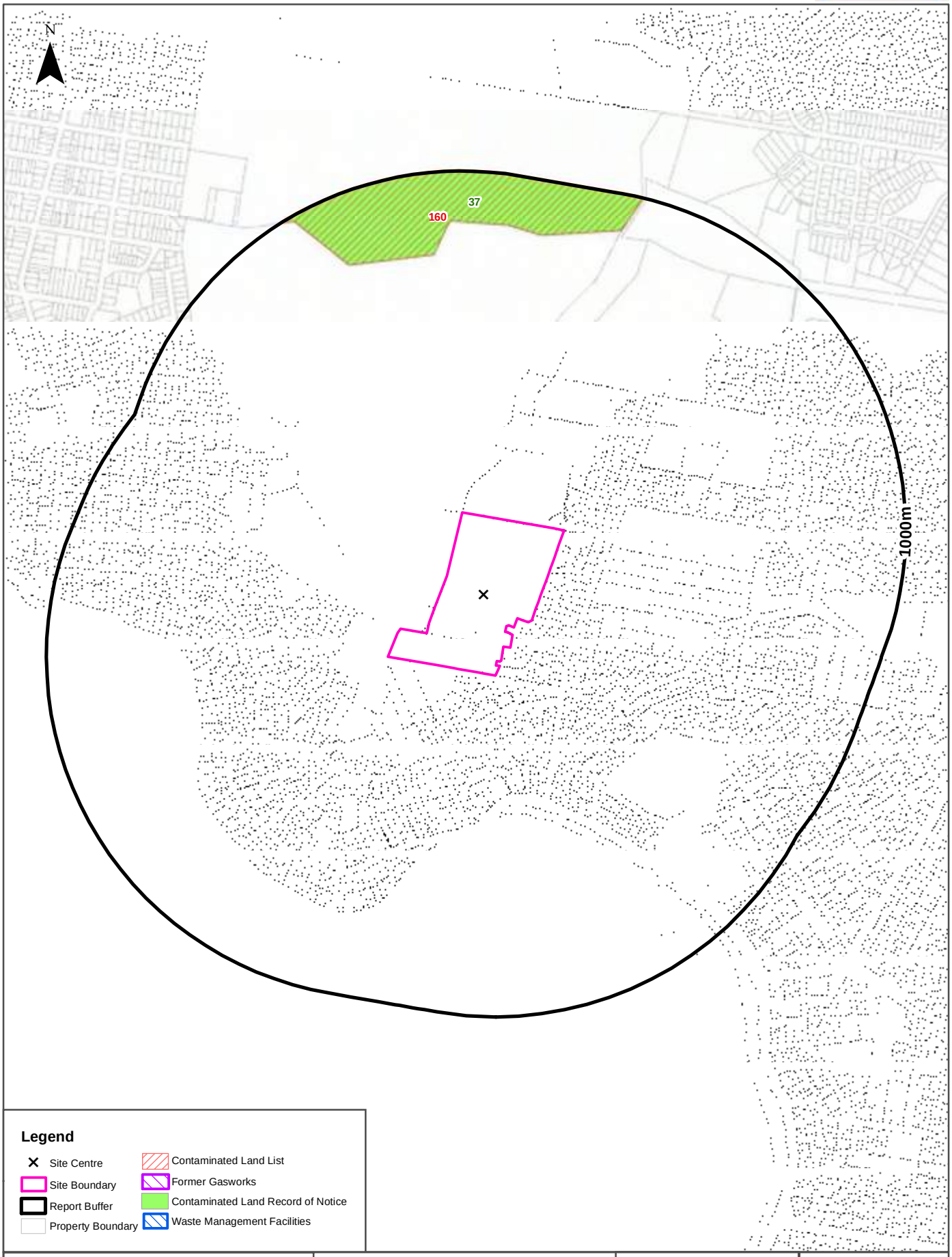
Aerial Imagery 2017

19 Daydawn Avenue, Warners Bay, NSW 2282



Contaminated Land & Waste Management Facilities

19 Daydawn Avenue, Warners Bay, NSW 2282



Data Sources: Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2017

Coordinate System: GDA 1994 MGA Zone 56

Date: 29April 2017

Contaminated Land & Waste Management Facilities

19 Daydawn Avenue, Warners Bay, NSW 2282

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the report buffer:

Map Id	Site	Address	Suburb	Activity	EPA site management class	Status	Dist	Direction	LC
160	Pasminco Cockle Creek Smelter	Lake Road	Boolaroo	Metal Industry	Contamination currently regulated under CLM Act	Current EPA List	760m	North	1

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

Contaminated Land & Waste Management Facilities

19 Daydawn Avenue, Warners Bay, NSW 2282

Contaminated Land: Records of Notice

Record of Notices within the report buffer:

Map Id	Area No	Name	Address	Suburb	Notices	Distance	Direction	LC
37	3353	Pasminco Cockle Creek Smelter	Lake Road	Boolaroo	4 current and 3 former	760m	North	1

Former Gasworks

Former Gasworks within the report buffer:

Map Id	Location	Council	Further Info	Distance	Direction	LC
N/A	No records in buffer					

National Waste Management Site Database

Sites on the National Waste Management Site Database within the report buffer:

Site Id	Owner	Name	Address	Suburb	Postcode	Landfill	Reprocess	Transfer	Distance	Direction	LC
N/A	No records in buffer										

EPA PFAS Investigation Program

19 Daydawn Avenue, Warners Bay, NSW 2282

EPA PFAS Investigation Program

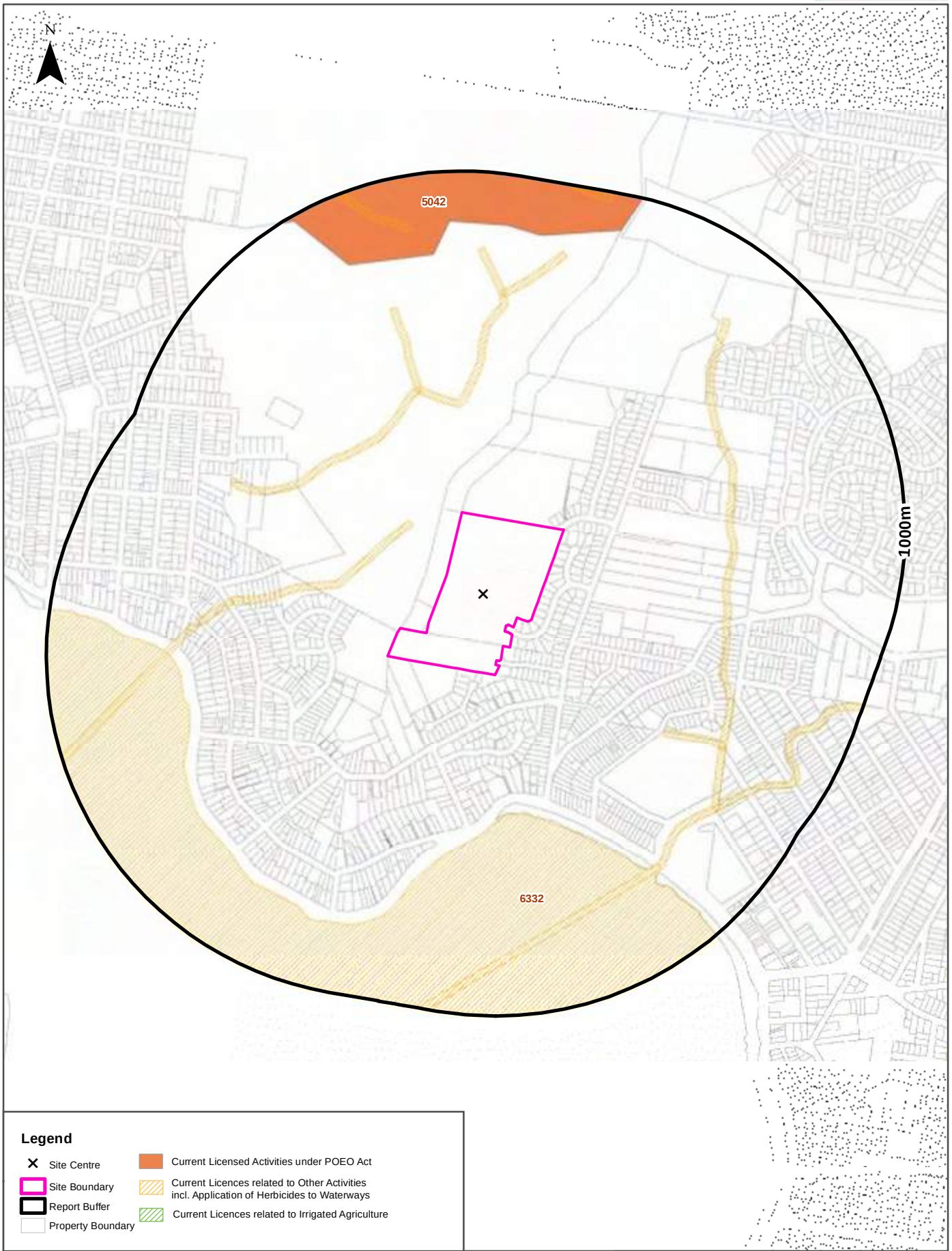
Sites that are part of the EPA PFAS investigation program, within 2km:

Id	Site	Address	Loc Conf	Distance	Direction
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority

Current EPA Licensed Activities

19 Daydawn Avenue, Warners Bay, NSW 2282



EPA Activities

19 Daydawn Avenue, Warners Bay, NSW 2282

Licensed Activities under the POEO Act 1997

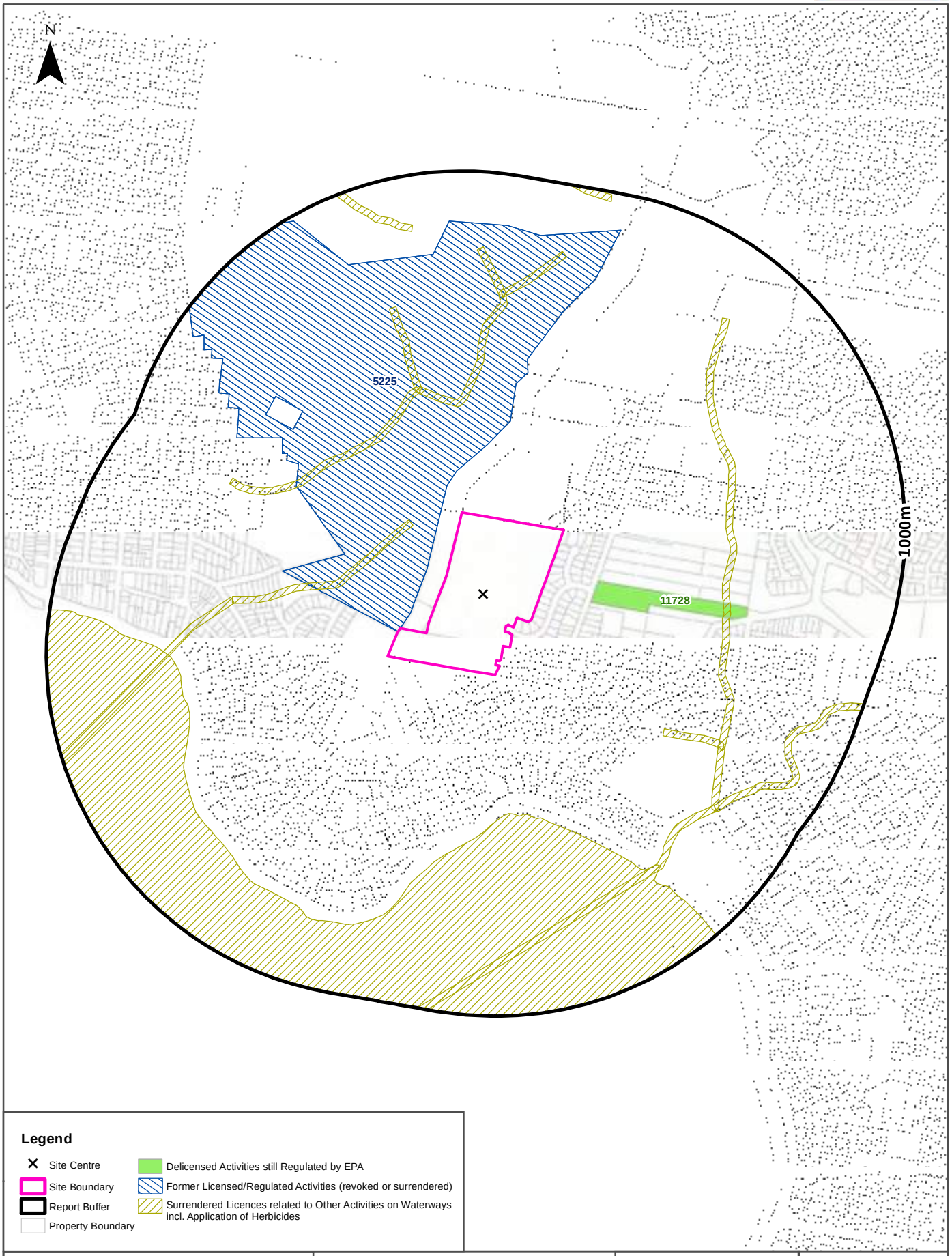
Licensed activities under the Protection of the Environment Operations Act 1997, within the report buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
6332	LAKE MACQUARIE CITY COUNCIL	-	-	SPEERS POINT	Other activities	7	130m	West
5042	PASMINCO COCKLE CREEK SMELTER PTY LIMITED	PASMINCO COCKLE CREEK SMELTER & INCITEC FERTILIZERS	MAIN ROAD	BOOLAROO	Waste disposal by application to land	1	760m	North
5042	PASMINCO COCKLE CREEK SMELTER PTY LIMITED	PASMINCO COCKLE CREEK SMELTER & INCITEC FERTILIZERS	MAIN ROAD	BOOLAROO	Waste storage - hazardous, restricted solid, liquid, clinical and related waste and asbestos waste	1	760m	North

POEO Licence Data Source: Environment Protection Authority

Delicensed & Former Licensed EPA Activities

19 Daydawn Avenue, Warners Bay, NSW 2282



EPA Activities

19 Daydawn Avenue, Warners Bay, NSW 2282

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the report buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
11728	HCOA OPERATIONS (AUSTRALIA) PTY LIMITED	WARNERS BAY PRIVATE HOSPITAL	FAIRFAX ROAD	WARNERS BAY	Hazardous, Industrial or Group A Waste Generation or Storage	1	144m	East

Delicensed Activities Data Source: Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the report buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
5225	BUTTAI GRAVEL PTY LTD	SPEERS POINT QUARRY, HOPKINS STREET, SPEERS POINT	Surrendered	15/11/1999	Crushing, grinding or separating	1	0m	North West
5225	BUTTAI GRAVEL PTY LTD	SPEERS POINT QUARRY, HOPKINS STREET, SPEERS POINT	Surrendered	15/11/1999	Land-based extractive activity	1	0m	North West
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	7	130m	-
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	7	130m	-
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	7	130m	-

Former Licensed Activities Data Source: Environment Protection Authority

UPSS Sensitive Zones

19 Daydawn Avenue, Warners Bay, NSW 2282

Aerial Imagery 2014

19 Daydawn Avenue, Warners Bay, NSW 2282

Scale: 0 50 100 200 Meters	Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 April 2017

Aerial Imagery 2010

19 Daydawn Avenue, Warners Bay, NSW 2282

Scale: 0 50 100 200 Meters	Data Sources: Aerial Imagery © 2017 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 April, 2017

Aerial Imagery 2005

19 Daydawn Avenue, Warners Bay, NSW 2282

Scale:
0 50 100 200
Meters

Data Sources: Aerial Imagery © 2017 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 27 April, 2017

Aerial Imagery 1993

19 Daydawn Avenue, Warners Bay, NSW 2282

Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)

Coordinate System: GDA 1994 MGA Zone 56

Date: 27 April, 2017

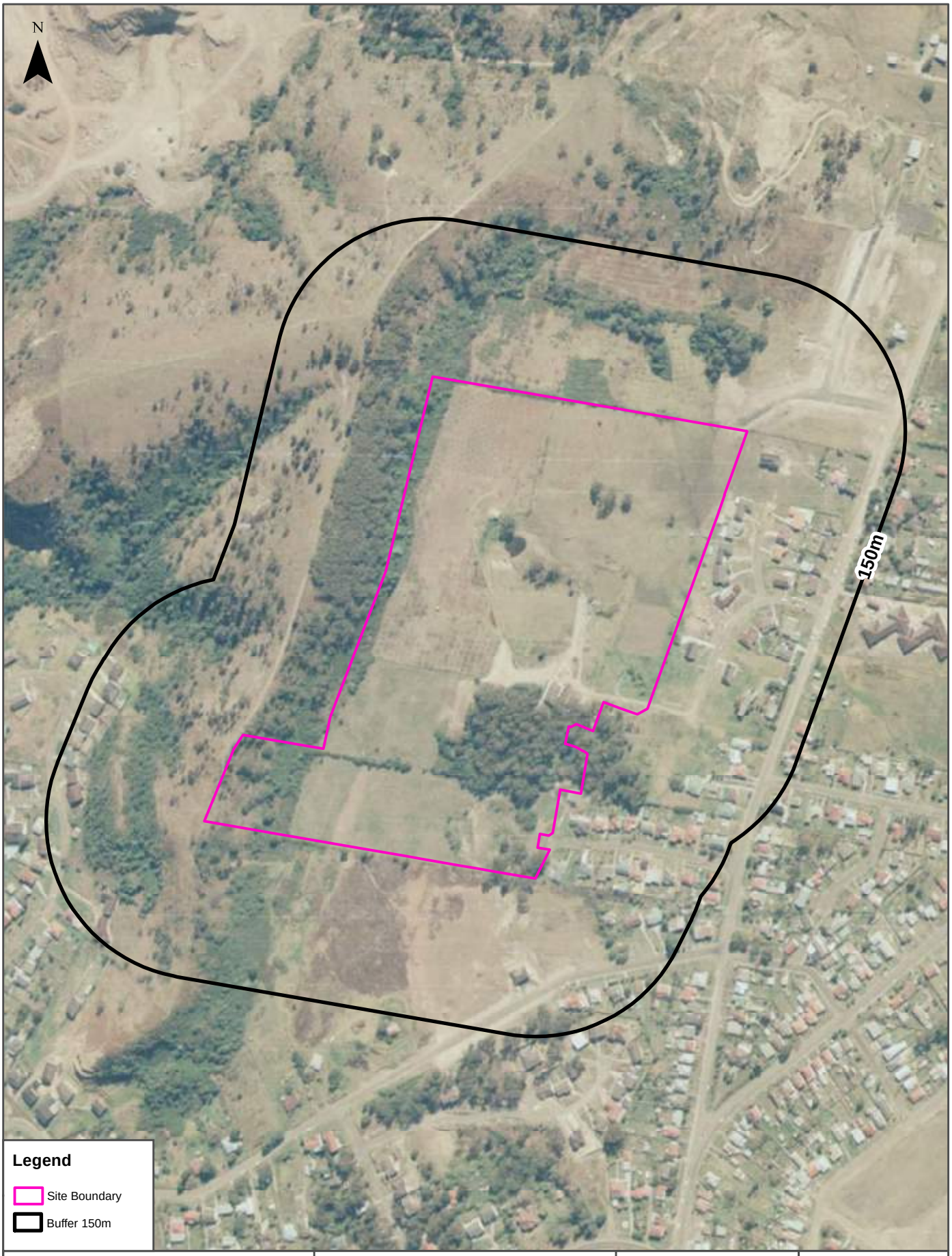
Aerial Imagery 1983

19 Daydawn Avenue, Warners Bay, NSW 2282

Scale: 0 50 100 Meters 200	Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)	Coordinate System: GDA 1994 MGA Zone 56	Date: 27 April, 2017

Aerial Imagery 1976

19 Daydawn Avenue, Warners Bay, NSW 2282



Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)

Coordinate System: GDA 1994 MGA Zone 56

Date: 27 April, 2017

Aerial Imagery 1965

19 Daydawn Avenue, Warners Bay, NSW 2282

Legend

Site Boundary

Buffer 150m

Scale: 0 50 100 200 Meters

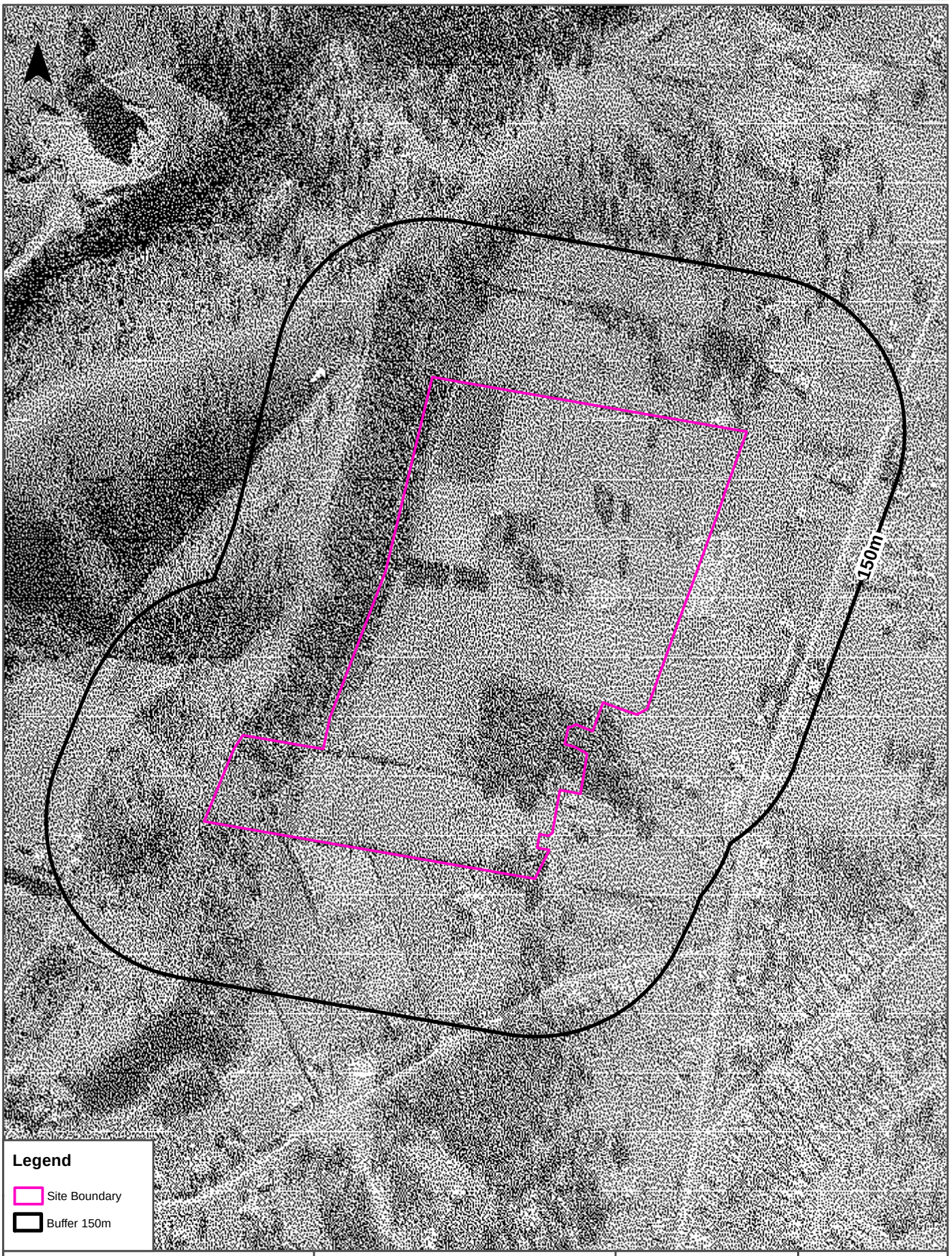
Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)

Coordinate System: GDA 1994 MGA Zone 56

Date: 27 April, 2017

Aerial Imagery 1954

19 Daydawn Avenue, Warners Bay, NSW 2282



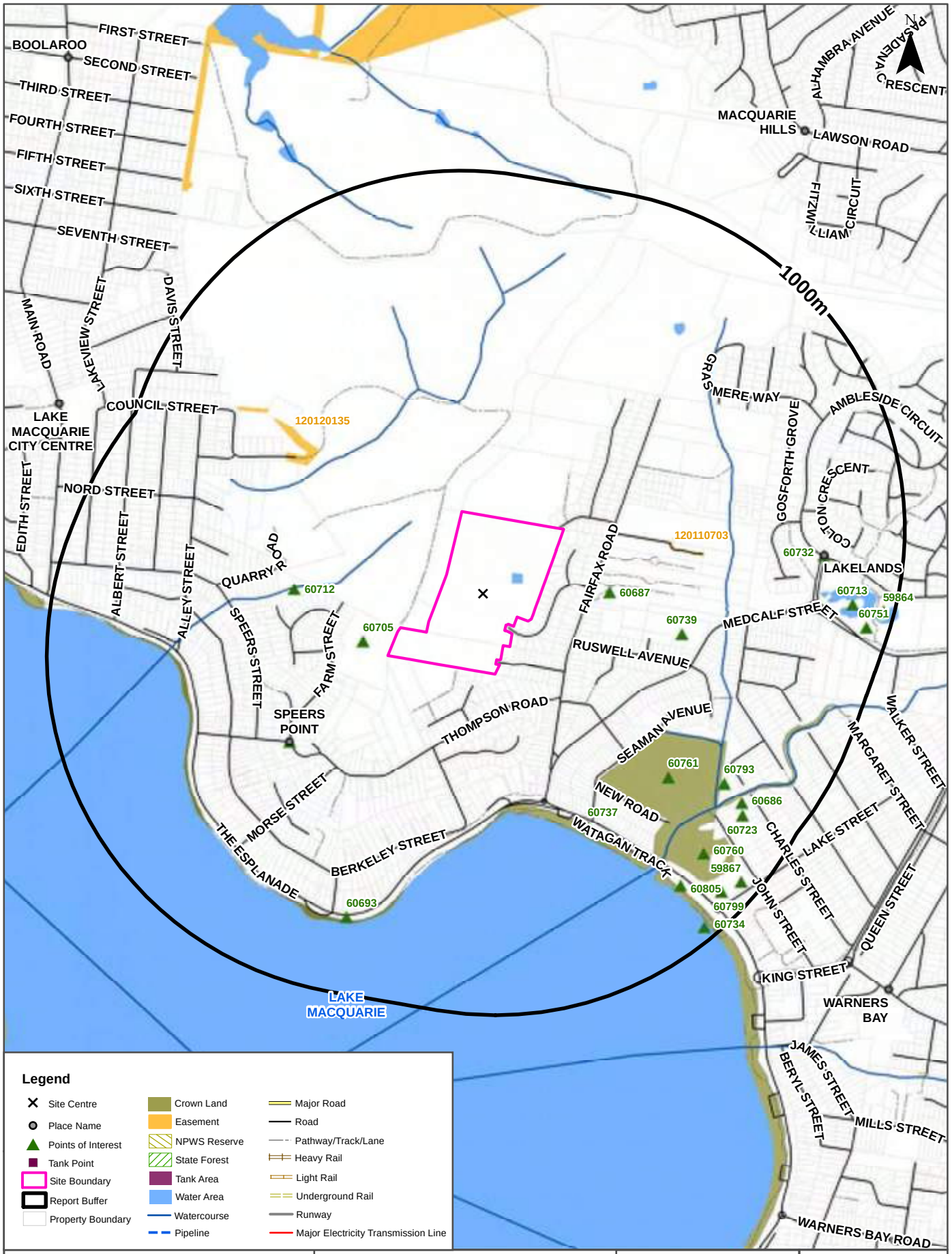
Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)

Coordinate System: GDA 1994 MGA Zone 56

Date: 27 April, 2017

Topographic Features

19 Daydawn Avenue, Warners Bay, NSW 2282



Data Sources: Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2017

Coordinate System: GDA 1994 MGA Zone 56

Date: 29April 2017

Topographic Features

19 Daydawn Avenue, Warners Bay, NSW 2282

Points of Interest

What Points of Interest exist within the report buffer?

Map Id	Feature Type	Label	Distance	Direction
60705	Park	Park	83m	West
60687	General Hospital	WARNERS BAY PRIVATE HOSPITAL	189m	East
60712	Park	Park	328m	West
60729	Suburb	SPEERS POINT	382m	South West
60739	Primary School	BIDDABAH PUBLIC SCHOOL	430m	East
60737	Park	WARNER RESERVE	522m	South East
60761	Sports Field	FEIGHAN PARK	591m	South East
60793	Sports Court	NETBALL COURTS	743m	South East
60732	Suburb	LAKELANDS	767m	East
60693	Headland	SPEERS POINT	776m	South West
60760	Sports Field	WARNER PARK	805m	South East
60686	Club	WARNERS BAY SPORTS CLUB	816m	South East
60805	Picnic Area	Picnic Area	825m	South East
60723	Sports Field	BOWLING GREENS	834m	South East
60713	Park	Park	874m	East
60799	Park	LEO PARK	921m	South East
60751	Sports Court	TENNIS COURTS	932m	East
59867	Community Facility	LAKE MACQUARIE PERFORMING ARTS CENTRE	944m	South East
60734	Wharf	Wharf	962m	South East
59864	Community Facility	LAKELANDS COMMUNITY CENTRE	967m	East

Topographic Features

19 Daydawn Avenue, Warners Bay, NSW 2282

Tanks (Areas)

What are the Tank Areas located within the report buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Tanks (Points)

What are the Tank Points located within the report buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Major Easements

What Major Easements exist within the report buffer?
Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
120110703	Primary	Undefined		318m	East
120120135	Primary	Undefined		454m	North West

Topographic Features

19 Daydawn Avenue, Warners Bay, NSW 2282

State Forest

What State Forest exist within the report buffer?

State Forest Number	State Forest Name	Distance	Direction
N/A	No records in buffer		

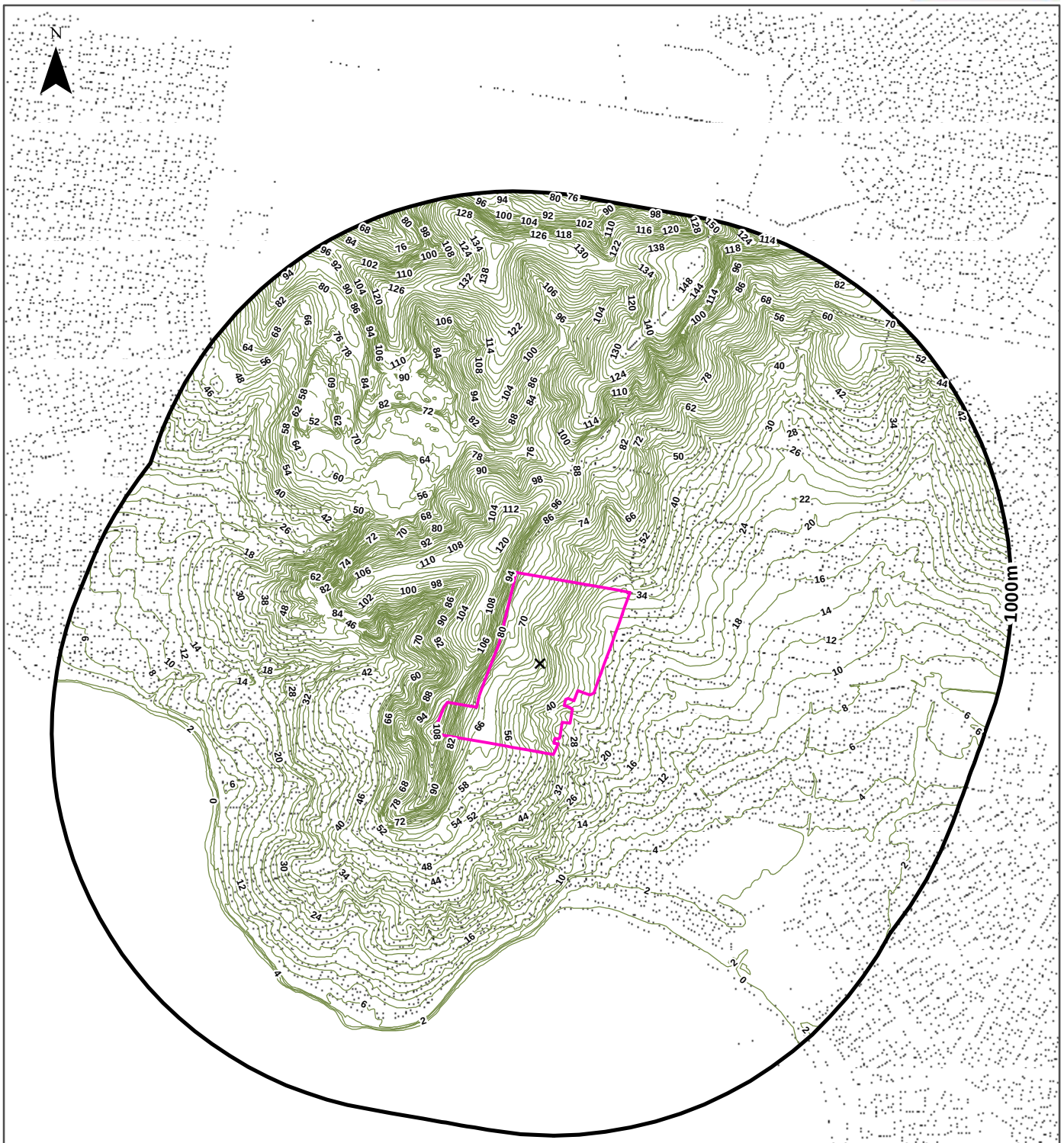
National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the report buffer?

Reserve Number	Reserve Type	Reserve Name	Gazetted Date	Distance	Direction
N/A	No records in buffer				

Elevation Contours (m AHD)

19 Daydawn Avenue, Warners Bay, NSW 2282



Legend

- Site Centre
- Elevation Contour (m AHD)
- Site Boundary
- Report Buffer
- Property Boundary

Accuracy & Currency: This contour data can be up to 0.4 of the contour interval out in height and must therefore not be used for any design or engineering works, but only as a general guide to topography. Gaps may occur along contour lines due to vertical topography, obscured topography in the source photography such as buildings, dense vegetation or dead ground, or the fact that original buildings have been replaced in the intervening thirty years since the original contour capture.

Scale: 0 100 200 400 Meters

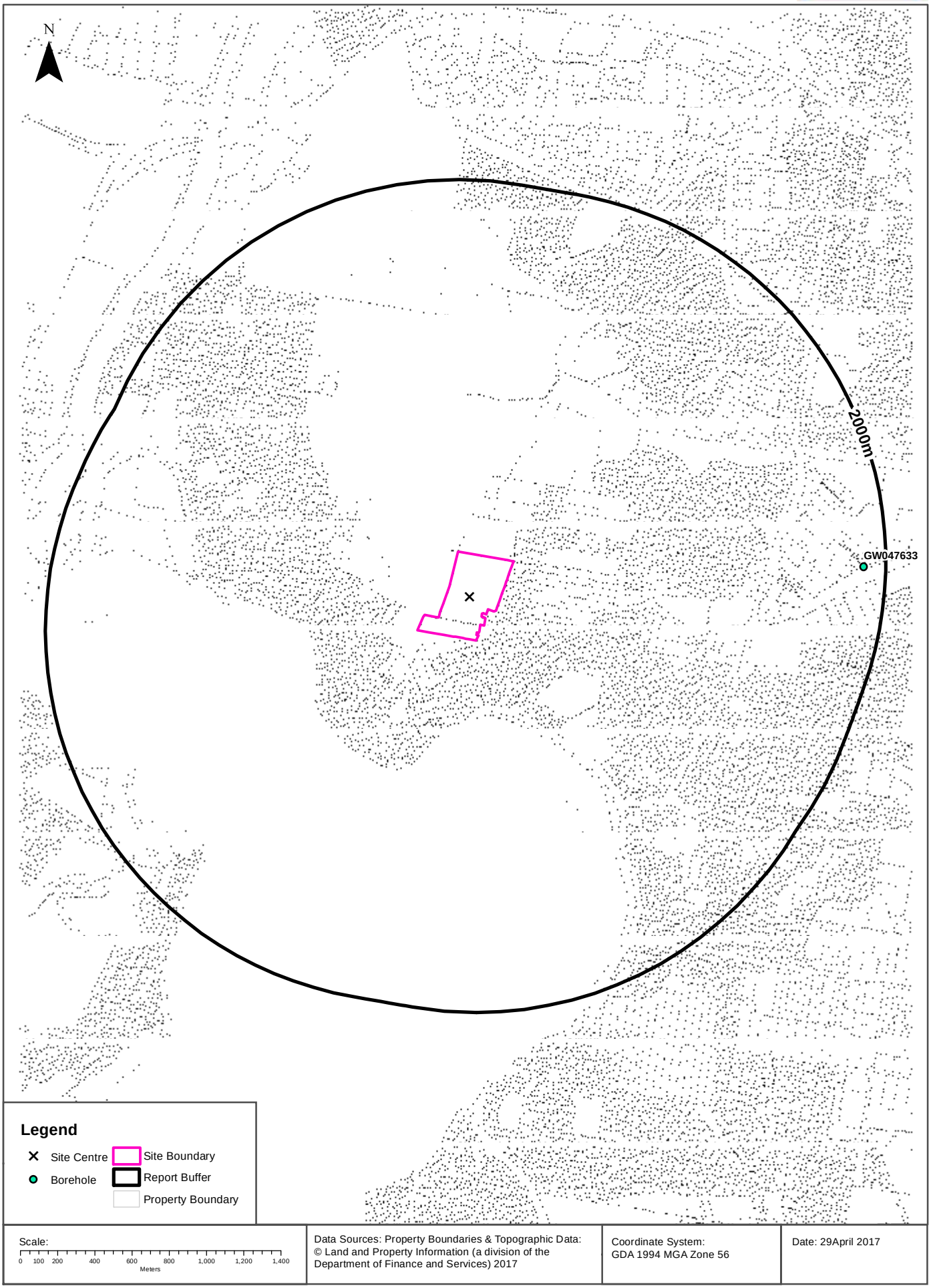
Data Sources: Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2017

Coordinate System: GDA 1994 MGA Zone 56

Date: 29April 2017

Groundwater Boreholes

19 Daydawn Avenue, Warners Bay, NSW 2282



Hydrogeology & Groundwater

19 Daydawn Avenue, Warners Bay, NSW 2282

Hydrogeology

Description of aquifers on-site:

Description
Fractured or fissured, extensive aquifers of low to moderate productivity

Description of aquifers within the report buffer:

Description
Fractured or fissured, extensive aquifers of low to moderate productivity

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)

Groundwater Boreholes

Boreholes within 2km of the site:

GW No.	Licence No	Work Type	Owner Type	Purpose	Contractor	Complete Date	Final Depth	Drilled Depth	Salinity	SWL	Yield	Elev	Dist	Dir
GW047633	20BL015389	Bore	Local Govt	Drainage		01/11/1962	27.70	27.70	1001-3000 ppm				1883m	East

Borehole Data Source : NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation for all bores prefixed with GW. All other bores

Driller's Logs

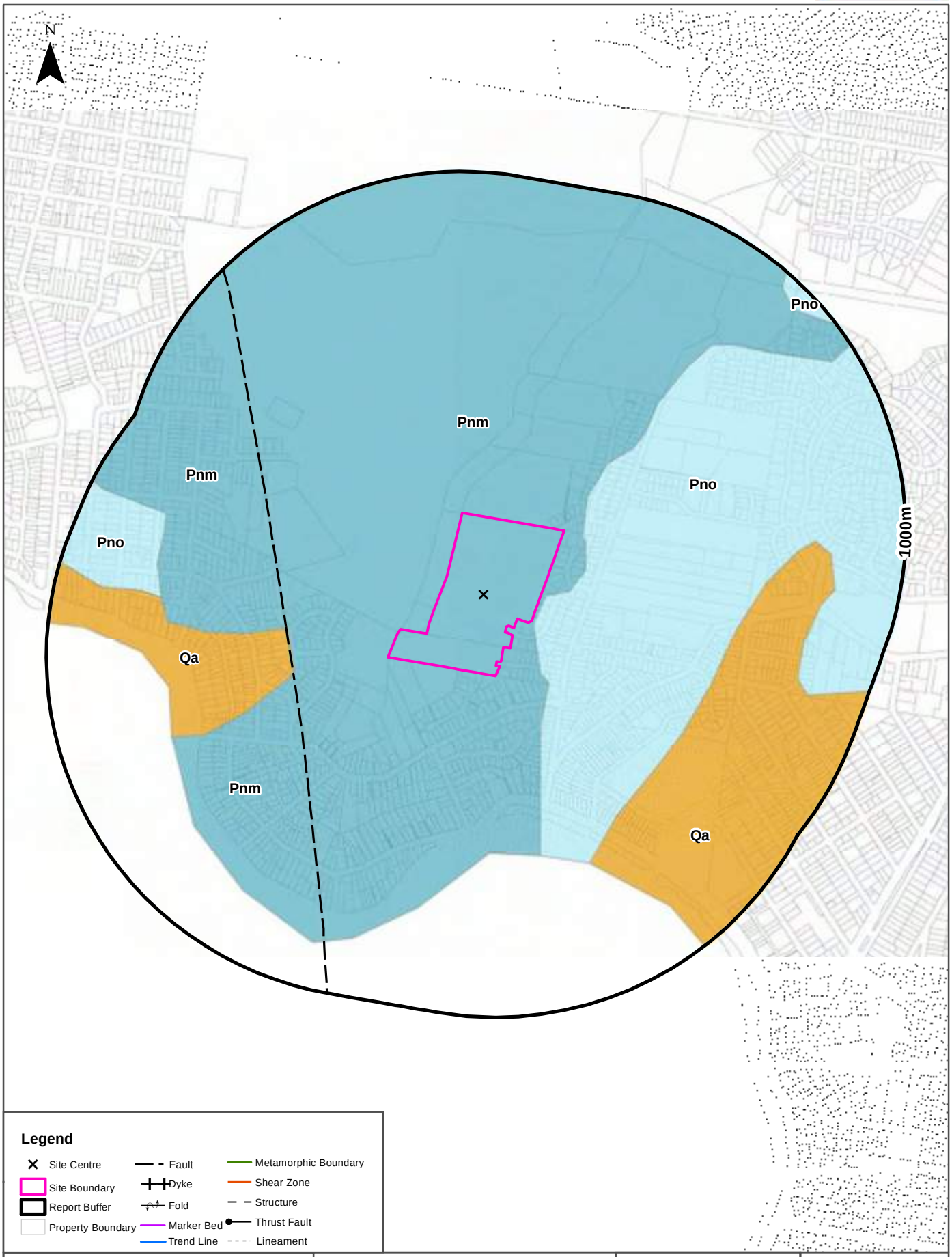
Drill log data relevant to the boreholes within 2km of the site:

Groundwater No	Drillers Log	Distance	Direction
GW047633	0.00m-3.05m Overburden 3.05m-23.16m Shale 3.05m-23.16m Coal Small Seam 23.16m-27.74m Coal	1883m	East

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp

Geology 1:250,000

19 Daydawn Avenue, Warners Bay, NSW 2282



Geology

19 Daydawn Avenue, Warners Bay, NSW 2282

Geological Units

What are the Geological Units onsite?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Pnm	Conglomerate, sandstone, siltstone, tuff, coal	Moon Island Beach Subgroup	Newcastle Coal Measures	Moon Island Beach Subgroup	Palaeozoic			1:250,000

What are the Geological Units within the report buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Pnm	Conglomerate, sandstone, siltstone, tuff, coal	Moon Island Beach Subgroup	Newcastle Coal Measures	Moon Island Beach Subgroup	Palaeozoic			1:250,000
Pno	Sandstone, conglomerate, siltstone, coal, tuff	Boolaroo Subgroup	Newcastle Coal Measures	Boolaroo Subgroup	Palaeozoic			1:250,000
Qa	Undifferentiated alluvial deposits; sand, silt, clay and gravel; some residual and colluvial deposits. Includes some channel, levee, lacustrine, floodplain and swamp deposits. May include some higher level Tertiary terraces	undifferentiated			Cainozoic			1:250,000

Geological Structures

What are the Geological Structures onsite?

Feature	Name	Description	Map Sheet	Dataset
No features				1:250,000

What are the Geological Structures within the report buffer?

Feature	Name	Description	Map Sheet	Dataset
Fault		Fault, Accurate	Bohena	1:250,000
Fault		Fault, Accurate	Bohena	1:250,000
Fault		Fault, Accurate	Bohena	1:250,000
Fault		Fault, Concealed	Bohena	1:250,000

Geological Data Source : NSW Department of Industry, Resources & Energy

Naturally Occurring Asbestos Potential

19 Daydawn Avenue, Warners Bay, NSW 2282

Naturally Occurring Asbestos Potential

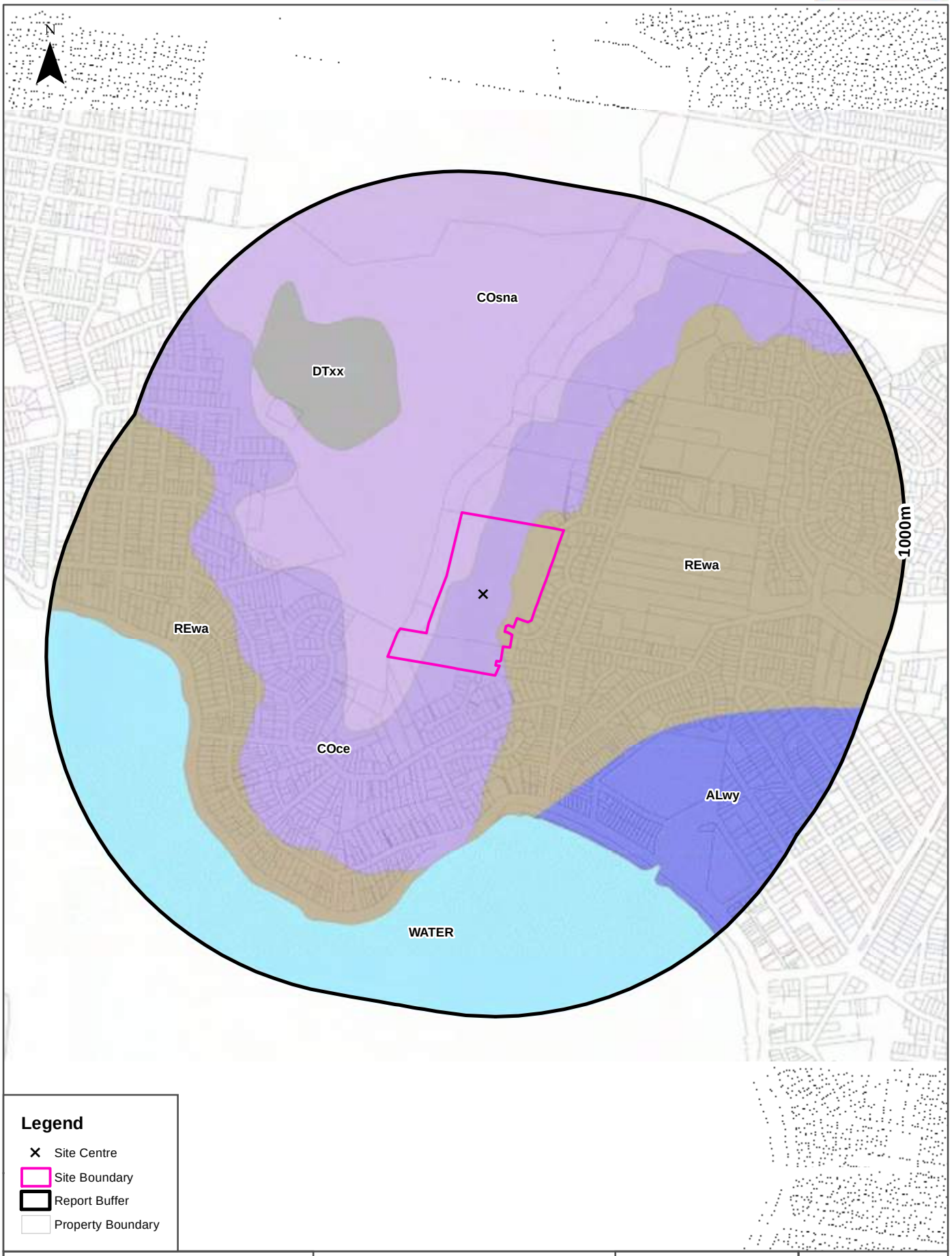
Naturally Occurring Asbestos Potential within the report buffer?

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Mining Subsidence District Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy

Soil Landscapes

19 Daydawn Avenue, Warners Bay, NSW 2282



Soils

19 Daydawn Avenue, Warners Bay, NSW 2282

Soil Landscapes

What are the onsite Soil Landscapes?

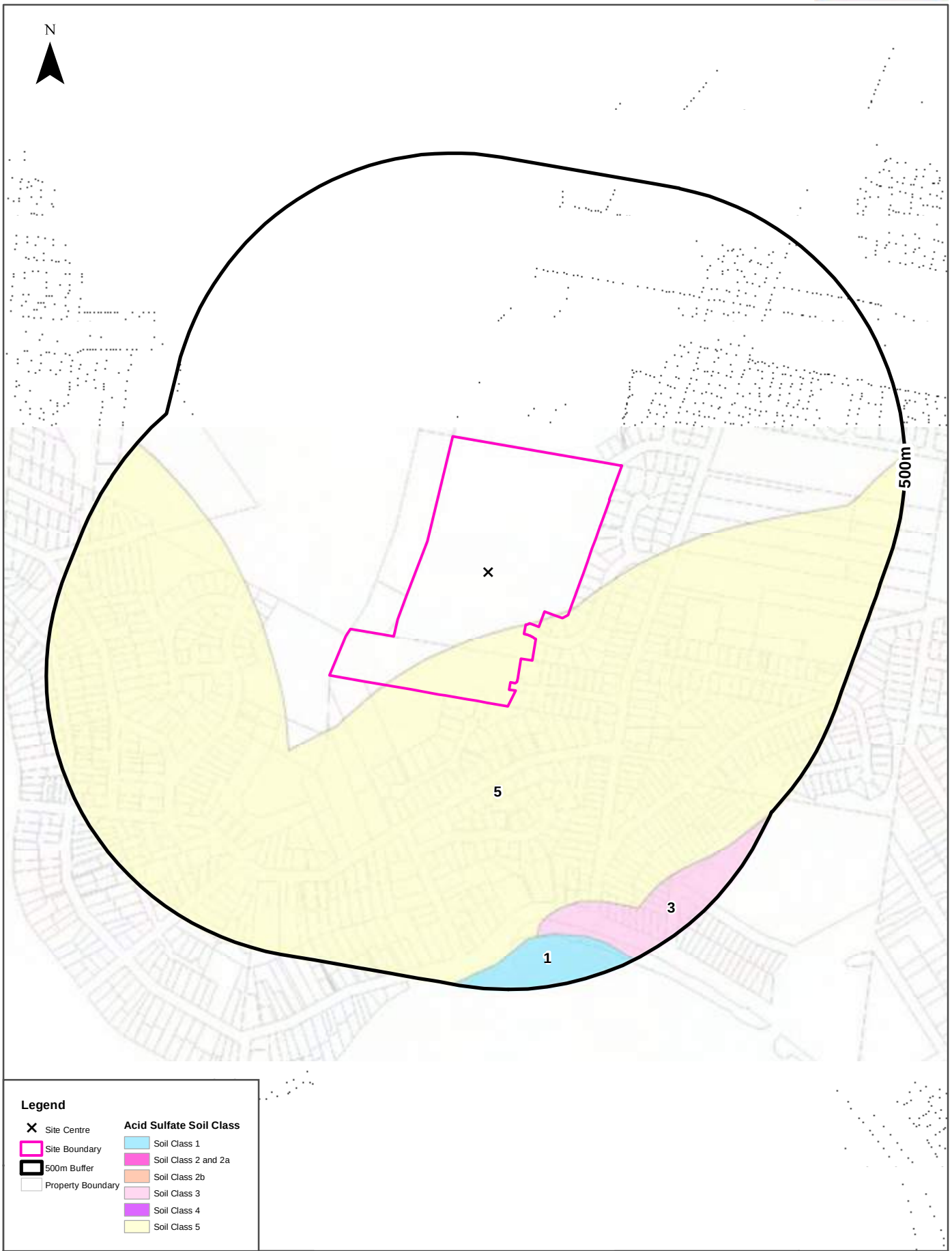
Soil Code	Name	Group	Process	Map Sheet	Scale
COce	CEDAR HILL		COLLUVIAL	Newcastle	1:100,000
COsna	STOCKRINGTON variant a		COLLUVIAL	Newcastle	1:100,000
REwa	WARNERS BAY		RESIDUAL	Newcastle	1:100,000

What are the Soil Landscapes within the report buffer?

Soil Code	Name	Group	Process	Map Sheet	Scale
ALwy	WYONG		ALLUVIAL	Newcastle	1:100,000
COce	CEDAR HILL		COLLUVIAL	Newcastle	1:100,000
COsna	STOCKRINGTON variant a		COLLUVIAL	Newcastle	1:100,000
DTxx	DISTURBED TERRAIN		DISTURBED TERRAIN	Newcastle	1:100,000
REwa	WARNERS BAY		RESIDUAL	Newcastle	1:100,000
WATER	WATER		WATER	Newcastle	1:100,000

Acid Sulfate Soils

19 Daydawn Avenue, Warners Bay, NSW 2282



Data Sources: Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2017

Coordinate System: GDA 1994 MGA Zone 56

Date: 29April 2017

Standard Local Environmental Plan Acid Sulfate Soils

19 Daydawn Avenue, Warners Bay, NSW 2282

Standard Local Environmental Plan Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

Soil Class	Description	LEP
5	Works within 500 metres of adjacent Class 1, 2, 3, or 4 land that is below 5 metres AHD and by which the watertable is likely to be lowered below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land, present an environmental risk	Lake Macquarie Local Environmental Plan 2014

If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	LEP	Distance	Direction
3	Works more than 1 metre below natural ground surface present an environmental risk; Works by which the watertable is likely to be lowered more than 1 metre below natural ground surface, present an environmental risk	Lake Macquarie Local Environmental Plan 2014	366m	South East
1	Any works present an environmental risk	Lake Macquarie Local Environmental Plan 2014	408m	South

Dryland Salinity

19 Daydawn Avenue, Warners Bay, NSW 2282

Dryland Salinity

Is there Dryland Salinity data onsite?

No

Is there Dryland Salinity data within the report buffer?

No

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
N/A	N/A	N/A	N/A	N/A

Dryland Salinity Data Source : National Land and Water Resources Audit
The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information. Any persons using this information do so at their own risk.
In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

Mining Subsidence Districts

19 Daydawn Avenue, Warners Bay, NSW 2282

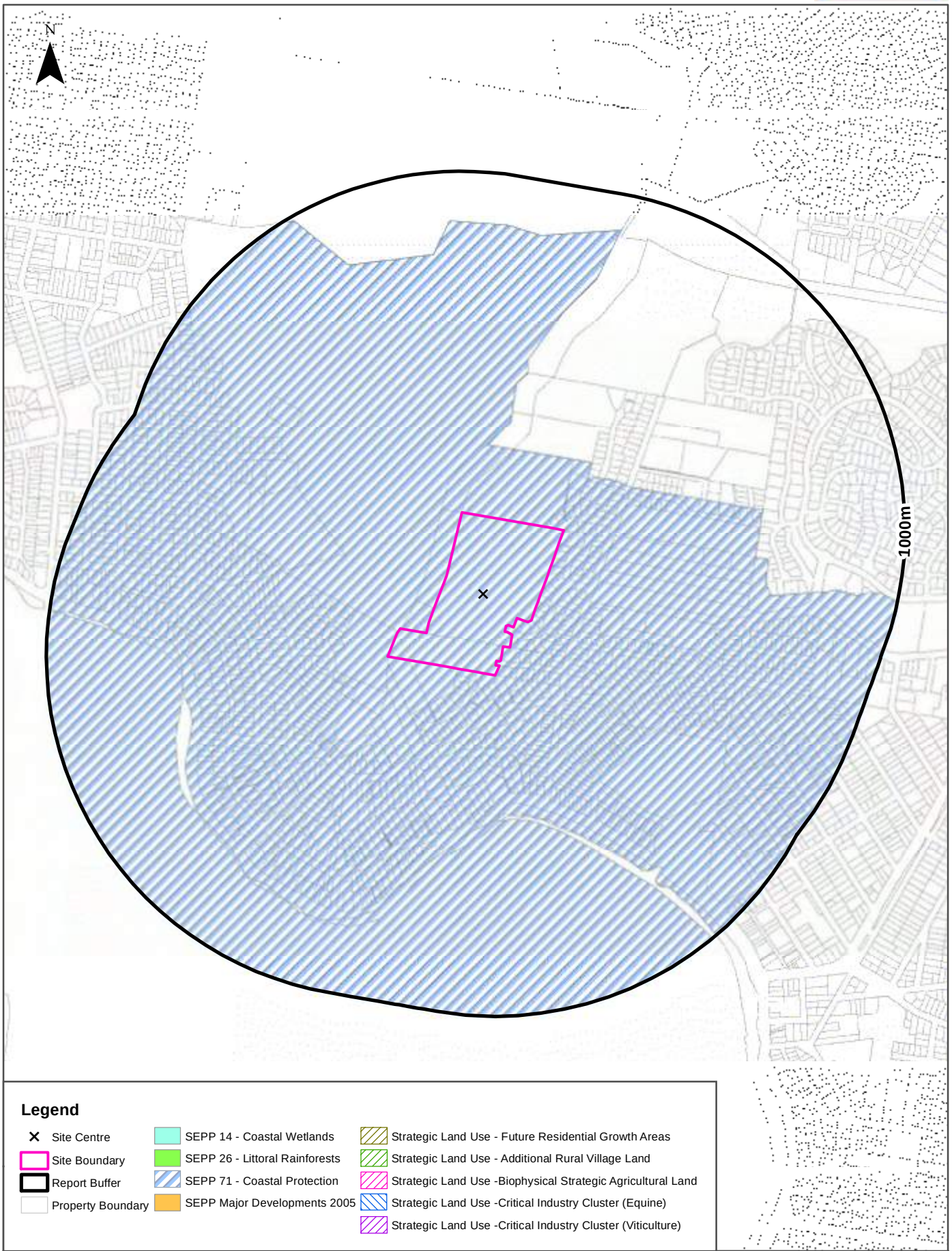
Mining Subsidence Districts

Mining Subsidence Districts within the report buffer?

District	Distance	Direction
LAKE MACQUARIE (Proposed Revoked Area)	0m	Onsite

State Environmental Planning Policy

19 Daydawn Avenue, Warners Bay, NSW 2282



Environmental Zoning

19 Daydawn Avenue, Warners Bay, NSW 2282

State Environmental Planning Policy Protected Areas

Are there any State Environmental Planning Policy Protected Areas onsite or within the report buffer?

Dataset	Onsite	Within Site Buffer	Distance
SEPP14 - Coastal Wetlands	No	No	N/A
SEPP26 - Littoral Rainforests	No	No	N/A
SEPP71 - Coastal Protection Zone	Yes - SEPP71 covers 100% of the site	Yes	0m

SEPP Protected Areas Data Source: NSW Department of Planning & Environment

State Environmental Planning Policy Major Developments (2005)

State Environmental Planning Policy Major Developments within the report buffer?

Map Id	Feature	Effective Date	Distance	Direction
N/A	No records within buffer			

SEPP Major Development Data Source: NSW Department of Planning & Environment

State Environmental Planning Policy Strategic Land Use Areas

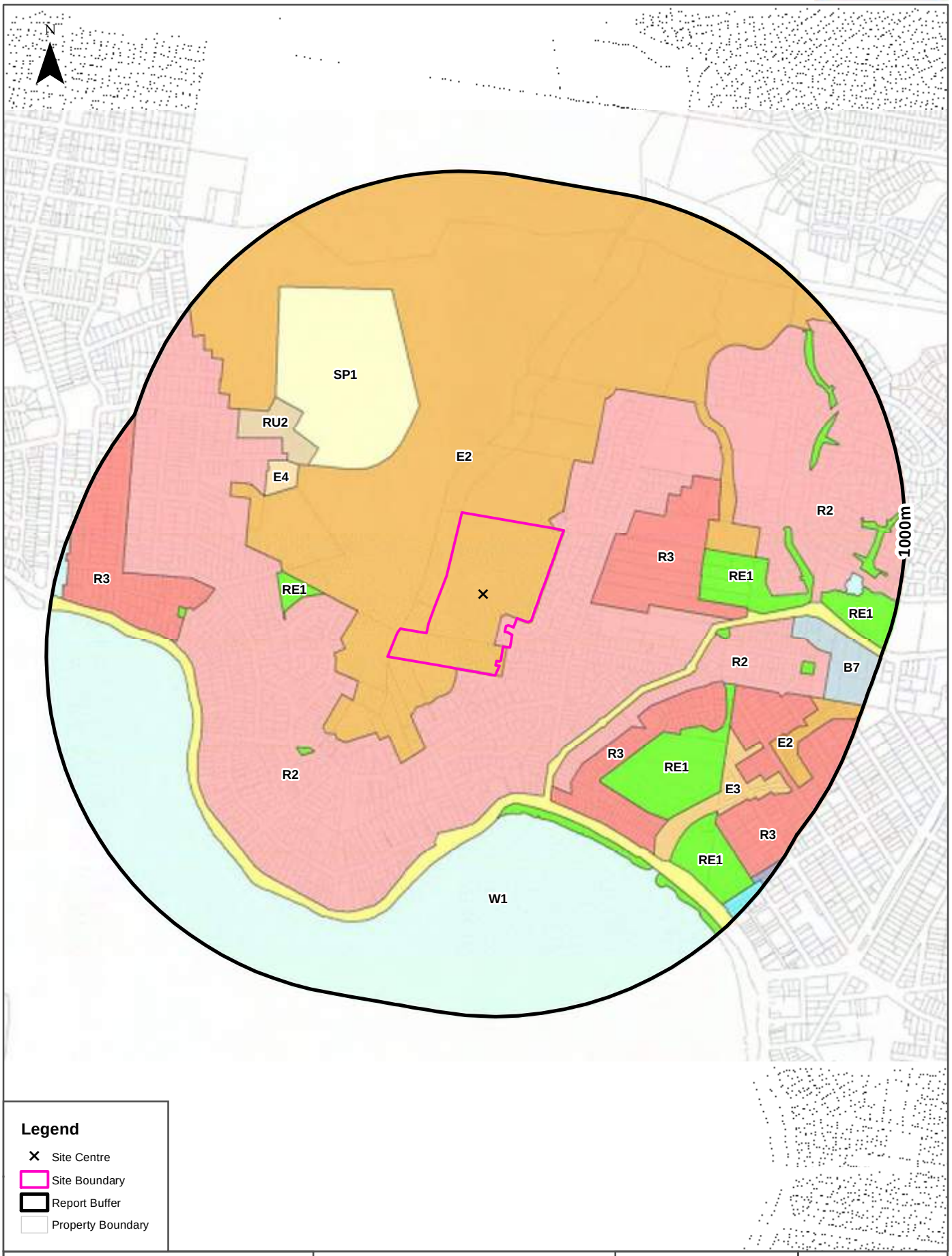
State Environmental Planning Policy Strategic Land Use Areas onsite or within the report buffer?

Strategic Land Use	SEPPNo	Effective Date	Amendment	Amendment Year	Distance	Direction
No records within buffer						

SEPP Strategic Land Use Data Source: NSW Department of Planning & Environment

LEP Planning Zones

19 Daydawn Avenue, Warners Bay, NSW 2282



Data Sources: Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2017
Planning: NSW Crown Copyright - Planning & Environment

Coordinate System: GDA 1994 MGA Zone 56

Date: 29April 2017

Local Environmental Plan

19 Daydawn Avenue, Warners Bay, NSW 2282

Land Zoning

What Local Environmental Plan Land Zones exist within the report buffer?

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
E2	Environmental Conservation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		0m	Onsite
R2	Low Density Residential		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		0m	Onsite
R3	Medium Density Residential		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		145m	East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		243m	West
SP1	Special Activities	Special Activities	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		266m	North West
SP2	Infrastructure	Infrastructure	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		290m	South
R2	Low Density Residential		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		310m	East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		351m	South West
R3	Medium Density Residential		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		363m	South East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		380m	South
W1	Natural Waterways		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		408m	South
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		415m	East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		432m	South East
RU2	Rural Landscape		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		461m	North West
E4	Environmental Living		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		489m	North West
R2	Low Density Residential		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		492m	East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		516m	East
R3	Medium Density Residential		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		545m	West
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		607m	West
R3	Medium Density Residential		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		626m	South East
E3	Environmental Management		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		657m	South East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		718m	South East
B7	Business Park		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		720m	East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		742m	North East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		753m	South East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		776m	East
E2	Environmental Conservation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		783m	South East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		787m	East
B1	Neighbourhood Centre		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		838m	East
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		850m	East

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RE1	Public Recreation		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		856m	North East
B2	Local Centre		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017	Amendment No 6	944m	South East
B4	Mixed Use		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017	Amendment No 6	954m	South East
B1	Neighbourhood Centre		Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		965m	West

Local Environmental Plan

19 Daydawn Avenue, Warners Bay, NSW 2282

Minimum Subdivision Lot Size

What are the onsite Local Environmental Plan Minimum Subdivision Lot Sizes?

Symbol	Minimum Lot Size	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
AB2	40 ha	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		97.05
G	450 m²	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	24/03/2017		2.95

Maximum Height of Building

What are the onsite Local Environmental Plan Maximum Height of Buildings?

Symbol	Maximum Height of Building	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
4	5.50 m	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	27/01/2017		97
9	8.50 m	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	27/01/2017		3

Floor Space Ratio

What are the onsite Local Environmental Plan Floor Space Ratios?

Symbol	Floor Space Ratio	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
No Data							

Land Application

What are the onsite Local Environmental Plan Land Applications?

Application Type	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
Included	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	31/07/2015		100

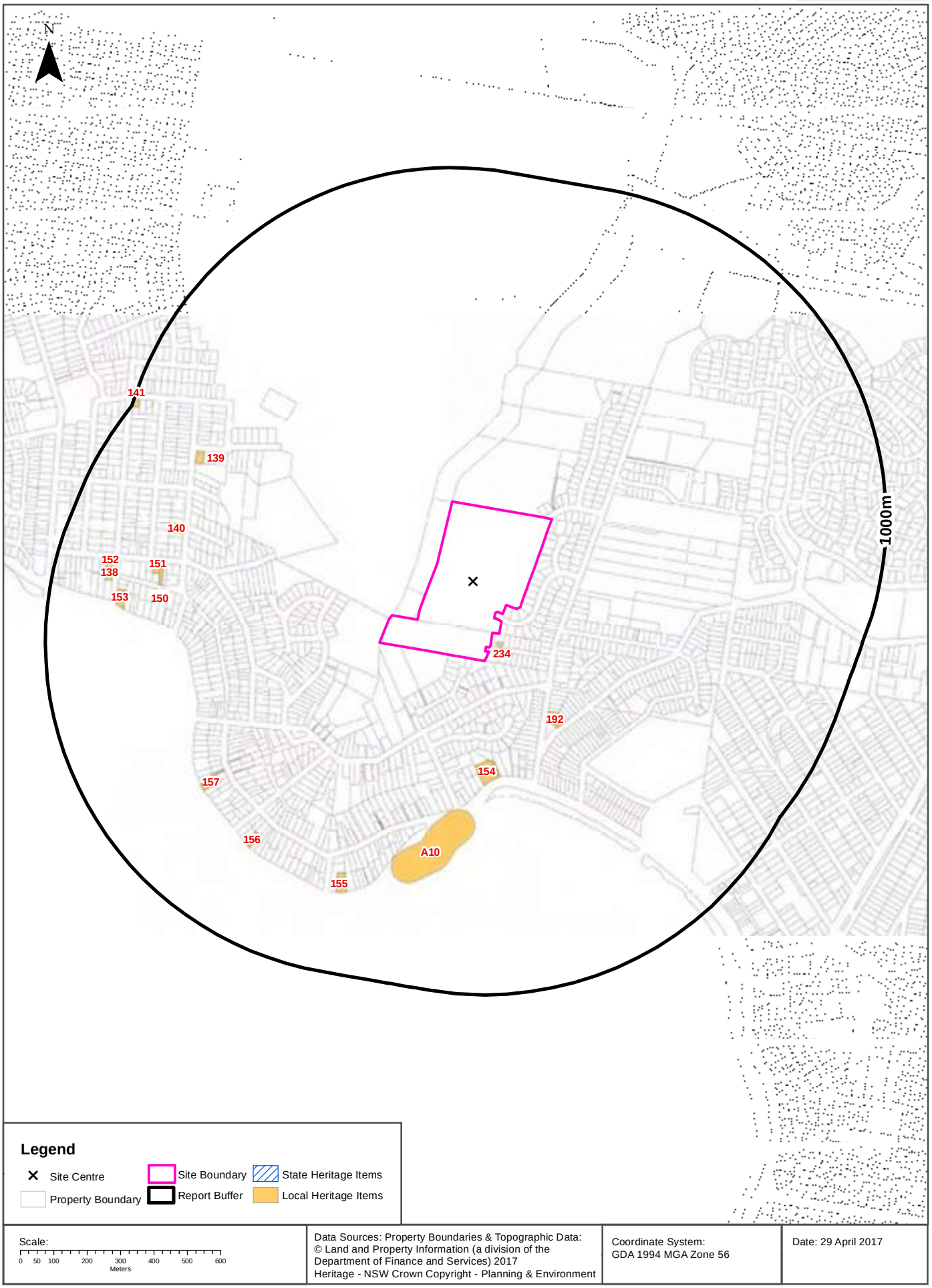
Land Reservation Acquisition

What are the onsite Local Environmental Plan Land Reservation Acquisitions?

Reservation	LEP	Published Date	Commenced Date	Currency Date	Amendment	Comments	Percentage of Site Area
No Data							

Heritage Items

19 Daydawn Avenue, Warners Bay, NSW 2282



Heritage

19 Daydawn Avenue, Warners Bay, NSW 2282

State Heritage Items

What are the State Heritage Items located within the report buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
N/A	No records in buffer							

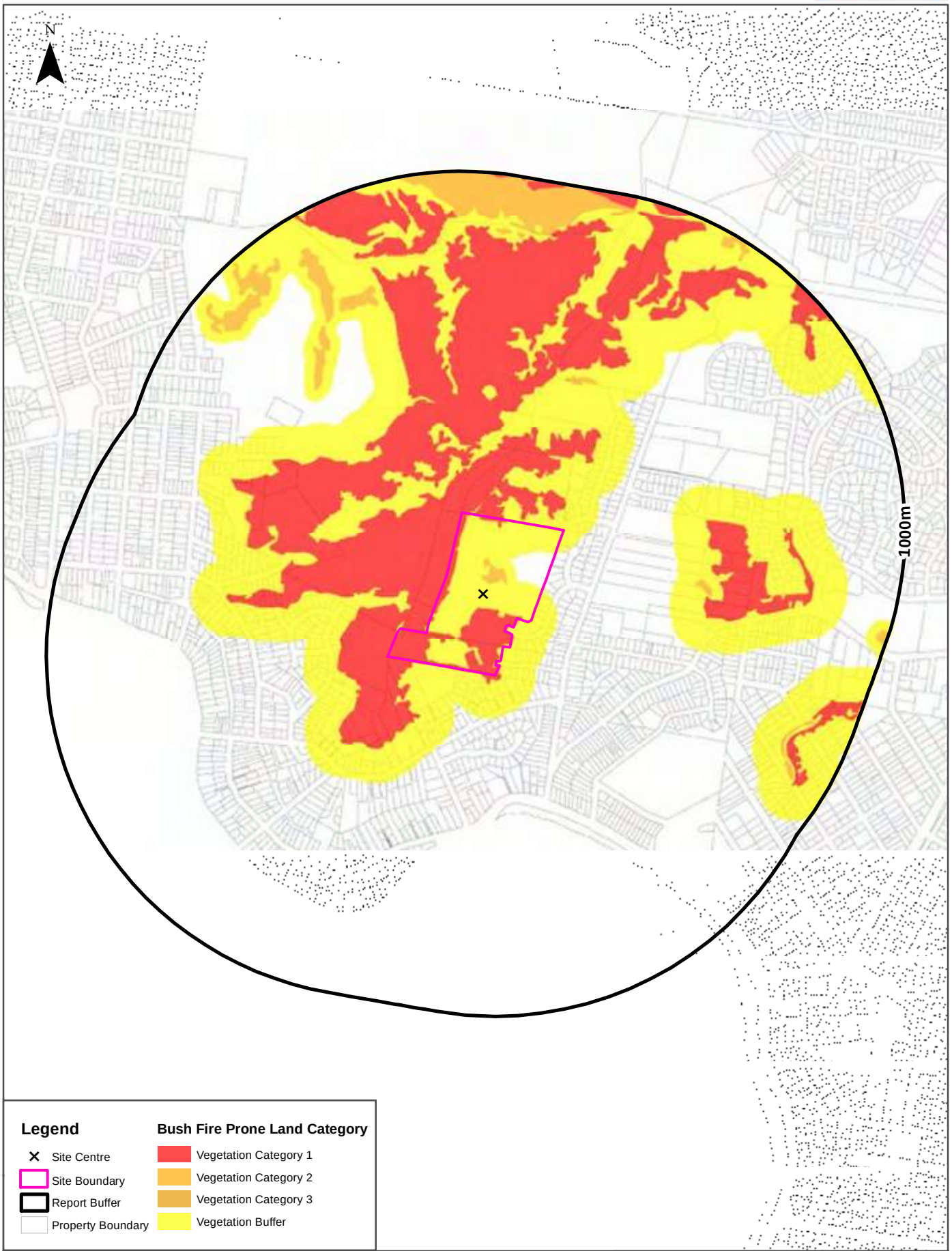
Local Heritage Items

What are the Local Heritage Items located within the report buffer?

Map Id	Name	Classification	Significance	LEP or Act	Published Date	Commenced Date	Currency Date	Distance	Direction
234	Cottage	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	13m	South East
192	House "Ali's Palace"	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	243m	South East
154	House "The Knoll"	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	297m	South
A10	Nature Reserve and being permian fossil insect horizon	Item - Archaeological	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	450m	South
157	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	602m	South West
140	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	669m	West
150	Cottage	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	674m	West
156	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	677m	South West
151	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	691m	West
155	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	695m	South West
139	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	725m	North West
153	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	773m	West
138	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	824m	West
152	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	829m	West
141	House	Item - General	Local	Lake Macquarie Local Environmental Plan 2014	12/09/2014	10/10/2014	18/11/2016	979m	North West

Natural Hazards - Bush Fire Prone Land

19 Daydawn Avenue, Warners Bay, NSW 2282



Data Sources: Bush Fire Prone Land: © NSW Rural Fire Service 2017. Property Boundaries: © Land and Property Information (a division of the Department of Finance and Services) 2017

Coordinate System: GDA 1994 MGA Zone 56

Date: 29 April 2017

Natural Hazards

19 Daydawn Avenue, Warners Bay, NSW 2282

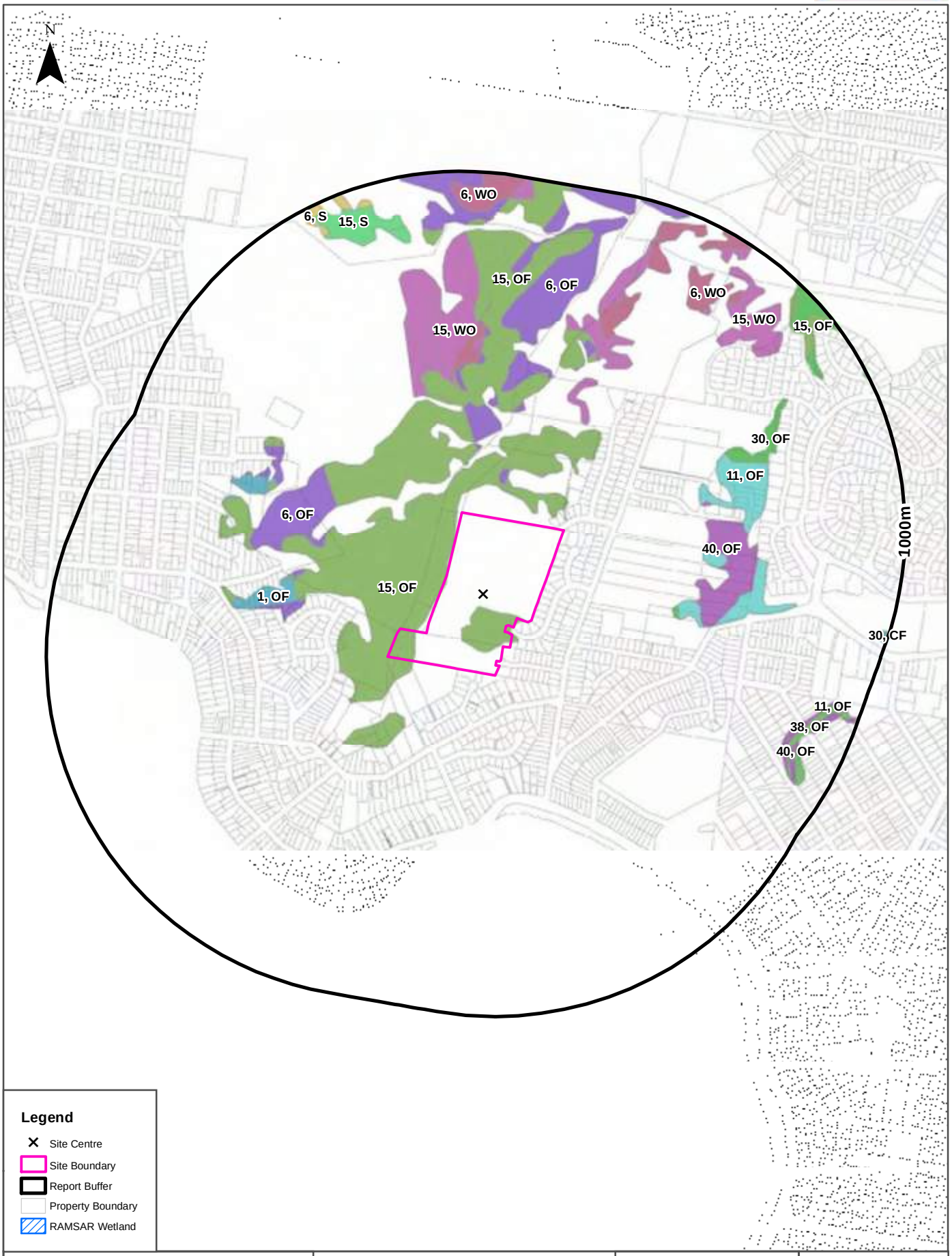
Bush Fire Prone Land

What are the nearest Bush Fire Prone Land Categories that exist within the report buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	0m	Onsite
Vegetation Category 1	0m	Onsite
Vegetation Category 2	0m	Onsite

Ecological Constraints - Vegetation & RAMSAR Wetlands

19 Daydawn Avenue, Warners Bay, NSW 2282



Ecological Constraints

19 Daydawn Avenue, Warners Bay, NSW 2282

Lower Hunter and Central Coast Regional Vegetation Survey

What vegetation from the Lower Hunter and Central Coast Regional Survey exists within the report buffer?

Map id	Unit Desc	Canopy Code	Canopy Cover	Species	Distance	Direction
15	Coastal Foothills Spotted Gum - Ironbark Forest	OF	Mid Dense (Open Forest) 50-<100% cover	C. maculata / E. umbra / E. siderophloia	0m	Onsite
6	Coastal Narrabeen Moist Forest	OF	Mid Dense (Open Forest) 50-<100% cover	S. glomulifera / E. saligna / E. acmenoides	84m	North
1	Coastal Wet Gully Forest	OF	Mid Dense (Open Forest) 50-<100% cover	S. glomulifera / E. saligna / Acmena smithii / Guioa semiglauca	218m	West
15	Coastal Foothills Spotted Gum - Ironbark Forest	WO	Sparse (Woodland) 20-<50% cover	C. maculata / E. umbra / E. siderophloia	316m	North East
30	Coastal Plains Smooth-barked Apple Woodland	OF	Mid Dense (Open Forest) 50-<100% cover	A. costata / C. gummifera / E. capitellata / E. umbra	373m	East
11	Coastal Sheltered Apple - Peppermint Forest	OF	Mid Dense (Open Forest) 50-<100% cover	A. costata / E. piperita	385m	East
40	Swamp Oak Rushland Forest	OF	Mid Dense (Open Forest) 50-<100% cover	C. glauca / Melaleuca ericifolia / Baumea juncea	406m	East
6	Coastal Narrabeen Moist Forest	WO	Sparse (Woodland) 20-<50% cover	S. glomulifera / E. saligna / E. acmenoides	412m	North
15	Coastal Foothills Spotted Gum - Ironbark Forest	S	Scrub	C. maculata / E. umbra / E. siderophloia	804m	North
38	Redgum Rough Barked Apple Forest	OF	Mid Dense (Open Forest) 50-<100% cover	E. tereticronis / A. floribunda / E. resinifera subsp resinifera	833m	East
6	Coastal Narrabeen Moist Forest	S	Scrub	S. glomulifera / E. saligna / E. acmenoides	887m	North
11	Coastal Sheltered Apple - Peppermint Forest	CF	Closed Forest 100% cover	A. costata / E. piperita	967m	East
30	Coastal Plains Smooth-barked Apple Woodland	CF	Closed Forest 100% cover	A. costata / C. gummifera / E. capitellata / E. umbra	991m	East

Lower Hunter and Central Coast Regional Vegetation Survey: NSW Office of Environment and Heritage

RAMSAR Wetlands

What RAMSAR Wetland areas exist within the report buffer?

Map Id	RAMSAR Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

RAMSAR Wetlands Data Source: © Commonwealth of Australia - Department of Environment

Ecological Constraints

19 Daydawn Avenue, Warners Bay, NSW 2282

ATLAS of NSW Wildlife

Endangered &Vulnerable Species on the ATLAS of NSW Wildlife database, within 10km of the site?

Class	Family	Scientific	Common	Exotic	NSW Status	Commonwealth Status
Amphibia	Hylidae	Litoria aurea	Green and Golden Bell Frog	No	Endangered, Protected	Vulnerable
Amphibia	Myobatrachidae	Crinia tinnula	Wallum Froglet	No	Vulnerable, Protected	
Amphibia	Myobatrachidae	Pseudophryne australis	Red-crowned Toadlet	No	Vulnerable, Protected	
Aves	Acanthizidae	Chthonicola sagittata	Speckled Warbler	No	Vulnerable, Protected	
Aves	Accipitridae	Circus assimilis	Spotted Harrier	No	Vulnerable, Protected	
Aves	Accipitridae	Haliaeetus leucogaster	White-bellied Sea-Eagle	No	Vulnerable, Protected	CAMBA
Aves	Accipitridae	Hieraaetus morphnoides	Little Eagle	No	Vulnerable, Protected	
Aves	Accipitridae	Lophoictinia isura	Square-tailed Kite	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Accipitridae	Pandion cristatus	Eastern Osprey	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Anatidae	Oxyura australis	Blue-billed Duck	No	Vulnerable, Protected	
Aves	Ardeidae	Ixobrychus flavicollis	Black Bittern	No	Vulnerable, Protected	
Aves	Artamidae	Artamus cyanopterus cyanopterus	Dusky Woodswallow	No	Vulnerable, Protected	
Aves	Cacatuidae	Callocephalon fimbriatum	Gang-gang Cockatoo	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Cacatuidae	Calyptorhynchus lathami	Glossy Black-Cockatoo	No	Vulnerable, Protected, Category 2 Sensitive Species	
Aves	Charadriidae	Charadrius mongolus	Lesser Sand-plover	No	Vulnerable, Protected	E,C,J,K
Aves	Ciconiidae	Ephippiorhynchus asiaticus	Black-necked Stork	No	Endangered, Protected	
Aves	Climacteridae	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	No	Vulnerable, Protected	
Aves	Columbidae	Ptilinopus magnificus	Wompoo Fruit-Dove	No	Vulnerable, Protected	
Aves	Columbidae	Ptilinopus regina	Rose-crowned Fruit-Dove	No	Vulnerable, Protected	
Aves	Columbidae	Ptilinopus superbus	Superb Fruit-Dove	No	Vulnerable, Protected	
Aves	Diomedeidae	Diomedea exulans	Wandering Albatross	No	Endangered, Protected	E,J
Aves	Diomedeidae	Thalassarche melanophris	Black-browed Albatross	No	Vulnerable, Protected	Vulnerable
Aves	Haematopodidae	Haematopus longirostris	Pied Oystercatcher	No	Endangered, Protected	
Aves	Jacanidae	Irediparra gallinacea	Comb-crested Jacana	No	Vulnerable, Protected	
Aves	Laridae	Onychoprion fuscata	Sooty Tern	No	Vulnerable, Protected	
Aves	Meliphagidae	Anthochaera phrygia	Regent Honeyeater	No	Critically Endangered Species, Protected	Critically Endangered
Aves	Meliphagidae	Epthianura albifrons	White-fronted Chat	No	Vulnerable, Protected	
Aves	Neosittidae	Daphoenositta chrysoptera	Varied Sittella	No	Vulnerable, Protected	
Aves	Petroicidae	Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	No	Vulnerable, Protected	
Aves	Petroicidae	Petroica boodang	Scarlet Robin	No	Vulnerable, Protected	

Class	Family	Scientific	Common	Exotic	NSW Status	Commonwealth Status
Aves	Procellariidae	Macronectes giganteus	Southern Giant Petrel	No	Endangered, Protected	Endangered
Aves	Psittacidae	Glossopsitta pusilla	Little Lorikeet	No	Vulnerable, Protected	
Aves	Psittacidae	Lathamus discolor	Swift Parrot	No	Endangered, Protected, Category 3 Sensitive Species	Critically Endangered
Aves	Psittacidae	Neophema pulchella	Turquoise Parrot	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Rostratulidae	Rostratula australis	Australian Painted Snipe	No	Endangered, Protected	Endangered
Aves	Scolopacidae	Calidris ferruginea	Curlew Sandpiper	No	Endangered, Protected	CE,C,J,K
Aves	Strigidae	Ninox connivens	Barking Owl	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Strigidae	Ninox strenua	Powerful Owl	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Tytonidae	Tyto novaehollandiae	Masked Owl	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Tytonidae	Tyto tenebricosa	Sooty Owl	No	Vulnerable, Protected, Category 3 Sensitive Species	
Insecta	Petaluridae	Petalura gigantea	Giant Dragonfly	No	Endangered	
Mammalia	Balaenidae	Eubalaena australis	Southern Right Whale	No	Endangered, Protected	Endangered
Mammalia	Burramyidae	Cercartetus nanus	Eastern Pygmy-possum	No	Vulnerable, Protected	
Mammalia	Dasyuridae	Dasyurus maculatus	Spotted-tailed Quoll	No	Vulnerable, Protected	Endangered
Mammalia	Emballonuridae	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	No	Vulnerable, Protected	
Mammalia	Molossidae	Mormopterus norfolkensis	Eastern Freetail-bat	No	Vulnerable, Protected	
Mammalia	Petauridae	Petaurus australis	Yellow-bellied Glider	No	Vulnerable, Protected	
Mammalia	Petauridae	Petaurus norfolcensis	Squirrel Glider	No	Vulnerable, Protected	
Mammalia	Phascolarctidae	Phascolarctos cinereus	Koala	No	Vulnerable, Protected	Vulnerable
Mammalia	Pteropodidae	Pteropus poliocephalus	Grey-headed Flying-fox	No	Vulnerable, Protected	Vulnerable
Mammalia	Vespertilionidae	Chalinolobus dwyeri	Large-eared Pied Bat	No	Vulnerable, Protected	Vulnerable
Mammalia	Vespertilionidae	Falsistrellus tasmaniensis	Eastern False Pipistrelle	No	Vulnerable, Protected	
Mammalia	Vespertilionidae	Miniopterus australis	Little Bentwing-bat	No	Vulnerable, Protected	
Mammalia	Vespertilionidae	Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	No	Vulnerable, Protected	
Mammalia	Vespertilionidae	Myotis macropus	Southern Myotis	No	Vulnerable, Protected	
Mammalia	Vespertilionidae	Scoteanax rueppellii	Greater Broad-nosed Bat	No	Vulnerable, Protected	
Mammalia	Vespertilionidae	Vespadelus troughtoni	Eastern Cave Bat	No	Vulnerable, Protected	
Reptilia	Cheloniidae	Chelonia mydas	Green Turtle	No	Vulnerable, Protected	Vulnerable
Flora	Apocynaceae	Cynanchum elegans	White-flowered Wax Plant	No	Endangered, Protected	Endangered
Flora	Asteraceae	Rutidosis heterogama	Heath Wrinklewort	No	Vulnerable, Protected	Vulnerable
Flora	Asteraceae	Senecio spathulatus	Coast Groundsel	No	Endangered, Protected	
Flora	Elaeocarpaceae	Tetratheca glandulosa		No	Vulnerable, Protected	
Flora	Elaeocarpaceae	Tetratheca juncea	Black-eyed Susan	No	Vulnerable, Protected	Vulnerable
Flora	Ericaceae	Epacris purpurascens var. purpurascens		No	Vulnerable, Protected	
Flora	Euphorbiaceae	Chamaesyce psammogeton	Sand Spurge	No	Endangered, Protected	
Flora	Myrtaceae	Angophora inopina	Charmhaven Apple	No	Vulnerable, Protected	Vulnerable

Class	Family	Scientific	Common	Exotic	NSW Status	Commonwealth Status
Flora	Myrtaceae	Callistemon linearifolius	Netted Bottle Brush	No	Vulnerable, Protected, Category 3 Sensitive Species	
Flora	Myrtaceae	Eucalyptus camfieldii	Camfield's Stringybark	No	Vulnerable, Protected	Vulnerable
Flora	Myrtaceae	Melaleuca biconvexa	Biconvex Paperbark	No	Vulnerable, Protected	Vulnerable
Flora	Myrtaceae	Syzygium paniculatum	Magenta Lilly Pilly	No	Endangered, Protected	Vulnerable
Flora	Orchidaceae	Cryptostylis hunteriana	Leafless Tongue Orchid	No	Vulnerable, Protected, Category 2 Sensitive Species	Vulnerable
Flora	Orchidaceae	Diuris praecox	Rough Doubletail	No	Vulnerable, Protected, Category 2 Sensitive Species	Vulnerable
Flora	Polygonaceae	Muehlenbeckia costata	Scrambling Lignum	No	Vulnerable, Protected	
Flora	Proteaceae	Grevillea parviflora subsp. parviflora	Small-flower Grevillea	No	Vulnerable, Protected	Vulnerable
Flora	Proteaceae	Grevillea shiressii		No	Vulnerable, Protected	Vulnerable
Flora	Zannichelliaceae	Zannichellia palustris		No	Endangered, Protected	

Data does not include records not defined as either endangered or vulnerable, and category 1 sensitive species are also excluded. NSW Office of Environment and Heritage's Atlas of NSW Wildlife, which holds data from a number of custodians. Data obtained 29/04/2017

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Appendix D

HISTORICAL LAND TITLES

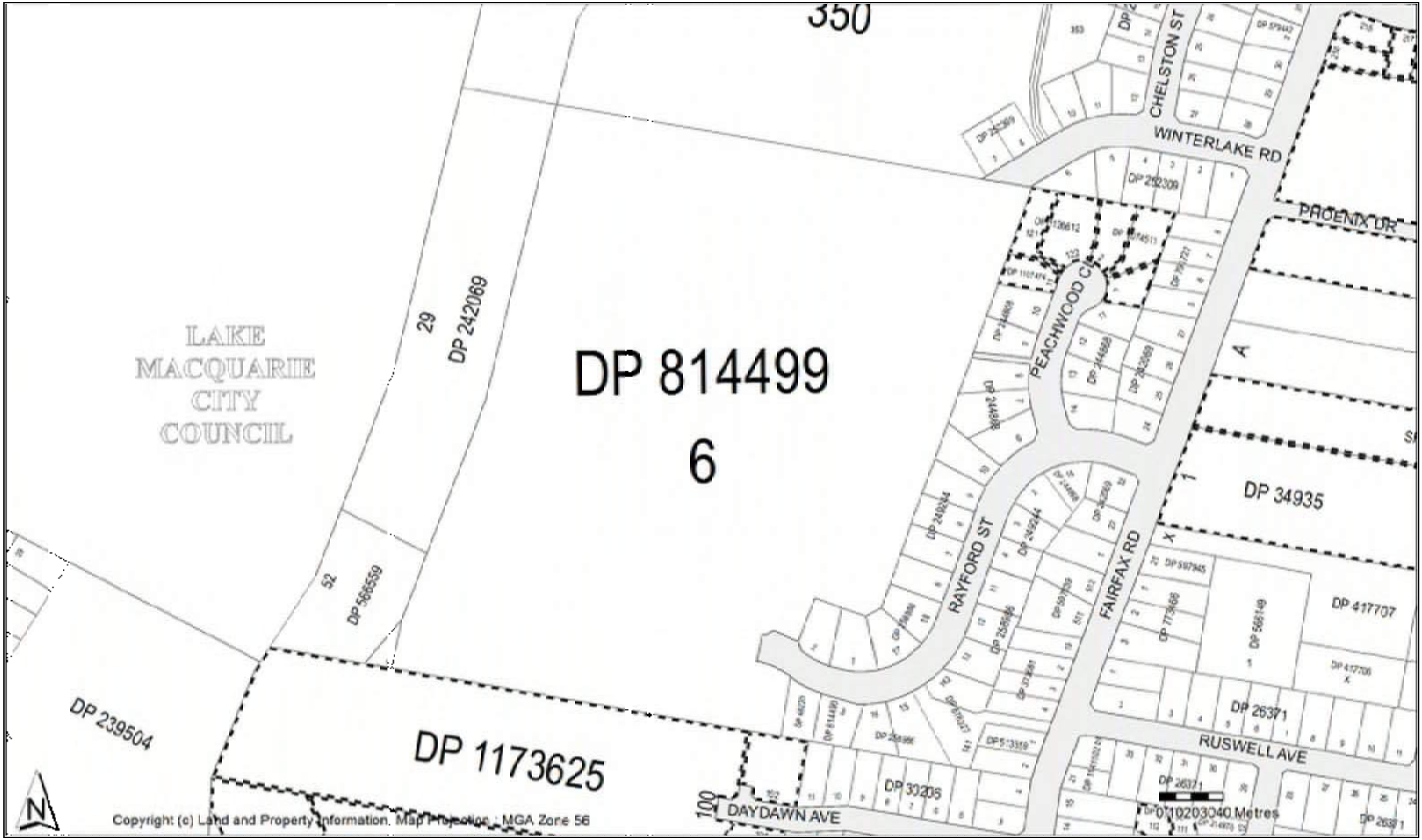
Cadastral Records Enquiry Report

Ref : wsp pb - warners bay

Requested Parcel : Lot 6 DP 814499

Identified Parcel : Lot 6 DP 814499

Locality : WARNERS BAY **LGA :** LAKE MACQUARIE **Parish :** KAHIBAH **County :** NORTHUMBERLAND



	Status	Surv/Comp	Purpose
DP34935			
Lot(s): 1			
DP1167911	REGISTERED	SURVEY	EASEMENT
DP1060085			
Lot(s): 111, 112			
DP214976	HISTORICAL	SURVEY	SUBDIVISION
DP1074511			
Lot(s): 2, 3, 4			
DP791727	HISTORICAL	SURVEY	SUBDIVISION
DP1107474			
Lot(s): 11			
DP791727	HISTORICAL	SURVEY	SUBDIVISION
DP1074511	REGISTERED	SURVEY	SUBDIVISION
DP1120431			
Lot(s): 27			
DP856871	HISTORICAL	SURVEY	SUBDIVISION
DP1116890	REGISTERED	SURVEY	EASEMENT
Lot(s): 28			
DP5355	HISTORICAL	SURVEY	UNRESEARCHED
DP1126612			
Lot(s): 121, 122			
DP791727	HISTORICAL	SURVEY	SUBDIVISION
DP1074511	REGISTERED	SURVEY	SUBDIVISION
DP1107474	REGISTERED	SURVEY	SUBDIVISION
DP1173625			
Lot(s): 100, 101, 102			
DP651218	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1116890	REGISTERED	SURVEY	EASEMENT
Lot(s): 101			
DP30206	HISTORICAL	SURVEY	UNRESEARCHED
DP1221805			
Lot(s): 213, 215, 216, 217, 218			
DP264554	HISTORICAL	SURVEY	SUBDIVISION
DP506386	HISTORICAL	SURVEY	SUBDIVISION
DP1212396	REGISTERED	SURVEY	SUBDIVISION
DP1226966			
Lot(s): 100			
DP5355	HISTORICAL	SURVEY	UNRESEARCHED
SP70386			
DP382547	HISTORICAL	SURVEY	UNRESEARCHED
DP1056730	REGISTERED	SURVEY	SUBDIVISION
SP73958			
DP374408	HISTORICAL	SURVEY	UNRESEARCHED
DP1076425	REGISTERED	SURVEY	SUBDIVISION

Requested Parcel : Lot 6 DP 814499 **Identified Parcel :** Lot 6 DP 814499

Locality : WARNERS BAY **LGA :** LAKE MACQUARIE **Parish :** KAHIBAH **County :** NORTHUMBERLAND

Plan	Surv/Comp	Purpose
DP20222	SURVEY	UNRESEARCHED
DP26371	SURVEY	UNRESEARCHED
DP30206	SURVEY	UNRESEARCHED
DP34935	COMPILATION	DEPARTMENTAL
DP41401	COMPILATION	CROWN FOLIO CREATION
DP214976	SURVEY	SUBDIVISION
DP239504	SURVEY	SUBDIVISION
DP242069	SURVEY	SUBDIVISION
DP244868	SURVEY	SUBDIVISION
DP249244	SURVEY	SUBDIVISION
DP252309	SURVEY	SUBDIVISION
DP258986	SURVEY	SUBDIVISION
DP335551	SURVEY	UNRESEARCHED
DP373681	SURVEY	UNRESEARCHED
DP374408	SURVEY	UNRESEARCHED
DP394307	SURVEY	UNRESEARCHED
DP417706	SURVEY	UNRESEARCHED
DP417707	SURVEY	UNRESEARCHED
DP440021	SURVEY	UNRESEARCHED
DP440049	SURVEY	UNRESEARCHED
DP513359	SURVEY	SUBDIVISION
DP566149	SURVEY	RESUMPTION OR ACQUISITION
DP566559	SURVEY	SUBDIVISION
DP579442	SURVEY	SUBDIVISION
DP597039	SURVEY	SUBDIVISION
DP597945	SURVEY	SUBDIVISION
DP771139	SURVEY	SUBDIVISION
DP773466	SURVEY	SUBDIVISION
DP776503	SURVEY	SUBDIVISION
DP790637	SURVEY	SUBDIVISION
DP791727	SURVEY	SUBDIVISION
DP814499	SURVEY	SUBDIVISION
DP876327	SURVEY	SUBDIVISION
DP1060085	SURVEY	SUBDIVISION
DP1074511	SURVEY	SUBDIVISION
DP1107474	SURVEY	SUBDIVISION
DP1120431	SURVEY	SUBDIVISION
DP1126612	SURVEY	SUBDIVISION
DP1141102	SURVEY	SUBDIVISION
DP1173625	SURVEY	SUBDIVISION
DP1221805	SURVEY	SUBDIVISION
DP1221805	UNRESEARCHED	SUBDIVISION
DP1226966	SURVEY	REDEFINITION
SP48220	COMPILATION	STRATA PLAN
SP54950	COMPILATION	STRATA PLAN
SP70386	COMPILATION	STRATA PLAN
SP73958	COMPILATION	STRATA PLAN

[redacted]

ICATE OF TITLE

PROPERTY ACT, 1900

NEW SOUTH WALES

Vol. 11772 Fol. 207

(Page 1) Vol. 11772 Fol. 207

Appln. No.10217

Prior Titles Vol.2423 Fol. 41
Vol.8605 Fol.136

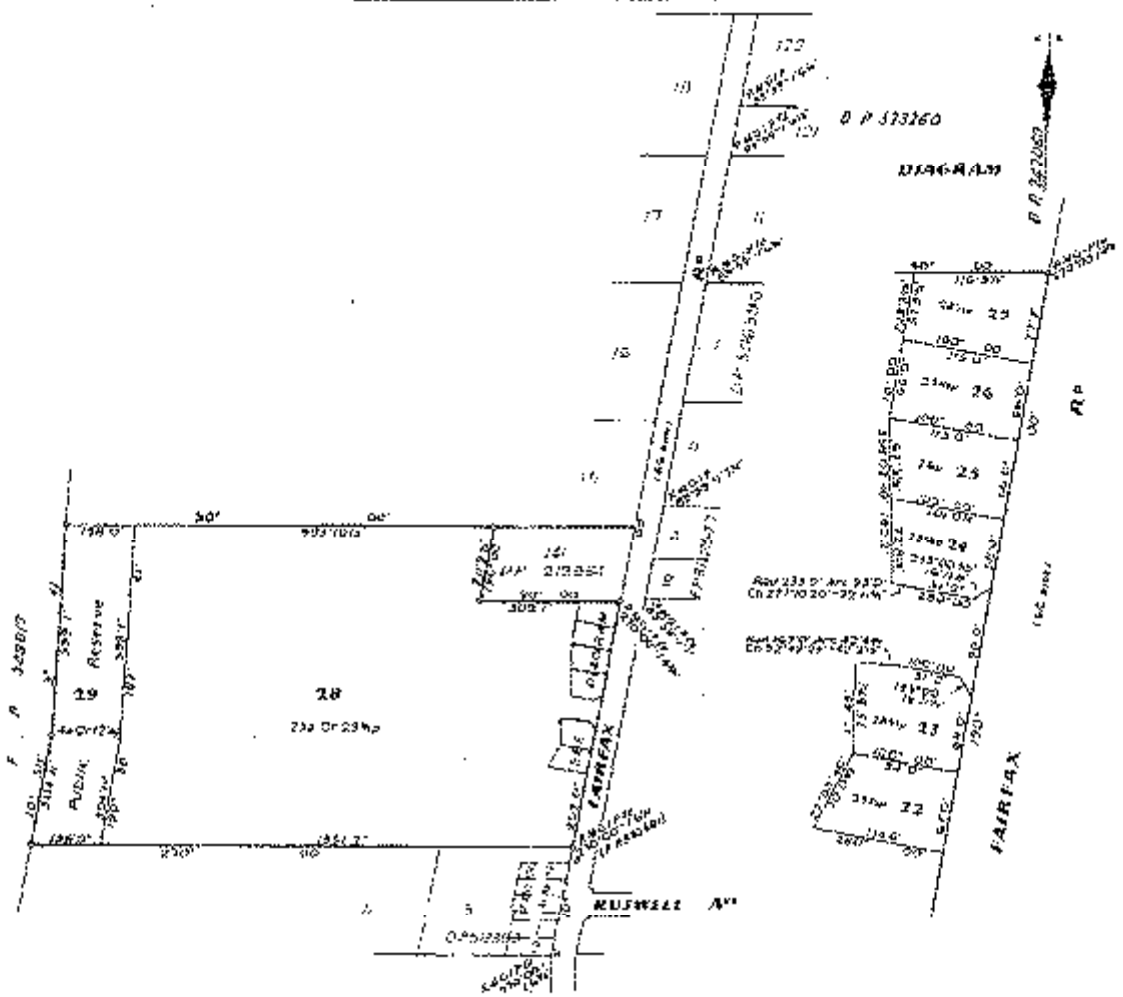
CANCELLED

Edition issued 10-2-1972

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 28 in Deposited Plan 242069 at Speers Point in the Shire of Lake Macquarie Parish of Kahibah and County of Northumberland being part of Portion 10 granted to William Brooks on 16-5-1839. EXCEPTING THEREOUT all mines of coal and other minerals excepted by Transfers Nos.558696 and A57424.

FIRST SCHEDULE

ERIC JAMES WILLIAMS of Speers Point, Farmer.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Registrar General

Vol. 11772 Fol. 207

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
This deed is cancelled as to whole (in roads). New Certificates of Title have issued on 11-7-1973 for lots in Deposited Plan No. 244568 as follows:- Lots 5 to 15 Vol. 12132 Fol. 135 to 145 respectively. REGISTRAR GENERAL					
The residue of land in this certificate of title comprises road & pathway. Entered 11-7-1973 REGISTRAR GENERAL					

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION
			The interest of the Council of the Shire of Lake Macquarie in the new roads and pathway shown on D.P. 244568	22.6.1973	[signature]	
	N318902		[illegible]			
			by the registration of Deposited Plan 244568	22.6.1973	[signature]	

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

12152 Fol. 158

(Page 1) Vol.

NEW SOUTH WALES

[redacted] ICATE OF TITLE

[redacted] PROPERTY ACT, 1900

Appln. No. 10237

Prior Title Vol.11772 Fol.207

Vol. 12152 Fol. 158

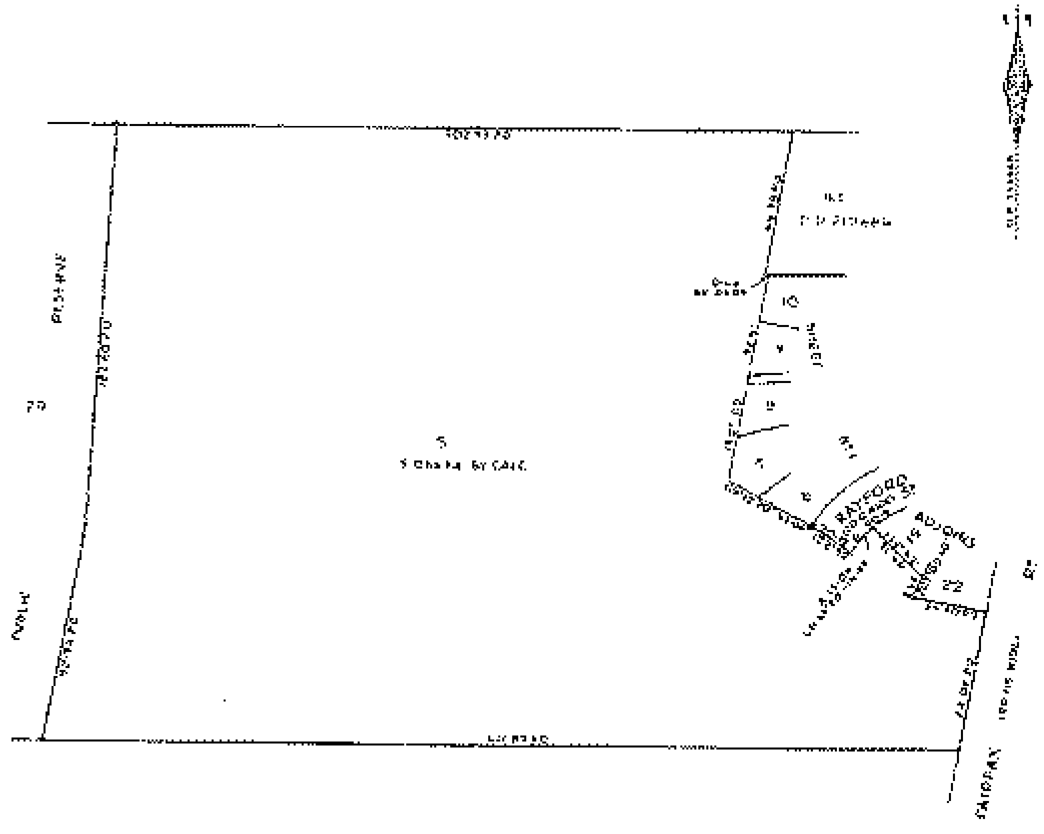
Edition issued 4-3-1973

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 5 in Deposited Plan 244869 at Warners Bay in the Shire of Lake Macquarie Parish of Kahibah and County of Northumberland being part of Portion 10 granted to William Brooks on 16-5-1832. EXCEPTING THEREOUT all mines of coal and other minerals excepted by Transfers Nos. 598096 and A57426.

FIRST SCHEDULE

ERIC JAMES WILLIAMS, of Speers Point, Farmer.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Registrar General

Vol. 12152 Fol. 158

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
This deed is cancelled as to the whole New Certificates of Title have issued on 2-12-94 for lots in Deposited Plan No. 326359 as follows:- Lots 50 to 52 Vol. 12951 Fol 219 to 221 respectively. REGISTRAR GENERAL					

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION	

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

[redacted]ICATE OF TITLE

NEW SOUTH WALES [redacted] PROPERTY ACT, 1900

Vol. 12321 Fol. 212

Appln No. 10237

CANCELLED

Prior Titles Vol. 7590 Fol. 3
Vol.12152 Fol.158

Edition issued 17-1-1977.

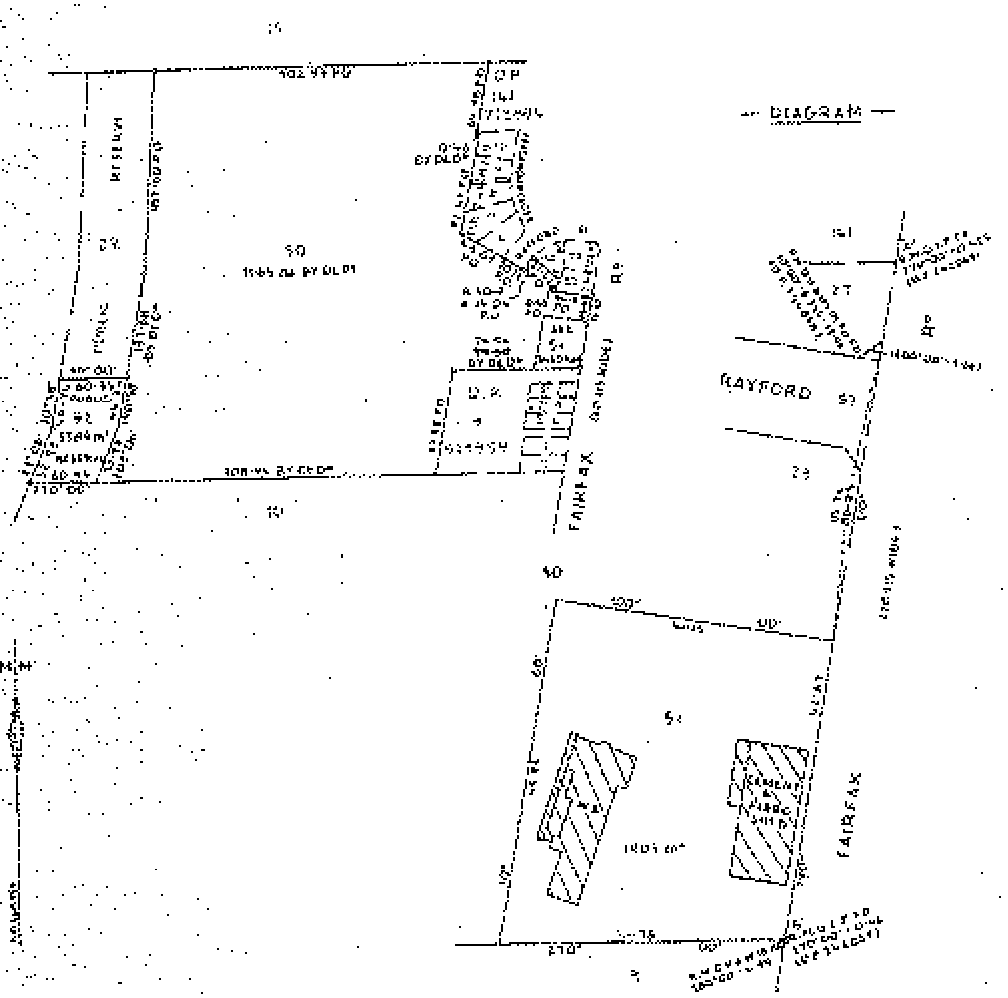
(Page 1) Vol. 12321 Fol. 212

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 50 in Deposited Plan 566559 at Speers Point in the Shire of Lake Macquarie Parish of Kahibah and County of Northumberland being part of Portion 50 granted to William Brooks on 16-5-1839. EXCEPTING THEREOUT all mines of coal and other minerals excepted by Transfers Nos. 558696, A57426 and 651643.

FIRST SCHEDULE

ERIC JAMES WILLIAMS of Speers Point, Farmer.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Vol. 12321 Fol. 212

DP249244 PROG TITLE WHOLE EX ROAD

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
This deed is annulled as to the whole (see road)					
[illegible]					
Deposited Plan No. 249244					
Lots 1 to 11 ... [illegible] 12726 Fols. 239-242 [illegible]					
REGISTRAR GENERAL					

The residue of land in this folio is now in road in D.P. 249244.

REGISTRAR GENERAL

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION
			The Council of the Shire of Lake Macquarie is the new road shown on D.P.249244	18-2-1975	[signature]	
88B INST	P 155327		Interests created pursuant to Section 88B Conveyancing Act, 1919, by the registration of Deposited Plan 249244	18-2-1975	[signature]	

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

[redacted] CATE OF TITLE

[redacted] PROPERTY ACT, 1900

NEW SOUTH WALES

Vol. 12726 Fol. 49

Appln. No. 10237

Prior Title Vol. 12321 Fol. 212

Edition Issued 7-8-1975

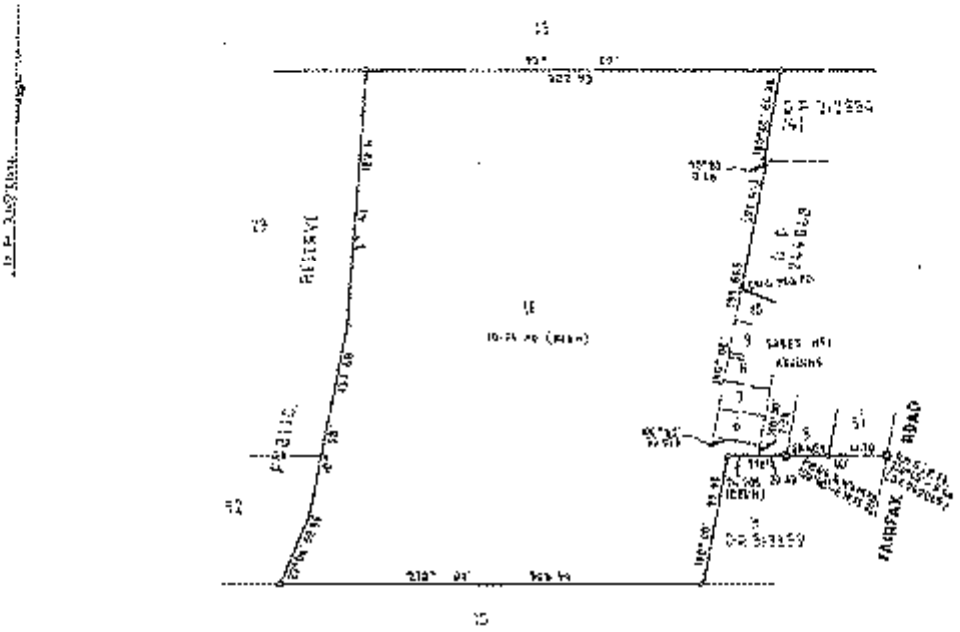
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES

CANCELLED



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 11 in Deposited Plan 249244 at Warners Bay in the Shire of Lake Macquarie, Parish of Kahibah and County of Northumberland being part of Portion 10 granted to William Brooks on 16-5-1839. EXCEPTING THEREOUT all mines of coal and other minerals excepted by Transfers Nos. 558696, A57424 and 661645.

FIRST SCHEDULE

ERIC JAMES WILLIAMS of Speers Point, Farmer.

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. Easement to drain water appurtenant to the land above described created by the registration of Deposited Plan 249244 See P158327.

(Page 1) Vol. 12726 Fol. 49

CT 5/3/79
DP258786

Vol. 12726 Fol. 49

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General

NEW CERTIFICATE OF TITLE ISSUING ON DP258786
NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO SURVEY DRAFTING BRANCH.

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION
Transfer	P252843		Easement to drain water created by the registration of DP258786 is hereby released as regards that part of the land shown hatched black in Certificate of Title Vol 12726 Fol 49	30.3.1977	[signature]	

This deed is cancelled as to WHOLE EX DP
New Certificates of Title have issued on 12/1/79
for lots in DEPOSITED Plan No. 258786 as follows:
Lots 1 to 70 Vol 13999 Fol 91/140 respectively.

[signature]
REGISTRAR GENERAL

The residue of land in this folio comprises ROAD in DP 258786

[signature]
REGISTRAR GENERAL

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

[redacted]

FICATE OF TITLE

NEW SOUTH WALES

[redacted]AL PROPERTY ACT, 1900

Vol. 13944 Fol. 100

Appln. No. 10937

Prior Title Vol. 12726 Fol. 49

EDITION ISSUED

12 9 [illegible]

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

CANCELLED

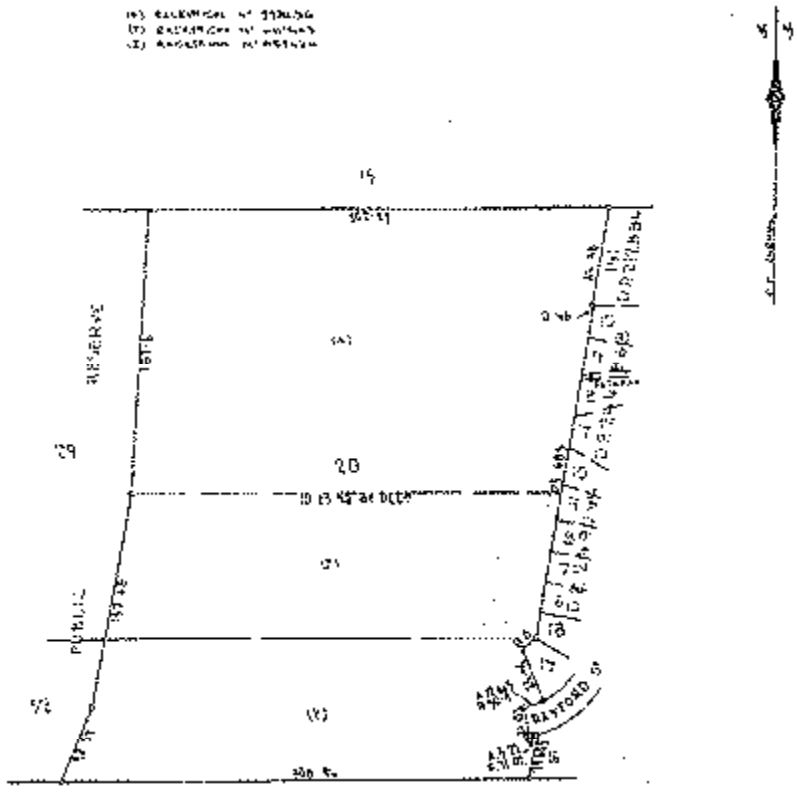
Registrar General

SEE AUTO FOLIO

(Page 1) Vol. 13944 Fol. 100

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 20 in Deposited Plan 258986 at Speers Point in the Shire of Lake Macquarie Parish of Kahibah and County of Northumberland being part of Portion 10 granted to William Brooks on 16-3-1839. EXCEPTING THEREOUT all mines of coal and other minerals excepted by Transfer Nos.558696, 661643 and A57424 as regards the land shown so affected in Deposited Plan 258986.

FIRST SCHEDULE

ERIC JAMES WILLIAMS of Speers Point, Farmer.

SECOND SCHEDULE

GR4 1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
GW2 2. DP849244 Easement to drain water appurtenant to the land above described (see P156327).

Vol. 13944 Fol. 100

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT		REGISTERED	Signature of Registrar General
	NATURE	NUMBER		

SECOND SCHEDULE (continued)

INSTRUMENT		PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION
NATURE	NUMBER				

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Ref:wsp pb - warners /Stc:T [redacted]
97-03TA

TRANSMISSION APPLICATION

Section 93 Real Property Act 19

Land Titles Office use only

0
541013 U

Office of State Revenue use only

E

(A) **LAND**
Show no more than 20 References to Title.

Identifier 6/814499

(B) **REGISTERED DEALING**
If applicable.

(C) **LODGED BY**

L.T.O. Box	Name, Address or DX and Telephone
	L. J. KANE & CO. RGO Box 30P
	REFERENCE (max. 15 characters): TH - Blundell

(D) **DECEASED REGISTERED PROPRIETOR**

ERIC JAMES WILLIAMS

(E) **APPLICANT**

TA — ERIC JAMES WILLIAMS JNR., KENNETH JOHN WILLIAMS & FAY BLUNDELL

(F) I, the Applicant, being entitled as Executors of the **will/estate** of the Deceased Registered Proprietor (who died on 31 October 1994) pursuant to ~~Probate/Letters of Administration~~ No. 111930/95 granted on 15 August 1995 to Eric James Williams Jnr., Kenneth John Williams & Fay Blundell, apply to be registered as proprietor of the estate or interest of the Deceased Registered Proprietor in the **Land/Registered Dealing** specified above.

(G) Certified correct for the purposes of the Real property Act 1900. **DATE** 14.9.95.

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

[signature]
Signature of Witness

S. Carmichael
Name of Witness (BLOCK LETTERS)

C/- Turnbull Hill Partners
The Mall Charlestown
Address of Witness

EVIDENCE SIGHTED & RETURNED (office use only)

[signature]
T. Blundell & F Williams
Signature of Applicant

CHECKED BY (office use only)

(H)

CONSENT OF EXECUTOR OR ADMINISTRATOR

I, ... **Executor of the will /Administrator of the estate** of the Deceased Registered Proprietor, hereby consent to this application.

.....
Signature of Witness

.....
Name of Witness (BLOCK LETTERS)

.....
Address of Witness

.....
Signature of Executor/Administrator

INSTRUCTIONS FOR COMPLETION

STAMP DUTY: If the Applicant is a devisee, beneficiary, next-of-kin or otherwise beneficially entitled or if the Deceased Registered Proprietor died prior to 31 December 1981 the application must be presented to the Office of State Revenue prior to lodgment at the Land Titles Office.

1. The Application must be completed clearly and legibly in permanent, dense, black or dark blue non-copying ink. If using a dot-matrix printer the print must be letter-quality.
2. Do not use an eraser or correction fluid to make alterations: rule through rejected material. Initial each alteration in the lefthand margin.
3. If the space provided at any point is insufficient, you may annex additional pages. These must be the same size as the form; paper quality, colour, etc, must conform to the requirements set out in Land Titles Office Information Bulletin No. 19. All pages of any annexure must be signed by the person executing the Application and any attesting witness.
4. The following instructions relate to the marginal letters on the application.

(A) LAND
Show the relevant Reference to Title. If there are more than 20 show none in this panel. Place ALL of them on an annexure (see 3 above) with 20 per sheet.

(B) REGISTERED DEALING
Show the registration number of any lease, mortgage or charge in regard to which the Applicant is applying to be registered as a proprietor.

(C) LODGED BY
This section relates to the person or firm lodging the Application at the Land Titles Office.
Reference (max. 15 characters) This is optional. Any slashes, dots, blank spaces, etc, will be counted as characters.

(D) DECEASED REGISTERED PROPRIETOR
Show the name in full. Address and occupation need not be shown.

(E) APPLICANT
Show the name in full. Address and occupation need not be shown.

(F) WILL/ESTATE, etc
Amend "will/estate", "Probate/Letters of Administration" and "Land/Registered Dealing" as appropriate.
In the relevant spaces show the capacity (executor, devisee, etc) in which the Applicant is entitled to apply, the number and date of grant of the Probate or Letters of Administration pursuant to which the application is made, and the name of the person to whom the grant was made.

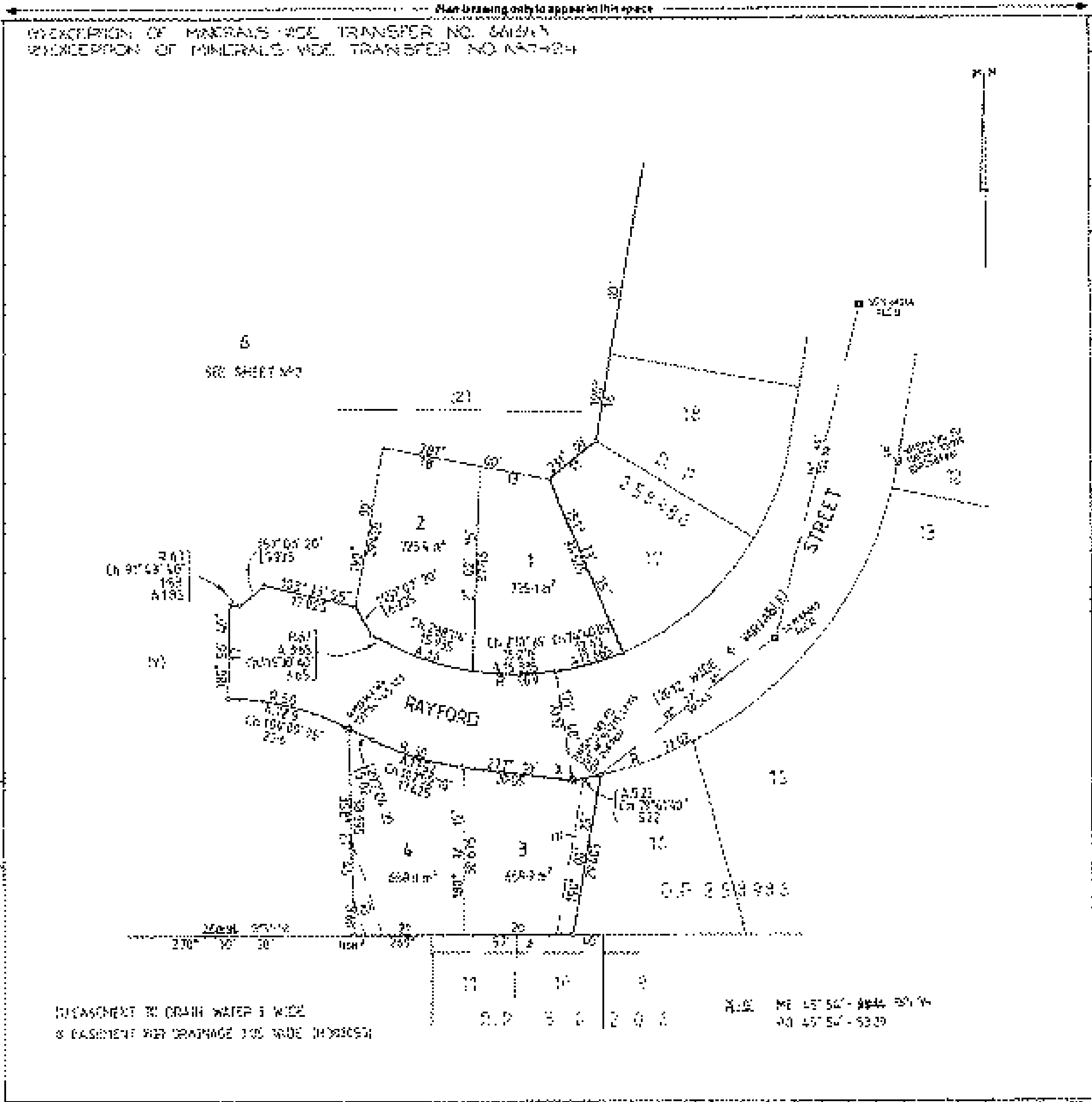
(G) EXECUTION
General The application must be executed by or on behalf of the Applicant.
By the Applicant Personally The application must be signed in the presence of an adult witness who is not an Applicant and who knows the party executing personally. The witness should complete the appropriate section of the application.
By the Applicant's Attorney The Power of Attorney must be registered in the General Register of Deeds at the Land Titles Office. The execution should take the form, "AB by her attorney XY *[full name]* pursuant to Power of Attorney Book 1234 Number 567".
Under Authority If the application is made pursuant to any statutory, judicial or other authority, except a Power of Attorney (see above), the nature of the authority should be disclosed.
By a Corporation under Seal The execution should include a statement that the seal has been properly affixed, for example, "... pursuant to a resolution of the board of directors ...". Alternatively, all those attesting the affixing of the seal must state their position in the corporation.

(H) CONSENT OF EXECUTOR OR ADMINISTRATOR
This is required only where the Applicant claims to be entitled other than as executor, administrator or trustee.

The completed Application must be lodged by hand at the LAND TITLES OFFICE, Queen's Square, Sydney, together with the Certificate of Title, the probate or letters of administration (or a copy thereof certified by a solicitor to be a true copy) and a completed Notice of Sale.

If you have any questions about filling out the form, please call 228-6666 and ask for our Customer Services Branch.

PLAN FORM 2



Council Clerk's Office Approval

Council Clerk's Certificate

TABLE OF MEASUREMENTS

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day 6th January 1992

OFFICE USE ONLY

DP 814499

Registered (SR) 21.1.1992

TORRENS

SUBDIVISION

DP 259983

PLAN OF SUBDIVISION OF LOT 20 DP 259983

LGA: LAKE MACQUARIE

Locality: WARNERS BAY

Parish: KAHIBAH

County: NORTHUMBERLAND

Graeme John Egerton

of Asquith & deWitt Pty Ltd

20/6/91

DP 753995 DP 30206

It is intended

A) To dedicate the extension of Rayford Street to the public as road

B) To create lot 5 as public reserve

C) To create pursuant to section 88B of the conveyancing act 1919, as amended

(1) Easement to drain water 3 wide

(2) Restrictions as to user

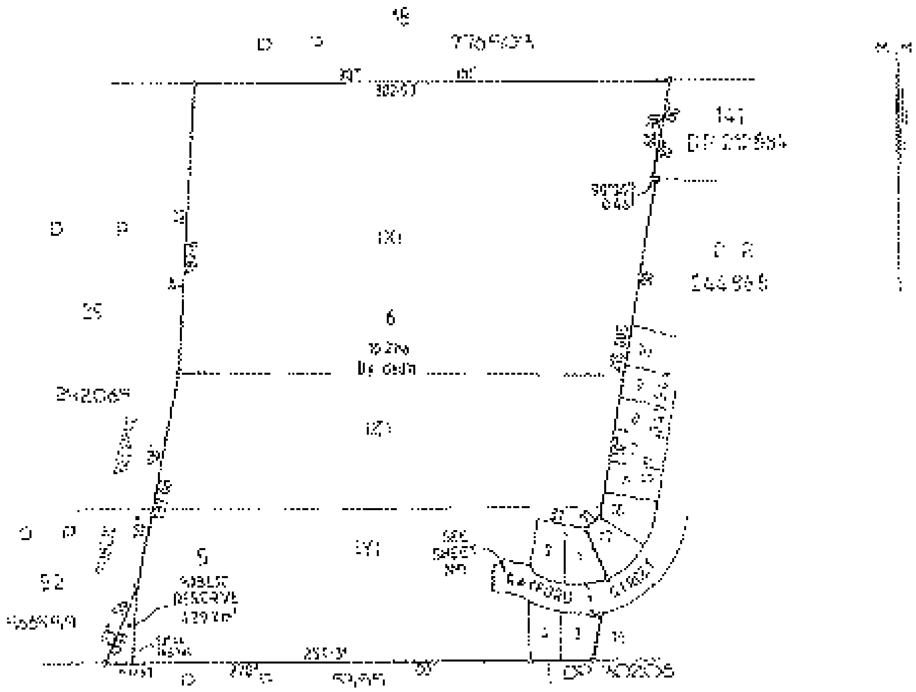
PLAN FORM 3

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

OFFICE USE ONLY

DP 914499

(X) EXCEPTION OF MINERALS - VIDE TRANSFER NO 556696
(Y) EXCEPTION OF MINERALS - VIDE TRANSFER NO 566645
(Z) EXCEPTION OF MINERALS - VIDE TRANSFER NO A501124



Registered 5-1-1992

This negative is a photograph made as a permanent record of a document in the custody of the Registrar General this day 5th January 1992

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
27/1/2017 8:48AM

FOLIO: 6/814499

First Title(s): OLD SYSTEM
Prior Title(s): 20/258986

Recorded	Number	Type of Instrument	C.T. Issue
8/1/1992	DP814499	DEPOSITED PLAN	FOLIO CREATED EDITION 1
18/9/1995	O541013	TRANSMISSION APPLICATION	EDITION 2
5/5/1997	3031704	TRANSFER	EDITION 3
19/8/1999	6111550	DEPARTMENTAL DEALING	
24/3/2010	AF390701	CAVEAT	
26/11/2010	AF903973	WITHDRAWAL OF CAVEAT	
1/12/2016	AK966808	CAVEAT	

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
27/1/2017 12:24PM

FOLIO: 20/258986

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 13944 FOL 100

Recorded	Number	Type of Instrument	C.T. Issue
5/6/1987		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
28/9/1987		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
8/1/1992	DP814499	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS

*** END OF SEARCH ***

PB - Warners Bay PRINTED ON 27/1/2017

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 6/814499

SEARCH DATE	TIME	EDITION NO	DATE
27/1/2017	8:46 AM	3	5/5/1997

LAND

LOT 6 IN DEPOSITED PLAN 814499
AT WARNERS BAY
LOCAL GOVERNMENT AREA LAKE MACQUARIE
PARISH OF KAHIBAH COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP814499

FIRST SCHEDULE

ERIC JAMES WILLIAMS (JUNIOR)
KENNETH JOHN WILLIAMS
FAY BLUNDELL
AS TENANTS IN COMMON IN EQUAL SHARES (T 3031704)

SECOND SCHEDULE (7 NOTIFICATIONS)

---

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 558696 LAND EXCLUDES MINERALS AFFECTING PART OF THE LAND ABOVE DESCRIBED SHOWN SO BURDENED IN THE TITLE DIAGRAM
3 661643 LAND EXCLUDES MINERALS AFFECTING PART OF THE LAND ABOVE DESCRIBED SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 A57424 LAND EXCLUDES MINERALS AFFECTING PART OF THE LAND ABOVE DESCRIBED SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP249244 EASEMENT TO DRAIN WATER APPURTENANT TO THE LAND ABOVE DESCRIBED
6 EASEMENT(S) APPURTENANT TO THE LAND ABOVE DESCRIBED CREATED BY: DP814499 -EASEMENT TO DRAIN WATER 3 WIDE
* 7 AK966808 CAVEAT BY WARNERS BAY HOLDINGS PTY LTD

NOTATIONS

NOTE: THE CERTIFICATE OF TITLE FOR THIS FOLIO OF THE REGISTER DOES NOT INCLUDE SECURITY FEATURES INCLUDED ON COMPUTERISED CERTIFICATES OF TITLE ISSUED FROM 4TH JANUARY, 2004. IT IS RECOMMENDED THAT STRINGENT PROCESSES ARE ADOPTED IN VERIFYING THE IDENTITY OF THE PERSON(S) CLAIMING A RIGHT TO DEAL WITH THE LAND COMPRISED IN THIS FOLIO.

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

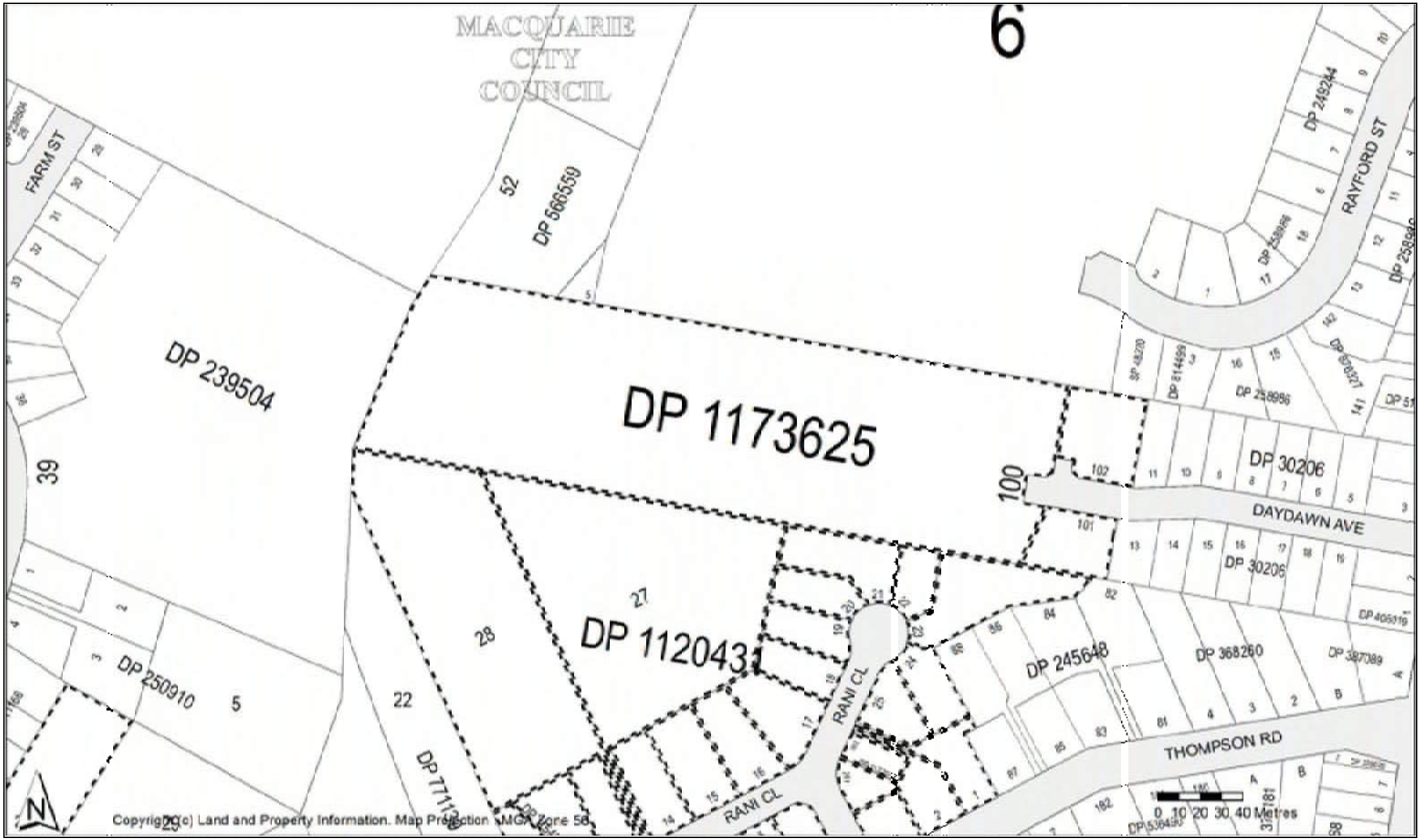
wsp pb - warners PRINTED ON 27/1/2017

Cadastral Records Enquiry Report

Ref : wsp - warners bay

Requested Parcel : Lot 100 DP 1173625 **Identified Parcel :** Lot 100 DP 1173625

Locality : WARNERS BAY **LGA :** LAKE MACQUARIE **Parish :** KAHIBAH **County :** NORTHUMBERLAND



Requested Parcel : Lot 100 DP 1173625 **Identified Parcel :** Lot 100 DP 1173625

Locality : WARNERS BAY **LGA :** LAKE MACQUARIE **Parish :** KAHIBAH **County :** NORTHUMBERLAND

	Status	Surv/Comp	Purpose
DP238538			
Lot(s): 22			
DP1020498	REGISTERED	COMPILATION	EASEMENT
DP1120431			
Lot(s): 21, 22, 23			
DP1173625	REGISTERED	SURVEY	SUBDIVISION
Lot(s): 1, 2, 3, 4, 5, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 27			
DP856871	HISTORICAL	SURVEY	SUBDIVISION
DP1116890	REGISTERED	SURVEY	EASEMENT
Lot(s): 13, 28			
DP5355	HISTORICAL	SURVEY	UNRESEARCHED
DP1154287			
Lot(s): 121, 122			
DP5355	HISTORICAL	SURVEY	UNRESEARCHED
DP1120431	REGISTERED	SURVEY	SUBDIVISION
DP1172053			
Lot(s): 261, 262			
DP856871	HISTORICAL	SURVEY	SUBDIVISION
DP1116890	REGISTERED	SURVEY	EASEMENT
DP1120431	REGISTERED	SURVEY	SUBDIVISION
DP1173625			
Lot(s): 100, 101, 102			
DP651218	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1116890	REGISTERED	SURVEY	EASEMENT
Lot(s): 101			
DP30206	HISTORICAL	SURVEY	UNRESEARCHED

Caution: For all **ACTIVITY PRIOR to SEPT 2002** you must refer to the RGs Charting and Reference Maps.

Requested Parcel : Lot 100 DP 1173625 **Identified Parcel :** Lot 100 DP 1173625

Locality : WARNERS BAY **LGA :** LAKE MACQUARIE **Parish :** KAHIBAH **County :** NORTHUMBERLAND

Plan	Surv/Comp	Purpose
DP13168	SURVEY	UNRESEARCHED
DP30206	SURVEY	UNRESEARCHED
DP238538	SURVEY	SUBDIVISION
DP239504	SURVEY	SUBDIVISION
DP242069	SURVEY	SUBDIVISION
DP244868	SURVEY	SUBDIVISION
DP245648	SURVEY	SUBDIVISION
DP249244	SURVEY	SUBDIVISION
DP250910	SURVEY	SUBDIVISION
DP255449	SURVEY	SUBDIVISION
DP258986	SURVEY	SUBDIVISION
DP335312	COMPILATION	UNRESEARCHED
DP359628	COMPILATION	UNRESEARCHED
DP368260	SURVEY	UNRESEARCHED
DP373681	SURVEY	UNRESEARCHED
DP374181	SURVEY	UNRESEARCHED
DP387089	SURVEY	UNRESEARCHED
DP403655	SURVEY	UNRESEARCHED
DP406019	SURVEY	UNRESEARCHED
DP411166	SURVEY	UNRESEARCHED
DP513359	SURVEY	SUBDIVISION
DP536490	SURVEY	SUBDIVISION
DP566559	SURVEY	SUBDIVISION
DP583098	SURVEY	SUBDIVISION
DP771139	SURVEY	SUBDIVISION
DP790637	SURVEY	SUBDIVISION
DP804655	SURVEY	SUBDIVISION
DP814499	SURVEY	SUBDIVISION
DP876327	SURVEY	SUBDIVISION
DP1120431	SURVEY	SUBDIVISION
DP1154287	SURVEY	SUBDIVISION
DP1172053	SURVEY	SUBDIVISION
DP1173625	SURVEY	SUBDIVISION
SP48220	COMPILATION	STRATA PLAN

[redacted]

CANC

CERTIFICATE OF TITLE

[redacted]PERTY ACT, 1900, as amended.

10206060

SEE AL

NEW SOUTH WALES

Application 10237

Prior Title Vol. 2264 Fol. 47

Vol. _____ Fol. _____

Edition issued 6-1-1965

K159629

BF

Fol. 60

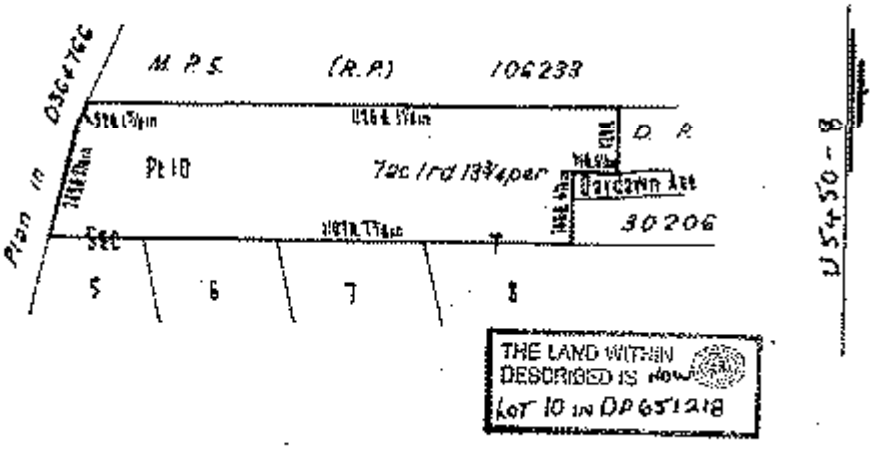
(Page 1) Vol. 10206

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Witness M J Hosfield

Registrar General.

PLAN SHOWING LOCATION OF LAND



K159629 ALS

Scale: 300 feet to one inch

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in the part of Lot 10 of Section 7 in Deposited Plan 5355 shown in the plan hereon at Speers Point in the Shire of Lake Macquarie Parish of Kahibah and County of Northumberland being part of Portion 10 granted to William Brooks on 16-5-1839 excepting thereout all coal and other minerals excepted by Transfer No. 660840.

Registrar General.

FIRST SCHEDULE (continued overleaf)

~~CLARENCE GEORGE COMFORD, of Speers Point, Orchardist, and EENA MAY COMFORD, his Wife, as Joint Tenants.~~

Registrar General.

SECOND SCHEDULE (continued overleaf)

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Registrar General.

Vol. 10206 Fol. 60

K149825 K203193 Q277479 V616551TR V665606TR

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
~~Edna May [illegible] of [illegible] Widow~~	~~[illegible]~~	~~K149825~~	~~[illegible]~~	~~2-1-1966~~	[signature]
~~Penny Williams and Jeffrey John Williams in ½ share as joint tenants and Judith Anne Lamb in ½ share AS TENANTS IN COMMON by Transfer V616551.~~					[seal]
~~Registered 14.3.1985~~					
~~Judith Anne [illegible] Lamb and Winifred Joy Williams as tenants in common, in equal shares by [illegible] V665606~~					[seal]
~~Registered 19-12-1986.~~					
JUDITH ANNE LAMB AND WINIFRED JOY WILLIAMS AS tenants in common in equal shares					
CANCELLED					

SEE AUTO FOLIO

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		
~~Mortgage~~	~~K203193~~	~~[illegible]~~	~~to the Commercial Bank of Australia Limited~~	~~[illegible]~~	[signature]	Discharged	Q277479	[signature]

FORM No. 62 NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Form: 033A
Release: 2.0
www.lands.nsw.gov.au

TRANSMISSION APPLICATION

New South Wales
Section 93 Real Property Act 1900

AG986515K

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.

STAMP DUTY — Office of State Revenue use only

(A) **LAND** — Torrens Title: 10/651218

(B) **REGISTERED DEALING** — Number: | Torrens Title:

(C) **LODGED BY** — Document Collection Box: BOX 30P | Name, Address or DX and Telephone: L J KANE & CO LLPN 123818G | Reference: PTS - WILLIAMS | CODE: TA

(D) **DECEASED REGISTERED PROPRIETOR** — Winifred Joy WILLIAMS

(E) **APPLICANT** — Peter Charles HICKS and Gregory John ELSWORTHY

(F) I, the applicant, being entitled as Executors of the estate of the deceased registered proprietor (who died on 15/09/2007) pursuant to probate No. 121146/07 granted on 11/12/2007 to Peter Charles HICKS and Gregory John ELSWORTHY (a certified copy of which is lodged herewith) apply to be registered as the proprietor of the estate or interest of the deceased registered proprietor in the abovementioned land.

DATE 9 MAY 2012.

(G) 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.

Signature of witness: B. Killingly

Name of witness: BRUCE KILLINGLY
Address of witness: 37 WRIGHTSON AVE BAR BEACH 2300

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

Signature of Applicant:

(H) **CONSENT OF EXECUTOR, ADMINISTRATOR OR TRUSTEE**

I,

CLICK & PICK >>> of the deceased registered proprietor, consent to this application.

Signature of witness: B. Killingly

Name of witness: BRUCE KILLINGLY

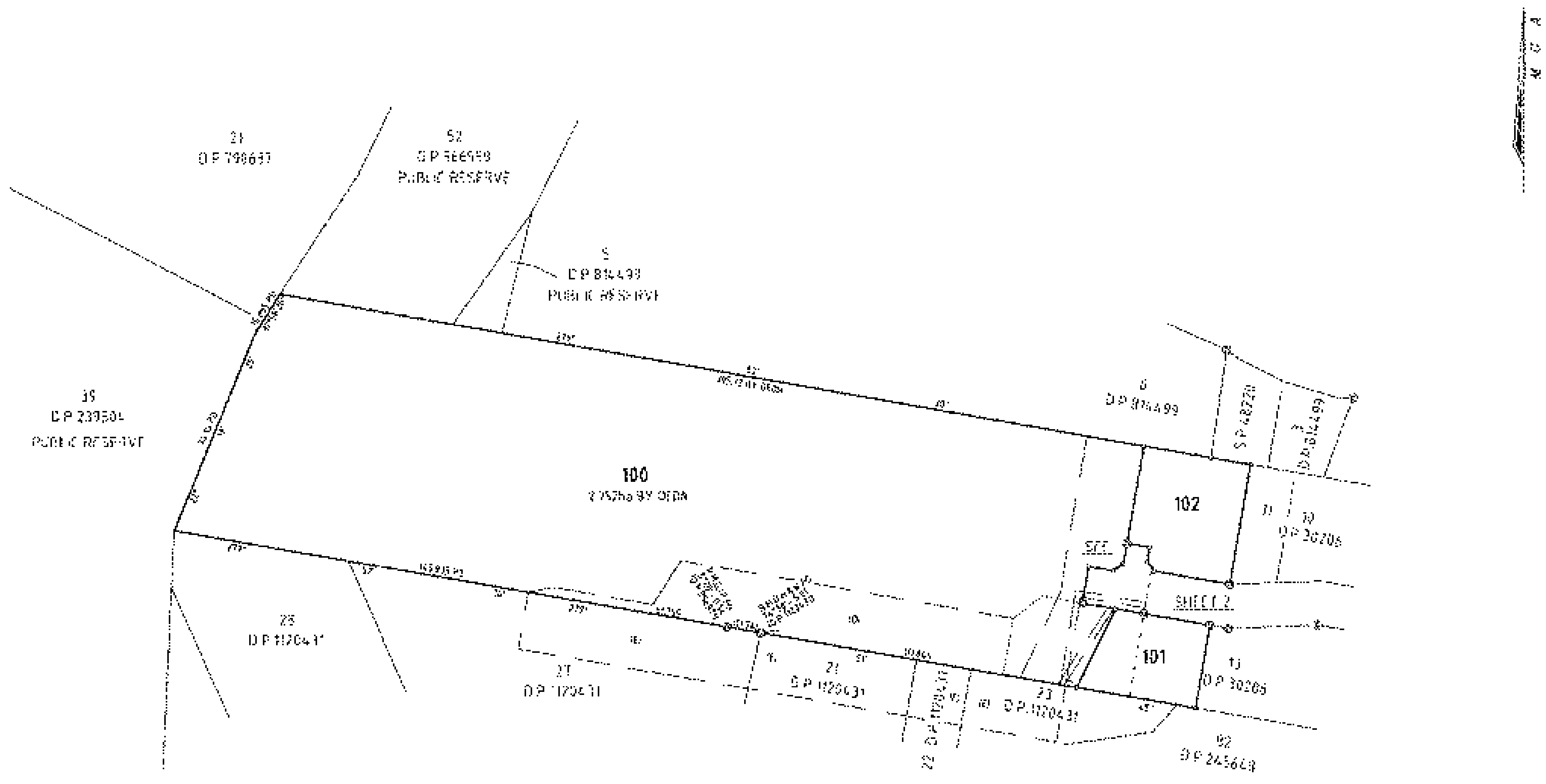
Address of witness: 37 WRIGHTSON AVE BAR BEACH 2300

Signature of:

ALL HANDWRITING MUST BE IN BLOCK CAPITALS.

Office use only—
Evidence sighted/sighted and returned:

DEPARTMENT OF LANDS
LAND AND PROPERTY INFORMATION DIVISION
0507

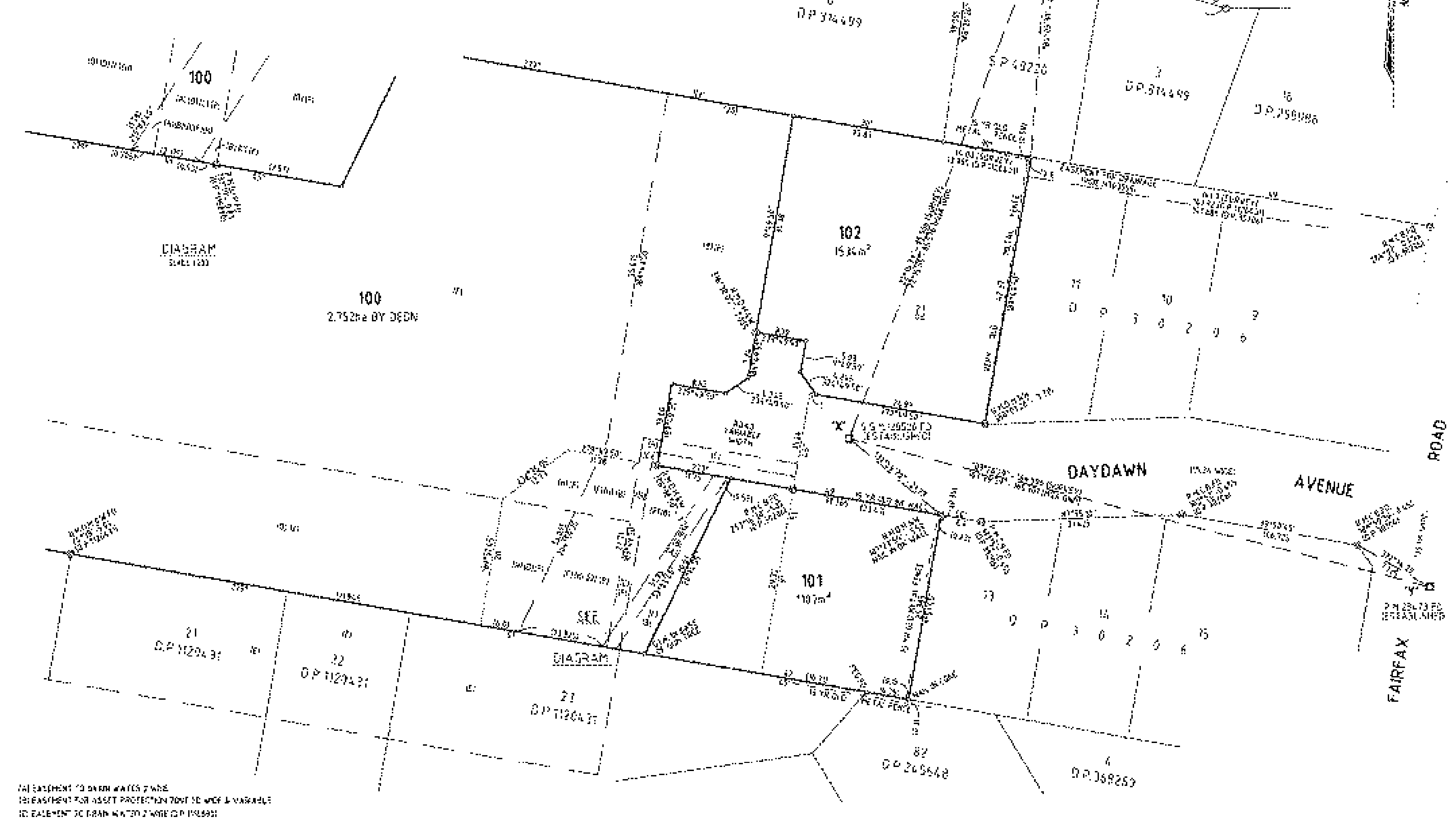


(A) EASEMENT TO DRAIN WATER 1 WIDE
(B) EASEMENT FOR ASSET PROTECTION ZONE 20 WIDE & VARIABLE
(C) EASEMENT TO DRAIN WATER 2 WIDE (DP 749540)
(D) EASEMENT FOR ASSET PROTECTION ZONE 20 WIDE & VARIABLE (DP 1116550)
(E) AREA BENEFITED BY EASEMENT (D)
(F) RESTRICTION AS TO USER
(G) RESTRICTION AS TO USER
(H) RESTRICTION AS TO USER

Surveyor: [illegible]	PLAN OF SUBDIVISION OF LOT 10 DP 651218 & LOT 12 DP 30206	LGA: LAKE MACQUARIE	Registered	DP1173625
Date of Survey: [illegible] 2011		Locality: SPEERS POINT	26.6.2012	
Surveyor's Reference: [illegible]		Subdivision No: 10/2012		
		Lengths are in metres. Reduction Ratio 1:1000		

Table of mm

SURVEYING & SPATIAL INFORMATION REGULATION 2012 (CLAUSE 35(1)(b))				
MARK	MGA CO-ORDINATES - ZONE 56 EASTING	NORTHING	CLASS	ORDER
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
COMBINED SCALE AND SEA LEVEL CORRECTION : [illegible]				
SOURCE	MGA CO-ORDINATES ADOPTED FROM SCIMS AS AT 4th AUGUST 2011			



(A) EASEMENT TO DRAIN WATER 2 WIDE
(B) EASEMENT FOR ASSET PROTECTION ZONE 30 WIDE & VARIABLE
(C) EASEMENT TO DRAIN WATER 2 WIDE (D.P. [illegible])
(D) EASEMENT FOR ASSET PROTECTION ZONE 30 WIDE & VARIABLE (D.P. [illegible])
(E) AREA BENEFITED BY EASEMENT (C)
(F) RESTRICTION AS TO USER
(G) RESTRICTION AS TO USER
(H) RESTRICTION AS TO USER

Surveyor: [illegible] Date of Survey: 4th July 2011 Surveyor's Reference: [illegible]	PLAN OF SUBDIVISION OF LOT 10 DP 651278 & LOT 12 DP 302096	LGA: LAKE MACQUARIE Locality: SPEERS POINT Subdivision No: 10/2972 Lengths are in metres. Reduction Ratio 1:400	Registered 28.6.2012	DP1173625

PLAN FORM 6 WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION ePlan

DEPOSITED PLAN ADMINISTRATION SHEET Sheet 1 of 2 sheet(s)

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT, 1919, AS AMENDED, IT IS INTENDED TO CREATE:-

1. EASEMENT TO DRAIN WATER 2.0 WIDE (A)
2. EASEMENT FOR ASSET PROTECTION ZONE 20 WIDE AND VARIABLE (B)
3. RESTRICTIONS AS TO USER (F)
4. RESTRICTIONS AS TO USER (G)
5. RESTRICTIONS AS TO USER (H)

IT IS INTENDED TO DEDICATE THE EXTENSION OF DAYDAWN AVENUE TO THE PUBLIC AS ROAD SUBJECT TO THE EXISTING EASEMENT TO DRAIN WATER 2 WIDE (DP1116890)

Use PLAN FORM 6A for additional certificates, signatures, seals and statements

DP1173625

* OFFICE USE ONLY

Registered: 26.6.2012
Title System: TORRENS
Purpose: SUBDIVISION

PLAN OF SUBDIVISION OF LOT 10 D.P.651218 & LOT 12 D.P.30206

LGA: LAKE MACQUARIE
Locality: SPEERS POINT
Parish: KAHIBAH
County: NORTHUMBERLAND

Crown Lands NSW/Western Lands Office Approval

I ..... in approving this plan certify (Authorised Officer)
that all necessary approvals in regard to the allocation of the land shown herein have been given.
Signature: .....
Date: .....
File Number: .....
Office: .....

Subdivision Certificate

I certify that provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to:

the proposed Subdivision set out herein (insert 'subdivision' or 'new road')

L. Field

* Authorised Person/~~General Manager~~ / ~~Accredited Certifier~~

Council Authority: Lake Macquarie City Council
Date of endorsement: 24 February 2012
Accreditation no: .....
Subdivision Certificate no: 10/2012
File no: DA/1795/2009/A

* Delete whichever is inapplicable.

Surveying and Spatial Information Regulation 2006

I, ALEX LASCELLES
of de Witt Consulting P.O. Box 859 CHARLESTOWN 2290
a surveyor registered under the Surveying and Spatial Information Act 2002 certify that the survey represented in this plan is accurate, has been made in accordance with the Surveying and Spatial Information Regulation 2006, and was completed
on 28th JULY 2011
This survey relates to Part Lot 100 & Lots 101-102
(specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)

Signature A. Lascelles Dated 10/2/12
Surveyor registered under the Surveying and Spatial Information Act, 2002
Datum Line: 'X' - 'Y'
Type: Urban / ~~Rural~~

Plans used in preparation of survey/compilation.

D.P.1120431	D.P.245648	D.P.30206
D.P.814499	D.P.258986	D.P.1120431

(If insufficient space use Plan Form 6A annexure sheet)

SURVEYORS REFERENCE: 026

ePlan

PLAN FORM 6A (Annexure Sheet) WARNING:CREASING OR FOLDING WILL LEAD TO REJECTION

DEPOSITED PLAN ADMINISTRATION SHEET Sheet 2 of 2 sheet(s)

PLAN OF SUBDIVISION OF LOT 10 D.P.651218
LOT 12 D.P.30206

DP1173625

Registered: 26.6.2012

Subdivision Certificate No: SC\10\2012 Date of Endorsement: 24 FEBRUARY 2012

AUSTRALIA AND NEW ZEALAND
BANKING GROUP LIMITED
A.C.N. 005 357 522
BY ITS ATTORNEY UNDER POWER
OF ATTORNEY BOOK No. 4465 No. 246

ACTING MANAGER SECURITIES

Peter Charles Hicks - Trustee

Judith Lamb.
Judith LAMB.

GREG. 024 JOHN. E
TRUSTEE

JEFFREY JOHN WILLIAMS

G. Field
Greg Field
Lake Macquarie City Council

SURVEYORS REFERENCE: 028

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
28/4/2017 8:32AM

FOLIO: 10/651218

First Title(s): OLD SYSTEM
Prior Title(s): VOL 10206 FOL 60

Recorded	Number	Type of Instrument	C.T. Issue
2/12/1992		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
17/12/1993		AMENDMENT: TITLE DIAGRAM	
11/9/2007	DP1116890	DEPOSITED PLAN	EDITION 1
16/5/2012	AG986515	TRANSMISSION APPLICATION (EXECUTOR, ADMINISTRATOR, TRUSTEE)	
26/6/2012	DP1173625	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
28/4/2017 8:31AM

FOLIO: 100/1173625

First Title(s): OLD SYSTEM
Prior Title(s): 10/651218

Recorded	Number	Type of Instrument	C.T. Issue
26/6/2012	DP1173625	DEPOSITED PLAN	FOLIO CREATED EDITION 1
22/11/2012	AH384283	TRANSFER	EDITION 2
31/1/2014	AI343751	MORTGAGE	EDITION 3

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 100/1173625

SEARCH DATE	TIME	EDITION NO	DATE
28/4/2017	8:28 AM	3	31/1/2014

LAND

LOT 100 IN DEPOSITED PLAN 1173625
AT SPEERS POINT
LOCAL GOVERNMENT AREA LAKE MACQUARIE
PARISH OF KAHIBAH COUNTY OF NORTHUMBERLAND
TITLE DIAGRAM DP1173625

FIRST SCHEDULE

NIGEL ANDREW BLUNDELL (T AH384283)

SECOND SCHEDULE (9 NOTIFICATIONS)

---

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 660840 LAND EXCLUDES MINERALS
3 DP1116890 EASEMENT TO DRAIN WATER 2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
4 DP1116890 EASEMENT FOR ASSET PROTECTION ZONE 20 METRE(S) WIDE AND VARIABLE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
5 DP1173625 EASEMENT TO DRAIN WATER 2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
6 DP1173625 EASEMENT FOR ASSET PROTECTION ZONE 20 METRE(S) WIDE AND VARIABLE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
7 DP1173625 RESTRICTION(S) ON THE USE OF LAND REFERRED TO AND NUMBERED (3) IN THE S.88B INSTRUMENT
8 DP1173625 RESTRICTION(S) ON THE USE OF LAND REFERRED TO AND NUMBERED (5) IN THE S.88B INSTRUMENT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM
9 AI343751 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Appendix E

COUNCIL PROVIDED INFOMRATION

Lake Macquarie City Council

5 July 2016

INFOTRACK PTY LTD
DX 578
SYDNEY

Our Ref:103314
Your Ref:
14995:42424
ABN 81 065 027 868

SECTION 149 PLANNING CERTIFICATE

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979

Fee Paid: 53.00

Receipt No: 8831407

Receipt Date: 4 July 2016

DESCRIPTION OF LAND

Address: 40 Rayford Street, WARNERS BAY NSW 2282

Lot Details: Lot 6 DP 814499

Parish: Kahibah

County: Northumberland

For: BRIAN BELL
GENERAL MANAGER

J Hayes

Our Ref: Your Ref:

ADVICE PROVIDED IN ACCORDANCE WITH SECTION 149(2)

1 Names of Relevant Planning Instruments and Development Control Plans

(1) The name of each environmental planning instrument that applies to the carrying out of development on the land.

Lake Macquarie Local Environmental Plan 2014

State Environmental Planning Policy - (Housing for Seniors or People with a Disability) 2004 (This SEPP applies to the land to the extent provided by Clause 4 of the SEPP)

State Environmental Planning Policy (Affordable Rental Housing) 2009

State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004

State Environmental Planning Policy (Exempt and Complying Development Codes) 2008

State Environmental Planning Policy (Infrastructure) 2007

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007

State Environmental Planning Policy (State and Regional Development) 2011

State Environmental Planning Policy (State Significant Precincts) 2005

State Environmental Planning Policy No. 19 – Bushland in Urban Areas

State Environmental Planning Policy No. 21 – Caravan Parks

State Environmental Planning Policy No. 32 – Urban Consolidation (Redevelopment of Urban Land)

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

State Environmental Planning Policy No. 44 – Koala Habitat Protection

State Environmental Planning Policy No. 50 – Canal Estate Development

State Environmental Planning Policy No. 55 – Remediation of Land

State Environmental Planning Policy No. 62 - Sustainable Aquaculture

State Environmental Planning Policy No. 64 – Advertising and Signage

State Environmental Planning Policy No. 71 – Coastal Protection

(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act (unless the Secretary has notified the council that the making of the proposed instrument has been deferred indefinitely or has not been approved).

Lake Macquarie Local Environmental Plan 2014 (Amendment No. F2014/01451)

Lake Macquarie Local Environmental Plan 2014 (Amendment No. RZ/3/2014)

Lake Macquarie Local Environmental Plan 2014 (Amendment No. F2016/00440)

Lake Macquarie Local Environmental Plan 2014 (Amendment No. RZ/11/2014)

(3) The name of each development control plan that applies to the carrying out of development on the land.

Lake Macquarie Development Control Plan 2014

(4) In this clause, proposed environmental planning instrument includes a planning proposal for a Local Environmental Plan or a Draft environmental planning instrument.

2 Zoning and land use under relevant Local Environmental Plans

(1) The following answers (a) to (h) relate to the instrument (see 1(1) above).

(a) (i) The identity of the zone applying to the land.

E2 Environmental Conservation

under Lake Macquarie Local Environmental Plan 2014

(ii) The purposes for which the instrument provides that development may be carried out within the zone without the need for development consent.

Exempt development as provided in Schedule 2; Home occupations

(iii) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent.

Bed and breakfast accommodation; Boat sheds; Building identification signs; Business identification signs; Car parks; Community facilities; Dual occupancies (attached); Dwelling houses; Eco-tourist facilities; Emergency services facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Home-based child care; Home businesses; Information and education facilities; Recreation areas; Roads; Water recreation structures

(iv) The purposes for which the instrument provides that development is prohibited within the zone.

Business premises; Hotel or motel accommodation; Industries; Multi dwelling housing; Recreation facilities (major); Residential flat buildings;

Restricted Premises; Retail premises; Seniors housing; Service stations; Warehouse or distribution centres; and any other development not specified in item (ii) or (iii)

(i) The identity of the zone applying to the land

R2 Low Density Residential

under Lake Macquarie Local Environmental Plan 2014

(ii) The purposes for which the instrument provides that development may be carried out within the zone without the need for development consent.

Exempt development as provided in Schedule 2; Home-based child care; Home occupations

(iii) The purposes for which the instrument provides that development may not be carried out within the zone except with development consent.

Bed and breakfast accommodation; Boarding houses; Boat sheds; Building identification signs; Business identification signs; Child care centres; Community facilities; Dual occupancies; Dwelling houses; Emergency services facilities; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Group homes; Health consulting rooms; Home businesses; Home industries; Hostels; Kiosks; Neighbourhood shops; Places of public worship; Recreation areas; Respite day care centres; Roads; Secondary dwellings; Semi-detached dwellings; Seniors housing; Shop top housing; Water recreation structures

(iv) The purposes for which the instrument provides that development is prohibited within the zone.

Any other development not specified in item (ii) or (iii)

NOTE: **Under Lake Macquarie Local Environmental Plan 2014 (Amendment No. RZ/3/2014), the Planning Proposal seeks to permit with consent utility infrastructure, *water supply system, sewage treatment plant and water recycling facility* in this zone to support development, while maintaining environmental zones for environmental purposes.**

NOTE: **The advice in sections (a) above relates only to restrictions that apply by virtue of the zones indicated. The Lake Macquarie LEP 2014 includes additional provisions that require development consent for particular types of development, or in particular circumstances, irrespective of zoning.**

(b) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.

Yes, there are development standards applying to the land that fix minimum land dimensions for the erection of a dwelling house.

Minimum lot size of 40 ha. Refer to Clause 4.2a of LMLEP 2014 for further information.

(c) Whether the land includes or comprises critical habitat.

No

(d) Whether the land is in a conservation area (however described).

Yes

(e) Whether an item of environmental heritage (however described) is situated on the land.

Local Environmental Plan 2014 Schedule 5 Part 1 Heritage Items

There are no items listed for this land under Local Environmental Plan 2014 Schedule 5 Part 1 Heritage items.

Local Environmental Plan 2014 Schedule 5 Part 2 Heritage conservation areas

There are no items listed for this land under Local Environmental Plan 2014 Schedule 5 Part 2 Heritage conservation areas.

Local Environmental Plan 2014 Schedule 5 Part 3 Archaeological sites

There are no items listed for this land under Local Environmental Plan 2014 Schedule 5 Part 3 Archaeological sites.

Local Environmental Plan 2014 Schedule 5 Part 4 Landscape Items

There are no items listed for this land under Local Environmental Plan 2014 Schedule 5 Part 4 Landscape items.

Local Environmental Plan 2004 Schedule 4 Part 1 Heritage Items

There are no heritage items listed for this land within Local Environmental Plan 2004 Schedule 4 Part 1.

NOTE: **An item of environmental heritage, namely Aboriginal heritage, listed within the Aboriginal Heritage Information Management System (AHIMS), may affect the land. The applicant should contact the Office of Environment and Heritage (OEH) for more information.**

(2) The following answers relate to the Draft Instrument (see 1(2) above).

(a) Nil

NOTE: The advice in section (a) above relates only to restrictions that apply by virtue of the zones indicated. The Draft instrument may include additional provisions that require development consent for particular types of development, or in particular circumstances, irrespective of zoning.

(b) Whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.

There are no development standards applying to the land that fix minimum land dimensions for the erection of a dwelling house.

(c) Whether the land includes or comprises critical habitat.

No

(d) Whether the land is in a conservation area (however described).

No

(e) Whether an item of environmental heritage (however described) is situated on the land.

No

3 Complying development

The extent to which the land is land on which complying development may be carried out under each of the codes for complying development because of the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), and 1.18 (1) (c3) and 1.19 of *State Environmental Planning Policy (Exempt and Complying Development Codes) 2008*.

General Housing Code

Complying development under the General Housing Code MAY NOT be carried out on part of the land because the land is partly affected by specific land exemptions.

Note: If the land is only affected by the "heritage conservation area" exemption, then complying development under the General Housing Code MAY be carried out on the land if the development is a detached outbuilding or swimming pool.

The land is affected by the following specific land exemptions:

The land is excluded land being land identified by an environmental planning instrument as being environmentally sensitive or within an ecologically sensitive area.

The land is within an environmentally sensitive area being land within an area of high aboriginal cultural significance.

Housing Alterations Code

Complying development under the Housing Alterations Code MAY NOT be carried

out on part of the land because the land is partly affected by specific land exemptions.

The land is affected by the following specific land exemptions:

The land is within an environmentally sensitive area being land within an area of high aboriginal cultural significance.

Commercial and Industrial Alterations Code

Complying development under the Commercial and Industrial Alterations Code MAY NOT be carried out on part of the land because the land is partly affected by specific land exemptions.

The land is affected by the following specific land exemptions:

The land is within an environmentally sensitive area being land within an area of high aboriginal cultural significance.

Commercial and Industrial (New Buildings and Additions) Code

Complying development under the Commercial and Industrial (New Buildings and Additions) Code MAY NOT be carried out on part of the land because the land is partly affected by specific land exemptions.

The land is affected by the following specific land exemptions:

The land is excluded land being land identified by an environmental planning instrument as being environmentally sensitive or within an ecologically sensitive area.

The land is within an environmentally sensitive area being land within an area of high aboriginal cultural significance.

Subdivisions Code

Complying development under the Subdivisions Code MAY NOT be carried out on part of the land because the land is partly affected by specific land exemptions.

The land is affected by the following specific land exemptions:

The land is within an environmentally sensitive area being land within an area of high aboriginal cultural significance.

Rural Housing Code

Complying development under the Rural Housing Code MAY NOT be carried out on part of the land because the land is partly affected by specific land exemptions.

Note: If the land is only affected by the "heritage conservation area" exemption, then complying development under the Rural Housing Code MAY be carried out on the land if the development is a detached outbuilding or swimming pool.

The land is affected by the following specific land exemptions:

The land is excluded land being land identified by an environmental planning instrument as being environmentally sensitive or within an ecologically sensitive

area.

The land is within an environmentally sensitive area being land within an area of high aboriginal cultural significance.

General Development Code

Complying development under the General Development Code MAY NOT be carried out on part of the land because the land is partly affected by specific land exemptions.

The land is affected by the following specific land exemptions:

The land is within an environmentally sensitive area being land within an area of high aboriginal cultural significance.

Demolition Code

Complying development under the Demolition Code MAY NOT be carried out on part of the land because the land is partly affected by specific land exemptions.

The land is affected by the following specific land exemptions:

The land is within an environmentally sensitive area being land within an area of high aboriginal cultural significance.

Fire Safety Code

Complying development under the Fire Safety Code MAY NOT be carried out on part of the land because the land is partly affected by specific land exemptions.

The land is affected by the following specific land exemptions:

The land is within an environmentally sensitive area being land within an area of high aboriginal cultural significance.

4 Coastal Protection

Whether or not the land is affected by the operation of section 38 or 39 of the Coastal Protection Act 1979, but only to the extent that the Council has been so notified by the Department of Public Works.

The land is within the defined coastal zone for the purpose of the Coastal Protection Act 1979 and no notifications have been received from the Department of Natural Resources under that Act.

4A Information relating to beaches and coasts

1 Whether an order has been made under Part 4D of the Coastal Protection Act 1979 in relation to temporary coastal protection works (within the meaning of that Act) on the land (or on public land adjacent to that land), except where the council is satisfied that such an order has been fully complied with.

Nil

2 (a) Whether the council has been notified under section 55X of the Coastal Protection Act 1979 that temporary coastal protection works (within the meaning of that Act) have been placed on the land (or on public land adjacent to that land)

Nil

(b) If works have been so placed — whether the council is satisfied that the works have been removed and the land restored in accordance with that Act.

Nil

4B Annual charges under Local Government Act 1993 for coastal protection services that relate to existing coastal protection works

Whether the owner (or any previous owner) of the land has consented in writing to the land being subject to annual charges under section 496B of the Local Government Act 1993 for coastal protection services that relate to existing coastal protection works (within the meaning of section 553B of that Act).

Nil

NOTE: "Existing coastal protection works" are works to reduce the impact of coastal hazards on land (such as seawalls, revetments, groynes and beach nourishment) that existed before the commencement of section 553B of the Local Government Act 1993.

5 Mine subsidence

Whether or not the land is proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

The land is within a proclaimed Mine Subsidence District under the *Mine Subsidence Compensation Act 1961*. The approval of the Mines Subsidence Board is required for all subdivision and building, except for certain minor structures. Surface development controls are in place to prevent damage from old, current, or future mining. It is strongly recommended prospective purchasers consult with the Mine Subsidence Board regarding mine subsidence and any surface development guidelines. The Board can assist with information, mine subsidence, and advise whether existing structures comply with the requirements of the *Act*.

6 Road widening and road realignment

Whether the land is affected by any road widening or realignment under:

(a) Division 2 of Part 3 of the Roads Act 1993.

No

(b) any environmental planning instrument.

No

(c) any resolution of the Council.

No, other road widening proposals may affect this land and if so, will be noted on the SECTION 149(5) certificate.

7 Council and other public authority policies on hazard risk restrictions

Whether or not the land is affected by a policy:

(i) adopted by the Council, or

(ii) adopted by any other public authority and notified to the Council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the Council,

that restricts the development of the land because of the likelihood of:

(a) land slip or subsidence

Yes

Relevant sections of Lake Macquarie Development Control Plan 2014 apply when development is proposed on land covered by Council's geotechnical areas map. The map is available for viewing at the Council. If you require any further clarification on the policy and how it may affect any possible development contact the Council on 02 4921 0333.

(b) bushfire

Yes

(c) tidal inundation

No

(d) acid sulfate soils

Yes

Relevant sections of Lake Macquarie Development Control Plan 2014 apply when development is proposed on land covered by the Acid Sulfate Soils Map included in Lake Macquarie Local Environmental Plan 2014. If you require any further clarification on the policy and how it may affect any possible development contact the Council on 02 4921 0333.

(e) any other risk (other than flooding).

Contaminated or potentially contaminated land
Council has adopted a policy that may restrict the development of Contaminated or Potentially Contaminated land. This policy is implemented when zoning, development, or land use changes are proposed. Council does not hold sufficient information about previous use of the land to determine whether the land is contaminated. Consideration of Council's adopted Policy located in DCP 2014, and the application of provisions under relevant State legislation is recommended.

NOTE: **The absence of a council policy restricting development of the land by reason of a particular natural hazard does not mean that the risk from that hazard is non-existent.**

7A Flood related development controls information

(1) Whether or not development on that land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) is subject to flood related development controls.

No

(2) Whether or not development on that land or part of the land for any other purpose is subject to flood related development controls.

No

(3) Words and expressions in this clause have the same meanings as in the standard instrument set out in the *Standard Instrument (Local Environmental Plans) Order 2006.*

8 Land reserved for acquisition

Whether or not any environmental planning instrument or proposed environmental planning instrument referred to in Clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

No

9 Contributions Plans

The name of each contributions plan applying to the land.

Lake Macquarie Development Contributions Plan - Glendale Contributions Catchment - 2015

9A Biodiversity Certified Land

This land is not biodiversity certified land within the meaning of Part 7AA of the Threatened Species Conservation Act 1995.

10 Biobanking Agreements

This land is not subject to a Biobanking agreement entered under Part 7A of the Threatened Species Conservation Act 1995.

11 Bush Fire Prone Land

SOME of the land is bush fire prone land.

NOTE: The Lake Macquarie Bush Fire Prone Land Map can be inspected at Council's Administration Building during normal office hours or contact Council on 02 4921 0333.

12 Property Vegetation Plans

The land IS NOT subject to a property vegetation plan under the Native Vegetation Act 2003.

NOTE: The advice provided in this section is based on notification by the Hunter Central Rivers Catchment Management Authority of the approval of a plan. Further information about property vegetation plans should be obtained from that Authority.

13 Orders under Trees (Disputes Between Neighbours) Act 2006

Has an order been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land (but only if the council has been notified of the order).

The land IS NOT subject to an order made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

14 Directions under Part 3A

If there is a direction by the Minister in force under section 75P (2) (c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect, a statement to that effect identifying the provision that does not have effect.

Nil

15 Site compatibility certificates and conditions for seniors housing

(a) Whether there is a current site compatibility certificate (seniors housing), of which the council is aware, in respect of proposed development on the land.

Council is not aware of any site capability certificate for any proposed development on the land.

(b) Any terms of a kind referred to in clause 18 (2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 that have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.

Nil

16 Site compatibility certificates for infrastructure

Whether there is a valid site compatibility certificate (infrastructure), of which the council is aware, in respect of proposed development on the land.

Council is not aware of any site capability certificate for any proposed development on the land.

17 Site compatibility certificates and conditions for affordable rental housing

(1) Whether there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land.

Council is not aware of any site capability certificate for any proposed development on the land.

(2) Any terms of a kind referred to in clause 17 (1) or 38 (1) of *State Environmental Planning Policy (Affordable Rental Housing) 2009* that have been imposed as a condition of consent to a development application in respect of the land.

Nil

18 Paper subdivision information

(1) The name of any development plan adopted by a relevant authority that applies to the land or that is proposed to be subject to a consent ballot.

Nil

(2) The date of any subdivision order that applies to the land.

Not Applicable

Note Words and expressions used in this clause have the same meaning as they have in Part 16C of Environmental Planning and Assessment Regulation 2000.

19 Site verification certificates

Whether there is a current site verification certificate, of which the council is aware, in respect of the land.

No

(a) The matter certified by the certificate

Not Applicable

(b) The date on which the certificate ceases to be current

Not Applicable

(c) A copy of the certificate (if any) may be obtained from the head office of the Department of Planning and Infrastructure.

Note A site verification certificate sets out the Secretary's opinion as to whether the land concerned is or is not biophysical strategic agricultural land or critical industry cluster land—see Division 3 of Part 4AA of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.

20 Loose-fill asbestos insulation

If the land includes any residential premises (within the meaning of Division 1A of Part 8 of the *Home Building Act 1989*) that are listed on the register that is required to be maintained under that Division

No. Council **has not** been notified that a residential premises erected on this land has been identified in the NSW Fair Trading Loose-Fill Asbestos Insulation Register as containing loose-fill asbestos ceiling insulation.

NOTE: The following matters are prescribed by section 59 (2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate:

Matters arising under the Contaminated Land Management Act 1997 (s59 (2))

(a) The land to which the certificate relates is significantly contaminated land within the meaning of that Act - if the land (or part of the land) is significantly contaminated land at the date when the certificate is issued,

No

(b) The land to which the certificate relates is subject to a management order within the meaning of that Act - if it is subject to such an order at the date when the certificate is issued,

No

(c) The land to which the certificate relates is the subject of an approved voluntary management proposal within the meaning of that Act - if it is the subject of such an

approved proposal at the date when the certificate is issued,

No

(d) The land to which the certificate relates is subject to an ongoing maintenance order within the meaning of that Act - if it is subject to such an order at the date when the certificate is issued,

No

(e) The land to which the certificate relates is the subject of a site audit statement within the meaning of that Act - if a copy of such a statement has been provided at any time to the local authority issuing the certificate.

No

NOTE: Section 26 of the Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009 provides that a planning certificate must include advice about any exemption under section 23 or authorisation under section 24 of the Act if the council is provided with a copy of the exemption or authorisation by the Co-ordinator General under that Act.

Nation Building and Jobs Plan (State Infrastructure Delivery) Act 2009

Council has not been provided with an exemption or authorisation by the Co-ordinator General under the Act.

Appendix F

SOIL BORE LOGS

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB01

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description					
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VL L MD D VD / VS S F ST VST H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J			FILL: Silty sand, fine to medium grained, brown, loose, slightly moist with fine to medium grained rock gravel.	M		No odour or staining observed
												FRAG_1 ~5m from hole SB1_0.2
				0.30					FILL: Silty sand, fine to medium grained, light brown, dense, dry with fine to medium grained rock gravel.			
					PID=0 ppm	J						SB1_0.4
				0.60					Refusal END OF BOREHOLE AT 0.60 m			
				1								

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB02

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J			FILL: Silty sand, fine to medium grained, brown, with fine to medium rock gravel.	M		No odour or staining observed SB2_0.1
				0.20	PID=0 ppm	J			Silty SAND: Fine grained, grey to tan with fine to medium grained conglomerate gravel.	D		Tree root observed SB2_0.3
				0.50					Refusal. END OF BOREHOLE AT 0.50 m			
				1								

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

SB03

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VL L MD D VD / VS S F ST VST H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J			FILL: Silty sand, fine grained, brown, with fine to medium grained rock gravel (20%).	M		No odour or staining observed.
												SB3_0.2
				0.30					FILL: As above, becoming grey.	D		
				0.40	PID=0 ppm	J			Silty CLAY, low plasticity, mottled grey, brown and orange with some sand and gravels.			SB3_0.5 + DUP1 + TRIP1
					PID=0 ppm	J						SB3_0.8
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB04

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description					
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY FB VS VL S L F MD ST D VST VD H	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J			FILL: Silty sand, fine grained, brown, with fine to medium grained rock gravel (20%).	M		No odour or staining observed SB4_0.1 SB4_0.3
				0.40	PID=0 ppm	J			Refusal. END OF BOREHOLE AT 0.40 m			
				1								

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB05

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VL L MD D VD / VS S F ST VST H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Gravelly sand, fine grained, grey brown, with fine to medium grained gravel and reworked clay.	M		SB5_0.1
					PID=0 ppm	J						SB5_0.4
				0.80					Silty CLAY: Grey to black, with some sand and gravel (10%) and rootlets.			Slight organic odour.
					PID=0.5 ppm	J						SB5_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB06

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Gravelly sand, fine to medium grained, grey brown, with trace clay (10%).	D		SB6_0.0
					PID=0 ppm	J						SB6_0.1
				0.20					FILL: As above, grey with some orange. Possibly reworked natural.			
												SB6_0.3
				0.35	PID=0 ppm	J			Silty CLAY: Grey, with trace orange gravel.			
				0.40					Refusal, inferred coarse gravel. END OF BOREHOLE AT 0.40 m			
				1								

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB07

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description					
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Gravelly sand, grey.	D		SB7_0.0
					PID=0 ppm	J						SB7_0.2 + DUP2 + TRIP2
				0.30					FILL: As above, becoming light grey.			
					PID=0 ppm	J						SB7_0.4
				0.50					Refusal, inferred coarse gravel. END OF BOREHOLE AT 0.50 m			
				1								

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB08

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST / FB VL L MD D VD H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Gravelly sand, light grey to brown, with fine to medium grained gravel.	D		SB8_0.0 No odour or staining
					PID=0 ppm	J						SB8_0.2
				0.50	PID=0 ppm	J			Silty CLAY: grey, friable.			SB8_0.5
					PID=0 ppm	J						SB8_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

SB09

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description					
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J			FILL: Gravelly sand, grey.	D		No odours or staining observed. SB9_0.2
				0.40					Refusal, inferred coarse gravel or cobbles. END OF BOREHOLE AT 0.40 m			
				1								

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB10

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VL L MD D VD / VS S F ST VST H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J			FILL: Gravelly silt, grey with fine to medium grained gravel.	D		No odours or staining observed. SB10_0.1
				0.40	PID=0 ppm	J			FILL: Sandy clay, red brown, friable.			SB10_0.4
				0.80	PID=0 ppm	J			Sandy CLAY: Mottled grey and light orange, friable, with fine to medium grained gravel.			SB10_0.8
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB11

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA									FILL: Gravelly sand, fine grained, with fine to coarse grained rock gravel.	D		No odours or staining observed.
					PID=0 ppm	J						SB11_0.2
				0.50					FILL: Sandy clay, pale yellow.	M		SB11_0.5
					PID=0 ppm	J						
				0.60					FILL: Gravelly silt, grey, medium dense, with fine grained sand.	D		
					PID=0 ppm	J						SB11_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB12

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description					
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST FB VL L MD D VD H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J			FILL: Gravelly sand, fine grained with fine to coarse grained rock gravel.	D		No odours or staining observed.
												SB12_0.2
					PID=0 ppm	J						SB12_0.4
				0.50					Refusa, inferred coarse gravel. END OF BOREHOLE AT 0.50 m			
				1								

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

SB13

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description					
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VL L MD D VD / VS S F ST VST H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J			FILL: Clayey sand, fine to medium grained, grey brown, with fine grained gravel (10%).	D		SB13_0.2
				0.30					Sandy CLAY: mottled grey and orange, with some gravel.	M		
					PID=0 ppm	J						SB13_0.6
				0.80					END OF BOREHOLE AT 0.80 m			
				1								

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB14

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VL L MD D VD / VS S F ST VST H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Gravelly sand, fine grained, grey, with fine to coarse grained gravels.	D		No odour or staining observed.
												SB14_0.1
					PID=0 ppm	J						SB14_0.2
				0.30					Sandy CLAY: Mottled grey and orange, soft to firm, with some gravels.			
					PID=0 ppm	J						SB14_0.5
				0.90	PID=0 ppm	J			Sandy CLAY: Mottled light grey and orange.			SB14_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB15

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0.5 ppm	J+B			FILL: Gravelly sand, fine grained, grey brown.	D		No odour or staining observed SB15_0.1
					PID=0 ppm	J+B						SB15_0.3
				0.40					Sandy CLAY: low plasticity, light brown, with some fine to medium grained gravel.	M		Possibly reworked
					PID=0 ppm	J+B						SB15_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB16

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST FB VL L MD D VD H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0.5 ppm	J+B			FILL: Gravelly sand, fine grained, grey brown.	D		No odour or staining observed SB16_0.1
				0.40	PID=0 ppm	J+B			Sandy CLAY: low plasticity, light brown, with some fine to medium grained gravel.	M		Possibly reworked SB16_0.5
					PID=0 ppm	J+B						SB16_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

SB17

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST FB VL L MD D VD H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Gravelly sand, fine grained, grey brown.	D		No odour or staining observed SB17_0.2
				0.40	PID=0 ppm	J+B			Sandy CLAY: low plasticity, mottled grey and orange, with some fine grained gravel.	M		SB17_0.5
					PID=0 ppm	J+B						SB17_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB18

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VL L MD D VD / VS S F ST VST H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Gravelly sand, fine grained, grey brown.	D		No odour or staining observed SB18_0.1 SB18_0.3 Possibly reworked
				0.50					Sandy CLAY: low plasticity, brown, with some fine grained gravel.	M		
				0.80					As above, light brown.			SB18_0.9
				1.00	PID=0 ppm	J+B						
				1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB19

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Gravelly sand, fine grained, grey.	D		No odour or staining observed SB19_0.1, DUP1, TRIP1
				0.40	PID=0 ppm	J+B			As above, becoming clayey sand.			SB19_0.4 Possibly reworked
				0.80	PID=0 ppm	J+B			Sandy CLAY: low plasticity, mottled grey and orange, with some fine grained gravel.	M		SB19_0.8
				1								
				1.20					END OF BOREHOLE AT 1.20 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

SB20

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA									FILL: Gravelly sand, fine grained, grey brown.	D		No odour or staining observed
					PID=0 ppm	J+B						SB20_0.2
				0.40					Sandy CLAY: low plasticity, brown, with some fine to medium grained gravel.	M		Possibly reworked
					PID=0 ppm	J+B						SB20_0.5
				0.80					As above, becoming lighter.			
					PID=0 ppm	J+B						SB20_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB21

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) / DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (FB VL L MD D VD / VS S F ST VST H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Clayey sand, fine grained, grey, with some fine to medium grained gravel.	W		No odour or staining observed SB21_0.1
					PID=0 ppm	J+B						Possibly reworked SB21_0.4
				0.70					Sandy CLAY: low plasticity, mottled grey and orange, with some fine grained gravel.	M		
					PID=0 ppm	J+B						SB21_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE ENVIRONMENTAL LOG

BOREHOLE NO.

SB22

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST FB VL L MD D VD H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Clayey sand, fine grained, grey, with some fine to medium grained gravel.	M		No odour or staining observed SB22_0.1
				0.40	PID=0 ppm	J+B			Sandy CLAY: low plasticity, mottled grey and orange, with some fine grained gravel.			Possibly reworked SB22_0.4
					PID=0 ppm	J+B						SB22_0.9
				1.00 1					END OF BOREHOLE AT 1.00 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

SB23

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description				
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST FB VL L MD D VD H)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA					PID=0 ppm	J+B			FILL: Clayey sand, fine grained, grey, with some fine to medium grained gravel.	M		No odour or staining observed
												SB23_0.2
				0.40	PID=0 ppm	J+B			Sandy CLAY: low plasticity, mottled grey and orange, with some fine to coarse grained gravel.			Possibly reworked, some riverstones SB23_0.4
					PID=0 ppm	J+B						SB23_0.9
				1								
				1.10					END OF BOREHOLE AT 1.10 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

SB24

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**3/5/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**3/5/17**
Borehole Location:	**19 Daydawn Ave, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description					
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY (VS S F ST VST H / FB VL L MD D VD)	STRUCTURE AND ADDITIONAL OBSERVATIONS
HA									FILL: Gravelly sand, fine grained, grey brown, with fine to medium grained gravel.	D		No odour or staining observed
												SB24_0.1
					PID=0 ppm	J+B						
				0.50					As above, light brown.			SB24_0.5
					PID=0 ppm	J+B						
												SB24_0.9
					PID=0 ppm	J+B						
				1								
				1.20					END OF BOREHOLE AT 1.20 m			

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

WSP | PARSONS BRINCKERHOFF

BOREHOLE NO.

BOREHOLE ENVIRONMENTAL LOG

SED1

SHEET 1 OF 1

Client:	**Pulver Cooper and Blackley Pty Ltd**	Date Commenced:	**2/2/17**
Project:	**PSI - 40 Rayford St and 19 Daydawn Ave, Warners Bay NSW**	Date Completed:	**2/2/17**
Borehole Location:	**40 Rayford St, Warners Bay NSW**	Recorded By:	**PB**
Project Number:	**2270547A**	Log Checked By:	**PB**

Drill Model/Mounting:	**Hand Auger**	Driller:	Surface RL:
Borehole Diameter:	**70 mm**	Driller Lic No:	Co-ords:

Borehole Information							Field Material Description					
1	2	3	4	5	6	7	8	9	10	11	12	13
METHOD	SUPPORT	WATER	WELL CONSTRUCTION	RL(m) DEPTH(m)	FIELD TEST	SAMPLE	GRAPHIC LOG	USC SYMBOL	SOIL/ROCK MATERIAL FIELD DESCRIPTION	MOISTURE	RELATIVE DENSITY /CONSISTENCY VS S F ST VST H / FB VL L MD D VD	STRUCTURE AND ADDITIONAL OBSERVATIONS
									CLAY: Grey and black, wet.			No odour or staining observed.
												SED1
					PID=0 ppm							
				0.20					END OF BOREHOLE AT 0.10 m			
				1								

This borehole log should be read in conjunction with WSP | Parsons Brinckerhoff's accompanying standard notes.

Appendix G

SOIL ANALYTICAL TABLES

WSP | PARSONS BRINCKERHOFF

Table 1
Analytical Results - Soil

Preliminary Site Investigation
40 Rayford St and 19 Daydawn Ave Warners Bay NSW
Pulver Cooper and Blackley Pty Ltd

						Physical Parameters		MNA Indicators		Inorganics									Asbestos							Metals							
						pH (Lab)	Clay	Sodium	TOC	Calcium	Magnesium	Potassium	Exchangeable Calcium	Exchangeable Magnesium	Exchangeable Potassium	Exchangeable Sodium	CEC	Organic Matter (calc)	Asbestos fibres	Asbestos Type	weight of sample	Asbestos in soil (<2mm AF/FA)	Asbestos in soil (>2mm to <7mm AF/FA)	Asbestos in soil (<7mm AF/FA)	Asbestos in soil (>7mm ACM)	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
						pH_Units	%	mg/kg	%w/w	mg/kg	mg/kg	mg/kg	meq/100g	meq/100g	meq/100g	meq/100g	meq/100g	%w/w	Detect	-	g	%w/w	%w/w	%w/w	%w/w	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR						0	0	2	500	2	2	2	0.01	0.02	0.01	0.01	0.02	0.1	0	-	1	0.001	0.001	0.001	0.01	3	0.3	0.3	0.5	1	0.05	0.5	0.5
NEPM HIL-A Residential						-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.01	100	20	-	6000	300	40	400	7,400
NEPM HSL-A/B, 0m to <1m, Sand, Soil						-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM EIL, Urban Res & Open Space						-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100	-	620	50	1100	-	180	370
NEPM ESL, Urban Res & Open Space, Coarse						-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Location	**Field ID**	**Date**	**Lab Report**	**Depth**	**Property**																												
-	FRAG_1	2/02/2017	SE161717	-	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FRAG_2	2/02/2017	SE161717	-	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	**Detect**	**Chrysotile**	-	-	-	-	-	-	-	-	-	-	-	-	-
SED1	SED1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8**	**1.5**	**9.1**	**11**	**43**	**0.07**	**3.4**	**130**
SB1	SB1_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**12**	**0.9**	**7.1**	**9.6**	**46**	**0.09**	**5.9**	**62**
SB2	SB2_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**11**	**1.1**	**7.5**	**10**	**40**	**0.07**	**5.2**	**89**
SB3	SB3_0.5	2/02/2017	SE161717	0.5	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**9**	<0.3	**11**	**5.4**	**7**	<0.05	**3.3**	**18**
SB4	SB4_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**10**	**1.6**	**7.1**	**12**	**81**	**0.11**	**5.1**	**86**
SB4	SB4_0.3	2/02/2017	SE161717	0.3	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB5	SB5_0.1	2/02/2017	SE161717A	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**588**	<0.001	<0.001	<0.001	<0.01	-	-	-	-	-	-	-	-
SB5	SB5_0.4	2/02/2017	SE161717	0.4	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8**	<0.3	**7.3**	**7.3**	**17**	<0.05	**4.1**	**38**
SB6	SB6_0.0	2/02/2017	SE161717	0	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**592**	<0.001	<0.001	<0.001	<0.01	-	-	-	-	-	-	-	-
SB6	SB6_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**7**	**0.5**	**5**	**5.7**	**28**	<0.05	**2.4**	**55**
SB6	SB6_0.3	2/02/2017	SE161717	0.3	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB7	SB7_0.0	2/02/2017	SE161717A	0	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**622**	<0.001	<0.001	<0.001	<0.01	-	-	-	-	-	-	-	-
SB7	SB7_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**10**	**1.8**	**9.4**	**16**	**72**	**0.14**	**4.8**	**110**
SB8	SB8_0.0	2/02/2017	SE161717	0	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**513**	<0.001	<0.001	<0.001	<0.01	-	-	-	-	-	-	-	-
SB8	SB8_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**7**	**0.9**	**7**	**10**	**48**	**0.1**	**5.4**	**79**
SB9	SB9_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**11**	**0.8**	**5.9**	**28**	**45**	**0.06**	**4.6**	**97**
SB10	SB10_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**12**	**1.6**	**12**	**13**	**66**	**0.07**	**3.5**	**100**
SB11	SB11_0.5	2/02/2017	SE161717	0.5	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5**	<0.3	**5.7**	**7.4**	**14**	<0.05	**2**	**82**
SB12	SB12_0.3	2/02/2017	SE161717	0.3	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**8**	<0.3	**8.1**	**4.3**	**11**	**0.06**	**2.8**	**20**
SB13	SB13_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5**	**0.6**	**5**	**7.5**	**24**	<0.05	**3**	**50**
SB14	SB14_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**419**	<0.001	<0.001	<0.001	<0.01	-	-	-	-	-	-	-	-
SB14	SB14_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**16**	**2.3**	**7.6**	**13**	**89**	**0.11**	**7**	**180**
SB14	SB14_0.9	2/02/2017	SE161717	0.9	Property 1	**5.4**	**36**	**460**	**0.17**	**510**	**770**	**150**	**2.5**	**6.3**	**0.39**	**2**	**11**	**0.3**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB15	SB15_0.3	3/05/2017	SE164924	0.3	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**11**	**0.6**	**7.1**	**20**	**37**	**0.09**	**9.1**	**42**
SB16	SB16_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**630**	<0.001	<0.001	<0.001	<0.01	**8**	**1.1**	**6.5**	**14**	**47**	**0.08**	**9.4**	**100**
SB17	SB17_0.2	3/05/2017	SE164924	0.2	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**605**	<0.001	<0.001	<0.001	<0.01	**7**	**1.1**	**8.9**	**18**	**52**	**0.09**	**7.9**	**88**
SB18	SB18_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**7**	**1.4**	**8.9**	**16**	**53**	**0.1**	**8.8**	**120**
SB18	SB18_0.9	3/05/2017	SE164924	0.9	Property 2	**6.8**	**13**	**31**	**0.79**	**660**	**98**	**300**	**3.3**	**0.8**	**0.76**	**0.13**	**5**	**1.4**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB19	SB19_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**513**	<0.001	<0.001	<0.001	<0.01	**8**	**1.5**	**10**	**13**	**60**	**0.09**	**7.1**	**110**
SB20	SB20_0.5	3/05/2017	SE164924	0.5	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4**	<0.3	**14**	**8.4**	**11**	**0.05**	**7.1**	**18**
SB21	SB21_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**7**	**0.5**	**12**	**11**	**30**	**0.07**	**7.7**	**47**
SB22	SB22_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**490**	<0.001	<0.001	<0.001	<0.01	-	-	-	-	-	-	-	-
SB22	SB22_0.4	3/05/2017	SE164924	0.4	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5**	<0.3	**11**	**5.6**	**11**	<0.05	**4.2**	**19**
SB23	SB23_0.2	3/05/2017	SE164924	0.2	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**5**	<0.3	**8.6**	**6**	**13**	**0.06**	**5.2**	**16**
SB24	SB24_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	**481**	<0.001	<0.001	<0.001	<0.01	-	-	-	-	-	-	-	-
SB24	SB24_0.5	3/05/2017	SE164924	0.5	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**4**	<0.3	**7**	**11**	**8**	<0.05	**5.1**	**29**
Statistical Summary																																	
Number of Results						2		2	2	2	2	2	2	2	2	2	2	2	12	-	10	10	10	10	10	28	28	28	28	28	28	28	28
Number of Detects						17		17	17	17	17	17	17	17	17	17	17	17	1	-	10	0	0	0	0	28	20	28	28	28	21	28	28
Minimum Concentration						5.4		31	0.17	510	98	150	2.5	0.8	0.39	0.13	5	0.3	0	-	419	<0.001	<0.001	<0.001	<0.01	4	<0.3	5	4.3	7	<0.05	2	16
Minimum Detect						5.4		31	0.17	510	98	150	2.5	0.8	0.39	0.13	5	0.3	ND	-	419	ND	ND	ND	ND	4	0.5	5	4.3	7	0.05	2	16
Maximum Concentration						6.8		460	0.79	660	770	300	3.3	6.3	0.76	2	11	1.4	0	-	630	<0.001	<0.001	<0.001	<0.01	16	2.3	14	28	89	0.14	9.4	180
Maximum Detect						6.8		460	0.79	660	770	300	3.3	6.3	0.76	2	11	1.4	ND	-	630	ND	ND	ND	ND	16	2.3	14	28	89	0.14	9.4	180
Average Concentration																			0	-	545	0.0005	0.0005	0.0005	0.005	8.2	0.84	8.4	11	38	0.067	5.4	71
Median Concentration						6.1		245.5	0.48	585	434	225	2.9	3.55	0.575	1.065	8	0.85	0	-	550.5	0.0005	0.0005	0.0005	0.005	8	0.8	7.6	11	40	0.07	5.1	79
Standard Deviation																			0	-	71	0	0	0	0	2.9	0.64	2.3	5.4	24	0.033	2.1	42
Number of Guideline Exceedances						0		0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)						0		0	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0	0	0	0	0	0	0	0	0	0

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Table 1
Analytical Results - Soil

Preliminary Site Investigation
40 Rayford St and 19 Daydawn Ave Warners Bay NSW
Pulver Cooper and Blackley Pty Ltd

						Total Petroleum Hydrocarbons				Total Recoverable Hydrocarbons							BTEX							PAH / Phenols																					
						C6 - C9	C10 - C14	C15 - C28	C29-C36	+C10 - C36 (Sum of total)	C6-C10	F1 C6-C10 less BTEX	>C10-C16	F2 C10-C16 less Naphthalene	>C16-C34	>C34-C40	C10 - C40 (Sum of total)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Total BTEX	1-Methylnaphthalene	2,4-dimethylphenol	2,4-dinitrophenol	2-methylnaphthalene	2-methylphenol	2-nitrophenol	4-chloro-3-methylphenol	4-nitrophenol	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	B(a)P Total Potency Equivalent	Benzo(b+j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	TEQ	mg/kg	mg/kg	mg/kg
LOR						20	20	45	45	110	25	25	25	25	90	120	210	0.1	0.1	0.1	0.1	0.2	0.3	0.6	0.1	0.5	2	0.1	0.5	0.5	2	1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
NEPM HIL-A Residential						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-	-	-
NEPM HSL-A/B, 0m to <1m, Sand, Soil						-	-	-	-	-	-	45	-	110	-	-	-	0.5	160	55	-	-	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM EIL, Urban Res & Open Space						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM ESL, Urban Res & Open Space, Coarse						-	-	-	-	-	-	180	-	120	300	2800	-	50	85	70	-	-	105	-	-	-	-	-	-	-	-	-	-	-	-	-	0.7	-	-	-	-
Location	**Field ID**	**Date**	**Lab Report**	**Depth**	**Property**																																					
-	FRAG_1	2/02/2017	SE161717	-	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FRAG_2	2/02/2017	SE161717	-	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED1	SED1	2/02/2017	SE161717	0.1	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB1	SB1_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB2	SB2_0.1	2/02/2017	SE161717	0.1	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB3	SB3_0.5	2/02/2017	SE161717	0.5	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4	SB4_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4	SB4_0.3	2/02/2017	SE161717	0.3	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	-	-	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB5	SB5_0.1	2/02/2017	SE161717A	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB5	SB5_0.4	2/02/2017	SE161717	0.4	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6	SB6_0.0	2/02/2017	SE161717	0	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6	SB6_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6	SB6_0.3	2/02/2017	SE161717	0.3	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	-	-	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB7	SB7_0.0	2/02/2017	SE161717A	0	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB7	SB7_0.2	2/02/2017	SE161717	0.2	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	**0.2**	**0.2**	**0.3**	**0.2**	**0.2**	**0.2**
SB8	SB8_0.0	2/02/2017	SE161717	0	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB8	SB8_0.2	2/02/2017	SE161717	0.2	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	-	-	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB9	SB9_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB10	SB10_0.1	2/02/2017	SE161717	0.1	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB11	SB11_0.5	2/02/2017	SE161717	0.5	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	-	-	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB12	SB12_0.3	2/02/2017	SE161717	0.3	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB13	SB13_0.2	2/02/2017	SE161717	0.2	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	-	-	<0.1	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB14	SB14_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB14	SB14_0.2	2/02/2017	SE161717	0.2	Property 1	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB14	SB14_0.9	2/02/2017	SE161717	0.9	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB15	SB15_0.3	3/05/2017	SE164924	0.3	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB16	SB16_0.1	3/05/2017	SE164924	0.1	Property 2	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB17	SB17_0.2	3/05/2017	SE164924	0.2	Property 2	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB18	SB18_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB18	SB18_0.9	3/05/2017	SE164924	0.9	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB19	SB19_0.1	3/05/2017	SE164924	0.1	Property 2	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB20	SB20_0.5	3/05/2017	SE164924	0.5	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB21	SB21_0.1	3/05/2017	SE164924	0.1	Property 2	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
SB22	SB22_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB22	SB22_0.4	3/05/2017	SE164924	0.4	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB23	SB23_0.2	3/05/2017	SE164924	0.2	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB24	SB24_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB24	SB24_0.5	3/05/2017	SE164924	0.5	Property 2	<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
Statistical Summary																																									
Number of Results						18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	13	13	18	13	13	13	13	18	18	18	18	18	18	18	18
Number of Detects						3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4
Minimum Concentration						<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
Minimum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	0.2	0.3	0.2	0.2
Maximum Concentration						<20	<20	<45	<45	<110	<25	<25	<25	<25	<90	<120	<210	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.6	<0.1	<0.5	<2	<0.1	<0.5	<0.5	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1
Maximum Detect						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.2	0.2	0.3	0.2	0.2
Average Concentration						10	10	23	23	55	13	13	13	13	45	60	105	0.05	0.05	0.05	0.05	0.1	0.15	0.3	0.05	0.25	1	0.05	0.25	0.25	1	0.5	0.05	0.05	0.05	0.06	0.06	0.11	0.06	0.06	0.06
Median Concentration						10	10	22.5	22.5	55	12.5	12.5	12.5	12.5	45	60	105	0.05	0.05	0.05	0.05	0.1	0.15	0.3	0.05	0.25	1	0.05	0.25	0.25	1	0.5	0.05	0.05	0.05	0.05	0.05	0.1	0.05	0.05	0.05
Standard Deviation						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.039	0.039	0.052	0.039	0.039	0.039
Number of Guideline Exceedances						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)						0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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Table 1
Analytical Results - Soil

Preliminary Site Investigation
40 Rayford St and 19 Daydawn Ave Warners Bay NSW
Pulver Cooper and Blackley Pty Ltd

							PAH / Phenols									Polychlorinated Biphenyls										Halogenated Benzenes	Halogenated Phenols						Pesticides		
							Chrysene	Cresol Total	Dibenz(a,h)anthracene	Carcinogenic PAHs (as B(a)P TPE)	Carcinogenic PAHs (as B(a)P TPE, PEFs:3)	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Phenol	Pyrene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Arochlor 1268	Aroclor 1262	PCBs (Sum of total)	Hexachlorobenzene	2,4,5-trichlorophenol	2,4,6-trichlorophenol	2,4-dichlorophenol	2,6-dichlorophenol	2-chlorophenol	Pentachlorophenol	Isodrin	Mirex	Parathion
							mg/kg	mg/kg	mg/kg	mg/kg	TEQ (mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR							0.1	1.5	0.1			0.1	0.1	0.1	0.1	0.8	0.1	0.5	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	1	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.2
NEPM HIL-A Residential							-	400	-	3	-	-	-	-	-	300	-	3000	-	-	-	-	-	-	-	-	-	1	10	-	-	-	-	-	100	-	10	-
NEPM HSL-A/B, 0m to <1m, Sand, Soil							-	-	-	-	-	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM EIL, Urban Res & Open Space							-	-	-	-	-	-	-	-	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM ESL, Urban Res & Open Space, Coarse							-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Location	**Field ID**	**Date**	**Lab Report**	**Depth**	**Property**																																	
-	FRAG_1	2/02/2017	SE161717	-	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FRAG_2	2/02/2017	SE161717	-	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED1	SED1	2/02/2017	SE161717	0.1	Property 1		<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
SB1	SB1_0.2	2/02/2017	SE161717	0.2	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB2	SB2_0.1	2/02/2017	SE161717	0.1	Property 1		<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
SB3	SB3_0.5	2/02/2017	SE161717	0.5	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4	SB4_0.1	2/02/2017	SE161717	0.1	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4	SB4_0.3	2/02/2017	SE161717	0.3	Property 1		<0.1	-	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB5	SB5_0.1	2/02/2017	SE161717A	0.1	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB5	SB5_0.4	2/02/2017	SE161717	0.4	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6	SB6_0.0	2/02/2017	SE161717	0	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6	SB6_0.1	2/02/2017	SE161717	0.1	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6	SB6_0.3	2/02/2017	SE161717	0.3	Property 1		<0.1	-	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB7	SB7_0.0	2/02/2017	SE161717A	0	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB7	SB7_0.2	2/02/2017	SE161717	0.2	Property 1		**0.2**	<1.5	<0.1	**0.4**	**0.4**	**0.4**	<0.1	**0.1**	<0.1	**2**	<0.1	<0.5	**0.4**	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
SB8	SB8_0.0	2/02/2017	SE161717	0	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB8	SB8_0.2	2/02/2017	SE161717	0.2	Property 1		<0.1	-	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB9	SB9_0.2	2/02/2017	SE161717	0.2	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB10	SB10_0.1	2/02/2017	SE161717	0.1	Property 1		<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
SB11	SB11_0.5	2/02/2017	SE161717	0.5	Property 1		<0.1	-	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB12	SB12_0.3	2/02/2017	SE161717	0.3	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB13	SB13_0.2	2/02/2017	SE161717	0.2	Property 1		<0.1	-	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	-	<0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB14	SB14_0.1	2/02/2017	SE161717	0.1	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB14	SB14_0.2	2/02/2017	SE161717	0.2	Property 1		<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
SB14	SB14_0.9	2/02/2017	SE161717	0.9	Property 1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB15	SB15_0.3	3/05/2017	SE164924	0.3	Property 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB16	SB16_0.1	3/05/2017	SE164924	0.1	Property 2		<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
SB17	SB17_0.2	3/05/2017	SE164924	0.2	Property 2		<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
SB18	SB18_0.1	3/05/2017	SE164924	0.1	Property 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB18	SB18_0.9	3/05/2017	SE164924	0.9	Property 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB19	SB19_0.1	3/05/2017	SE164924	0.1	Property 2		<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
SB20	SB20_0.5	3/05/2017	SE164924	0.5	Property 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB21	SB21_0.1	3/05/2017	SE164924	0.1	Property 2		<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
SB22	SB22_0.1	3/05/2017	SE164924	0.1	Property 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB22	SB22_0.4	3/05/2017	SE164924	0.4	Property 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB23	SB23_0.2	3/05/2017	SE164924	0.2	Property 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB24	SB24_0.1	3/05/2017	SE164924	0.1	Property 2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB24	SB24_0.5	3/05/2017	SE164924	0.5	Property 2		<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
Statistical Summary																																						
Number of Results							18	13	18	18	18	18	18	18	18	18	18	13	18	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Number of Detects							4	3	3	4	4	4	3	4	3	4	3	3	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum Concentration							<0.1	<1.5	<0.1	<0.2	<0.3	<0.1	<0.1	<0.1	<0.1	<0.8	<0.1	<0.5	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
Minimum Detect							0.2	ND	ND	0.4	0.4	0.4	ND	0.1	ND	2	ND	ND	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration							0.2	<1.5	<0.1	0.4	0.4	0.4	<0.1	0.1	<0.1	2	<0.1	<0.5	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<1	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.2
Maximum Detect							0.2	ND	ND	0.4	0.4	0.4	ND	0.1	ND	2	ND	ND	0.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration							0.06	0.75	0.05	0.12	0.17	0.073	0.05	0.053	0.05	0.51	0.05	0.25	0.073	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.05	0.25	0.25	0.25	0.25	0.25	0.25	0.05	0.05	0.1
Median Concentration							0.05	0.75	0.05	0.1	0.15	0.05	0.05	0.05	0.05	0.4	0.05	0.25	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.05	0.25	0.25	0.25	0.25	0.25	0.25	0.05	0.05	0.1
Standard Deviation							0.039	0	0	0.077	0.065	0.09	0	0.013	0	0.41	0	0	0.09	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)							0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

						Organochlorine Pesticides																												Organophosphorous Pesticides									
						2,4-DDT	4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane (cis)	gamma-Chlordane	d-BHC	DDD	DDT	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	o,p-DDD	o,p'-DDE	trans-Nonachlor	Azinophos methyl	Bromophos-ethyl	Chlorpyrifos	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Methidathion
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR						0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.5	0.5	0.5	0.2	0.2	0.2	0.5
NEPM HIL-A Residential						-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	-	-	6	-	300	-	-	-	-	-	160	-	-	-	-	-	-	-
NEPM HSL-A/B, 0m to <1m, Sand, Soil						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM EIL, Urban Res & Open Space						-	-	-	-	-	-	-	-	-	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
NEPM ESL, Urban Res & Open Space, Coarse						-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Location	**Field ID**	**Date**	**Lab Report**	**Depth**	**Property**																																		
-	FRAG_1	2/02/2017	SE161717	-	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	FRAG_2	2/02/2017	SE161717	-	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SED1	SED1	2/02/2017	SE161717	0.1	Property 1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
SB1	SB1_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB2	SB2_0.1	2/02/2017	SE161717	0.1	Property 1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
SB3	SB3_0.5	2/02/2017	SE161717	0.5	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4	SB4_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB4	SB4_0.3	2/02/2017	SE161717	0.3	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB5	SB5_0.1	2/02/2017	SE161717A	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB5	SB5_0.4	2/02/2017	SE161717	0.4	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6	SB6_0.0	2/02/2017	SE161717	0	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6	SB6_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB6	SB6_0.3	2/02/2017	SE161717	0.3	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB7	SB7_0.0	2/02/2017	SE161717A	0	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB7	SB7_0.2	2/02/2017	SE161717	0.2	Property 1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
SB8	SB8_0.0	2/02/2017	SE161717	0	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB8	SB8_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB9	SB9_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB10	SB10_0.1	2/02/2017	SE161717	0.1	Property 1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
SB11	SB11_0.5	2/02/2017	SE161717	0.5	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB12	SB12_0.3	2/02/2017	SE161717	0.3	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB13	SB13_0.2	2/02/2017	SE161717	0.2	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB14	SB14_0.1	2/02/2017	SE161717	0.1	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB14	SB14_0.2	2/02/2017	SE161717	0.2	Property 1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
SB14	SB14_0.9	2/02/2017	SE161717	0.9	Property 1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB15	SB15_0.3	3/05/2017	SE164924	0.3	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB16	SB16_0.1	3/05/2017	SE164924	0.1	Property 2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
SB17	SB17_0.2	3/05/2017	SE164924	0.2	Property 2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
SB18	SB18_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB18	SB18_0.9	3/05/2017	SE164924	0.9	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB19	SB19_0.1	3/05/2017	SE164924	0.1	Property 2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
SB20	SB20_0.5	3/05/2017	SE164924	0.5	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB21	SB21_0.1	3/05/2017	SE164924	0.1	Property 2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
SB22	SB22_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB22	SB22_0.4	3/05/2017	SE164924	0.4	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB23	SB23_0.2	3/05/2017	SE164924	0.2	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB24	SB24_0.1	3/05/2017	SE164924	0.1	Property 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SB24	SB24_0.5	3/05/2017	SE164924	0.5	Property 2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5

Statistical Summary

Number of Results		13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Number of Detects		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Minimum Concentration		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
Minimum Detect		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.2	<0.2	<0.2	<0.5
Maximum Detect		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.25	0.25	0.25	0.1	0.1	0.1	0.25
Median Concentration		0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.05	0.1	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.1	0.1	0.1	0.25	0.25	0.25	0.1	0.1	0.1	0.25
Standard Deviation		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2
Soil RPDs

Preliminary Site Investigation -
40 Rayford St and 19 Daydawn Ave, Warners Bay NSW
Pulver Cooper and Blackley Pty Ltd

Field Duplicates (SOIL)
Filter: ALL

			SDG	SGS 04 May 17	SGS 04 May 17		SGS 04 May 17	SGS 04 May 17		SGS 07 Feb 17	SGS 07 Feb 17		SGS 07 Feb 17	Interlab_D	
			Field_ID	SB19_0.1	DUP1	RPD	SB19_0.1	TRIP1	RPD	SB7_0.2	DUP2	RPD	SB7_0.2	TRIP2	RPD
			Sampled_Date-Time	3/05/2017	3/05/2017		3/05/2017	3/05/2017		2/02/2017	2/02/2017		2/02/2017	2/02/2017	
Group	**Analyte**	**Units**	**EQL**												
BTEX	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.2	0
	Benzene	mg/kg	0.1 (Primary): 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.2	0
	Ethylbenzene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Total BTEX	mg/kg	0.6 (Primary): 0.2 (Interlab)	<0.6	<0.6	0	<0.6	<0.6	0	<0.6	<0.6	0	<0.6	<0.2	0
	Xylene (o)	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 (Primary): 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.5	0
	Xylene Total	mg/kg	0.3 (Primary): 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.3	0	<0.3	<0.5	0
Metals	Arsenic	mg/kg	3 (Primary): 5 (Interlab)	8.0	7.0	13	8.0	5.0	46	10.0	10.0	0	10.0	8.0	22
	Cadmium	mg/kg	0.3 (Primary): 1 (Interlab)	**1.5**	**0.4**	**116**	**1.5**	**<0.3**	**133**	1.8	2.2	20	1.8	2.0	11
	Chromium (III+VI)	mg/kg	0.3 (Primary): 2 (Interlab)	10.0	13.0	26	10.0	9.8	2	9.4	10.0	6	**9.4**	**4.0**	**81**
	Copper	mg/kg	0.5 (Primary): 5 (Interlab)	13.0	8.1	46	**13.0**	**7.0**	**60**	16.0	17.0	6	16.0	12.0	29
	Lead	mg/kg	1 (Primary): 5 (Interlab)	**60.0**	**17.0**	**112**	**60.0**	**10.0**	**143**	72.0	88.0	20	72.0	76.0	5
	Mercury	mg/kg	0.05 (Primary): 0.1 (Interlab)	0.09	0.07	25	0.09	0.06	40	0.14	0.15	7	0.14	<0.1	33
	Nickel	mg/kg	0.5 (Primary): 2 (Interlab)	7.1	6.9	3	7.1	4.3	49	4.8	4.5	6	**4.8**	**2.0**	**82**
	Zinc	mg/kg	0.5 (Primary): 5 (Interlab)	**110.0**	**28.0**	**119**	**110.0**	**18.0**	**144**	110.0	130.0	17	110.0	105.0	5
PAH	Benzo[b+j]fluoranthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	**0.2**	**<0.1**	**67**	0.2	<0.5	0
PAH/Phenols	1-Methylnaphthalene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1		
	2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1		
	Acenaphthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Acenaphthylene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Benz(a)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	**0.2**	**<0.1**	**67**	0.2	<0.5	0
	Benzo(a) pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	**0.2**	**<0.1**	**67**	0.2	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	**0.2**	**<0.1**	**67**	0.2	<0.5	0
	Benzo(k)fluoranthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	**0.2**	**<0.1**	**67**	0.2	<0.5	0
	Chrysene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	**0.2**	**<0.1**	**67**	0.2	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Fluoranthene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	**0.4**	**<0.1**	**120**	0.4	<0.5	0
	Fluorene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	0.1	<0.1	0	0.1	<0.5	0
	Naphthalene	mg/kg	0.1 (Primary): 1 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Naphthalene	mg/kg	0.1 (Primary): 1 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	PAHs (Sum of total)	mg/kg	0.8 (Primary): 0.5 (Interlab)	<0.8	<0.8	0	<0.8	<0.8	0	**2.0**	**<0.8**	**86**	**2.0**	**<0.5**	**120**
	Phenanthrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.5	0
	Pyrene	mg/kg	0.1 (Primary): 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	**0.4**	**<0.1**	**120**	0.4	<0.5	0
ols															
Physical Parameters	% Moisture	mg/kg	5000	180000.0	160000.0	12	180000.0	160000.0	12	160000.0	160000.0	0	160000.0		
arameters															
Total Recoverable Hyd	+C10 - C36 (Sum of total)	mg/kg	110 (Primary): 50 (Interlab)	<110.0	<110.0	0	<110.0	<110.0	0	<110.0	<110.0	0	<110.0	<50.0	0
	>C10-C16	mg/kg	25 (Primary): 50 (Interlab)	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<50.0	0
	>C16-C34	mg/kg	90 (Primary): 100 (Interlab)	<90.0	<90.0	0	<90.0	<90.0	0	<90.0	<90.0	0	<90.0	<100.0	0
	>C34-C40	mg/kg	120 (Primary): 100 (Interlab)	<120.0	<120.0	0	<120.0	<120.0	0	<120.0	<120.0	0	<120.0	<100.0	0
	C6 - C9	mg/kg	20 (Primary): 10 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<10.0	0
	C10 - C14	mg/kg	20 (Primary): 50 (Interlab)	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<20.0	0	<20.0	<50.0	0
	C15 - C28	mg/kg	45 (Primary): 100 (Interlab)	<45.0	<45.0	0	<45.0	<45.0	0	<45.0	<45.0	0	<45.0	<100.0	0
	C29-C36	mg/kg	45 (Primary): 100 (Interlab)	<45.0	<45.0	0	<45.0	<45.0	0	<45.0	<45.0	0	<45.0	<100.0	0
	C6-C10	mg/kg	25 (Primary): 10 (Interlab)	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<10.0	0
	C10 - C40 (Sum of total)	mg/kg	210 (Primary): 50 (Interlab)	<210.0	<210.0	0	<210.0	<210.0	0	<210.0	<210.0	0	<210.0	<50.0	0
	F1 C6-C10 less BTEX	mg/kg	25 (Primary): 10 (Interlab)	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<10.0	0
	F2 C10-C16 less Naphthalene	mg/kg	25 (Primary): 50 (Interlab)	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<25.0	0	<25.0	<50.0	0

*RPDs have only been considered where a concentration is greater than 0 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (0-5 x EQL); 50 (5-10 x EQL); 50 (> 10 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

					C6 - C9	C6-C10	>C10-C16	Benzene
					mg/kg	mg/kg	mg/kg	mg/kg
LOR					20	25	25	0.1
Location	**Field ID**	**Date**	**Lab Report Number**	**Depth**				
TB1	TB1	2/02/2017	SE161717	-	<20	<25	<25	<0.1
TB2	TB2	3/05/2017	SE164924	-	<20	<25	<25	<0.1

Appendix H

LABORATORY CERTIFICATES

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Philip Burns
Client	Parsons Brinckerhoff Australia Pty Ltd
Address	Level 3, 51-55 Bolton Street Newcastle NSW 2300
Telephone	02 4929 8300
Facsimile	02 9272 5101
Email	philip.burns@wspgroup.com
Project	**Warners Bay**
Order Number	**2270547A**
Samples	24

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE161717 R0**
Date Received	7/2/2017
Date Reported	15/2/2017

COMMENTS

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

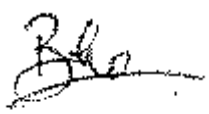
Clay content subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.

No respirable fibres detected in all soil samples using trace analysis technique as per AS 4964-2004.

Sample #21 was ashed after initial stereo microscope examination, re-examined and trace analysis performed on sample where asbestos has not been detected.
No trace asbestos fibres detected using trace analysis technique.

Asbestos analysed by Approved Identifiers Ravee Sivasubramaniam and Yusuf Kuthpudin .

SIGNATORIES

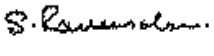


Bennet Lo
Senior Organic Chemist/Metals Chemist

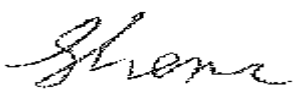
Huong Crawford
Production Manager

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head



Ravee Sivasubramaniam
Hygiene Team Leader



Shane McDermott
Senior Laboratory Technician

VOC's in Soil [AN433] Tested: 10/2/2017

PARAMETER	UOM	LOR	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB4_0.3 SOIL - 2/2/2017 SE161717.005	SB6_0.3 SOIL - 2/2/2017 SE161717.009	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB8_0.2 SOIL - 2/2/2017 SE161717.011
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6

PARAMETER	UOM	LOR	SB10_0.1 SOIL - 2/2/2017 SE161717.013	SB11_0.5 SOIL - 2/2/2017 SE161717.014	SB13_0.2 SOIL - 2/2/2017 SE161717.016	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6

PARAMETER	UOM	LOR	DUP2 SOIL - 2/2/2017 SE161717.023	TB1 SOIL - 2/2/2017 SE161717.024
Benzene	mg/kg	0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1
Naphthalene	mg/kg	0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 10/2/2017

PARAMETER	UOM	LOR	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB4_0.3 SOIL - 2/2/2017 SE161717.005	SB6_0.3 SOIL - 2/2/2017 SE161717.009	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB8_0.2 SOIL - 2/2/2017 SE161717.011
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	SB10_0.1 SOIL - 2/2/2017 SE161717.013	SB11_0.5 SOIL - 2/2/2017 SE161717.014	SB13_0.2 SOIL - 2/2/2017 SE161717.016	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	DUP2 SOIL - 2/2/2017 SE161717.023	TB1 SOIL - 2/2/2017 SE161717.024
Benzene (F0)	mg/kg	0.1	<0.1	<0.1
TRH C6-C9	mg/kg	20	<20	<20
TRH C6-C10	mg/kg	25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 9/2/2017

PARAMETER	UOM	LOR	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB4_0.3 SOIL - 2/2/2017 SE161717.005	SB6_0.3 SOIL - 2/2/2017 SE161717.009	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB8_0.2 SOIL - 2/2/2017 SE161717.011
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	SB10_0.1 SOIL - 2/2/2017 SE161717.013	SB11_0.5 SOIL - 2/2/2017 SE161717.014	SB13_0.2 SOIL - 2/2/2017 SE161717.016	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	DUP2 SOIL - 2/2/2017 SE161717.023	TB1 SOIL - 2/2/2017 SE161717.024
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 9/2/2017

PARAMETER	UOM	LOR	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB4_0.3 SOIL - 2/2/2017 SE161717.005	SB6_0.3 SOIL - 2/2/2017 SE161717.009	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB8_0.2 SOIL - 2/2/2017 SE161717.011
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.4**	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.4**	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.1**	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	**0.2**	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	<0.2	<0.2	<0.2	**0.3**	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	**0.4**	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	**0.4**	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	**2.0**	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	**2.0**	<0.8

PARAMETER	UOM	LOR	SB10_0.1 SOIL - 2/2/2017 SE161717.013	SB11_0.5 SOIL - 2/2/2017 SE161717.014	SB13_0.2 SOIL - 2/2/2017 SE161717.016	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 9/2/2017 (continued)

PARAMETER	UOM	LOR	DUP2 SOIL - 2/2/2017 SE161717.023
Naphthalene	mg/kg	0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1
Fluorene	mg/kg	0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1
Anthracene	mg/kg	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1
Pyrene	mg/kg	0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1
Chrysene	mg/kg	0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8

Speciated Phenols in Soil [AN420] Tested: 9/2/2017

PARAMETER	UOM	LOR	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB10_0.1 SOIL - 2/2/2017 SE161717.013	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
Phenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	<1	<1	<1	<1
Total Cresol	mg/kg	1.5	<1.5	<1.5	<1.5	<1.5	<1.5
2-chlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-nitrophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-nitrophenol	mg/kg	1	<1	<1	<1	<1	<1
2,4,5-trichlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	<1	<1	<1	<1
Pentachlorophenol	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrophenol	mg/kg	2	<2	<2	<2	<2	<2
4-chloro-3-methylphenol	mg/kg	2	<2	<2	<2	<2	<2

OC Pesticides in Soil [AN420] Tested: 9/2/2017

PARAMETER	UOM	LOR	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB10_0.1 SOIL - 2/2/2017 SE161717.013	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OP Pesticides in Soil [AN420] Tested: 9/2/2017

PARAMETER	UOM	LOR	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB10_0.1 SOIL - 2/2/2017 SE161717.013	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2

PCBs in Soil [AN420] Tested: 9/2/2017

PARAMETER	UOM	LOR	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB10_0.1 SOIL - 2/2/2017 SE161717.013	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
Arochlor 1016	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1221	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1232	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1242	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1248	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1254	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1260	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1262	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Arochlor 1268	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PCBs (Arochlors)	mg/kg	1	<1	<1	<1	<1	<1

pH in soil (1:5) [AN101] Tested: 9/2/2017

PARAMETER	UOM	LOR	SB14_0.9 SOIL - 2/2/2017 SE161717.019
pH	pH Units	-	**5.4**

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122] Tested: 13/2/2017

PARAMETER	UOM	LOR	SB14_0.9 SOIL - 2/2/2017 SE161717.019
Exchangeable Sodium, Na	mg/kg	2	**460**
Exchangeable Sodium, Na	meq/100g	0.01	**2.0**
Exchangeable Sodium Percentage*	%	0.1	**17.9**
Exchangeable Potassium, K	mg/kg	2	**150**
Exchangeable Potassium, K	meq/100g	0.01	**0.39**
Exchangeable Potassium Percentage*	%	0.1	**3.5**
Exchangeable Calcium, Ca	mg/kg	2	**510**
Exchangeable Calcium, Ca	meq/100g	0.01	**2.5**
Exchangeable Calcium Percentage*	%	0.1	**22.6**
Exchangeable Magnesium, Mg	mg/kg	2	**770**
Exchangeable Magnesium, Mg	meq/100g	0.02	**6.3**
Exchangeable Magnesium Percentage*	%	0.1	**56.1**
Cation Exchange Capacity	meq/100g	0.02	**11**

TOC in Soil [AN188] Tested: 10/2/2017

PARAMETER	UOM	LOR	SB14_0.9 SOIL - 2/2/2017 SE161717.019
Total Organic Carbon	%w/w	0.05	**0.17**
Organic Matter (calc)*	%w/w	0.1	**0.3**

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 10/2/2017

PARAMETER	UOM	LOR	SB1_0.2 SOIL - 2/2/2017 SE161717.001	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB3_0.5 SOIL - 2/2/2017 SE161717.003	SB4_0.1 SOIL - 2/2/2017 SE161717.004	SB5_0.4 SOIL - 2/2/2017 SE161717.006
Arsenic, As	mg/kg	3	12	11	9	10	8
Cadmium, Cd	mg/kg	0.3	0.9	1.1	<0.3	1.6	<0.3
Chromium, Cr	mg/kg	0.3	7.1	7.5	11	7.1	7.3
Copper, Cu	mg/kg	0.5	9.6	10	5.4	12	7.3
Lead, Pb	mg/kg	1	46	40	7	81	17
Nickel, Ni	mg/kg	0.5	5.9	5.2	3.3	5.1	4.1
Zinc, Zn	mg/kg	0.5	62	89	18	86	38

PARAMETER	UOM	LOR	SB6_0.1 SOIL - 2/2/2017 SE161717.008	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB8_0.2 SOIL - 2/2/2017 SE161717.011	SB9_0.2 SOIL - 2/2/2017 SE161717.012	SB10_0.1 SOIL - 2/2/2017 SE161717.013
Arsenic, As	mg/kg	3	7	10	7	11	12
Cadmium, Cd	mg/kg	0.3	0.5	1.8	0.9	0.8	1.6
Chromium, Cr	mg/kg	0.3	5.0	9.4	7.0	5.9	12
Copper, Cu	mg/kg	0.5	5.7	16	10	28	13
Lead, Pb	mg/kg	1	28	72	48	45	66
Nickel, Ni	mg/kg	0.5	2.4	4.8	5.4	4.6	3.5
Zinc, Zn	mg/kg	0.5	55	110	79	97	100

PARAMETER	UOM	LOR	SB11_0.5 SOIL - 2/2/2017 SE161717.014	SB12_0.3 SOIL - 2/2/2017 SE161717.015	SB13_0.2 SOIL - 2/2/2017 SE161717.016	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
Arsenic, As	mg/kg	3	5	8	5	16	8
Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	0.6	2.3	1.5
Chromium, Cr	mg/kg	0.3	5.7	8.1	5.0	7.6	9.1
Copper, Cu	mg/kg	0.5	7.4	4.3	7.5	13	11
Lead, Pb	mg/kg	1	14	11	24	89	43
Nickel, Ni	mg/kg	0.5	2.0	2.8	3.0	7.0	3.4
Zinc, Zn	mg/kg	0.5	82	20	50	180	130

PARAMETER	UOM	LOR	DUP2 SOIL - 2/2/2017 SE161717.023
Arsenic, As	mg/kg	3	10
Cadmium, Cd	mg/kg	0.3	2.2
Chromium, Cr	mg/kg	0.3	10
Copper, Cu	mg/kg	0.5	17
Lead, Pb	mg/kg	1	88
Nickel, Ni	mg/kg	0.5	4.5
Zinc, Zn	mg/kg	0.5	130

Mercury in Soil [AN312] Tested: 13/2/2017

PARAMETER	UOM	LOR	SB1_0.2 SOIL - 2/2/2017 SE161717.001	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB3_0.5 SOIL - 2/2/2017 SE161717.003	SB4_0.1 SOIL - 2/2/2017 SE161717.004	SB5_0.4 SOIL - 2/2/2017 SE161717.006
Mercury	mg/kg	0.05	**0.09**	**0.07**	<0.05	**0.11**	<0.05

PARAMETER	UOM	LOR	SB6_0.1 SOIL - 2/2/2017 SE161717.008	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB8_0.2 SOIL - 2/2/2017 SE161717.011	SB9_0.2 SOIL - 2/2/2017 SE161717.012	SB10_0.1 SOIL - 2/2/2017 SE161717.013
Mercury	mg/kg	0.05	<0.05	**0.14**	**0.10**	**0.06**	**0.07**

PARAMETER	UOM	LOR	SB11_0.5 SOIL - 2/2/2017 SE161717.014	SB12_0.3 SOIL - 2/2/2017 SE161717.015	SB13_0.2 SOIL - 2/2/2017 SE161717.016	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SED1 SOIL - 2/2/2017 SE161717.020
Mercury	mg/kg	0.05	<0.05	**0.06**	<0.05	**0.11**	**0.07**

PARAMETER	UOM	LOR	DUP2 SOIL - 2/2/2017 SE161717.023
Mercury	mg/kg	0.05	**0.15**

Moisture Content [AN002] Tested: 10/2/2017

PARAMETER	UOM	LOR	SB1_0.2 SOIL - 2/2/2017 SE161717.001	SB2_0.1 SOIL - 2/2/2017 SE161717.002	SB3_0.5 SOIL - 2/2/2017 SE161717.003	SB4_0.1 SOIL - 2/2/2017 SE161717.004	SB4_0.3 SOIL - 2/2/2017 SE161717.005
% Moisture	%w/w	0.5	18	14	18	14	9.8

PARAMETER	UOM	LOR	SB5_0.4 SOIL - 2/2/2017 SE161717.006	SB6_0.1 SOIL - 2/2/2017 SE161717.008	SB6_0.3 SOIL - 2/2/2017 SE161717.009	SB7_0.2 SOIL - 2/2/2017 SE161717.010	SB8_0.2 SOIL - 2/2/2017 SE161717.011
% Moisture	%w/w	0.5	15	12	9.9	16	15

PARAMETER	UOM	LOR	SB9_0.2 SOIL - 2/2/2017 SE161717.012	SB10_0.1 SOIL - 2/2/2017 SE161717.013	SB11_0.5 SOIL - 2/2/2017 SE161717.014	SB12_0.3 SOIL - 2/2/2017 SE161717.015	SB13_0.2 SOIL - 2/2/2017 SE161717.016
% Moisture	%w/w	0.5	13	11	16	15	14

PARAMETER	UOM	LOR	SB14_0.2 SOIL - 2/2/2017 SE161717.018	SB14_0.9 SOIL - 2/2/2017 SE161717.019	SED1 SOIL - 2/2/2017 SE161717.020	DUP2 SOIL - 2/2/2017 SE161717.023	TB1 SOIL - 2/2/2017 SE161717.024
% Moisture	%w/w	0.5	19	15	62	16	<0.5

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 13/2/2017

PARAMETER	UOM	LOR	SB6_0.0 SOIL - 2/2/2017 SE161717.007	SB14_0.1 SOIL - 2/2/2017 SE161717.017
Total Sample Weight	g	1	**592**	**419**
ACM in >7mm Sample*	g	0.01	<0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	<0.0001	<0.0001
AF/FA in <2mm Sample*	g	0.0001	<0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001	<0.001
Fibre Type	No unit	-	NAD	NAD,ORG

Fibre ID in bulk materials [AN602] Tested: 13/2/2017

PARAMETER	UOM	LOR	FRAG_1 MATERIAL - 2/2/2017 SE161717.021	FRAG_2 MATERIAL - 2/2/2017 SE161717.022
Asbestos Detected	No unit	-	No	Yes

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pre-treated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN122	The Exchangeable Sodium Percentage (ESP) is calculated as the exchangeable sodium divided by the CEC (all in meq/100g) times 100. ESP can be used to categorise the sodicity of the soil as below: ESP < 6% non-sodic ESP 6-15% sodic ESP >15% strongly sodic Method is refernced to Rayment and Higginson, 1992, sections 15D3 and 15N1.-
AN188	The organic material in the soil sample is oxidised with chromic acid in the presence of excess sulfuric acid, without external heat being applied. The excess dichromate ion is determined by titration with standard ammonium iron (II) sulfate solution and the amount of oxidised material is calculated from the quantity of dichromate reduced. Referenced to NEPM 105 and AS1289.1.1.1.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf).
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	AMO = Amosite Detected CRY = Chrysotile Detected CRO = Crocidolite Detected ORG = Organic Fibres Detected SMF = Synthetic Mineral Fibres Detected UMF = Unknown Mineral Fibres Detected NAD = No Asbestos Detected
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

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

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

STATEMENT OF QA/QC PERFORMANCE

SE161717 R0

CLIENT DETAILS

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Project	**Warners Bay**
Order Number	**2270547A**
Samples	24

LABORATORY DETAILS

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SGS Reference	**SE161717 R0**
Date Received	07 Feb 2017
Date Reported	15 Feb 2017

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Matrix Spike	Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	22 Soil, 2 Material
Date documentation received	7/2/2017	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	1.4°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE161717 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) — Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB14_0.9	SE161717.019	LB118570	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017

Fibre ID in bulk materials — Method: ME-(AU)-[ENV]AN602

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
FRAG_1	SE161717.021	LB118578	02 Feb 2017	07 Feb 2017	02 Feb 2018	13 Feb 2017	02 Feb 2018	14 Feb 2017
FRAG_2	SE161717.022	LB118578	02 Feb 2017	07 Feb 2017	02 Feb 2018	13 Feb 2017	02 Feb 2018	14 Feb 2017

Gravimetric Determination of Asbestos in Soil — Method: ME-(AU)-[ENV]AN605

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB6_0.0	SE161717.007	LB118576	02 Feb 2017	07 Feb 2017	01 Aug 2017	13 Feb 2017	01 Aug 2017	14 Feb 2017
SB14_0.1	SE161717.017	LB118576	02 Feb 2017	07 Feb 2017	01 Aug 2017	13 Feb 2017	01 Aug 2017	14 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB1_0.2	SE161717.001	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB2_0.1	SE161717.002	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB3_0.5	SE161717.003	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB4_0.1	SE161717.004	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB5_0.4	SE161717.006	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB6_0.1	SE161717.008	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB7_0.2	SE161717.010	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB8_0.2	SE161717.011	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB9_0.2	SE161717.012	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB10_0.1	SE161717.013	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB11_0.5	SE161717.014	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB12_0.3	SE161717.015	LB118574	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB13_0.2	SE161717.016	LB118569	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SB14_0.2	SE161717.018	LB118569	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
SED1	SE161717.020	LB118569	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017
DUP2	SE161717.023	LB118569	02 Feb 2017	07 Feb 2017	02 Mar 2017	13 Feb 2017	02 Mar 2017	14 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB1_0.2	SE161717.001	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB2_0.1	SE161717.002	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB3_0.5	SE161717.003	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB4_0.1	SE161717.004	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB4_0.3	SE161717.005	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB5_0.4	SE161717.006	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB6_0.1	SE161717.008	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB6_0.3	SE161717.009	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB7_0.2	SE161717.010	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB8_0.2	SE161717.011	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB9_0.2	SE161717.012	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB10_0.1	SE161717.013	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB11_0.5	SE161717.014	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB12_0.3	SE161717.015	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB13_0.2	SE161717.016	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB14_0.2	SE161717.018	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SB14_0.9	SE161717.019	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
SED1	SE161717.020	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
DUP2	SE161717.023	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017
TB1	SE161717.024	LB118445	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	15 Feb 2017	13 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB2_0.1	SE161717.002	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB4_0.3	SE161717.005	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB6_0.3	SE161717.009	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB7_0.2	SE161717.010	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB8_0.2	SE161717.011	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017

HOLDING TIME SUMMARY

SE161717 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB10_0.1	SE161717.013	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB11_0.5	SE161717.014	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB13_0.2	SE161717.016	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB14_0.2	SE161717.018	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SED1	SE161717.020	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
DUP2	SE161717.023	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
TB1	SE161717.024	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB2_0.1	SE161717.002	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB4_0.3	SE161717.005	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB6_0.3	SE161717.009	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB7_0.2	SE161717.010	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB8_0.2	SE161717.011	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB10_0.1	SE161717.013	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB11_0.5	SE161717.014	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB13_0.2	SE161717.016	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB14_0.2	SE161717.018	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SED1	SE161717.020	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
DUP2	SE161717.023	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
TB1	SE161717.024	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB2_0.1	SE161717.002	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB4_0.3	SE161717.005	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB6_0.3	SE161717.009	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB7_0.2	SE161717.010	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB8_0.2	SE161717.011	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB10_0.1	SE161717.013	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB11_0.5	SE161717.014	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB13_0.2	SE161717.016	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB14_0.2	SE161717.018	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SED1	SE161717.020	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
DUP2	SE161717.023	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
TB1	SE161717.024	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB2_0.1	SE161717.002	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB4_0.3	SE161717.005	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB6_0.3	SE161717.009	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB7_0.2	SE161717.010	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB8_0.2	SE161717.011	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB10_0.1	SE161717.013	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB11_0.5	SE161717.014	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB13_0.2	SE161717.016	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SB14_0.2	SE161717.018	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
SED1	SE161717.020	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
DUP2	SE161717.023	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017
TB1	SE161717.024	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	14 Feb 2017

pH in soil (1:5) — Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB14_0.9	SE161717.019	LB118433	02 Feb 2017	07 Feb 2017	09 Feb 2017	09 Feb 2017	10 Feb 2017	10 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB2_0.1	SE161717.002	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB4_0.3	SE161717.005	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017

HOLDING TIME SUMMARY

SE161717 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB6_0.3	SE161717.009	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB7_0.2	SE161717.010	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB8_0.2	SE161717.011	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB10_0.1	SE161717.013	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB11_0.5	SE161717.014	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB13_0.2	SE161717.016	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB14_0.2	SE161717.018	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SED1	SE161717.020	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
DUP2	SE161717.023	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
TB1	SE161717.024	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017

TOC in Soil — Method: ME-(AU)-[ENV]AN188

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB14_0.9	SE161717.019	LB118450	02 Feb 2017	07 Feb 2017	02 Mar 2017	10 Feb 2017	02 Mar 2017	14 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB1_0.2	SE161717.001	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB2_0.1	SE161717.002	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB3_0.5	SE161717.003	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB4_0.1	SE161717.004	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB5_0.4	SE161717.006	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB6_0.1	SE161717.008	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB7_0.2	SE161717.010	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB8_0.2	SE161717.011	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB9_0.2	SE161717.012	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB10_0.1	SE161717.013	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB11_0.5	SE161717.014	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB12_0.3	SE161717.015	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB13_0.2	SE161717.016	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SB14_0.2	SE161717.018	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
SED1	SE161717.020	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017
DUP2	SE161717.023	LB118478	02 Feb 2017	07 Feb 2017	01 Aug 2017	10 Feb 2017	01 Aug 2017	14 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB2_0.1	SE161717.002	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB4_0.3	SE161717.005	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB6_0.3	SE161717.009	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB7_0.2	SE161717.010	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB8_0.2	SE161717.011	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB10_0.1	SE161717.013	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB11_0.5	SE161717.014	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB13_0.2	SE161717.016	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SB14_0.2	SE161717.018	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
SED1	SE161717.020	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
DUP2	SE161717.023	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017
TB1	SE161717.024	LB118373	02 Feb 2017	07 Feb 2017	16 Feb 2017	09 Feb 2017	21 Mar 2017	13 Feb 2017

VOCs in Soil — Method: ME-(AU)-[ENV]AN433

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB2_0.1	SE161717.002	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB4_0.3	SE161717.005	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB6_0.3	SE161717.009	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB7_0.2	SE161717.010	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB8_0.2	SE161717.011	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB10_0.1	SE161717.013	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB11_0.5	SE161717.014	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB13_0.2	SE161717.016	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB14_0.2	SE161717.018	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SED1	SE161717.020	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017

HOLDING TIME SUMMARY

SE161717 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DUP2	SE161717.023	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
TB1	SE161717.024	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB2_0.1	SE161717.002	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB4_0.3	SE161717.005	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB6_0.3	SE161717.009	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB7_0.2	SE161717.010	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB8_0.2	SE161717.011	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB10_0.1	SE161717.013	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB11_0.5	SE161717.014	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB13_0.2	SE161717.016	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SB14_0.2	SE161717.018	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
SED1	SE161717.020	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
DUP2	SE161717.023	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017
TB1	SE161717.024	LB118443	02 Feb 2017	07 Feb 2017	16 Feb 2017	10 Feb 2017	22 Mar 2017	13 Feb 2017

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	89
	SB7_0.2	SE161717.010	%	60 - 130%	79
	SB10_0.1	SE161717.013	%	60 - 130%	83
	SB14_0.2	SE161717.018	%	60 - 130%	84
	SED1	SE161717.020	%	60 - 130%	93

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	88
	SB7_0.2	SE161717.010	%	60 - 130%	90
	SB10_0.1	SE161717.013	%	60 - 130%	88
	SB14_0.2	SE161717.018	%	60 - 130%	82
	SED1	SE161717.020	%	60 - 130%	86
d14-p-terphenyl (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	92
	SB7_0.2	SE161717.010	%	60 - 130%	92
	SB10_0.1	SE161717.013	%	60 - 130%	102
	SB14_0.2	SE161717.018	%	60 - 130%	84
	SED1	SE161717.020	%	60 - 130%	104

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	SB2_0.1	SE161717.002	%	70 - 130%	88
	SB4_0.3	SE161717.005	%	70 - 130%	88
	SB6_0.3	SE161717.009	%	70 - 130%	88
	SB7_0.2	SE161717.010	%	70 - 130%	90
	SB8_0.2	SE161717.011	%	70 - 130%	90
	SB10_0.1	SE161717.013	%	70 - 130%	88
	SB11_0.5	SE161717.014	%	70 - 130%	88
	SB13_0.2	SE161717.016	%	70 - 130%	88
	SB14_0.2	SE161717.018	%	70 - 130%	82
	SED1	SE161717.020	%	70 - 130%	86
	DUP2	SE161717.023	%	70 - 130%	94
d14-p-terphenyl (Surrogate)	SB2_0.1	SE161717.002	%	70 - 130%	92
	SB4_0.3	SE161717.005	%	70 - 130%	106
	SB6_0.3	SE161717.009	%	70 - 130%	98
	SB7_0.2	SE161717.010	%	70 - 130%	92
	SB8_0.2	SE161717.011	%	70 - 130%	104
	SB10_0.1	SE161717.013	%	70 - 130%	102
	SB11_0.5	SE161717.014	%	70 - 130%	104
	SB13_0.2	SE161717.016	%	70 - 130%	92
	SB14_0.2	SE161717.018	%	70 - 130%	84
	SED1	SE161717.020	%	70 - 130%	104
	DUP2	SE161717.023	%	70 - 130%	92
d5-nitrobenzene (Surrogate)	SB2_0.1	SE161717.002	%	70 - 130%	90
	SB4_0.3	SE161717.005	%	70 - 130%	82
	SB6_0.3	SE161717.009	%	70 - 130%	86
	SB7_0.2	SE161717.010	%	70 - 130%	88
	SB8_0.2	SE161717.011	%	70 - 130%	88
	SB10_0.1	SE161717.013	%	70 - 130%	88
	SB11_0.5	SE161717.014	%	70 - 130%	86
	SB13_0.2	SE161717.016	%	70 - 130%	88
	SB14_0.2	SE161717.018	%	70 - 130%	76
	SED1	SE161717.020	%	70 - 130%	84
	DUP2	SE161717.023	%	70 - 130%	92

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	89
	SB7_0.2	SE161717.010	%	60 - 130%	79
	SB10_0.1	SE161717.013	%	60 - 130%	83
	SB14_0.2	SE161717.018	%	60 - 130%	84
	SED1	SE161717.020	%	60 - 130%	93

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2,4,6-Tribromophenol (Surrogate)	SB2_0.1	SE161717.002	%	70 - 130%	84
	SB7_0.2	SE161717.010	%	70 - 130%	77
	SB10_0.1	SE161717.013	%	70 - 130%	73
	SB14_0.2	SE161717.018	%	70 - 130%	78
	SED1	SE161717.020	%	70 - 130%	80
d5-phenol (Surrogate)	SB2_0.1	SE161717.002	%	50 - 130%	109
	SB7_0.2	SE161717.010	%	50 - 130%	103
	SB10_0.1	SE161717.013	%	50 - 130%	101
	SB14_0.2	SE161717.018	%	50 - 130%	104
	SED1	SE161717.020	%	50 - 130%	109

VOCs in Soil — Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	76
	SB4_0.3	SE161717.005	%	60 - 130%	76
	SB6_0.3	SE161717.009	%	60 - 130%	71
	SB7_0.2	SE161717.010	%	60 - 130%	78
	SB8_0.2	SE161717.011	%	60 - 130%	77
	SB10_0.1	SE161717.013	%	60 - 130%	72
	SB11_0.5	SE161717.014	%	60 - 130%	75
	SB13_0.2	SE161717.016	%	60 - 130%	74
	SB14_0.2	SE161717.018	%	60 - 130%	76
	SED1	SE161717.020	%	60 - 130%	86
	DUP2	SE161717.023	%	60 - 130%	91
	TB1	SE161717.024	%	60 - 130%	77
d4-1,2-dichloroethane (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	79
	SB4_0.3	SE161717.005	%	60 - 130%	87
	SB6_0.3	SE161717.009	%	60 - 130%	86
	SB7_0.2	SE161717.010	%	60 - 130%	83
	SB8_0.2	SE161717.011	%	60 - 130%	87
	SB10_0.1	SE161717.013	%	60 - 130%	89
	SB11_0.5	SE161717.014	%	60 - 130%	84
	SB13_0.2	SE161717.016	%	60 - 130%	83
	SB14_0.2	SE161717.018	%	60 - 130%	87
	SED1	SE161717.020	%	60 - 130%	79
	DUP2	SE161717.023	%	60 - 130%	74
	TB1	SE161717.024	%	60 - 130%	96
d8-toluene (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	72
	SB4_0.3	SE161717.005	%	60 - 130%	82
	SB6_0.3	SE161717.009	%	60 - 130%	79
	SB7_0.2	SE161717.010	%	60 - 130%	78
	SB8_0.2	SE161717.011	%	60 - 130%	81
	SB10_0.1	SE161717.013	%	60 - 130%	82
	SB11_0.5	SE161717.014	%	60 - 130%	75
	SB13_0.2	SE161717.016	%	60 - 130%	73
	SB14_0.2	SE161717.018	%	60 - 130%	77
	SED1	SE161717.020	%	60 - 130%	79
	DUP2	SE161717.023	%	60 - 130%	74
	TB1	SE161717.024	%	60 - 130%	92
Dibromofluoromethane (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	71
	SB4_0.3	SE161717.005	%	60 - 130%	82
	SB6_0.3	SE161717.009	%	60 - 130%	78
	SB7_0.2	SE161717.010	%	60 - 130%	75
	SB8_0.2	SE161717.011	%	60 - 130%	80
	SB10_0.1	SE161717.013	%	60 - 130%	84
	SB11_0.5	SE161717.014	%	60 - 130%	77
	SB13_0.2	SE161717.016	%	60 - 130%	75
	SB14_0.2	SE161717.018	%	60 - 130%	80
	SED1	SE161717.020	%	60 - 130%	72
	DUP2	SE161717.023	%	60 - 130%	73
	TB1	SE161717.024	%	60 - 130%	87

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Volatile Petroleum Hydrocarbons in Soil

Method: ME-(AU)-[ENV]AN433

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	76
	SB4_0.3	SE161717.005	%	60 - 130%	76
	SB6_0.3	SE161717.009	%	60 - 130%	71
	SB7_0.2	SE161717.010	%	60 - 130%	78
	SB8_0.2	SE161717.011	%	60 - 130%	77
	SB10_0.1	SE161717.013	%	60 - 130%	72
	SB11_0.5	SE161717.014	%	60 - 130%	75
	SB13_0.2	SE161717.016	%	60 - 130%	74
	SB14_0.2	SE161717.018	%	60 - 130%	76
	SED1	SE161717.020	%	60 - 130%	86
	DUP2	SE161717.023	%	60 - 130%	91
	TB1	SE161717.024	%	60 - 130%	77
d4-1,2-dichloroethane (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	79
	SB4_0.3	SE161717.005	%	60 - 130%	87
	SB6_0.3	SE161717.009	%	60 - 130%	86
	SB7_0.2	SE161717.010	%	60 - 130%	83
	SB8_0.2	SE161717.011	%	60 - 130%	87
	SB10_0.1	SE161717.013	%	60 - 130%	89
	SB11_0.5	SE161717.014	%	60 - 130%	84
	SB13_0.2	SE161717.016	%	60 - 130%	83
	SB14_0.2	SE161717.018	%	60 - 130%	87
	SED1	SE161717.020	%	60 - 130%	79
	DUP2	SE161717.023	%	60 - 130%	74
	TB1	SE161717.024	%	60 - 130%	96
d8-toluene (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	72
	SB4_0.3	SE161717.005	%	60 - 130%	82
	SB6_0.3	SE161717.009	%	60 - 130%	79
	SB7_0.2	SE161717.010	%	60 - 130%	78
	SB8_0.2	SE161717.011	%	60 - 130%	81
	SB10_0.1	SE161717.013	%	60 - 130%	82
	SB11_0.5	SE161717.014	%	60 - 130%	75
	SB13_0.2	SE161717.016	%	60 - 130%	73
	SB14_0.2	SE161717.018	%	60 - 130%	77
	SED1	SE161717.020	%	60 - 130%	79
	DUP2	SE161717.023	%	60 - 130%	74
	TB1	SE161717.024	%	60 - 130%	92
Dibromofluoromethane (Surrogate)	SB2_0.1	SE161717.002	%	60 - 130%	71
	SB4_0.3	SE161717.005	%	60 - 130%	82
	SB6_0.3	SE161717.009	%	60 - 130%	78
	SB7_0.2	SE161717.010	%	60 - 130%	75
	SB8_0.2	SE161717.011	%	60 - 130%	80
	SB10_0.1	SE161717.013	%	60 - 130%	84
	SB11_0.5	SE161717.014	%	60 - 130%	77
	SB13_0.2	SE161717.016	%	60 - 130%	75
	SB14_0.2	SE161717.018	%	60 - 130%	80
	SED1	SE161717.020	%	60 - 130%	72
	DUP2	SE161717.023	%	60 - 130%	73
	TB1	SE161717.024	%	60 - 130%	87

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) — Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR

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

Sample Number	Parameter	Units	LOR	Result
LB118569.001	Mercury	mg/kg	0.05	<0.05
LB118574.001	Mercury	mg/kg	0.05	<0.05

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

Sample Number		Parameter	Units	LOR	Result
LB118373.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	75

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

Sample Number		Parameter	Units	LOR	Result
LB118373.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	90
		d14-p-terphenyl (Surrogate)	%	-	110

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

Sample Number	Parameter	Units	LOR	Result
LB118373.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

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

Sample Number		Parameter	Units	LOR	Result
LB118373.001		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	96
		2-fluorobiphenyl (Surrogate)	%	-	90
		d14-p-terphenyl (Surrogate)	%	-	110

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

Sample Number		Parameter	Units	LOR	Result
LB118373.001		Arochlor 1016	mg/kg	0.2	<0.2
		Arochlor 1221	mg/kg	0.2	<0.2
		Arochlor 1232	mg/kg	0.2	<0.2
		Arochlor 1242	mg/kg	0.2	<0.2
		Arochlor 1248	mg/kg	0.2	<0.2
		Arochlor 1254	mg/kg	0.2	<0.2
		Arochlor 1260	mg/kg	0.2	<0.2
		Arochlor 1262	mg/kg	0.2	<0.2
		Arochlor 1268	mg/kg	0.2	<0.2
		Total PCBs (Arochlors)	mg/kg	1	<1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	75

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

Sample Number		Parameter	Units	LOR	Result
LB118373.001		Phenol	mg/kg	0.5	<0.5
		2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1
		2-chlorophenol	mg/kg	0.5	<0.5
		2,4-dimethylphenol	mg/kg	0.5	<0.5
		2,6-dichlorophenol	mg/kg	0.5	<0.5
		2,4-dichlorophenol	mg/kg	0.5	<0.5
		2,4,6-trichlorophenol	mg/kg	0.5	<0.5
		2-nitrophenol	mg/kg	0.5	<0.5
		4-nitrophenol	mg/kg	1	<1
		2,4,5-trichlorophenol	mg/kg	0.5	<0.5
		2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1
		Pentachlorophenol	mg/kg	0.5	<0.5
		2,4-dinitrophenol	mg/kg	2	<2
		4-chloro-3-methylphenol	mg/kg	2	<2
	Surrogates	2,4,6-Tribromophenol (Surrogate)	%	-	92
		d5-phenol (Surrogate)	%	-	102

TOC in Soil — Method: ME-(AU)-[ENV]AN188

Sample Number	Parameter	Units	LOR

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

Sample Number	Parameter	Units	LOR	Result
LB118478.001	Arsenic, As	mg/kg	3	<3
	Cadmium, Cd	mg/kg	0.3	<0.3
	Chromium, Cr	mg/kg	0.3	<0.3
	Copper, Cu	mg/kg	0.5	<0.5
	Lead, Pb	mg/kg	1	<1
	Nickel, Ni	mg/kg	0.5	<0.5
	Zinc, Zn	mg/kg	0.5	<0.5

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

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

Sample Number		Parameter	Units	LOR	Result
LB118373.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

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

Sample Number		Parameter	Units	LOR	Result
LB118443.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	89
		d4-1,2-dichloroethane (Surrogate)	%	-	95
		d8-toluene (Surrogate)	%	-	90
		Bromofluorobenzene (Surrogate)	%	-	75
	Totals	Total BTEX	mg/kg	0.6	<0.6

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

Sample Number		Parameter	Units	LOR	Result
LB118443.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	89
		d4-1,2-dichloroethane (Surrogate)	%	-	95
		d8-toluene (Surrogate)	%	-	90

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.004	LB118574.014	Mercury	mg/kg	0.05	0.11	0.11	74	1
SE161717.015	LB118574.023	Mercury	mg/kg	0.05	0.06	<0.05	132	13
SE161828.006	LB118569.014	Mercury	mg/kg	0.05	<0.05	<0.05	171	0
SE161844.004	LB118569.024	Mercury	mg/kg	0.05	0.0283463605	0.0244683085	200	0

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.011	LB118445.011	% Moisture	%w/w	0.5	15	13	37	11
SE161717.024	LB118445.022	% Moisture	%w/w	0.5	<0.5	<0.5	200	0
SE161743.015	LB118445.033	% Moisture	%w/w	0.5	6.9	6.5	45	6
SE161828.006	LB118445.044	% Moisture	%w/w	0.5	6.7	7.2	44	7
SE161840.002	LB118445.055	% Moisture	%w/w	0.5	10.8	11.2	39	4
SE161840.003	LB118445.057	% Moisture	%w/w	0.5	12.5	12.2	38	2

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.013	LB118373.027		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	0	200	0
			Alpha BHC	mg/kg	0.1	<0.1	0	200	0
			Lindane	mg/kg	0.1	<0.1	0	200	0
			Heptachlor	mg/kg	0.1	<0.1	0	200	0
			Aldrin	mg/kg	0.1	<0.1	0	200	0
			Beta BHC	mg/kg	0.1	<0.1	0	200	0
			Delta BHC	mg/kg	0.1	<0.1	0	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	0	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	0	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	0	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	0	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	0	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	0	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	0.061	156	0
			Dieldrin	mg/kg	0.2	<0.2	0	200	0
			Endrin	mg/kg	0.2	<0.2	0	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	0	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	0	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	0	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	0	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	0.014	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	0	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	0	200	0
			Methoxychlor	mg/kg	0.1	<0.1	0	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	0	200	0
			Isodrin	mg/kg	0.1	<0.1	0	200	0
			Mirex	mg/kg	0.1	<0.1	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.13	0.116	30	7

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.013	LB118373.027		Dichlorvos	mg/kg	0.5	<0.5	0.01	200	0
			Dimethoate	mg/kg	0.5	<0.5	0	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	0.02	200	0
			Fenitrothion	mg/kg	0.2	<0.2	0.02	200	0
			Malathion	mg/kg	0.2	<0.2	0	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	0.01	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	0.01	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	0.01	200	0
			Methidathion	mg/kg	0.5	<0.5	0	200	0
			Ethion	mg/kg	0.2	<0.2	0	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	0.01	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.45	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.48	30	6

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

Original	Duplicate	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.013	LB118373.027		Naphthalene	mg/kg	0.1	<0.1	0	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	0	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	0	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	0	200	0
			Acenaphthene	mg/kg	0.1	<0.1	0	200	0
			Fluorene	mg/kg	0.1	<0.1	0	200	0
			Phenanthrene	mg/kg	0.1	<0.1	0.02	200	0
			Anthracene	mg/kg	0.1	<0.1	0	200	0
			Fluoranthene	mg/kg	0.1	<0.1	0.03	200	0
			Pyrene	mg/kg	0.1	<0.1	0.03	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	0.03	200	0
			Chrysene	mg/kg	0.1	<0.1	0.03	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	0.03	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	0.03	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	0.02	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	0.01	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	0	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	0.02	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ (mg/kg)	0.2	<0.2	0	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	0.242	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	0.121	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	0	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.43	30	2
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.45	30	2
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	0.48	30	6

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.013	LB118373.026		Arochlor 1016	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1221	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1232	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1242	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1248	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1254	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1260	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1262	mg/kg	0.2	<0.2	0	200	0
			Arochlor 1268	mg/kg	0.2	<0.2	0	200	0
			Total PCBs (Arochlors)	mg/kg	1	<1	0	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0	0.116	30	7

pH in soil (1:5) — Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161706.059	LB118433.014	pH	pH Units	-	8.9	9.2	31	3
SE161808.006	LB118433.025	pH	pH Units	-	5.5	5.5	32	0

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.013	LB118373.026	Phenol	mg/kg	0.5	<0.5	0	200	0
		2-methyl phenol (o-cresol)	mg/kg	0.5	<0.5	0	200	0
		3/4-methyl phenol (m/p-cresol)	mg/kg	1	<1	0	200	0
		Total Cresol	mg/kg	1.5	<1.5	0	200	0
		2-chlorophenol	mg/kg	0.5	<0.5	0	200	0
		2,4-dimethylphenol	mg/kg	0.5	<0.5	0	200	0
		2,6-dichlorophenol	mg/kg	0.5	<0.5	0	200	0
		2,4-dichlorophenol	mg/kg	0.5	<0.5	0	200	0
		2,4,6-trichlorophenol	mg/kg	0.5	<0.5	0	200	0
		2-nitrophenol	mg/kg	0.5	<0.5	0	200	0
		4-nitrophenol	mg/kg	1	<1	0	200	0
		2,4,5-trichlorophenol	mg/kg	0.5	<0.5	0	200	0
		2,3,4,6/2,3,5,6-tetrachlorophenol	mg/kg	1	<1	0	200	0
		Pentachlorophenol	mg/kg	0.5	<0.5	0	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.013	LB118373.026		2,4-dinitrophenol	mg/kg	2	<2	0	200	0
			4-chloro-3-methylphenol	mg/kg	2	<2	0	200	0
		Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	3.7	3.9	30	6
			d5-phenol (Surrogate)	mg/kg	-	2.0	2.18	30	8

TOC in Soil — Method: ME-(AU)-[ENV]AN188

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.019	LB118450.006	Total Organic Carbon	%w/w	0.05	0.17	0.16	46	8

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.013	LB118478.014	Arsenic, As	mg/kg	3	12	11	39	6
		Cadmium, Cd	mg/kg	0.3	1.6	1.6	48	0
		Chromium, Cr	mg/kg	0.3	12	9.0	35	25
		Copper, Cu	mg/kg	0.5	13	12	34	2
		Lead, Pb	mg/kg	1	66	67	32	1
		Nickel, Ni	mg/kg	0.5	3.5	2.5	47	35
		Zinc, Zn	mg/kg	0.5	100	110	32	3
SE161717.023	LB118478.021	Arsenic, As	mg/kg	3	10	9	40	7
		Cadmium, Cd	mg/kg	0.3	2.2	2.2	44	2
		Chromium, Cr	mg/kg	0.3	10	9.6	35	6
		Copper, Cu	mg/kg	0.5	17	18	33	4
		Lead, Pb	mg/kg	1	88	90	31	2
		Nickel, Ni	mg/kg	0.5	4.5	4.9	41	8
		Zinc, Zn	mg/kg	0.5	130	140	31	5

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.013	LB118373.027		TRH C10-C14	mg/kg	20	<20	0	200	0
			TRH C15-C28	mg/kg	45	<45	0	200	0
			TRH C29-C36	mg/kg	45	<45	0	200	0
			TRH C37-C40	mg/kg	100	<100	0	200	0
			TRH C10-C36 Total	mg/kg	110	<110	0	200	0
			TRH C10-C40 Total	mg/kg	210	<210	0	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	0	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	0	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	0	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	0	200	0

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.020	LB118443.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.6	4.2	50	15
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.0	3.6	50	9
			d8-toluene (Surrogate)	mg/kg	-	4.0	4.1	50	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.3	4.1	50	6
		Totals	Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0
SE161797.012	LB118443.024	Monocyclic	Benzene	mg/kg	0.1	0	0	200	0
		Aromatic	Toluene	mg/kg	0.1	0.01	0.01	200	0
			Ethylbenzene	mg/kg	0.1	0	0	200	0
			m/p-xylene	mg/kg	0.2	0.01	0.01	200	0
			o-xylene	mg/kg	0.1	0.01	0.01	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	0.01	0.02	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.81	4.44	50	8

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161797.012	LB118443.024	Surrogates	d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5	4.53	50	10
			d8-toluene (Surrogate)	mg/kg	-	4.61	4.32	50	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.81	3.59	50	6
		Totals	Total Xylenes*	mg/kg	0.3	0.02	0.02	200	0
			Total BTEX	mg/kg	0.6	0.03	0.03	200	0

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE161717.020	LB118443.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.6	4.2	30	15
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.0	3.6	30	9
			d8-toluene (Surrogate)	mg/kg	-	4.0	4.1	30	3
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.3	4.1	30	6
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0
SE161797.012	LB118443.024		TRH C6-C10	mg/kg	25	0.78	0.83	200	0
			TRH C6-C9	mg/kg	20	0.3	0.24	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.81	4.44	30	8
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	5	4.53	30	10
			d8-toluene (Surrogate)	mg/kg	-	4.61	4.32	30	6
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.81	3.59	30	6
		VPH F Bands	Benzene (F0)	mg/kg	0.1	0	0	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	0.75	0.8	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) — Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118570.002	Exchangeable Sodium, Na	mg/kg	2	NA	390	80 - 120	103
	Exchangeable Potassium, K	mg/kg	2	NA	343	80 - 120	100
	Exchangeable Calcium, Ca	mg/kg	2	NA	2570	80 - 120	99
	Exchangeable Magnesium, Mg	mg/kg	2	NA	635	80 - 120	95

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118569.002	Mercury	mg/kg	0.05	0.21	0.2	70 - 130	104
LB118574.002	Mercury	mg/kg	0.05	0.21	0.2	70 - 130	104

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118373.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	89
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	83
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	84
		Dieldrin	mg/kg	0.2	<0.2	0.2	60 - 140	78
		Endrin	mg/kg	0.2	<0.2	0.2	60 - 140	84
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	109
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.12	0.15	40 - 130	79

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118373.002		Dichlorvos	mg/kg	0.5	1.8	2	60 - 140	90
		Diazinon (Dimpylate)	mg/kg	0.5	1.6	2	60 - 140	82
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	1.7	2	60 - 140	83
		Ethion	mg/kg	0.2	1.6	2	60 - 140	81
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118373.002		Naphthalene	mg/kg	0.1	4.0	4	60 - 140	100
		Acenaphthylene	mg/kg	0.1	4.4	4	60 - 140	109
		Acenaphthene	mg/kg	0.1	4.1	4	60 - 140	103
		Phenanthrene	mg/kg	0.1	4.0	4	60 - 140	101
		Anthracene	mg/kg	0.1	3.8	4	60 - 140	94
		Fluoranthene	mg/kg	0.1	3.9	4	60 - 140	99
		Pyrene	mg/kg	0.1	3.7	4	60 - 140	94
		Benzo(a)pyrene	mg/kg	0.1	5.0	4	60 - 140	124
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.5	0.5	40 - 130	90
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	88

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118373.002	Arochlor 1260	mg/kg	0.2	0.5	0.4	60 - 140	122

pH in soil (1:5) — Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118433.003	pH	pH Units	-	7.4	7.415	98 - 102	100

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118373.002		Phenol	mg/kg	0.5	0.9	1	70 - 130	93
		2,4-dichlorophenol	mg/kg	0.5	1.1	1	70 - 130	106
		2,4,6-trichlorophenol	mg/kg	0.5	0.8	1	70 - 130	80
		Pentachlorophenol	mg/kg	0.5	0.9	1	70 - 130	94
	Surrogates	2,4,6-Tribromophenol (Surrogate)	mg/kg	-	4.3	5	40 - 130	85
		d5-phenol (Surrogate)	mg/kg	-	1.9	2	40 - 130	95

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

TOC in Soil — Method: ME-(AU)-[ENV]AN188

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118450.002	Total Organic Carbon	%w/w	0.05	0.28	0.325	80 - 120	85
LB118450.004	Total Organic Carbon	%w/w	0.05	NA	0.325	80 - 120	85

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118478.002	Arsenic, As	mg/kg	3	48	50	80 - 120	95
	Cadmium, Cd	mg/kg	0.3	48	50	80 - 120	97
	Chromium, Cr	mg/kg	0.3	47	50	80 - 120	94
	Copper, Cu	mg/kg	0.5	49	50	80 - 120	98
	Lead, Pb	mg/kg	1	48	50	80 - 120	97
	Nickel, Ni	mg/kg	0.5	49	50	80 - 120	97
	Zinc, Zn	mg/kg	0.5	49	50	80 - 120	97

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118373.002		TRH C10-C14	mg/kg	20	35	40	60 - 140	88
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	90
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	80
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	35	40	60 - 140	88
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	83
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	90

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118443.002	Monocyclic	Benzene	mg/kg	0.1	2.3	2.9	60 - 140	79
	Aromatic	Toluene	mg/kg	0.1	1.9	2.9	60 - 140	66
		Ethylbenzene	mg/kg	0.1	1.9	2.9	60 - 140	65
		m/p-xylene	mg/kg	0.2	4.5	5.8	60 - 140	78
		o-xylene	mg/kg	0.1	1.9	2.9	60 - 140	66
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	5	60 - 140	77
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.0	5	60 - 140	80
		d8-toluene (Surrogate)	mg/kg	-	4.1	5	60 - 140	83
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.6	5	60 - 140	113

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB118443.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	83
		TRH C6-C9	mg/kg	20	<20	23.2	60 - 140	71
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	5	60 - 140	77
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.0	5	60 - 140	80
		d8-toluene (Surrogate)	mg/kg	-	4.1	5	60 - 140	83
		Bromofluorobenzene (Surrogate)	mg/kg	-	5.6	5	60 - 140	113
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	108

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE161717.016	LB118569.004	Mercury	mg/kg	0.05	0.22	<0.05	0.2	90
SE161850.020	LB118574.004	Mercury	mg/kg	0.05	0.20	<0.05	0.2	85

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE161717.005	LB118373.026		Naphthalene	mg/kg	0.1	<0.1	4	106
			2-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	<0.1	4	119
			Acenaphthene	mg/kg	0.1	<0.1	4	106
			Fluorene	mg/kg	0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	<0.1	4	113
			Anthracene	mg/kg	0.1	<0.1	4	101
			Fluoranthene	mg/kg	0.1	<0.1	4	106
			Pyrene	mg/kg	0.1	<0.1	4	94
			Benzo(a)anthracene	mg/kg	0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	<0.1	4	106
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	-	86
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	-	90
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.5	-	96

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE161717.001	LB118478.004	Arsenic, As	mg/kg	3	53	12	50	83
		Cadmium, Cd	mg/kg	0.3	44	0.9	50	86
		Chromium, Cr	mg/kg	0.3	48	7.1	50	82
		Copper, Cu	mg/kg	0.5	54	9.6	50	88
		Lead, Pb	mg/kg	1	80	46	50	68 ⑨
		Nickel, Ni	mg/kg	0.5	48	5.9	50	85
		Zinc, Zn	mg/kg	0.5	99	62	50	75

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

QC Sample	Sample Number		Parameter	Units	LOR	Original	Spike	Recovery%
SE161717.005	LB118373.026		TRH C10-C14	mg/kg	20	<20	40	85
			TRH C15-C28	mg/kg	45	<45	40	88
			TRH C29-C36	mg/kg	45	<45	40	98
			TRH C37-C40	mg/kg	100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	<110	-	-
			TRH C10-C40 Total	mg/kg	210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	40	83
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	40	98
			TRH >C34-C40 (F4)	mg/kg	120	<120	-	-

VOCs in Soil — Method: ME-(AU)-[ENV]AN433

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE161717.002	LB118443.004	Monocyclic	Benzene	mg/kg	0.1	2.1	<0.1	2.9	72
		Aromatic	Toluene	mg/kg	0.1	2.0	<0.1	2.9	68
			Ethylbenzene	mg/kg	0.1	1.9	<0.1	2.9	66
			m/p-xylene	mg/kg	0.2	4.1	<0.2	5.8	70
			o-xylene	mg/kg	0.1	2.0	<0.1	2.9	67

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE161717.002	LB118443.004	Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.2	3.6	-	85
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	3.9	-	74
			d8-toluene (Surrogate)	mg/kg	-	3.6	3.6	-	71
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	3.8	-	97
		Totals	Total Xylenes*	mg/kg	0.3	6.1	<0.3	-	-
			Total BTEX	mg/kg	0.6	12	<0.6	-	-

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE161717.002	LB118443.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	83
			TRH C6-C9	mg/kg	20	<20	<20	23.2	71
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.2	3.6	-	85
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	3.7	3.9	-	74
			d8-toluene (Surrogate)	mg/kg	-	3.6	3.6	-	71
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.8	3.8	-	97
		VPH F	Benzene (F0)	mg/kg	0.1	2.1	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	117

MATRIX SPIKE DUPLICATES

SE161717 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover tthe performance of this service.
-	Sample not analysed for this analyte.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Philip Burns
Client	Parsons Brinckerhoff Australia Pty Ltd
Address	Level 3, 51-55 Bolton Street Newcastle NSW 2300
Telephone	02 4929 8300
Facsimile	02 9272 5101
Email	philip.burns@wspgroup.com
Project	**Warners Bay**
Order Number	**2270547A**
Samples	2

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE161717 R0**
Date Received	07 Feb 2017
Date Reported	15 Feb 2017

COMMENTS

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

Clay content subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.

No respirable fibres detected in all soil samples using trace analysis technique as per AS 4964-2004.

Sample #21 was ashed after initial stereo microscope examination, re-examined and trace analysis performed on sample where asbestos has not been detected.
No trace asbestos fibres detected using trace analysis technique.

Asbestos analysed by Approved Identifiers Ravee Sivasubramaniam and Yusuf Kuthpudin .

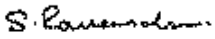
SIGNATORIES

Bennet Lo
Senior Organic Chemist/Metals Chemis

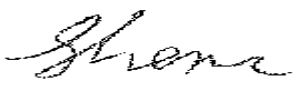
Huong Crawford
Production Manager

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head



Ravee Sivasubramaniam
Hygiene Team Leader



Shane McDermott
Senior Laboratory Technician

ANALYTICAL REPORT

RESULTS

Fibre ID in bulk materials — Method AN602

Laboratory Reference	Client Reference	Matrix	Sample Description	Date Sampled	Fibre Identification
SE161717.021	FRAG_1	Other	35x30x5mm cement sheet fragment	02 Feb 2017	No Asbestos Detected Organic Fibres Detected
SE161717.022	FRAG_2	Other	55x25x4mm cement sheet fragment	02 Feb 2017	Chrysotile Asbestos Detected

METHOD SUMMARY

SE161717 R0

METHOD	METHODOLOGY SUMMARY
AN602	Qualitative identification of chrysotile, amosite and crocidolite in bulk samples by polarised light microscopy (PLM) in conjunction with dispersion staining (DS). AS4964 provides the basis for this document. Unequivocal identification of the asbestos minerals present is made by obtaining sufficient diagnostic `clues`, which provide a reasonable degree of certainty, dispersion staining is a mandatory `clue` for positive identification. If sufficient `clues` are absent, then positive identification of asbestos is not possible. This procedure requires removal of suspect fibres/bundles from the sample which cannot be returned.
AN602	Fibres/material that cannot be unequivocably identified as one of the three asbestos forms, will be reported as unknown mineral fibres (umf).

FOOTNOTES

Amosite	-	Brown Asbestos	NA	-	Not Analysed
Chrysotile	-	White Asbestos	LNR	-	Listed, Not Required
Crocidolite	-	Blue Asbestos	*	-	NATA accreditation does not cover the performance of this service.
Amphiboles	-	Amosite and/or Crocidolite	**	-	Indicative data, theoretical holding time exceeded.

(In reference to soil samples only) This report does not comply with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment and Remediation and Management of Asbestos Contaminated sites in Western Australia - May 2009.

Sampled by the client.

Where reported: 'Asbestos Detected': Asbestos detected by polarised light microscopy, including dispersion staining.
Where reported: 'No Asbestos Found': No Asbestos Found by polarised light microscopy, including dispersion staining.
Where reported: 'UMF Detected': Mineral fibres of unknown type detected by polarised light microscopy, including dispersion staining. Confirmation by another independent analytical technique may be necessary.

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos-containing bulk materials using polarised light microscopy. This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Philip Burns	Manager	Jon Dicker
Client	Parsons Brinckerhoff Australia Pty Ltd	Laboratory	SGS Cairns Environmental
Address	Level 3, 51-55 Bolton Street Newcastle NSW 2300	Address	Unit 2, 58 Comport St Portsmith QLD 4870
Telephone	02 4929 8300	Telephone	+61 07 4035 5111
Facsimile	02 8594 0499	Facsimile	+61 07 4035 5122
Email	au.environmental.sydney@sgs.com	Email	AU.Environmental.Cairns@sgs.com
Project	**Warners Bay**	SGS Reference	**CE125539 R0**
Order Number	**SE161717**	Date Received	08 Feb 2017
Samples	1	Date Reported	14 Feb 2017

COMMENTS

Accredited for compliance with ISO/IEC 17025. NATA accredited laboratory 2562(3146)

SIGNATORIES

Anthony Nilsson
Operations Manager

Jon Dicker
Manager Northern QLD

Parameter	Units	LOR	Sample Number: CE125539.001 Sample Matrix: Soil Sample Date: 06 Feb 2017 Sample Name: SB14_0.9
Moisture Content Method: AN002 Tested: 8/2/2017			
% Moisture	%w/w	1	**14**
Particle sizing of soils by sieving Method: AN005 Tested: 14/2/2017			
Passing 75µm	%w/w	1	**57**
Retained 75µm	%w/w	1	**43**
Particle sizing of soils <75µm by hydrometer Method: AN005 Tested: 14/2/2017			
Clay (<0.002mm)	%w/w	0.1	**36**

QC SUMMARY

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

No QC samples were reported for this job.

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN005	The particle size distribution of a soil is determined by wet sieving, using a maximum of 900 mL of deionised water to sieve all fractions down to 75 µm. Referenced to AS1289.3.6.1 and AS1141.11.

FOOTNOTES

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

Samples analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

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

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Philip Burns
Client	Parsons Brinckerhoff Australia Pty Ltd
Address	Level 3, 51-55 Bolton Street Newcastle NSW 2300
Telephone	02 4929 8300
Facsimile	02 9272 5101
Email	philip.burns@wspgroup.com
Project	**Warners Bay - Additional**
Order Number	**2270547A**
Samples	27

LABORATORY DETAILS

Manager	Huong Crawford
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Email	au.environmental.sydney@sgs.com
SGS Reference	**SE161717A R0**
Date Received	15/2/2017
Date Reported	16/2/2017

COMMENTS

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

No respirable fibres detected in all soil samples using trace analysis technique as per AS 4964-2004.

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam .

SIGNATORIES

Ravee Sivasubramaniam
Hygiene Team Leader

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 16/2/2017

PARAMETER	UOM	LOR	SB5_0.1 SOIL - 2/2/2017 SE161717A.025	SB7_0.0 SOIL - 2/2/2017 SE161717A.026	SB8_0.0 SOIL - 2/2/2017 SE161717A.027
Total Sample Weight	g	1	**588**	**622**	**513**
ACM in >7mm Sample*	g	0.01	<0.01	<0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	<0.0001	<0.0001	<0.0001
AF/FA in <2mm Sample*	g	0.0001	<0.0001	<0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001
Fibre Type	No unit	-	NAD,ORG	NAD,ORG	NAD,ORG

METHOD SUMMARY

SE161717A R0

METHOD	METHODOLOGY SUMMARY
AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	AMO = Amosite Detected CRY = Chrysotile Detected CRO = Crocidolite Detected ORG = Organic Fibres Detected SMF = Synthetic Mineral Fibres Detected UMF = Unknown Mineral Fibres Detected NAD = No Asbestos Detected
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

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

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1702961**	Page	: 1 of 6
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: PHILIP BURNS	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8503
Project	: 2270547A WARNERS BAY	Date Samples Received	: 08-Feb-2017 15:50
Order number	: 2270547A	Date Analysis Commenced	: 09-Feb-2017
C-O-C number	: ----	Issue Date	: 15-Feb-2017 12:12
Sampler	: PHILIP BURNS		
Site	: ----		
Quote number	: EN/085/15 V7		
No. of samples received	: 2		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

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

When no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Client sample ID	TRIP2	----	----	----	----
			Client sampling date / time	02-Feb-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1702961-002	--------	--------	--------	--------
				Result	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1	%	**18.2**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**8**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	**2**	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**4**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**12**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**76**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**2**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**105**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	TRIP2	----	----	----	----
				Client sampling date / time	02-Feb-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1702961-002	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of BTEX**	----	0.2	mg/kg		<0.2	----	----	----	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**83.9**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**84.4**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**84.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**87.0**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**93.0**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**96.8**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**104**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**109**	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL** (Matrix: **SOIL**)				Client sample ID	**TRIP2**	----	----	----	----
				Client sampling date / time	02-Feb-2017 00:00	----	----	----	----
Compound	*CAS Number*	*LOR*	*Unit*		**ES1702961-002**	--------	--------	--------	--------
					Result	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
4-Bromofluorobenzene	460-00-4	0.2	%		**106**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1702961**	Page	: 1 of 7
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: PHILIP BURNS	Contact	: Loren Schiavon
Address	: GPO BOX 5394 SYDNEY NSW, AUSTRALIA 2001	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8503
Project	: 2270547A WARNERS BAY	Date Samples Received	: 08-Feb-2017
Order number	: 2270547A	Date Analysis Commenced	: 09-Feb-2017
C-O-C number	: ----	Issue Date	: 15-Feb-2017
Sampler	: PHILIP BURNS		
Site	: ----		
Quote number	: EN/085/15 V7		
No. of samples received	: 2		
No. of samples analysed	: 1		

ilac-MRA NATA
Accreditation No. 825
Accredited for compliance with ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Wisam Marassa	Inorganics Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (QC Lot: 748994)									
ES1702953-002	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	5.5	5.4	0.00	No Limit
ES1702963-006	Anonymous	EA055-103: Moisture Content (dried @ 103°C)	----	1	%	8.7	8.4	3.84	No Limit
EG005T: Total Metals by ICP-AES (QC Lot: 752751)									
EB1702348-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	5	8	39.7	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	5	46.8	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	39	13	97.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	39	29	29.5	No Limit
ES1702973-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	15	12	21.5	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	5	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	7	7	0.00	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	13	18	29.6	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	24	25	6.14	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 752752)									
EB1702348-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
ES1702973-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 748872)									
ES1702958-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 748872) - continued									
ES1702958-001	Anonymous	EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 748871)									
ES1702958-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 749085)									
ES1702961-002	TRIP2	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
ES1702982-011	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 748871)									
ES1702958-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 749085)									
ES1702961-002	TRIP2	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
ES1702982-011	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 749085)									
ES1702961-002	TRIP2	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP080: BTEXN (QC Lot: 749085) - continued									
ES1702982-011	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 752751)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	21.7 mg/kg	103	86	126
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	4.64 mg/kg	97.0	83	113
EG005T: Chromium	7440-47-3	2	mg/kg	<2	43.9 mg/kg	102	76	128
EG005T: Copper	7440-50-8	5	mg/kg	<5	32 mg/kg	102	86	120
EG005T: Lead	7439-92-1	5	mg/kg	<5	40 mg/kg	98.9	80	114
EG005T: Nickel	7440-02-0	2	mg/kg	<2	55 mg/kg	104	87	123
EG005T: Zinc	7440-66-6	5	mg/kg	<5	60.8 mg/kg	104	80	122
EG035T: Total Recoverable Mercury by FIMS (QCLot: 752752)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	2.57 mg/kg	90.2	70	105
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 748872)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	88.8	77	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	93.4	72	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	94.6	73	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	94.0	72	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	93.6	75	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	94.3	77	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	89.2	73	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	91.0	74	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	90.0	69	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	97.2	75	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	91.0	68	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	94.3	74	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	91.0	70	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	94.4	61	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	93.0	62	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	96.0	63	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 748871)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	200 mg/kg	100	75	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	300 mg/kg	110	77	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	200 mg/kg	107	71	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 749085)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	104	68	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 748871)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 748871) - continued								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	250 mg/kg	101	77	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	350 mg/kg	110	74	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	150 mg/kg	93.6	63	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 749085)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	101	68	128
EP080: BTEXN (QCLot: 749085)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.1	62	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	102	67	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	97.7	65	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	99.8	66	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	102	68	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	101	63	119

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EG005T: Total Metals by ICP-AES (QCLot: 752751)							
EB1702348-001	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	97.3	70	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	95.8	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	95.3	70	130
		EG005T: Copper	7440-50-8	250 mg/kg	92.4	70	130
		EG005T: Lead	7439-92-1	250 mg/kg	95.4	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	95.2	70	130
		EG005T: Zinc	7440-66-6	250 mg/kg	92.9	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 752752)							
EB1702348-001	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	111	70	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 748872)							
ES1702958-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	87.4	70	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	95.8	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 748871)							
ES1702958-001	Anonymous	EP071: C10 - C14 Fraction	----	523 mg/kg	80.7	73	137
		EP071: C15 - C28 Fraction	----	2319 mg/kg	80.5	53	131

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 748871) - continued							
ES1702958-001	Anonymous	EP071: C29 - C36 Fraction	----	1714 mg/kg	87.4	52	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 749085)							
ES1702961-002	TRIP2	EP080: C6 - C9 Fraction	----	32.5 mg/kg	99.1	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 748871)							
ES1702958-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	88.8	73	137
		EP071: >C16 - C34 Fraction	----	3223 mg/kg	84.8	53	131
		EP071: >C34 - C40 Fraction	----	1058 mg/kg	93.1	52	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 749085)							
ES1702961-002	TRIP2	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	96.7	70	130
EP080: BTEXN (QCLot: 749085)							
ES1702961-002	TRIP2	EP080: Benzene	71-43-2	2.5 mg/kg	84.2	70	130
		EP080: Toluene	108-88-3	2.5 mg/kg	84.2	70	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	89.2	70	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	86.7	70	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	88.3	70	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	84.8	70	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES1702961**	Page	: 1 of 4
Client	: **PARSONS BRINCKERHOFF AUSTRALIA PTY LIMITED**	Laboratory	: Environmental Division Sydney
Contact	: PHILIP BURNS	Telephone	: +61 2 8784 8503
Project	: 2270547A WARNERS BAY	Date Samples Received	: 08-Feb-2017
Site	: ----	Issue Date	: 15-Feb-2017
Sampler	: PHILIP BURNS	No. of samples received	: 2
Order number	: 2270547A	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055-103)							
TRIP2	**02-Feb-2017**	**----**	----	----	**09-Feb-2017**	16-Feb-2017	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
TRIP2	**02-Feb-2017**	**13-Feb-2017**	01-Aug-2017	✓	**13-Feb-2017**	01-Aug-2017	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
TRIP2	**02-Feb-2017**	**13-Feb-2017**	02-Mar-2017	✓	**13-Feb-2017**	02-Mar-2017	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
TRIP2	**02-Feb-2017**	**09-Feb-2017**	16-Feb-2017	✓	**09-Feb-2017**	21-Mar-2017	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
TRIP2	**02-Feb-2017**	**09-Feb-2017**	16-Feb-2017	✓	**09-Feb-2017**	21-Mar-2017	✓
Soil Glass Jar - Unpreserved (EP080)							
TRIP2	**02-Feb-2017**	**10-Feb-2017**	16-Feb-2017	✓	**10-Feb-2017**	16-Feb-2017	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071)							
TRIP2	**02-Feb-2017**	**09-Feb-2017**	16-Feb-2017	✓	**09-Feb-2017**	21-Mar-2017	✓
Soil Glass Jar - Unpreserved (EP080)							
TRIP2	**02-Feb-2017**	**10-Feb-2017**	16-Feb-2017	✓	**10-Feb-2017**	16-Feb-2017	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
TRIP2	**02-Feb-2017**	**10-Feb-2017**	16-Feb-2017	✓	**10-Feb-2017**	16-Feb-2017	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055-103	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	13	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055-103	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 103-105 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40.
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270D Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM (2013) Schedule B(3) (Method 502 and 507)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Methanolic Extraction of Soils for Purge and Trap	* ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: WSP Parsons Brinckerhoff	TURNAROUND REQUIREMENTS: Standard TAT (List due date): 5 day TAT	FOR LABORATORY USE ONLY (Circle)
OFFICE: Newcastle	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: Warnam Bay PROJECT NO.: 2270547A	ALS QUOTE NO.: EN-085-16V2	Free ice / frozen ice bricks present upon arrival? Yes No N/A
ORDER NUMBER: PURCHASE ORDER NO.: 2270547A	COUNTRY OF ORIGIN:	COC SEQUENCE NUMBER (Circle): COC: 1 2 3 4 5 6 7; Or: 1 2 3 4 5 6 7
PROJECT MANAGER: Philip Burns CONTACT PH: 0401499279		Receipt Sample Temperature on Receipt: °C
SAMPLER: Philip Burns SAMPLER MOBILE: 0401499279	RELINQUISHED BY: Philip Burns	Other comment: 22.4
COC Emailed to ALS? (YES / NO) EDD FORMAT (or default):	DATE/TIME: 8/2/17 10000	RECEIVED BY: [illegible]
Email Reports to (will default to PM if no other addresses are listed): philip.burns@wsp.com		DATE/TIME: 8/2/17 1550
Email invoice to (will default to PM if no other addresses are listed): ephinvoices@pb.com.au		RELINQUISHED BY: / DATE/TIME:
		RECEIVED BY: / DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS Matrix: Soil(S) Water(W)			CONTAINER INFORMATION								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL SAMPLE BAGS	B-26 (TRH, BTEX, PAH, 8 metals)	Asbestos ID	525 TRH/BTEX/NAP/PAH/Pb	TRH			Comments
2	TRIP1	2/02/2017	S		1				X			
2	TRIP2	2/02/2017	S		1	X						
				TOTAL	2							

Environmental Division
Sydney
Work Order Reference
ES1702961

Telephone : +61-2-8784 8555

Water Containers: Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lithium Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS

Contact	Philip Burns
Client	Parsons Brinckerhoff Australia Pty Ltd
Address	Level 3, 51-55 Bolton Street Newcastle NSW 2300
Telephone	02 4929 8300
Facsimile	02 9272 5101
Email	philip.burns@wspgroup.com
Project	**PCB Warners Bay**
Order Number	**2270547A**
Samples	16

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE164924 R0**
Date Received	4/5/2017
Date Reported	11/5/2017

COMMENTS

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

Clay Content subcontracted to SGS Cairns, 2/58 Comport St, Portsmith QLD 4870, NATA Accreditation Number: 2562, Site Number: 3146.

No respirable fibres detected in soil samples using trace analysis technique as per AS 4964-2004.

Asbestos analysed by Approved Identifier Yusuf Kuthpudin

SIGNATORIES

Dong Liang
Metals/Inorganics Team Leader

Kamrul Ahsan
Senior Chemist

Ly Kim Ha
Organic Section Head

Ravee Sivasubramaniam
Hygiene Team Leader

VOC's in Soil [AN433] Tested: 8/5/2017

PARAMETER	UOM	LOR	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB19_0.1 SOIL - 3/5/2017 SE164924.005	SB21_0.1 SOIL - 3/5/2017 SE164924.007	SB24_0.5 SOIL - 3/5/2017 SE164924.012
Benzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

PARAMETER	UOM	LOR	DUP1 SOIL - 3/5/2017 SE164924.013	TRIP1 SOIL - 3/5/2017 SE164924.014
Benzene	mg/kg	0.1	<0.1	<0.1
Toluene	mg/kg	0.1	<0.1	<0.1
Ethylbenzene	mg/kg	0.1	<0.1	<0.1
m/p-xylene	mg/kg	0.2	<0.2	<0.2
o-xylene	mg/kg	0.1	<0.1	<0.1
Total Xylenes*	mg/kg	0.3	<0.3	<0.3
Total BTEX	mg/kg	0.6	<0.6	<0.6
Naphthalene	mg/kg	0.1	<0.1	<0.1

Volatile Petroleum Hydrocarbons in Soil [AN433] Tested: 8/5/2017

PARAMETER	UOM	LOR	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB19_0.1 SOIL - 3/5/2017 SE164924.005	SB21_0.1 SOIL - 3/5/2017 SE164924.007	SB24_0.5 SOIL - 3/5/2017 SE164924.012
TRH C6-C9	mg/kg	20	<20	<20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25	<25	<25

PARAMETER	UOM	LOR	DUP1 SOIL - 3/5/2017 SE164924.013	TRIP1 SOIL - 3/5/2017 SE164924.014	TB2 SOIL - 3/5/2017 SE164924.015
TRH C6-C9	mg/kg	20	<20	<20	<20
Benzene (F0)	mg/kg	0.1	<0.1	<0.1	<0.1
TRH C6-C10	mg/kg	25	<25	<25	<25
TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	<25

TRH (Total Recoverable Hydrocarbons) in Soil [AN403] Tested: 8/5/2017

PARAMETER	UOM	LOR	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB19_0.1 SOIL - 3/5/2017 SE164924.005	SB21_0.1 SOIL - 3/5/2017 SE164924.007	SB24_0.5 SOIL - 3/5/2017 SE164924.012
TRH C10-C14	mg/kg	20	<20	<20	<20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45	<45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45	<45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100	<100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25	<25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	<25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90	<90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120	<120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110	<110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210	<210	<210	<210

PARAMETER	UOM	LOR	DUP1 SOIL - 3/5/2017 SE164924.013	TRIP1 SOIL - 3/5/2017 SE164924.014
TRH C10-C14	mg/kg	20	<20	<20
TRH C15-C28	mg/kg	45	<45	<45
TRH C29-C36	mg/kg	45	<45	<45
TRH C37-C40	mg/kg	100	<100	<100
TRH >C10-C16 (F2)	mg/kg	25	<25	<25
TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25
TRH >C16-C34 (F3)	mg/kg	90	<90	<90
TRH >C34-C40 (F4)	mg/kg	120	<120	<120
TRH C10-C36 Total	mg/kg	110	<110	<110
TRH C10-C40 Total	mg/kg	210	<210	<210

PAH (Polynuclear Aromatic Hydrocarbons) in Soil [AN420] Tested: 8/5/2017

PARAMETER	UOM	LOR	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB19_0.1 SOIL - 3/5/2017 SE164924.005	SB21_0.1 SOIL - 3/5/2017 SE164924.007	SB24_0.5 SOIL - 3/5/2017 SE164924.012
Naphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8	<0.8	<0.8	<0.8

PARAMETER	UOM	LOR	DUP1 SOIL - 3/5/2017 SE164924.013	TRIP1 SOIL - 3/5/2017 SE164924.014
Naphthalene	mg/kg	0.1	<0.1	<0.1
2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.1	<0.1	<0.1
Fluorene	mg/kg	0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1
Anthracene	mg/kg	0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	<0.1	<0.1
Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1
Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1
Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1
Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1
Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1
Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	<0.2	<0.2
Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3
Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2
Total PAH (18)	mg/kg	0.8	<0.8	<0.8
Total PAH (NEPM/WHO 16)	mg/kg	0.8	<0.8	<0.8

OC Pesticides in Soil [AN420] Tested: 8/5/2017

PARAMETER	UOM	LOR	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB19_0.1 SOIL - 3/5/2017 SE164924.005	SB21_0.1 SOIL - 3/5/2017 SE164924.007	SB24_0.5 SOIL - 3/5/2017 SE164924.012
Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lindane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Delta BHC	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDE	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Endrin	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
o,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
p,p'-DDD	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
p,p'-DDT	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Isodrin	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1

OP Pesticides in Soil [AN420] Tested: 8/5/2017

PARAMETER	UOM	LOR	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB19_0.1 SOIL - 3/5/2017 SE164924.005	SB21_0.1 SOIL - 3/5/2017 SE164924.007	SB24_0.5 SOIL - 3/5/2017 SE164924.012
Dichlorvos	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dimethoate	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	<0.2	<0.2	<0.2

pH in soil (1:5) [AN101] Tested: 9/5/2017

PARAMETER	UOM	LOR	SB18_0.9 SOIL - 3/5/2017 SE164924.016
pH	pH Units	-	**6.8**

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) [AN122] Tested: 9/5/2017

PARAMETER	UOM	LOR	SB18_0.9 SOIL - 3/5/2017 SE164924.016
Exchangeable Sodium, Na	mg/kg	2	**31**
Exchangeable Sodium, Na	meq/100g	0.01	**0.13**
Exchangeable Sodium Percentage*	%	0.1	**2.7**
Exchangeable Potassium, K	mg/kg	2	**300**
Exchangeable Potassium, K	meq/100g	0.01	**0.76**
Exchangeable Potassium Percentage*	%	0.1	**15.1**
Exchangeable Calcium, Ca	mg/kg	2	**660**
Exchangeable Calcium, Ca	meq/100g	0.01	**3.3**
Exchangeable Calcium Percentage*	%	0.1	**66.3**
Exchangeable Magnesium, Mg	mg/kg	2	**98**
Exchangeable Magnesium, Mg	meq/100g	0.02	**0.80**
Exchangeable Magnesium Percentage*	%	0.1	**16.0**
Cation Exchange Capacity	meq/100g	0.02	**5.0**

TOC in Soil [AN188] Tested: 10/5/2017

PARAMETER	UOM	LOR	SB18_0.9 SOIL - 3/5/2017 SE164924.016
Total Organic Carbon	%w/w	0.05	**0.79**
Organic Matter (calc)*	%w/w	0.1	**1.4**

Total Recoverable Metals in Soil/Waste Solids/Materials by ICPOES [AN040/AN320] Tested: 8/5/2017

PARAMETER	UOM	LOR	SB15_0.3 SOIL - 3/5/2017 SE164924.001	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB18_0.1 SOIL - 3/5/2017 SE164924.004	SB19_0.1 SOIL - 3/5/2017 SE164924.005
Arsenic, As	mg/kg	3	11	8	7	7	8
Cadmium, Cd	mg/kg	0.3	0.6	1.1	1.1	1.4	1.5
Chromium, Cr	mg/kg	0.3	7.1	6.5	8.9	8.9	10
Copper, Cu	mg/kg	0.5	20	14	18	16	13
Lead, Pb	mg/kg	1	37	47	52	53	60
Nickel, Ni	mg/kg	0.5	9.1	9.4	7.9	8.8	7.1
Zinc, Zn	mg/kg	0.5	42	100	88	120	110
Iron, Fe	mg/kg	50	-	-	-	-	-

PARAMETER	UOM	LOR	SB20_0.5 SOIL - 3/5/2017 SE164924.006	SB21_0.1 SOIL - 3/5/2017 SE164924.007	SB22_0.4 SOIL - 3/5/2017 SE164924.009	SB23_0.2 SOIL - 3/5/2017 SE164924.010	SB24_0.5 SOIL - 3/5/2017 SE164924.012
Arsenic, As	mg/kg	3	4	7	5	5	4
Cadmium, Cd	mg/kg	0.3	<0.3	0.5	<0.3	<0.3	<0.3
Chromium, Cr	mg/kg	0.3	14	12	11	8.6	7.0
Copper, Cu	mg/kg	0.5	8.4	11	5.6	6.0	11
Lead, Pb	mg/kg	1	11	30	11	13	8
Nickel, Ni	mg/kg	0.5	7.1	7.7	4.2	5.2	5.1
Zinc, Zn	mg/kg	0.5	18	47	19	16	29
Iron, Fe	mg/kg	50	-	-	-	-	-

PARAMETER	UOM	LOR	DUP1 SOIL - 3/5/2017 SE164924.013	TRIP1 SOIL - 3/5/2017 SE164924.014	SB18_0.9 SOIL - 3/5/2017 SE164924.016
Arsenic, As	mg/kg	3	7	5	-
Cadmium, Cd	mg/kg	0.3	0.4	<0.3	-
Chromium, Cr	mg/kg	0.3	13	9.8	-
Copper, Cu	mg/kg	0.5	8.1	7.0	-
Lead, Pb	mg/kg	1	17	10	-
Nickel, Ni	mg/kg	0.5	6.9	4.3	-
Zinc, Zn	mg/kg	0.5	28	18	-
Iron, Fe	mg/kg	50	-	-	16000

Mercury in Soil [AN312] Tested: 8/5/2017

PARAMETER	UOM	LOR	SB15_0.3 SOIL - 3/5/2017 SE164924.001	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB18_0.1 SOIL - 3/5/2017 SE164924.004	SB19_0.1 SOIL - 3/5/2017 SE164924.005
Mercury	mg/kg	0.05	0.09	0.08	0.09	0.10	0.09

PARAMETER	UOM	LOR	SB20_0.5 SOIL - 3/5/2017 SE164924.006	SB21_0.1 SOIL - 3/5/2017 SE164924.007	SB22_0.4 SOIL - 3/5/2017 SE164924.009	SB23_0.2 SOIL - 3/5/2017 SE164924.010	SB24_0.5 SOIL - 3/5/2017 SE164924.012
Mercury	mg/kg	0.05	0.05	0.07	<0.05	0.06	<0.05

PARAMETER	UOM	LOR	DUP1 SOIL - 3/5/2017 SE164924.013	TRIP1 SOIL - 3/5/2017 SE164924.014
Mercury	mg/kg	0.05	0.07	0.06

Moisture Content [AN002] Tested: 5/5/2017

PARAMETER	UOM	LOR	SB15_0.3 SOIL - 3/5/2017 SE164924.001	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB18_0.1 SOIL - 3/5/2017 SE164924.004	SB19_0.1 SOIL - 3/5/2017 SE164924.005
% Moisture	%w/w	0.5	18	15	15	20	18

PARAMETER	UOM	LOR	SB20_0.5 SOIL - 3/5/2017 SE164924.006	SB21_0.1 SOIL - 3/5/2017 SE164924.007	SB22_0.4 SOIL - 3/5/2017 SE164924.009	SB23_0.2 SOIL - 3/5/2017 SE164924.010	SB24_0.5 SOIL - 3/5/2017 SE164924.012
% Moisture	%w/w	0.5	18	20	17	17	12

PARAMETER	UOM	LOR	DUP1 SOIL - 3/5/2017 SE164924.013	TRIP1 SOIL - 3/5/2017 SE164924.014	TB2 SOIL - 3/5/2017 SE164924.015	SB18_0.9 SOIL - 3/5/2017 SE164924.016
% Moisture	%w/w	0.5	16	16	<0.5	16

Sample Subcontracted [] Tested: 10/5/2017

PARAMETER	UOM	LOR	SB18_0.9 SOIL - 3/5/2017 SE164924.016
Sample Subcontracted*	No unit	-	Subcontracted

Gravimetric Determination of Asbestos in Soil [AN605] Tested: 11/5/2017

PARAMETER	UOM	LOR	SB16_0.1 SOIL - 3/5/2017 SE164924.002	SB17_0.2 SOIL - 3/5/2017 SE164924.003	SB19_0.1 SOIL - 3/5/2017 SE164924.005	SB22_0.1 SOIL - 3/5/2017 SE164924.008	SB24_0.1 SOIL - 3/5/2017 SE164924.011
Total Sample Weight	g	1	**630**	**605**	**513**	**490**	**481**
ACM in >7mm Sample*	g	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
AF/FA in >2mm to <7mm Sample*	g	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
AF/FA in <2mm Sample*	g	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Asbestos in soil (>7mm ACM)*	%w/w	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asbestos in soil (>2mm to <7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<2mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Asbestos in soil (<7mm AF/FA)*	%w/w	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Fibre Type	No unit	-	NAD.ORG	NAD.ORG	NAD	NAD.ORG	NAD

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN040/AN320	A portion of sample is digested with nitric acid to decompose organic matter and hydrochloric acid to complete the digestion of metals. The digest is then analysed by ICP OES with metals results reported on the dried sample basis. Based on USEPA method 200.8 and 6010C.
AN040	A portion of sample is digested with Nitric acid to decompose organic matter and Hydrochloric acid to complete the digestion of metals and then filtered for analysis by ASS or ICP as per USEPA Method 200.8.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, sediments and sludges, an extract with water (or 0.01M CaCl2) is made at a ratio of 1:5 and the pH determined and reported on the extract. Reference APHA 4500-H+.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pre-treated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN122	The Exchangeable Sodium Percentage (ESP) is calculated as the exchangeable sodium divided by the CEC (all in meq/100g) times 100. ESP can be used to categorise the sodicity of the soil as below: ESP < 6% non-sodic ESP 6-15% sodic ESP >15% strongly sodic Method is refernced to Rayment and Higginson, 1992, sections 15D3 and 15N1.-
AN188	The organic material in the soil sample is oxidised with chromic acid in the presence of excess sulfuric acid, without external heat being applied. The excess dichromate ion is determined by titration with standard ammonium iron (II) sulfate solution and the amount of oxidised material is calculated from the quantity of dichromate reduced. Referenced to NEPM 105 and AS1289.1.1.1.
AN312	Mercury by Cold Vapour AAS in Soils: After digestion with nitric acid, hydrogen peroxide and hydrochloric acid, mercury ions are reduced by stannous chloride reagent in acidic solution to elemental mercury. This mercury vapour is purged by nitrogen into a cold cell in an atomic absorption spectrometer or mercury analyser. Quantification is made by comparing absorbances to those of the calibration standards. Reference APHA 3112/3500
AN403	Total Recoverable Hydrocarbons: Determination of Hydrocarbons by gas chromatography after a solvent extraction. Detection is by flame ionisation detector (FID) that produces an electronic signal in proportion to the combustible matter passing through it. Total Recoverable Hydrocarbons (TRH) are routinely reported as four alkane groupings based on the carbon chain length of the compounds: C6-C9, C10-C14, C15-C28 and C29-C36 and in recognition of the NEPM 1999 (2013), >C10-C16 (F2), >C16-C34 (F3) and >C34-C40 (F4). F2 is reported directly and also corrected by subtracting Naphthalene (from VOC method AN433) where available.
AN403	Additionally, the volatile C6-C9 fraction may be determined by a purge and trap technique and GC/MS because of the potential for volatiles loss. Total Petroleum Hydrocarbons (TPH) follows the same method of analysis after silica gel cleanup of the solvent extract. Aliphatic/Aromatic Speciation follows the same method of analysis after fractionation of the solvent extract over silica with differential polarity of the eluent solvents.
AN403	The GC/FID method is not well suited to the analysis of refined high boiling point materials (ie lubricating oils or greases) but is particularly suited for measuring diesel, kerosene and petrol if care to control volatility is taken. This method will detect naturally occurring hydrocarbons, lipids, animal fats, phenols and PAHs if they are present at sufficient levels, dependent on the use of specific cleanup/fractionation techniques. Reference USEPA 3510B, 8015B.
AN420	(SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols (etc) in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN433	VOCs and C6-C9 Hydrocarbons by GC-MS P&T: VOC`s are volatile organic compounds. The sample is presented to a gas chromatograph via a purge and trap (P&T) concentrator and autosampler and is detected with a Mass Spectrometer (MSD). Solid samples are initially extracted with methanol whilst liquid samples are processed directly. References: USEPA 5030B, 8020A, 8260.

AN605	This technique gravimetrically determines the mass of Asbestos Containing Material retained on a 7mm Sieve and assumes that 15% of this ACM is asbestos. This calculated asbestos weight is then calculated as a percentage of the total sample weight.
AN605	This technique also gravimetrically determines the mass of Fibrous Asbestos (FA) and Asbestos Fines (AF) Containing Material retained on and passing a 2mm sieve post 7mm sieving. Assumes that FA and AF are 100% asbestos containing. This calculated asbestos weight is then calculated as a percentage of the total sample weight. This does not include free fibres which are only observed by standard trace analysis as per AN 602.
AN605	AMO = Amosite Detected CRY = Chrysotile Detected CRO = Crocidolite Detected ORG = Organic Fibres Detected SMF = Synthetic Mineral Fibres Detected UMF = Unknown Mineral Fibres Detected NAD = No Asbestos Detected
AN605	Insofar as is technically feasible, this report is consistent with the analytical reporting recommendations in the Western Australian Department of Health Guidelines for the Assessment Remediation and Management of Asbestos - Contaminated Sites in Western Australia - May 2009.

FOOTNOTES

*	NATA accreditation does not cover the performance of this service.	-	Not analysed.	UOM	Unit of Measure.
		NVL	Not validated.	LOR	Limit of Reporting.
**	Indicative data, theoretical holding time exceeded.	IS	Insufficient sample for analysis.	↑↓	Raised/lowered Limit of Reporting.
		LNR	Sample listed, but not received.		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

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

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

STATEMENT OF QA/QC PERFORMANCE

SE164924 R0

CLIENT DETAILS

Contact	Philip Burns
Client	Parsons Brinckerhoff Australia Pty Ltd
Address	Level 3, 51-55 Bolton Street Newcastle NSW 2300
Telephone	02 4929 8300
Facsimile	02 9272 5101
Email	philip.burns@wspgroup.com
Project	**PCB Warners Bay**
Order Number	**2270547A**
Samples	16

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE164924 R0**
Date Received	04 May 2017
Date Reported	11 May 2017

COMMENTS

All the laboratory data for each environmental matrix was compared to SGS' stated Data Quality Objectives (DQO). Comments arising from the comparison were made and are reported below.

The data relating to sampling was taken from the Chain of Custody document and was supplied by the Client.
This QA/QC Statement must be read in conjunction with the referenced Analytical Report.
The Statement and the Analytical Report must not be reproduced except in full.

All Data Quality Objectives were met with the exception of the following:

Duplicate	TOC in Soil	1 item

SAMPLE SUMMARY

Samples clearly labelled	Yes	Complete documentation received	Yes
Sample container provider	SGS	Sample cooling method	Ice
Samples received in correct containers	Yes	Sample counts by matrix	16 Soil
Date documentation received	4/5/2017	Type of documentation received	COC
Samples received in good order	Yes	Samples received without headspace	Yes
Sample temperature upon receipt	3.5°C	Sufficient sample for analysis	Yes
Turnaround time requested	Standard		

HOLDING TIME SUMMARY

SE164924 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB18_0.9	SE164924.016	LB123730	03 May 2017	04 May 2017	31 May 2017	09 May 2017	31 May 2017	10 May 2017

Mercury in Soil

Method: ME-(AU)-[ENV]AN312

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB15_0.3	SE164924.001	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
SB16_0.1	SE164924.002	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
SB17_0.2	SE164924.003	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
SB18_0.1	SE164924.004	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
SB19_0.1	SE164924.005	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
SB20_0.5	SE164924.006	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
SB21_0.1	SE164924.007	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
SB22_0.4	SE164924.009	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
SB23_0.2	SE164924.010	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
SB24_0.5	SE164924.012	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
DUP1	SE164924.013	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017
TRIP1	SE164924.014	LB123623	03 May 2017	04 May 2017	31 May 2017	08 May 2017	31 May 2017	09 May 2017

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB15_0.3	SE164924.001	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB16_0.1	SE164924.002	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB17_0.2	SE164924.003	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB18_0.1	SE164924.004	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB19_0.1	SE164924.005	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB20_0.5	SE164924.006	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB21_0.1	SE164924.007	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB22_0.4	SE164924.009	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB23_0.2	SE164924.010	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB24_0.5	SE164924.012	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
DUP1	SE164924.013	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
TRIP1	SE164924.014	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
TB2	SE164924.015	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017
SB18_0.9	SE164924.016	LB123593	03 May 2017	04 May 2017	17 May 2017	05 May 2017	10 May 2017	09 May 2017

OC Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB16_0.1	SE164924.002	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB17_0.2	SE164924.003	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB19_0.1	SE164924.005	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB21_0.1	SE164924.007	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB24_0.5	SE164924.012	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
DUP1	SE164924.013	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
TRIP1	SE164924.014	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017

OP Pesticides in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB16_0.1	SE164924.002	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB17_0.2	SE164924.003	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB19_0.1	SE164924.005	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB21_0.1	SE164924.007	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB24_0.5	SE164924.012	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
DUP1	SE164924.013	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
TRIP1	SE164924.014	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017

PAH (Polynuclear Aromatic Hydrocarbons) in Soil

Method: ME-(AU)-[ENV]AN420

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB16_0.1	SE164924.002	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB17_0.2	SE164924.003	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB19_0.1	SE164924.005	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB21_0.1	SE164924.007	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB24_0.5	SE164924.012	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017

HOLDING TIME SUMMARY

SE164924 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
DUP1	SE164924.013	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
TRIP1	SE164924.014	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017

pH in soil (1:5) — Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB18_0.9	SE164924.016	LB123700	03 May 2017	04 May 2017	10 May 2017	09 May 2017	10 May 2017	09 May 2017

TOC in Soil — Method: ME-(AU)-[ENV]AN188

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB18_0.9	SE164924.016	LB123816	03 May 2017	04 May 2017	31 May 2017	10 May 2017	31 May 2017	10 May 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB15_0.3	SE164924.001	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB16_0.1	SE164924.002	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB17_0.2	SE164924.003	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB18_0.1	SE164924.004	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB19_0.1	SE164924.005	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB20_0.5	SE164924.006	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB21_0.1	SE164924.007	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB22_0.4	SE164924.009	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB23_0.2	SE164924.010	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB24_0.5	SE164924.012	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
DUP1	SE164924.013	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
TRIP1	SE164924.014	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	09 May 2017
SB18_0.9	SE164924.016	LB123616	03 May 2017	04 May 2017	30 Oct 2017	08 May 2017	30 Oct 2017	10 May 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB16_0.1	SE164924.002	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB17_0.2	SE164924.003	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB19_0.1	SE164924.005	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB21_0.1	SE164924.007	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB24_0.5	SE164924.012	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
DUP1	SE164924.013	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
TRIP1	SE164924.014	LB123603	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB16_0.1	SE164924.002	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB17_0.2	SE164924.003	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB19_0.1	SE164924.005	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB21_0.1	SE164924.007	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB24_0.5	SE164924.012	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
DUP1	SE164924.013	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
TRIP1	SE164924.014	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
TB2	SE164924.015	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017

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

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
SB16_0.1	SE164924.002	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB17_0.2	SE164924.003	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB19_0.1	SE164924.005	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB21_0.1	SE164924.007	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
SB24_0.5	SE164924.012	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
DUP1	SE164924.013	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
TRIP1	SE164924.014	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017
TB2	SE164924.015	LB123602	03 May 2017	04 May 2017	17 May 2017	08 May 2017	17 Jun 2017	09 May 2017

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Tetrachloro-m-xylene (TCMX) (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	108
	SB17_0.2	SE164924.003	%	60 - 130%	113
	SB19_0.1	SE164924.005	%	60 - 130%	103
	SB21_0.1	SE164924.007	%	60 - 130%	105
	SB24_0.5	SE164924.012	%	60 - 130%	103

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	84
	SB17_0.2	SE164924.003	%	60 - 130%	80
	SB19_0.1	SE164924.005	%	60 - 130%	74
	SB21_0.1	SE164924.007	%	60 - 130%	82
	SB24_0.5	SE164924.012	%	60 - 130%	76
d14-p-terphenyl (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	94
	SB17_0.2	SE164924.003	%	60 - 130%	80
	SB19_0.1	SE164924.005	%	60 - 130%	92
	SB21_0.1	SE164924.007	%	60 - 130%	80
	SB24_0.5	SE164924.012	%	60 - 130%	80

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
2-fluorobiphenyl (Surrogate)	SB16_0.1	SE164924.002	%	70 - 130%	84
	SB17_0.2	SE164924.003	%	70 - 130%	80
	SB19_0.1	SE164924.005	%	70 - 130%	74
	SB21_0.1	SE164924.007	%	70 - 130%	82
	SB24_0.5	SE164924.012	%	70 - 130%	76
	DUP1	SE164924.013	%	70 - 130%	84
	TRIP1	SE164924.014	%	70 - 130%	80
d14-p-terphenyl (Surrogate)	SB16_0.1	SE164924.002	%	70 - 130%	94
	SB17_0.2	SE164924.003	%	70 - 130%	80
	SB19_0.1	SE164924.005	%	70 - 130%	92
	SB21_0.1	SE164924.007	%	70 - 130%	80
	SB24_0.5	SE164924.012	%	70 - 130%	80
	DUP1	SE164924.013	%	70 - 130%	80
	TRIP1	SE164924.014	%	70 - 130%	82
d5-nitrobenzene (Surrogate)	SB16_0.1	SE164924.002	%	70 - 130%	90
	SB17_0.2	SE164924.003	%	70 - 130%	76
	SB19_0.1	SE164924.005	%	70 - 130%	78
	SB21_0.1	SE164924.007	%	70 - 130%	80
	SB24_0.5	SE164924.012	%	70 - 130%	76
	DUP1	SE164924.013	%	70 - 130%	84
	TRIP1	SE164924.014	%	70 - 130%	84

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	70
	SB17_0.2	SE164924.003	%	60 - 130%	77
	SB19_0.1	SE164924.005	%	60 - 130%	73
	SB21_0.1	SE164924.007	%	60 - 130%	75
	SB24_0.5	SE164924.012	%	60 - 130%	77
	DUP1	SE164924.013	%	60 - 130%	76
	TRIP1	SE164924.014	%	60 - 130%	71
d4-1,2-dichloroethane (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	79
	SB17_0.2	SE164924.003	%	60 - 130%	85
	SB19_0.1	SE164924.005	%	60 - 130%	82
	SB21_0.1	SE164924.007	%	60 - 130%	78
	SB24_0.5	SE164924.012	%	60 - 130%	83
	DUP1	SE164924.013	%	60 - 130%	81
	TRIP1	SE164924.014	%	60 - 130%	83
d8-toluene (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	75
	SB17_0.2	SE164924.003	%	60 - 130%	82
	SB19_0.1	SE164924.005	%	60 - 130%	78

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
d8-toluene (Surrogate)	SB21_0.1	SE164924.007	%	60 - 130%	71
	SB24_0.5	SE164924.012	%	60 - 130%	77
	DUP1	SE164924.013	%	60 - 130%	76
	TRIP1	SE164924.014	%	60 - 130%	78
Dibromofluoromethane (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	83
	SB17_0.2	SE164924.003	%	60 - 130%	71
	SB19_0.1	SE164924.005	%	60 - 130%	73
	SB21_0.1	SE164924.007	%	60 - 130%	85
	SB24_0.5	SE164924.012	%	60 - 130%	82
	DUP1	SE164924.013	%	60 - 130%	70
	TRIP1	SE164924.014	%	60 - 130%	71

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

Parameter	Sample Name	Sample Number	Units	Criteria	Recovery %
Bromofluorobenzene (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	70
	SB17_0.2	SE164924.003	%	60 - 130%	77
	SB19_0.1	SE164924.005	%	60 - 130%	73
	SB21_0.1	SE164924.007	%	60 - 130%	75
	SB24_0.5	SE164924.012	%	60 - 130%	77
	DUP1	SE164924.013	%	60 - 130%	76
	TRIP1	SE164924.014	%	60 - 130%	71
	TB2	SE164924.015	%	60 - 130%	74
d4-1,2-dichloroethane (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	79
	SB17_0.2	SE164924.003	%	60 - 130%	85
	SB19_0.1	SE164924.005	%	60 - 130%	82
	SB21_0.1	SE164924.007	%	60 - 130%	78
	SB24_0.5	SE164924.012	%	60 - 130%	83
	DUP1	SE164924.013	%	60 - 130%	81
	TRIP1	SE164924.014	%	60 - 130%	83
	TB2	SE164924.015	%	60 - 130%	94
d8-toluene (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	75
	SB17_0.2	SE164924.003	%	60 - 130%	82
	SB19_0.1	SE164924.005	%	60 - 130%	78
	SB21_0.1	SE164924.007	%	60 - 130%	71
	SB24_0.5	SE164924.012	%	60 - 130%	77
	DUP1	SE164924.013	%	60 - 130%	76
	TRIP1	SE164924.014	%	60 - 130%	78
	TB2	SE164924.015	%	60 - 130%	89
Dibromofluoromethane (Surrogate)	SB16_0.1	SE164924.002	%	60 - 130%	83
	SB17_0.2	SE164924.003	%	60 - 130%	71
	SB19_0.1	SE164924.005	%	60 - 130%	73
	SB21_0.1	SE164924.007	%	60 - 130%	85
	SB24_0.5	SE164924.012	%	60 - 130%	82
	DUP1	SE164924.013	%	60 - 130%	70
	TRIP1	SE164924.014	%	60 - 130%	71
	TB2	SE164924.015	%	60 - 130%	79

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) — Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR

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

Sample Number	Parameter	Units	LOR	Result
LB123623.001	Mercury	mg/kg	0.05	<0.05

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

Sample Number		Parameter	Units	LOR	Result
LB123603.001		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1
		Alpha BHC	mg/kg	0.1	<0.1
		Lindane	mg/kg	0.1	<0.1
		Heptachlor	mg/kg	0.1	<0.1
		Aldrin	mg/kg	0.1	<0.1
		Beta BHC	mg/kg	0.1	<0.1
		Delta BHC	mg/kg	0.1	<0.1
		Heptachlor epoxide	mg/kg	0.1	<0.1
		Alpha Endosulfan	mg/kg	0.2	<0.2
		Gamma Chlordane	mg/kg	0.1	<0.1
		Alpha Chlordane	mg/kg	0.1	<0.1
		p,p'-DDE	mg/kg	0.1	<0.1
		Dieldrin	mg/kg	0.2	<0.2
		Endrin	mg/kg	0.2	<0.2
		Beta Endosulfan	mg/kg	0.2	<0.2
		p,p'-DDD	mg/kg	0.1	<0.1
		p,p'-DDT	mg/kg	0.1	<0.1
		Endosulfan sulphate	mg/kg	0.1	<0.1
		Endrin Aldehyde	mg/kg	0.1	<0.1
		Methoxychlor	mg/kg	0.1	<0.1
		Endrin Ketone	mg/kg	0.1	<0.1
		Isodrin	mg/kg	0.1	<0.1
		Mirex	mg/kg	0.1	<0.1
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	%	-	76

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

Sample Number		Parameter	Units	LOR	Result
LB123603.001		Dichlorvos	mg/kg	0.5	<0.5
		Dimethoate	mg/kg	0.5	<0.5
		Diazinon (Dimpylate)	mg/kg	0.5	<0.5
		Fenitrothion	mg/kg	0.2	<0.2
		Malathion	mg/kg	0.2	<0.2
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2
		Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2
		Bromophos Ethyl	mg/kg	0.2	<0.2
		Methidathion	mg/kg	0.5	<0.5
		Ethion	mg/kg	0.2	<0.2
		Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2
	Surrogates	2-fluorobiphenyl (Surrogate)	%	-	86
		d14-p-terphenyl (Surrogate)	%	-	86

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

Sample Number	Parameter	Units	LOR	Result
LB123603.001	Naphthalene	mg/kg	0.1	<0.1
	2-methylnaphthalene	mg/kg	0.1	<0.1
	1-methylnaphthalene	mg/kg	0.1	<0.1
	Acenaphthylene	mg/kg	0.1	<0.1
	Acenaphthene	mg/kg	0.1	<0.1
	Fluorene	mg/kg	0.1	<0.1
	Phenanthrene	mg/kg	0.1	<0.1
	Anthracene	mg/kg	0.1	<0.1

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

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

Sample Number		Parameter	Units	LOR	Result
LB123603.001		Fluoranthene	mg/kg	0.1	<0.1
		Pyrene	mg/kg	0.1	<0.1
		Benzo(a)anthracene	mg/kg	0.1	<0.1
		Chrysene	mg/kg	0.1	<0.1
		Benzo(a)pyrene	mg/kg	0.1	<0.1
		Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1
		Dibenzo(ah)anthracene	mg/kg	0.1	<0.1
		Benzo(ghi)perylene	mg/kg	0.1	<0.1
		Total PAH (18)	mg/kg	0.8	<0.8
	Surrogates	d5-nitrobenzene (Surrogate)	%	-	76
		2-fluorobiphenyl (Surrogate)	%	-	86
		d14-p-terphenyl (Surrogate)	%	-	86

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

Sample Number		Parameter	Units	LOR	Result
LB123616.001		Arsenic, As	mg/kg	3	<3
		Cadmium, Cd	mg/kg	0.3	<0.3
		Chromium, Cr	mg/kg	0.3	<0.3
		Copper, Cu	mg/kg	0.5	<0.5
		Lead, Pb	mg/kg	1	<1
		Nickel, Ni	mg/kg	0.5	<0.5
		Zinc, Zn	mg/kg	0.5	<0.5
		Iron, Fe	mg/kg	50	<50

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

Sample Number		Parameter	Units	LOR	Result
LB123603.001		TRH C10-C14	mg/kg	20	<20
		TRH C15-C28	mg/kg	45	<45
		TRH C29-C36	mg/kg	45	<45
		TRH C37-C40	mg/kg	100	<100
		TRH C10-C36 Total	mg/kg	110	<110

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

Sample Number		Parameter	Units	LOR	Result
LB123602.001	Monocyclic Aromatic	Benzene	mg/kg	0.1	<0.1
	Hydrocarbons	Toluene	mg/kg	0.1	<0.1
		Ethylbenzene	mg/kg	0.1	<0.1
		m/p-xylene	mg/kg	0.2	<0.2
		o-xylene	mg/kg	0.1	<0.1
	Polycyclic VOCs	Naphthalene	mg/kg	0.1	<0.1
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	80
		d4-1,2-dichloroethane (Surrogate)	%	-	86
		d8-toluene (Surrogate)	%	-	85
		Bromofluorobenzene (Surrogate)	%	-	76
	Totals	Total BTEX	mg/kg	0.6	<0.6

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

Sample Number		Parameter	Units	LOR	Result
LB123602.001		TRH C6-C9	mg/kg	20	<20
	Surrogates	Dibromofluoromethane (Surrogate)	%	-	80
		d4-1,2-dichloroethane (Surrogate)	%	-	86
		d8-toluene (Surrogate)	%	-	85

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164846.008	LB123623.024	Mercury	mg/kg	0.05	<0.05	<0.05	200	0
SE164924.012	LB123623.014	Mercury	mg/kg	0.05	<0.05	<0.05	187	0

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164853.003	LB123593.022	% Moisture	%w/w	0.5	8.3	8.2	42	0
SE164855.030	LB123593.033	% Moisture	%w/w	0.5	6.1	5.7	47	6
SE164861.005	LB123593.044	% Moisture	%w/w	0.5	81.7	81.5	31	0
SE164861.007	LB123593.047	% Moisture	%w/w	0.5	86.2	86.3	31	0
SE164924.007	LB123593.011	% Moisture	%w/w	0.5	20	23	35	13

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164924.012	LB123603.015		Hexachlorobenzene (HCB)	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Lindane	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor	mg/kg	0.1	<0.1	<0.1	200	0
			Aldrin	mg/kg	0.1	<0.1	<0.1	200	0
			Beta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Delta BHC	mg/kg	0.1	<0.1	<0.1	200	0
			Heptachlor epoxide	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			Gamma Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			Alpha Chlordane	mg/kg	0.1	<0.1	<0.1	200	0
			trans-Nonachlor	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDE	mg/kg	0.1	<0.1	<0.1	200	0
			Dieldrin	mg/kg	0.2	<0.2	<0.2	200	0
			Endrin	mg/kg	0.2	<0.2	<0.2	200	0
			o,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			o,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Beta Endosulfan	mg/kg	0.2	<0.2	<0.2	200	0
			p,p'-DDD	mg/kg	0.1	<0.1	<0.1	200	0
			p,p'-DDT	mg/kg	0.1	<0.1	<0.1	200	0
			Endosulfan sulphate	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Aldehyde	mg/kg	0.1	<0.1	<0.1	200	0
			Methoxychlor	mg/kg	0.1	<0.1	<0.1	200	0
			Endrin Ketone	mg/kg	0.1	<0.1	<0.1	200	0
			Isodrin	mg/kg	0.1	<0.1	<0.1	200	0
			Mirex	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.15	0.15	30	0

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164924.012	LB123603.016		Dichlorvos	mg/kg	0.5	<0.5	<0.5	200	0
			Dimethoate	mg/kg	0.5	<0.5	<0.5	200	0
			Diazinon (Dimpylate)	mg/kg	0.5	<0.5	<0.5	200	0
			Fenitrothion	mg/kg	0.2	<0.2	<0.2	200	0
			Malathion	mg/kg	0.2	<0.2	<0.2	200	0
			Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	<0.2	<0.2	200	0
			Parathion-ethyl (Parathion)	mg/kg	0.2	<0.2	<0.2	200	0
			Bromophos Ethyl	mg/kg	0.2	<0.2	<0.2	200	0
			Methidathion	mg/kg	0.5	<0.5	<0.5	200	0
			Ethion	mg/kg	0.2	<0.2	<0.2	200	0
			Azinphos-methyl (Guthion)	mg/kg	0.2	<0.2	<0.2	200	0
		Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	3
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	7

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

Original	Duplicate	Parameter	Units	LOR

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164924.012	LB123603.016		Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthylene	mg/kg	0.1	<0.1	<0.1	200	0
			Acenaphthene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluorene	mg/kg	0.1	<0.1	<0.1	200	0
			Phenanthrene	mg/kg	0.1	<0.1	<0.1	200	0
			Anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Chrysene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(a)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	200	0
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	200	0
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	<0.2	<0.2	200	0
				TEQ (mg/kg)	0.2	<0.2	<0.2	200	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	<0.3	<0.3	134	0
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	<0.2	<0.2	175	0
			Total PAH (18)	mg/kg	0.8	<0.8	<0.8	200	0
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	30	3
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	3
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	30	7

pH in soil (1:5) — Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164871.052	LB123700.014	pH	pH Units	-	9.203	9.217	31	0
SE165027.006	LB123700.024	pH	pH Units	-	6.8	6.8	31	0

TOC in Soil — Method: ME-(AU)-[ENV]AN188

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164864.001	LB123816.004	Total Organic Carbon	%w/w	0.05	1.57400494	72.0215657489	18	25 ②
SE164871.036	LB123816.016	Total Organic Carbon	%w/w	0.05	1.32997927	171.2049298312	19	10
SE164871.046	LB123816.028	Total Organic Carbon	%w/w	0.05	1.24478252	811.3250211231	19	6

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164871.013	LB123616.024	Arsenic, As	mg/kg	3	28.1904564	3930.446590909	31	2
		Cadmium, Cd	mg/kg	0.3	1.665426079	51.5628148888	49	6
		Chromium, Cr	mg/kg	0.3	9.384409469	610.2808809197	35	9
		Copper, Cu	mg/kg	0.5	50.69337121	229.6093155165	30	6
		Lead, Pb	mg/kg	1	50.76893939	381.962977767	30	12
		Nickel, Ni	mg/kg	0.5	16.86514640	1588.735709989	33	11
		Zinc, Zn	mg/kg	0.5	83.23894507	573.153723161	31	27
SE164924.012	LB123616.014	Arsenic, As	mg/kg	3	4	4	53	5
		Cadmium, Cd	mg/kg	0.3	<0.3	<0.3	191	0
		Chromium, Cr	mg/kg	0.3	7.0	6.9	37	1
		Copper, Cu	mg/kg	0.5	11	10	35	6
		Lead, Pb	mg/kg	1	8	8	43	2
		Nickel, Ni	mg/kg	0.5	5.1	5.0	40	3
		Zinc, Zn	mg/kg	0.5	29	28	37	3

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

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164924.012	LB123603.016	TRH C10-C14	mg/kg	20	<20	<20	200	0
		TRH C15-C28	mg/kg	45	<45	<45	200	0
		TRH C29-C36	mg/kg	45	<45	<45	200	0
		TRH C37-C40	mg/kg	100	<100	<100	200	0

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164924.012	LB123603.016		TRH C10-C36 Total	mg/kg	110	<110	<110	200	0
			TRH C10-C40 Total	mg/kg	210	<210	<210	200	0
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	<25	<25	200	0
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	<25	<25	200	0
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	200	0
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	200	0

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164924.012	LB123602.014	Monocyclic	Benzene	mg/kg	0.1	<0.1	<0.1	200	0
		Aromatic	Toluene	mg/kg	0.1	<0.1	<0.1	200	0
			Ethylbenzene	mg/kg	0.1	<0.1	<0.1	200	0
			m/p-xylene	mg/kg	0.2	<0.2	<0.2	200	0
			o-xylene	mg/kg	0.1	<0.1	<0.1	200	0
		Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	3.8	50	8
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	4.4	50	5
			d8-toluene (Surrogate)	mg/kg	-	3.9	4.2	50	8
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	3.5	50	9
		Totals	Total Xylenes*	mg/kg	0.3	<0.3	<0.3	200	0
			Total BTEX	mg/kg	0.6	<0.6	<0.6	200	0

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

Original	Duplicate		Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE164924.012	LB123602.014		TRH C6-C10	mg/kg	25	<25	<25	200	0
			TRH C6-C9	mg/kg	20	<20	<20	200	0
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.1	3.8	30	8
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.2	4.4	30	5
			d8-toluene (Surrogate)	mg/kg	-	3.9	4.2	30	8
			Bromofluorobenzene (Surrogate)	mg/kg	-	3.9	3.5	30	9
		VPH F Bands	Benzene (F0)	mg/kg	0.1	<0.1	<0.1	200	0
			TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	200	0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) — Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123730.002	Exchangeable Sodium, Na	mg/kg	2	NA	390	80 - 120	95
	Exchangeable Potassium, K	mg/kg	2	NA	343	80 - 120	92
	Exchangeable Calcium, Ca	mg/kg	2	NA	2570	80 - 120	92
	Exchangeable Magnesium, Mg	mg/kg	2	NA	635	80 - 120	91

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123623.002	Mercury	mg/kg	0.05	0.22	0.2	70 - 130	109

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123603.002		Heptachlor	mg/kg	0.1	0.2	0.2	60 - 140	117
		Aldrin	mg/kg	0.1	0.2	0.2	60 - 140	119
		Delta BHC	mg/kg	0.1	0.2	0.2	60 - 140	119
		Dieldrin	mg/kg	0.2	0.2	0.2	60 - 140	115
		Endrin	mg/kg	0.2	0.2	0.2	60 - 140	118
		p,p'-DDT	mg/kg	0.1	0.2	0.2	60 - 140	124
	Surrogates	Tetrachloro-m-xylene (TCMX) (Surrogate)	mg/kg	-	0.16	0.15	40 - 130	104

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123603.002		Dichlorvos	mg/kg	0.5	1.7	2	60 - 140	85
		Diazinon (Dimpylate)	mg/kg	0.5	2.0	2	60 - 140	100
		Chlorpyrifos (Chlorpyrifos Ethyl)	mg/kg	0.2	2.0	2	60 - 140	100
		Ethion	mg/kg	0.2	1.5	2	60 - 140	77
	Surrogates	2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.5	40 - 130	112

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123603.002		Naphthalene	mg/kg	0.1	4.0	4	60 - 140	101
		Acenaphthylene	mg/kg	0.1	3.3	4	60 - 140	84
		Acenaphthene	mg/kg	0.1	4.3	4	60 - 140	107
		Phenanthrene	mg/kg	0.1	4.7	4	60 - 140	116
		Anthracene	mg/kg	0.1	5.0	4	60 - 140	126
		Fluoranthene	mg/kg	0.1	4.4	4	60 - 140	110
		Pyrene	mg/kg	0.1	4.6	4	60 - 140	115
		Benzo(a)pyrene	mg/kg	0.1	3.4	4	60 - 140	85
	Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	80
		2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.5	40 - 130	86
		d14-p-terphenyl (Surrogate)	mg/kg	-	0.6	0.5	40 - 130	112

pH in soil (1:5) — Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123700.003	pH	pH Units	-	7.4	7.415	98 - 102	100

TOC in Soil — Method: ME-(AU)-[ENV]AN188

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123816.002	Total Organic Carbon	%w/w	0.05	0.28	0.325	80 - 120	86
LB123816.025	Total Organic Carbon	%w/w	0.05	0.27	0.325	80 - 120	83

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

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123616.002	Arsenic, As	mg/kg	3	47	50	80 - 120	94
	Cadmium, Cd	mg/kg	0.3	49	50	80 - 120	98
	Chromium, Cr	mg/kg	0.3	49	50	80 - 120	97
	Copper, Cu	mg/kg	0.5	48	50	80 - 120	95
	Lead, Pb	mg/kg	1	48	50	80 - 120	97
	Nickel, Ni	mg/kg	0.5	49	50	80 - 120	98

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123616.002		Zinc, Zn	mg/kg	0.5	49	50	80 - 120	98
		Iron, Fe	mg/kg	50	51	50	80 - 120	101

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123603.002		TRH C10-C14	mg/kg	20	46	40	60 - 140	115
		TRH C15-C28	mg/kg	45	<45	40	60 - 140	108
		TRH C29-C36	mg/kg	45	<45	40	60 - 140	78
	TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	46	40	60 - 140	115
		TRH >C16-C34 (F3)	mg/kg	90	<90	40	60 - 140	93
		TRH >C34-C40 (F4)	mg/kg	120	<120	20	60 - 140	75

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123602.002	Monocyclic	Benzene	mg/kg	0.1	2.5	2.9	60 - 140	86
	Aromatic	Toluene	mg/kg	0.1	2.5	2.9	60 - 140	86
		Ethylbenzene	mg/kg	0.1	2.4	2.9	60 - 140	83
		m/p-xylene	mg/kg	0.2	5.2	5.8	60 - 140	90
		o-xylene	mg/kg	0.1	2.5	2.9	60 - 140	85
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	5	60 - 140	80
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.4	5	60 - 140	88
		d8-toluene (Surrogate)	mg/kg	-	4.5	5	60 - 140	91
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	5	60 - 140	88

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

Sample Number		Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB123602.002		TRH C6-C10	mg/kg	25	<25	24.65	60 - 140	94
		TRH C6-C9	mg/kg	20	21	23.2	60 - 140	88
	Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	4.0	5	60 - 140	80
		d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.4	5	60 - 140	88
		d8-toluene (Surrogate)	mg/kg	-	4.5	5	60 - 140	91
		Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	5	60 - 140	88
	VPH F Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	7.25	60 - 140	111

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE164924.001	LB123623.004	Mercury	mg/kg	0.05	0.24	0.09	0.2	76

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE164924.003	LB123603.015		Naphthalene	mg/kg	0.1	4.1	<0.1	4	102
			2-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			1-methylnaphthalene	mg/kg	0.1	<0.1	<0.1	-	-
			Acenaphthylene	mg/kg	0.1	4.0	<0.1	4	100
			Acenaphthene	mg/kg	0.1	4.2	<0.1	4	106
			Fluorene	mg/kg	0.1	<0.1	<0.1	-	-
			Phenanthrene	mg/kg	0.1	4.6	<0.1	4	114
			Anthracene	mg/kg	0.1	4.2	<0.1	4	104
			Fluoranthene	mg/kg	0.1	5.0	<0.1	4	124
			Pyrene	mg/kg	0.1	4.4	<0.1	4	108
			Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Chrysene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(b&j)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(k)fluoranthene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(a)pyrene	mg/kg	0.1	3.6	<0.1	4	91
			Indeno(1,2,3-cd)pyrene	mg/kg	0.1	<0.1	<0.1	-	-
			Dibenzo(ah)anthracene	mg/kg	0.1	<0.1	<0.1	-	-
			Benzo(ghi)perylene	mg/kg	0.1	<0.1	<0.1	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=0	TEQ	0.2	3.6	<0.2	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR	TEQ (mg/kg)	0.3	3.8	<0.3	-	-
			Carcinogenic PAHs, BaP TEQ <LOR=LOR/2	TEQ (mg/kg)	0.2	3.7	<0.2	-	-
			Total PAH (18)	mg/kg	0.8	34	<0.8	-	-
		Surrogates	d5-nitrobenzene (Surrogate)	mg/kg	-	0.4	0.4	-	78
			2-fluorobiphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	78
			d14-p-terphenyl (Surrogate)	mg/kg	-	0.4	0.4	-	76

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

QC Sample	Sample Number	Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE164924.001	LB123616.004	Arsenic, As	mg/kg	3	51	11	50	82
		Cadmium, Cd	mg/kg	0.3	45	0.6	50	89
		Chromium, Cr	mg/kg	0.3	51	7.1	50	88
		Copper, Cu	mg/kg	0.5	62	20	50	84
		Lead, Pb	mg/kg	1	75	37	50	75
		Nickel, Ni	mg/kg	0.5	53	9.1	50	88
		Zinc, Zn	mg/kg	0.5	83	42	50	81

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE164924.003	LB123603.015		TRH C10-C14	mg/kg	20	44	<20	40	110
			TRH C15-C28	mg/kg	45	45	<45	40	113
			TRH C29-C36	mg/kg	45	<45	<45	40	108
			TRH C37-C40	mg/kg	100	<100	<100	-	-
			TRH C10-C36 Total	mg/kg	110	130	<110	-	-
			TRH C10-C40 Total	mg/kg	210	<210	<210	-	-
		TRH F Bands	TRH >C10-C16 (F2)	mg/kg	25	44	<25	40	110
			TRH >C10-C16 (F2) - Naphthalene	mg/kg	25	44	<25	-	-
			TRH >C16-C34 (F3)	mg/kg	90	<90	<90	40	115
			TRH >C34-C40 (F4)	mg/kg	120	<120	<120	-	-

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE164855.001	LB123602.004	Monocyclic	Benzene	mg/kg	0.1	2.3	<0.1	2.9	80
		Aromatic	Toluene	mg/kg	0.1	2.2	<0.1	2.9	74
			Ethylbenzene	mg/kg	0.1	2.3	<0.1	2.9	79
			m/p-xylene	mg/kg	0.2	4.9	<0.2	5.8	84
			o-xylene	mg/kg	0.1	2.4	<0.1	2.9	82

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE164855.001	LB123602.004	Polycyclic	Naphthalene	mg/kg	0.1	<0.1	<0.1	-	-
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.6	-	75
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.3	4.1	-	85
			d8-toluene (Surrogate)	mg/kg	-	4.2	4.1	-	84
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	3.8	-	87
		Totals	Total Xylenes*	mg/kg	0.3	7.3	<0.3	-	-
			Total BTEX	mg/kg	0.6	14	<0.6	-	-

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

QC Sample	Sample Number		Parameter	Units	LOR	Result	Original	Spike	Recovery%
SE164855.001	LB123602.004		TRH C6-C10	mg/kg	25	<25	<25	24.65	92
			TRH C6-C9	mg/kg	20	20	<20	23.2	87
		Surrogates	Dibromofluoromethane (Surrogate)	mg/kg	-	3.8	3.6	-	75
			d4-1,2-dichloroethane (Surrogate)	mg/kg	-	4.3	4.1	-	85
			d8-toluene (Surrogate)	mg/kg	-	4.2	4.1	-	84
			Bromofluorobenzene (Surrogate)	mg/kg	-	4.4	3.8	-	87
		VPH F	Benzene (F0)	mg/kg	0.1	2.3	<0.1	-	-
		Bands	TRH C6-C10 minus BTEX (F1)	mg/kg	25	<25	<25	7.25	120

MATRIX SPIKE DUPLICATES

SE164924 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

QC criteria are subject to internal review according to the SGS QA/QC plan and may be provided on request or alternatively can be found here: http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical Documents/MP-AU-ENV-QU-022 QA QC Plan.pdf

*	NATA accreditation does not cover the performance of this service.
-	Sample not analysed for this analyte.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Philip Burns	Manager	Jon Dicker
Client	Parsons Brinckerhoff Australia Pty Ltd	Laboratory	SGS Cairns Environmental
Address	Level 3, 51-55 Bolton Street Newcastle NSW 2300	Address	Unit 2, 58 Comport St Portsmith QLD 4870
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Project	**PCB Warners Bay**	SGS Reference	**CE127220 R0**
Order Number	**SE164924**	Date Received	08 May 2017
Samples	1	Date Reported	10 May 2017

COMMENTS

Accredited for compliance with ISO/IEC 17025- Testing. NATA accredited laboratory 2562(3146)

SIGNATORIES

Anthony Nilsson
Operations Manager

Jon Dicker
Manager Northern QLD

Parameter	Units	LOR	Sample Number: CE127220.001 Sample Matrix: Soil Sample Date: 03 May 2017 Sample Name: SB18_0.9
Moisture Content Method: AN002 Tested: 8/5/2017			
% Moisture	%w/w	1	**16**
Particle sizing of soils by sieving Method: AN005 Tested: 10/5/2017			
Passing 75µm	%w/w	1	**41**
Retained 75µm	%w/w	1	**59**
Particle sizing of soils <75µm by hydrometer Method: AN005 Tested: 10/5/2017			
Clay (<0.002mm)	%w/w	0.1	**13**

QC SUMMARY

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

No QC samples were reported for this job.

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN005	The particle size distribution of a soil is determined by wet sieving, using a maximum of 900 mL of deionised water to sieve all fractions down to 75 µm. Referenced to AS1289.3.6.1 and AS1141.11.

FOOTNOTES

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

Samples analysed as received.
Solid samples expressed on a dry weight basis.

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

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

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

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

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

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

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

E-MAILED
4/5/17@12.37

SGS Environmental Services

Unit 16/33 Maddox St
Alexandria NSW 2015

Telephone No: 02 8594 0400
Facsimile No: 02 8594 0499

CHAIN OF CUSTODY & ANALYSIS REQUEST

Chain of Custody Number (if applicable): _____ Page _1___ of __4__

Company Name:	WSP Parsons Brinckerhoff	Project Name/No:	PCB Warners Bay
Address:	Level 3 51-55 Bolton Street	Purchase Order No:	2270547A
	Newcastle NSW 2300	Results Required By:	5 day TAT (10 / 5 / 17)
		Telephone:	0401499270
Contact Name:	Philip burns	Facsimile:	Philip.burns@wspgroup.com

SGS EHS Alexandria Laboratory

SE164924 COC
Received: 04 – May – 2017

Client Sample ID	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH, BTEXN, PAHs,	8 metals	OCP / OPP	Asbestos		Fe, pH, CEC, TOC and Clay content Hold	vTRH									
SB15_0.1			X								X										Jar + Bag
SB15_0.3	1		X				X														
SB15_0.9			X								X										
SB16_0.1	2		X			X	X	X	X												Jar + Bag
SB16_0.5			X								X										
SB16_0.9			X								X										
SB17_0.2	3		X			X	X	X	X												Jar + Bag
SB17_0.5			X								X										
SB17_0.9			X								X										
SB18_0.1	4		X				X														Jar + Bag
SB18_0.3			X								X										

Relinquished By: Philip Burns	Date/Time: 3/5/17	Received By:	Date/Time 04/05/17 @ 8:15
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: YES / NO	Temperature: AMBIENT / CHILLED	Sample Cooler Sealed: YES / NO	Laboratory Quotation No:

COMMENTS:

SGS Environmental Services

Unit 16/33 Maddox St
Alexandria NSW 2015

Telephone No: 02 8594 0400
Facsimile No: 02 8594 0499

CHAIN OF CUSTODY & ANALYSIS REQUEST

Chain of Custody Number (if applicable): _____ Page _2___ of __4__

Company Name:	WSP Parsons Brinckerhoff	Project Name/No:	PCB Warners Bay
Address:	Level 3 51-55 Bolton Street	Purchase Order No:	2270547A
	Newcastle NSW 2300	Results Required By:	5 day TAT (
		Telephone:	0401499270
Contact Name:	Philip burns	Facsimile:	Philip.burns@wspgroup.com

Client Sample ID	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH, BTEXN, PAHs,	8 metals	OCP / OPP	Asbestos		Fe, pH, CEC, TOC and Clay content	Hold	vTRH									
SB18_0.9	16		X								X											Jar + Bag
SB19_0.1	5		X			X	X	X	X													Jar + Bag
SB19_0.4			X									X										
SB19_0.9			X									X										
SB20_0.2			X									X										Jar + Bag
SB20_0.5	6		X				X															
SB20_0.9			X									X										
SB21_0.1	7		X			X	X	X														
SB21_0.4			X									X										
SB22_0.9			X									X										
SB22_0.1	8		X						X			X										Jar + Bag

Relinquished By: Philip Burns	Date/Time: 3/5/17	Received By:	Date/Time 04/05/17 @ 8:15
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: YES / NO	Temperature: AMBIENT / CHILLED	Sample Cooler Sealed: YES / NO	Laboratory Quotation No:
COMMENTS:			

SGS Environmental Services

Unit 16/33 Maddox St
Alexandria NSW 2015

Telephone No: 02 8594 0400
Facsimile No: 02 8594 0499

CHAIN OF CUSTODY & ANALYSIS REQUEST

Chain of Custody Number (if applicable): ____________

Page 3 of 4

Company Name:	WSP Parsons Brinckerhoff	Project Name/No:	PCB Warners Bay
Address:	Level 3 51-55 Bolton Street	Purchase Order No:	2270547A
	Newcastle NSW 2300	Results Required By:	5 day TAT (
		Telephone:	0401499270
Contact Name:	Philip burns	Facsimile:	Philip.burns@wspgroup.com

Client Sample ID	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH, BTEXN, PAHs,	8 metals	OCP / OPP	Asbestos		Fe, pH, CEC, TOC and Clay content	Hold	vTRH								
SB22_0.4	9		X				X														
SB22_0.9			X									X									
SB23_0.2	10		X				X														
SB23_0.4			X									X									
SB23_0.9			X									X									Jar + Bag
SB24_0.1	11		X						X												Jar + Bag
SB24_0.5	12		X			X	X	X													
SB24_0.9			X									X									
DUP1	13		X			X	X														
DUP2			X									X									
TRIP1	14		X			X	X														

Relinquished By: Philip Burns	Date/Time: 3/5/17	Received By: [signature]	Date/Time 04/05/17 @ 8:15
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: (YES) / NO	Temperature: AMBIENT / (CHILLED)	Sample Cooler Sealed: YES / NO	Laboratory Quotation No:

COMMENTS:

SGS Environmental Services

Unit 16/33 Maddox St
Alexandria NSW 2015

Telephone No: 02 8594 0400
Facsimile No: 02 8594 0499

CHAIN OF CUSTODY & ANALYSIS REQUEST

Chain of Custody Number (if applicable): _____

Company Name:	WSP Parsons Brinckerhoff	Project Name/No:	PCB Warners Bay
Address:	Level 3 51-55 Bolton Street	Purchase Order No:	2270547A
	Newcastle NSW 2300	Results Required By:	5 day TAT (
		Telephone:	0401499270
Contact Name:	Philip burns	Facsimile:	Philip.burns@wspgroup.com

Client Sample ID	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TRH, BTEXN, PAHs,	8 metals	OCP / OPP	Asbestos		Fe, pH, CEC, TOC and Clay content Hold	vTRH								
TRIP2			X								X									
TB2	15		X									X								
			X																	
			X																	
			X																	
			X																	
			X																	
			X																	
			X																	
			X																	
			X																	

Relinquished By: Philip Burns	Date/Time: 3/5/17	Received By:	Date/Time 04/05/17 @ 8:15
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: YES / NO	Temperature: AMBIENT / CHILLED	Sample Cooler Sealed: YES / NO	Laboratory Quotation No:
COMMENTS:			

Appendix I

SAFEWORK NSW RECORDS

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D17/074196
Your Ref: Philip Burns

17 February 2017

Attention: Philip Burns
WSP Parsons Brinckerhoff
Level 3
51-55 Bolton St
Newcastle NSW 2300

Dear Mr Burns,

RE SITE: 40 Rayford St Warners Bay NSW

I refer to your site search request received by SafeWork NSW on 8 February 2017 requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above mentioned premises.

For further information or if you have any questions, please call us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely,

Customer Service Officer
Customer Experience - Operations
SafeWork NSW