



REPORT TO
PACIFIC BROOK CHRISTIAN SCHOOL LTD
C/- NBRS ARCHITECTURE

ON
PRELIMINARY CONTAMINATION
ASSESSMENT

FOR
PROPOSED NEW SCHOOL DEVELOPMENT

AT
LOT 100, MAITLAND STREET,
MUSWELLBROOK, NSW

Date: 14 August 2020

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JKEnvironments

www.jkenvironments.com.au

EIS





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Report prepared by:

Harley Wang
Environmental Scientist

Report reviewed by:

Brendan Page
Principal Associate | Environmental Scientist

For and on behalf of

EIS

PO BOX 976

NORTH RYDE BC NSW 1670

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Executive Summary

Pacific Brook Christian School Ltd ('the client') commissioned Environmental Investigation Services (EIS)¹ to undertake a preliminary contamination assessment for due diligence at Lot 100, Maitland Street, Muswellbrook, NSW ('the site'). The site location is shown on Figure 1 and the assessment was confined to the site boundaries as shown on Figure 2.

The proposed development is at a pre-purchase due-diligence stage and we were not provided with any specific development details prior to this assessment. However, it is understood that the client proposes to utilise the site as a primary or secondary school.

The primary aims of the assessment were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make a preliminary assessment of the soil contamination conditions.

The conceptual site model identified the following areas of environmental concern/potential sources of contamination: imported fill material; fuel storage within a maintenance shed in the north-east corner of the site; historical agricultural use (horticultural use); use of pesticides and herbicides; hazardous building materials in existing and former buildings; and an off-site service station located to the south-east and up-gradient of the site.

Intrusive investigation works included soil sampling from 20 boreholes (BH1 to BH20). Hydrocarbons were identified above the human health-based criteria and/or the ecological criteria at a limited number of locations. The remaining contaminants of potential concern were either not detected in the soil samples or were present at low concentrations, below the nominated assessment criteria.

EIS are of the opinion that the results of the preliminary assessment suggest there is a low potential for significant, widespread site contamination that could preclude the proposed site use as a primary or secondary school. However, a review of the conceptual site model has identified a number of data gaps which would require further assessment to better assess the risks and to confirm site suitability for future development of the site as a primary or secondary school.

Based on the finding of the assessment, EIS are of the opinion that the site can be made suitable for the proposed primary or secondary school use, provided that the following recommendations are implemented:

- Complete a Stage 2 Detailed Site Investigation (DSI) to address the data gaps; and
- Complete a hazardous building materials survey of the on-site structures/buildings prior to the commencement of any demolition works.

The Stage 2 DSI would be used to establish whether remediation of the site is required. If remediation is required, a Remediation Action Plan (RAP) should also be prepared.

The conclusions and recommendations should be read in conjunction with the limitations presented in the body of this report.

¹ Environmental consulting division of Jeffery & Katauskas Pty Ltd (J&K)



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Abbreviations

Asbestos Fines/Fibrous Asbestos	AF/FA
Ambient Background Concentrations	ABC
Added Contaminant Limits	ACL
Asbestos Containing Material	ACM
Area of Environmental Concern	AEC
Australian Height Datum	AHD
Acid Sulfate Soil	ASS
Above-Ground Storage Tank	AST
Below Ground Level	BGL
Benzo(a)pyrene Toxicity Equivalent Factor	BaP TEQ
Bureau of Meteorology	BOM
Benzene, Toluene, Ethylbenzene, Xylene	BTEX
Cation Exchange Capacity	CEC
Contaminated Land Management	CLM
Contaminant(s) of Potential Concern	CoPC
Chain of Custody	COC
Conceptual Site Model	CSM
Development Application	DA
Data Quality Indicator	DQI
Data Quality Objective	DQO
Detailed Site Investigation	DSI
Ecological Investigation Level	EIL
Environmental Investigation Services	EIS
Ecological Screening Level	ESL
Environmental Management Plan	EMP
Excavated Natural Material	ENM
Environment Protection Authority	EPA
Environmental Site Assessment	ESA
Ecological Screening Level	ESL
Fibre Cement Fragment(s)	FCF
General Approval of Immobilisation	GAI
Health Investigation Level	HILs
Health Screening Level	HSLs
International Organisation of Standardisation	ISO
Lab Control Spike	LCS
Light Non-Aqueous Phase Liquid	LNAPL
Map Grid of Australia	MGA
National Association of Testing Authorities	NATA
National Environmental Protection Measure	NEPM
Organochlorine Pesticides	OCF
Organophosphate Pesticides	OPP
Polycyclic Aromatic Hydrocarbons	PAH
Potential ASS	PASS
Polychlorinated Biphenyls	PCBs
Photo-ionisation Detector	PID
Protection of the Environment Operations	POEO
Practical Quantitation Limit	PQL
Quality Assurance	QA
Quality Control	QC
Remediation Action Plan	RAP
Relative Percentage Difference	RPD
Site Assessment Criteria	SAC
Sampling, Analysis and Quality Plan	SAQP



Site Audit Statement	SAS
Site Audit Report	SAR
Site Specific Assessment	SSA
Source, Pathway, Receptor	SPR
Specific Contamination Concentration	SCC
Standard Penetration Test	SPT
Standard Sampling Procedure	SSP
Standing Water Level	SWL
Trip Blank	TB
Toxicity Characteristic Leaching Procedure	TCLP
Total Recoverable Hydrocarbons	TRH
Trip Spike	TS
Upper Confidence Limit	UCL
United States Environmental Protection Agency	USEPA
Underground Storage Tank	UST
Virgin Excavated Natural Material	VENM
Volatile Organic Compounds	VOC
World Health Organisation	WHO
Work Health and Safety	WHS
Units	
Litres	L
Metres BGL	mBGL
Metres	m
Millivolts	mV
Millilitres	ml or mL
Milliequivalents	meq
micro Siemens per Centimetre	$\mu\text{S}/\text{cm}$
Micrograms per Litre	$\mu\text{g}/\text{L}$
Milligrams per Kilogram	mg/kg
Milligrams per Litre	mg/L
Parts Per Million	ppm
Percentage	%

1 INTRODUCTION

Pacific Brook Christian School Ltd ('the client') commissioned Environmental Investigation Services (EIS)² to undertake a preliminary Contamination Assessment for due diligence at Lot 100, Maitland Street, Muswellbrook, NSW ('the site'). The site location is shown on Figure 1 and the assessment was confined to the site boundaries as shown on Figure 2.

This report has been prepared for the purpose of due-diligence as part of the client's proposed purchase of the site. EIS were not provided with any existing waste or contamination related reports for the site.

EIS commenced trading as JK Environments in 2019. The minor revisions to this report have not accounted for the re-branding, although it is noted that EIS and JKE are effectively the same entity.

1.1 Proposed Development Details

The proposed development is at a pre-purchase due-diligence stage and we were not provided with any specific development details prior to this assessment. However, it is understood that the client proposes to utilise the site as a primary or secondary school.

1.2 Aims and Objectives

The primary aims of the assessment were to identify any past or present potentially contaminating activities at the site, identify the potential for site contamination, and make a preliminary assessment of the soil contamination conditions. The assessment objectives were to:

- Provide an appraisal of the past site use(s) based on a review of historical records;
- Assess the current site conditions and use(s) via a site walkover inspection;
- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Assess the soil contamination conditions via implementation of a preliminary sampling and analysis program;
- Prepare a conceptual site model (CSM);
- Assess the potential risks posed by contamination to the receptors identified in the CSM (Tier 1 assessment);
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint); and
- Assess whether further intrusive investigation and/or remediation is required.

1.3 Scope of Work

The assessment was undertaken generally in accordance with an EIS proposal (Ref: EP49170B2) of 20 March 2019 and written acceptance from the client of 31 March 2019. The scope of work included the following:

² Environmental consulting division of Jeffery & Katauskas Pty Ltd (J&K)

- Review of site information, including background and site history information from a Lotsearch Pty Ltd *Environmental Risk and Planning Report*;
- Preparation of a CSM;
- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Interpretation of the analytical results against the adopted Site Assessment Criteria (SAC);
- Data Quality Assessment; and
- Preparation of a report including a Tier 1 risk assessment.

The scope of work was undertaken with reference to the National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)³, other guidelines made under or with regards to the Contaminated Land Management Act (1997)⁴ and State Environmental Planning Policy No.55 – Remediation of Land (1998)⁵. A list of reference documents/guidelines is included in the appendices.

³ National Environment Protection Council (NEPC), (2013). *National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)*. (referred to as NEPM 2013)

⁴ Contaminated Land Management Act 1997 (NSW) (referred to as CLM Act 1997)

⁵ *State Environmental Planning Policy No. 55 – Remediation of Land 1998* (NSW) (referred to as SEPP55)

2 SITE INFORMATION

2.1 Site Identification

Table 2-1: Site Identification

Current Site Owner:	Pacific Brook Christian School Ltd
Site Address:	Maitland Street, Muswellbrook, NSW
Lot & Deposited Plan:	Lot 100 in DP1261496
Current Land Use:	Vacant, formerly used as a plant nursery
Proposed Land Use:	School
Local Government Authority:	Muswellbrook Shire Council
Current Zoning:	RU3 – Forestry
Site Area (m²):	Approximately 25,000
RL (AHD in m) (approx.):	150 (based on Google Earth)
Geographical Location (decimal degrees) (approx.):	Latitude: -32.276078 Longitude: 150.896680
Site Location Plan:	Figure 1
Sample Location Plan:	Figure 2

2.2 Site Location and Regional Setting

The site is located near the town centre of Muswellbrook which is characterised by general residential, public recreation and commercial land uses. The site is bound by Maitland Street to the west and Muswellbrook Golf Course to the north, and is located approximately 500m to the south of Muscle Creek.

2.3 Topography

The regional topography is characterised by a relatively flat alluvial floodplain. The site is located towards the mid-slope of a gently sloping, north-facing hillside. The site itself is relatively flat and generally slopes towards Muscle Creek to the north. Parts along the northern site boundary, adjacent to the golf course, appear to have been levelled to account for the north-ward slope and to accommodate the adjacent golf course.

2.4 Site Inspection

A walkover inspection of the site was undertaken by EIS on 27 March 2019. The inspection was limited to accessible areas of the site and immediate surrounds. An internal inspection of buildings was undertaken

within accessible areas (i.e. unlocked). Selected site photographs obtained during the inspection are attached in the appendices.

A summary of the other inspection findings are outlined in the following subsections:

2.4.1 Current Site Use and/or Indicators of Former Site Use

At the time of the inspection, the site was vacant and unoccupied. Former signage observed at the entrance of the site ("Nursery") indicated that the site was a former plant nursery and was previously used for horticultural purposes.

2.4.2 Buildings, Structures and Roads

The site was occupied by approximately five buildings (see Figure 2). The majority of site structures were located towards the eastern portion of the site within the footprint of the former nursery operation. The eastern portion of the site was occupied by two permanent single-level buildings for administration and amenity purposes, along with a large steel garage-type structure used for chemical and fuel storage towards the eastern corner of the site. Gravel paved driveways and asphaltic concrete paved access roads were throughout the eastern portion of the site.

Three large seedbeds (presumably used for pot plant drainage and irrigation purposes) were located towards the central eastern portion of the site. These structures were of wood construction with gravel infill for water drainage and covered by geofabric-type material. Several greenhouses of steel, timber and glass construction were located along the north-eastern and eastern site boundaries. Concrete paved walkways were located amongst the seedbeds.

An above-ground water tank (approximately 10,000L) together with a pumping station was located within the central portion of the site. Two other underground water storage tanks (concrete construction), with tops visible above the ground surface were located adjacent to the south of the above-ground water tank. It is unknown whether groundwater was extracted via this facility for beneficial use onsite.

The central portion of the site was occupied by a single-storey residential-type house with a backyard area containing a small fibro garage. Based on an inspection of the fuse box mounted on the southern side of the building, this property was likely constructed prior to 1968. A small brick paved driveway connected this building to Maitland Street to the south.

The western portion of the site consisted of vacant bushland bordered by Muswellbrook Golf Course to the north and Maitland Street to the south.

The buildings and structures onsite were in relatively poor/dilapidated condition, with visible cracks and weathering of the external fibro cladding and painted surfaces. The asphaltic pavements and driveways predominantly located within the eastern portion of the site appeared to be in poor condition, with visible cracks and damage observed during the inspection.

2.4.3 Boundary Conditions, Soil Stability and Erosion

The southern and eastern site boundaries were fenced by steel and timber fencing that was approximately 2m tall respectively. The northern and western site boundaries were unfenced and open to the Muswellbrook Golf Course. No visible signs of soil erosion or instability were observed.

2.4.4 Visible or Olfactory Indicators of Contamination

Numerous fibre cement fragments (FCF) were observed within the north-eastern corner of the site. These were behind the steel maintenance shed and to the north of the adjacent admin/amenities building. These FCF were located around the vicinity of BH3, BH6 and BH9 (see HWF1 and HWF2 in Figure 2). The majority of the FCF were observed on the ground surface and were visibly weathered. Two samples were collected and analysed for the assessment and were found not to contain asbestos, as discussed later in this report.

2.4.5 Presence of Drums/Chemicals, Waste and Fill Material

Various chemicals (predominantly associated with horticultural use), fuel and oil were observed within the site. This included minor fuel (presumably diesel) in one 200L drum and diesel engine oil in a 20L container within the maintenance shed located in the north-eastern corner of the site. Other chemical storage within this maintenance shed included the following:

- Herbicides (Oxyfluorfen and Oryzalin) in small containers (1L); and
- Numerous small quantities (less than 1L) of Glyphosate herbicide stored on a workbench.

Staining was observed beneath the engine oil drum. Although the drums were underlain by a concrete floor, the drums were not contained in a bund.

A small stockpile was located near the eastern site boundary (see Figure 2). The stockpile consisted of clayey silt with organic material such as mulch and wood/timber. The stockpile was approximately 100m³.

2.4.6 Drainage and Services

Surface runoff would be expected to flow towards overland towards the Muswellbrook Golf Course before most likely flowing to the north and north-east towards Muscle Creek.

2.4.7 Sensitive Environments

Muscle Creek was located approximately 500m to the north and down-gradient of the site. Muscle Creek is considered a potential off-site receptor.

2.4.8 Landscaped Areas and Visible Signs of Plant Stress

Landscaped trees were located towards the eastern portion of the site including grassed areas. Native trees approximately 5m tall along with native and exotic grasses were located throughout the western portion of the site. All vegetation onsite appeared to be in good condition with no obvious dieback or stress observed.

2.5 Surrounding Land Use

During the site inspection, EIS observed the following land uses in the immediate surrounds:

- North – Muswellbrook Golf Course and Muscle Creek further north;
- South – Maitland Street, with commercial properties consisted of McDonald's restaurant and John Hunter Motel;
- East – Residential properties and Caltex service station approximately 70m from the eastern site boundary. The service station is shown on Figure 2; and
- West – Muswellbrook Golf Course and Maitland Street including residential properties further west.

EIS are of the opinion that the Caltex service station to the east of the site is a potential contamination source as the service station is located within 100m of the site boundary and is up-gradient.

2.6 Underground Services

The 'Dial Before You Dig' (DBYD) plans were reviewed for the assessment in order to establish whether any major underground services exist at the site or in the immediate vicinity that could act as a preferential pathway for contamination migration. Major services were not identified in the DBYD plans that would be expected to act as preferential pathways for contamination migration. However, during the site inspection on 26 March 2019, a suspected stormwater drain was observed along the southern site boundary (see Figure 2) that appeared to extend through the service station to the south-east of the site. Considering the geological conditions (discussed in Section 3), there is a potential for the stormwater trench to act as a preferential pathway for contamination migration (i.e. through relatively permeable backfill).

2.7 Section 10.7 Planning Certificate

The section 10.7 (2 and 5) planning certificates were reviewed for the assessment. Copies of the certificates are attached in the appendices. A summary of the relevant information is outlined below:

- The site is not deemed to be: significantly contaminated; subject to a management order; subject of an approved voluntary management proposal; or subject to an on-going management order under the provisions of the CLM Act 1997;
- The site is not the subject of a Site Audit Statement (SAS) provided to Muswellbrook Shire Council;
- The site is not located within an acid sulfate soil (ASS) risk area; and
- The land is not affected by any known environmental heritage items.

3 GEOLOGY AND HYDROGEOLOGY

3.1 Regional Geology

Regional geological information presented in the Lotsearch report (attached in the appendices) indicated that the eastern portion of the site is underlain by undifferentiated alluvial deposits, which typically consists of sand, silt, clay and gravel; some residual and colluvial deposits including some channel, levee, lacustrine, floodplain and swamp deposits. The western portion of the site is underlain by Branxton Formation of the Maitland Group, which typically consists of conglomerate, sandstone and siltstone.

3.2 Acid Sulfate Soil (ASS) Risk and Planning

The Atlas of Australian ASS identified that the majority if the site has a low probability of ASS occurrence (6-70%).

3.3 Hydrogeology

Hydrogeological information presented in the Lotsearch report indicated that the regional aquifer on-site and in the areas immediately surrounding the site includes porous, extensive highly productive aquifers. There were numerous registered bores within the report buffer of 2,000m. In summary:

- There was one registered bore located onsite. This was registered for waste disposal purposes;
- The majority of the bores in the vicinity were also registered for waste disposal purposes;
- There was one nearby bore (i.e. within 1,000m) registered for domestic use; and
- The drillers log information from the closest registered bores typically identified clay soil to depths of 0-7.6m, underlain by river gravel. Standing water levels (SWLs) in the bores ranged from 2mBGL to 10.2mBGL.

3.4 Receiving Water Bodies

The site location and regional topography indicates that excess surface water flows have the potential to enter the Muscle Creek located approximately 500m to the north of the site. This water body is a potential receptor.

4 SITE HISTORY INFORMATION

4.1 Review of Historical Aerial Photographs

Historical aerial photographs were included in the Lotsearch report (attached in the appendices). EIS has reviewed the photographs and summarised relevant information in the following table:

Table 4-1: Summary of Historical Aerial Photographs

Year	Details
1938	The site was located to the east of an unpaved road (presumably Maitland Street) and appeared to be part of a larger sports field that also included a walking track. The site was largely vacant and grassed with the exception of the track across the eastern portion of the site. A few scattered trees were visible within the eastern portion of the site. The surrounds appeared similar to the site and were mostly vacant.
1958	The site generally appeared similar to the 1938 aerial photograph. Developments had occurred to the south of the site, including several structures immediately south-east of the site. It is possible that these structures were associated with commercial land use such as a motor mechanics.
1964	The site had undergone development. Four structures were visible within the eastern portion of the site. It is possible that these structures were associated with nursery use. An access road was visible connecting Maitland street with the western site boundary. Further developments had occurred to the south and east of the site. The area to the west of the site had undergone development for residential-type use.
1967	The site generally appeared similar to the 1964 aerial photograph, with the exception of ploughing rows that were now visible to the south of the existing structures. Further developments had occurred to the east, west and south of the site. Areas to the south-east of the site had undergone further development for commercial-type use, including a service station type structure (i.e. canopy and paved forecourt) approximately 150m south-east of the site.
1974	Additional buildings/structures were visible in the central portion and north-eastern corner of the site. Several access roads were visible surrounding the structures within the eastern portion of the site and along the western site boundary. Trees had been planted along the perimeter of the site, including additional plantings in the eastern portion of the site. The surrounds generally appeared similar to the 1967 aerial photograph.
1989	The site generally appeared similar to the 1974 aerial photograph, with the exception of what appeared to be an additional planting facility immediately to the north-west of the nursery buildings. Vegetation growth had occurred in the open areas of the site, especially within the western portion of the site. The surrounds generally appeared similar to the 1974 aerial photograph. A new building, consistent with the John Hunter Motel building, was visible to the west of the site.
1993	The site and the immediate surrounds generally appeared similar to the 1989 aerial photograph. Muswellbrook Golf Course appeared to be in operation during this time.

1998	The site and the immediate surrounds generally appeared similar to the 1993 aerial photograph.
2003	The site and the immediate surrounds generally appeared similar to the 1998 aerial photograph.
2008	The site generally appeared similar to the 2003 aerial photograph, with the exception of a circular structure (consistent with the water storage tank) that was visible within the central portion of the site. The surrounds generally appeared similar to the 2003 aerial photograph. Further developments had occurred to the south-east of the site for residential-type use.
2013	The site and the immediate surrounds generally appeared similar to the 2008 aerial photograph.

4.2 Review of Historical Land Title Records

Historical land title records were reviewed for the assessment. The record search was undertaken by Advance Legal Searchers Pty Ltd. Copies of the title records are attached in the appendices. The title records indicated that the site was crown land prior to 2015. During this period there were various notices/leases in relation to occupation for a public park (1884 to 1963) and for a tree nursery and experimental plantings (1963 to 2018). In 2015, the ownership was transferred to the State of New South Wales, then subsequently to Pacific Brook Christian School in March 2020.

The 2020 change of ownership was not captured in the initial search but has been incorporated based on the current certificate of title supplied for preparation of this revision to the report.

Horticultural activities are considered to be potentially contaminating activities.

4.3 Review of Council Records

Council records were searched under an informal access to information request and were reviewed for the assessment. The council records indicate the following:

- There were no records of any Building Applications (BA) or Development Applications (DA) applicable to the site held by Muswellbrook Shire Council; and
- The site has been historically owned by the Forestry Corporation. Under the Forestry Act 2012, approval was not necessary for certain types of activities to be carried out onsite. Based on the site owner and current zoning (RU3 – Forestry), council may not possess complete records of the site in terms of any potentially contaminating activities that may have occurred during this period.

4.4 SafeWork NSW Records

A permission letter was sought from the client to facilitate a search of the SafeWork NSW records for licences to store dangerous goods. The permission letter was never received, therefore the search was not completed.

4.5 NSW EPA Records

The Lotsearch report (attached in the appendices) included information from the NSW EPA databases for the following:

- Records maintained in relation to contaminated land under Section 58 of the CLM Act 1997;
- Records of sites notified in accordance with the Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)⁶; and
- Licensed activities under the Protection of the Environment Operations Act (1997)⁷.

The search included the site area and surrounding areas in the report buffer of 1,000m. The search indicated the following:

- There were no records for the site or any properties in the report buffer under Section 58 of the CLM Act 1997;
- The site has not been notified with regards to the Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997. There were five notified properties in the report buffer, the closest of which includes a service station on Maitland Street, approximately 80m south-east of the site. The other notified properties included three service stations and a gasworks. These were more than 500m away and down-gradient from the site, therefore, these were not considered to represent an off-site source of contamination for the site; and
- There is one record for licenced activities at the site under the POEO Act 1997. This included logging operations as part of the Forestry Corporation of New South Wales land use. Current and historical licenses were identified for several properties within the report buffer, including railway systems activities, coal works and mining for coal and application of herbicides along waterways, however these activities are considered unlikely to pose a contamination risk to the site as they relate to areas that are a reasonable distance away from the site and are down-gradient.

4.6 Historical Business Directory and Additional Lotsearch Information

Historical business records for the site and surrounding areas in the report buffer were included in the Lotsearch report (attached in the appendices). The records indicated the following:

- A Forestry Commission Nursery was registered at the site between 1982 and 1991, this included garden supplies retail under the same business until at least 1991; and
- There was a motor painters and panel beaters business registered within the report buffer between 1970 and 1982. This was located adjacent to the south-eastern site boundary and was up-gradient of the site, so may be a potential source of contamination;
- There was a motor mechanics businesses registered within the report buffer during the 1970s and 1990s. Activities associated with this mechanics businesses included motor wreckers, motor towing services, motor painters and panel beaters, motor garages and engineers, motor accessories and spare parts dealer and motor car and truck dealer. This was approximately 80m south-east and up-gradient of the site;

⁶ NSW EPA, (2015). *Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997*. (referred to as Duty to Report Contamination)

⁷ Protection of the Environment Operations Act 1997 (NSW) (referred to as POEO Act 1997)

- There was a building contractors business registered within the report buffer between 1970 and 1982. This business was replaced by an electrical contractors business circa 1982, which included the manufacture and sales of electrical generating equipment including irrigation systems. This address associated with the above activities was approximately 121m to the south-east and up-gradient from the site. EIS are of the opinion that this business was unlikely to represent potential off-site source of contamination due to the distance away from site; and
- There was a service station registered within the report buffer between 1982 and 1991. This was located approximately 141m to the south-east of the site and up-gradient. This was not in the business register after 1991, however, during the EIS site inspection, this service station was noted to be present and was operational. EIS are of the opinion that this could be a potential off-site source of contamination.

In addition to the above, EIS have reviewed additional information contained within the Lotsearch report and note the following:

- The site is not within an area covered under the NSW EPA per- and polyfluoroalkyl substances (PFAS) investigation program;
- There is one state heritage item listed within the report buffer of 1,000m. This was the Muswellbrook Railway Station and yard group located approximately 843m and north-west of the site;
- There were numerous local heritage items listed within the report buffer, the closest of which was the Fitzgerald/Olympic Park Gates located approximately 426m and north-west of the site; and
- There were no ecological constraints mapped at the site or in the immediate surrounds.

4.7 Summary of Site History Information

A time line summary of the historical land uses and activities is presented in the table below. The information presented in the table is based on a weight of evidence assessment of the site history documentation and observations made by EIS.

Table 4-2: Summary of Historical Land Uses

Year(s)	Potential Land Use / Activities
Pre-1960s	Largely vacant. The site may have been part of a larger property utilised for public recreation purposes.
Circa 1960s to mid-1970s	Construction of buildings in the eastern section of the site. These buildings may have been associated with the tree nursery and experimental plantings operation as part of Muswellbrook State Forest (i.e. horticultural activities occurred on site).
Circa 1980s to present	Additional construction of buildings including greenhouse structures in the eastern section of the site. The development appeared similar to the existing nursery and it is likely that use of the site as a retail nursery occurred at least this time.

In addition to the above historical land uses, development of the land adjacent to the south-east site boundary had occurred from the late 1950s. This area had been identified as being used for numerous motor mechanics-type businesses and a service station. Historical business directory identified the service station to be operational from 1982, however, aerial photographs showed the service station to be in operation from

at least the 1970s. These areas and the associated historical land uses are considered to be potential off-site sources of contamination. Potential impacts to the site from such off-site sources could be associated with migration of contaminated groundwater.

4.8 Integrity of Site History Information

The majority of the site history information was obtained from government organisations as outlined in the relevant sections of this report. The veracity of the information from these sources is considered to be relatively high. A certain degree of information loss can be expected given the lack of specific land use details over time. EIS have relied upon the Lotsearch report and have not independently verified any information contained within. However, it is noted that the Lotsearch report is generated based on databases maintained by various government agencies and is expected to be reliable.

5 CONCEPTUAL SITE MODEL

NEPM (2013) defines a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM for the site is presented in the following sub-sections and is based on the site information (including the site inspection information) and the review of site history information. Reference should also be made to the figures attached in the appendices.

A review of the CSM in relation to source, pathway and receptor (SPR) linkages has been undertaken as part of the Tier 1 risk assessment process, as outlined in Section 9.

5.1 Potential Contamination Sources/AEC and CoPC

The potential contamination sources/AEC and CoPC are presented in the following table:

Table 5-1: Potential (and/or known) Contamination Sources/AEC and Contaminants of Potential Concern

Source / AEC	CoPC
<u>Fill material</u> – The north-eastern corner of the site appeared to be elevated from the Muswellbrook Golf Course level. It is possible that the site or parts of the site may have been filled. The fill may have been imported from various sources and could be contaminated. Potential ACM (fibre cement fragments) were identified on the ground surface in the north-east section of the site. It is unclear whether the potential ACM was associated within imported fill material or demolition of former structures onsite.	Heavy metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc), petroleum hydrocarbons (referred to as total recoverable hydrocarbons – TRHs), benzene, toluene, ethylbenzene and xylene (BTEX), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs), organophosphate pesticides (OPPs), polychlorinated biphenyls (PCBs) and asbestos.
<u>Fuel storage</u> – One 200L drum of possible diesel fuel was identified within the maintenance shed. Spillage could have occurred as a result of refuelling activities.	TRH, BTEX and PAHs (naphthalene)
<u>Historical agricultural use</u> – The site appears to have been used for horticultural activities. This could have resulted in contamination across the site via use of machinery, application of pesticides and building/demolition of various structures. Irrigation pipes made from asbestos cement may also be associated with this AEC.	Heavy metals, TRH, PAHs, OCPs, PCBs and asbestos EIS note that organic pesticides only became commercially available in the 1940s. Prior to this time pesticides were predominantly heavy metal compounds.
<u>Use of pesticides</u> – Pesticides may have been used beneath the buildings and/or around the site.	Heavy metals and OCPs
<u>Hazardous Building Material</u> – Hazardous building materials may be present as a result of former building and demolition activities. These materials may also be present in the existing buildings/structures on site. The single-storey residential house in the central section of the site appeared to be cladded by fibre cement sheeting. Visible cracking and weathering of the exterior cement sheeting was evident. Date	Asbestos, lead and PCBs

displayed on the electricity box (circa. 1968) mounted on the south side of the building suggested that the material used for construction of the building was likely to contain asbestos.	
<u>Off-site service station (and historical land uses), up-gradient from the site</u> – The site inspection indicated that an operational service station was to the south-east and up-gradient from the site. Other historical land uses including a mechanics/panel beaters also occurred in this area. Spillage or leakage of fuel could have occurred from USTs and has the potential to migrate onto the site via stormwater pipework which runs through the south of the site.	Heavy metals (lead), TRH and BTEX

EIS note that herbicides have not been included as CoPC as herbicides are not commonly found at residual concentrations likely to pose a risk to human health or the environment (NSW DEC 2005, *Guidelines for Assessing Former Orchards and Market Gardens*). Readily available literature indicates that the specific herbicides identified at the site tend not to be highly persistent in soil and are not expected to leach readily to groundwater⁸. On this basis, and considering the herbicides that were observed during the inspection were stored in containers, in relatively small quantities, the potential for the historical use of herbicides to pose an on-going risk to the receptors is considered to be relatively low.

5.2 Mechanism for Contamination, Affected Media, Receptors and Exposure Pathways

The mechanisms for contamination, affected media, receptors and exposure pathways relevant to the potential contamination sources/AEC are outlined in the following CSM table:

Table 5-2: CSM

Potential mechanism for contamination	Potential mechanisms for contamination include: • Fill material – importation of impacted material, ‘top-down’ impacts (e.g. placement of fill, leaching from surficial material etc), or sub-surface release (e.g. impacts from buried material); • Fuel storage – ‘top-down’, spills (e.g. during filling of the drums and/or dispensing activities); • Historical agricultural use – ‘top-down’ and spills (e.g. application of pesticides, refuelling or repairing machinery, and other activities at the ground surface level particularly within the maintenance shed); • Use of pesticides – ‘top-down’ and spills (e.g. during normal use, application and/or improper storage); • Hazardous building materials – ‘top-down’ (e.g. demolition resulting in surficial impacts in unpaved areas); and • Off-site land uses – ‘top-down’, spill or sub-surface release. Impacts to the site could occur via migration through the stormwater drainage line along the southern site boundary.
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⁸ <http://sitem.herts.ac.uk/aeru/ppdb/en/>

Affected media	Soil/soil vapour and groundwater have been identified as potentially affected media.
Receptor identification	Human receptors include future site occupants/users (including adults and children), construction workers and intrusive maintenance workers. Off-site human receptors include adjacent land users, groundwater users and recreational water users within Muscle Creek. Ecological receptors include terrestrial organisms and plants within unpaved areas, and freshwater ecology in Muscle Creek.
Potential exposure pathways	Potential exposure pathways relevant to the human receptors include ingestion, dermal absorption and inhalation of dust (all contaminants) and vapours (volatile TRH, naphthalene and BTEX). Potential exposure pathways for ecological receptors include primary contact and ingestion. Exposure during future site use could occur via direct contact with soil in unpaved areas such as gardens, inhalation of airborne asbestos fibres during soil disturbance, or inhalation of vapours within enclosed spaces such as buildings and basements.
Potential exposure mechanisms	The following have been identified as potential exposure mechanisms for site contamination: • Vapour intrusion into any proposed basement and/or building (either from soil contamination or volatilisation of contaminants from groundwater); • Contact (dermal, ingestion or inhalation) with exposed soils in landscaped areas and/or unpaved areas; • Migration of groundwater from up-gradient areas and onto the site, and/or migration of groundwater into nearby water bodies, including aquatic ecosystems and those being used for recreation; and • Migration of groundwater off-site into areas where groundwater is being utilised as a resource (i.e. for irrigation).
Presence of preferential pathways for contaminant movement	The suspected stormwater alignment/drain (see Figure 2) and the associated trench/trench backfill is a potential preferential pathway for contaminant migrations. This could occur via groundwater/seepage if present, or via soil/vapour migration through the stormwater and/or trench backfill.

6 SAMPLING, ANALYSIS AND QUALITY PLAN

6.1 Data Quality Objectives (DQO)

Data Quality Objectives (DQOs) were developed to define the type and quality of data required to achieve the project objectives outlined in Section 1.2. The DQOs were prepared with reference to the process outlined in Schedule B2 of NEPM (2013) and the Guidelines for the NSW Site Auditor Scheme, 3rd Edition (2017)⁹. The seven-step DQO approach for this project is outlined in the following sub-sections.

The DQO process is validated in part by the Data Quality Assurance/Quality Control (QA/QC) Evaluation. The Data (QA/QC) Evaluation is summarised in Section 8.1 and the detailed evaluation is provided in the appendices.

6.1.1 Step 1 - State the Problem

The CSM identified potential sources of contamination/AEC at the site that may pose a risk to human health and the environment. Investigation data is required to assess the contamination status of the site, assess the risks posed by the contaminants in the context of the proposed development/intended land use, and assess whether further investigation and/or remediation is required.

A waste classification is required prior to off-site disposal of excavated soil/bedrock.

6.1.2 Step 2 - Identify the Decisions of the Study

The objectives of the assessment are outlined in Section 1.2. The decisions to be made reflect these objectives and are as follows:

- Did the site inspection, or does the historical information identify potential contamination sources/AEC at the site?
- Are any results above the SAC?
- Do potential risks associated with contamination exist, and if so, what are they?
- Is remediation or further investigation required?
- Is the site characterisation sufficient to provide adequate confidence in the above decisions?
- Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

6.1.3 Step 3 - Identify Information Inputs

The primary information inputs required to address the decisions outlined in Step 2 include the following:

- Site information, including site observations and site history documentation;
- Sampling of potentially affected media. Soil media was applicable to this assessment;
- Observations of sub-surface variables such as soil type, photo-ionisation detector (PID) concentrations, odours and staining;
- Laboratory analysis of soils and fibre cement for the CoPC identified in the CSM; and

⁹ NSW EPA (2017). *Guidelines for the NSW Site Auditor Scheme, 3rd ed.* (referred to as Site Auditor Guidelines 2017)

- Field and laboratory QA/QC data.

6.1.4 Step 4 - Define the Study Boundary

The sampling will be confined to the site boundaries as shown in Figure 2 (spatial boundary). The sampling was completed between 26 March 2019 and 27 March 2019 (temporal boundary). Sampling was not undertaken within the existing building footprints due to access constraints.

6.1.5 Step 5 - Develop an Analytical Approach (or Decision Rule)

6.1.5.1 Tier 1 Screening Criteria

The laboratory data will be assessed against relevant Tier 1 screening criteria (referred to as SAC), as outlined in Section 7. Exceedances of the SAC do not necessarily indicate a requirement for remediation or a risk to human health and/or the environment. Exceedances are considered in the context of the CSM and valid SPR-linkages.

For this assessment, the individual results have been assessed as either above or below the SAC. Statistical evaluation of the dataset via calculation of mean values and/or 95% upper confidence limit (UCL) values has not been undertaken at this stage due to the preliminary nature of the assessment.

6.1.5.2 Field and Laboratory QA/QC

Field QA/QC included analysis of inter-laboratory duplicates, intra-laboratory duplicates, trip spike and trip blank samples. Further details regarding the sampling and analysis undertaken, and the acceptable limits adopted, is provided in the Data Quality (QA/QC) Evaluation in the appendices.

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the attached laboratory reports. These criteria were developed and implemented in accordance with the laboratory's National Association of Testing Authorities, Australia (NATA) accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

In the event that acceptable limits are not met by the laboratory analysis, other lines of evidence are reviewed (e.g. field observations of samples, preservation, handling etc) and, where required, consultation with the laboratory is undertaken in an effort to establish the cause of the non-conformance. Where uncertainty exists, EIS typically adopt the most conservative concentration reported (or in some cases, consider the data from the affected sample as an estimate).

6.1.5.3 Appropriateness of Practical Quantitation Limits (PQLs)

The PQLs of the analytical methods are considered in relation to the SAC to confirm that the PQLs are less than the SAC. In cases where the PQLs are greater than the SAC, a discussion of this is provided.

6.1.6 Step 6 – Specify Limits on Decision Errors

To limit the potential for decision errors, a range of quality assurance processes are adopted. A quantitative assessment of the potential for false positives and false negatives in the analytical results is undertaken with reference to Schedule B(3) of NEPM (2013) using the data quality assurance information collected.

Decision errors can be controlled through the use of hypothesis testing. The test can be used to show either that the baseline condition is false or that there is insufficient evidence to indicate that the baseline condition is false. The null hypothesis is an assumption that is assumed to be true in the absence of contrary evidence. For this assessment, the null hypothesis has been adopted which is that, there is considered to be a complete SPR linkage for the CoPC identified in the CSM unless this linkage can be proven not to (or unlikely to) exist. The null hypothesis has been adopted for this assessment.

6.1.7 Step 7 - Optimise the Design for Obtaining Data

The most resource-effective design will be used in an optimum manner to achieve the assessment objectives. Adjustment of the assessment design can occur following consultation or feedback from project stakeholders. For this investigation, the design was optimised via consideration of the various lines of evidence used to select the sample locations, the media being sampled, and also by the way in which the data were collected.

The sampling plan and methodology are outlined in the following sub-sections.

6.2 Soil Sampling Plan and Methodology

The soil sampling plan and methodology adopted for this assessment is outlined in the table below:

Table 6-1: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	Samples were collected from 20 locations as shown on the attached Figure 2. Based on the site area (25,000m ²), this number of locations corresponded to a sampling density of approximately one sample per 1,250m ² . The sampling plan was not designed to meet the minimum sampling density for hotspot identification, as outlined in the NSW EPA Contaminated Sites Sampling Design Guidelines (1995) ¹⁰ .
Sampling Plan	The sampling locations were placed on a judgemental sampling plan and were broadly positioned for site coverage, taking into consideration areas that were not easily accessible. Sampling preference was given to areas with structures or buildings present (i.e. the eastern portion of the site). This sampling plan was considered suitable to make a preliminary assessment of potential risks associated with the AEC and CoPC identified in the CSM, and assess whether further investigation is warranted.
Set-out and Sampling Equipment	Sampling locations were set out using a hand held GPS unit (with an accuracy of ±2m) and were checked for underground services by an external contractor prior to sampling.

¹⁰ NSW EPA, (1995), *Contaminated Sites Sampling Design Guidelines*. (referred to as EPA Sampling Design Guidelines 1995)

	Samples were collected using a push tube drill rig. Soil samples were obtained from disposable polyethylene push tube samplers.
Sample Collection and Field QA/QC	Soil samples were obtained on 26 and 27 March 2019 in accordance with the standard sampling procedure (SSP) attached in the appendices. Soil samples were collected from the fill and natural profiles based on field observations. The sample depths are shown on the logs attached in the appendices. Samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos quantification analysis were placed in 500mL zip-lock plastic bags. During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis.
Field Screening	A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp was used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records are maintained on file by EIS. Fill/spoil at the sampling locations was visually inspected during the works for the presence of fibre cement fragments.
Decontamination and Sample Preservation	Sampling personnel used disposable nitrile gloves during sampling activities. Soil samples were obtained from single-use disposable polyethylene push tube samplers, therefore decontamination procedure was not considered necessary. Soil samples were preserved by immediate storage in an insulated sample container with ice in accordance with the SSP. On completion of the fieldwork, the samples were stored temporarily in fridges in the EIS warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.

6.3 Analytical Schedule

The analytical schedule (primary samples, excludes duplicates) is outlined in the following table:

Table 6-2: Analytical Schedule

Analyte/CoPC	Fill Samples	Natural Soil Samples	Fibre Cement Material Samples
Heavy Metals	21	6	-
TRH/BTEX	21	8	-
TRH (silica gel)	2	-	-
PAHs	21	7	-
OCPs/OPPs	19	1	-
PCBs	19	1	-
Asbestos	10	-	2
pH/CEC/Clay Content (%)	3	-	-

6.3.1 Laboratory Analysis

Samples were analysed by an appropriate, NATA Accredited laboratory using the analytical methods detailed in Schedule B(3) of NEPM 2013. Reference should be made to the laboratory reports attached in the appendices for further details.

Table 6-3: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicates, trip blanks and trip spikes)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	214627, 214627-A
Inter-laboratory duplicate	Envirolab Services Pty Ltd VIC, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	16444

7 SITE ASSESSMENT CRITERIA (SAC)

The SAC were derived from the NEPM 2013 and other guidelines as discussed in the following sub-sections. The guideline values for individual contaminants are presented in the attached report tables and further explanation of the various criteria adopted is provided in the appendices.

Soil data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013) as outlined below.

7.1 Human Health

- Health Investigation Levels (HILs) for a 'residential with accessible soils' exposure scenario (HIL-A), which also applies to primary schools and day care centres;
- Health Screening Levels (HSLs) for a 'low-high density residential' exposure scenario (HSL-A & HSL-B). HSLs were calculated based on conservative assumptions including 'sand' soil type and the sample depth;
- Where exceedances of the HSLs were reported for hydrocarbons (TRH/BTEX and naphthalene), the soil health screening levels for direct contact presented in the CRC Care Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011)¹¹ were considered; and
- Asbestos results were assessed against the HSL-A criteria, however the overall assessment was based on asbestos being present or absent as a detailed asbestos quantification was not undertaken.

7.2 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for an 'urban residential and public open space' (URPOS) exposure scenario. These have only been applied to the top 2m of soil as outlined in NEPM (2013). The criteria for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the information presented in the CRC Care Technical Report No. 39 – Risk-based management and guidance for benzo(a)pyrene (2017)¹²; and
- ESLs were calculated based on the soil type. Initially, the most conservative added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013) were selected in conjunction with the published ambient background concentration (ABC) presented in the document titled Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (1995)¹³. Following the initial screening using this method, EILs for selected metals were calculated using site specific soil parameters for pH and cation exchange capacity (CEC) in two selected samples from BH5 and BH19. . This method is considered to be adequate for the Tier 1 screening.

¹¹ Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC Care), (2011). Technical Report No. 10 - *Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document*

¹² CRC Care, (2011). *Technical Report No. 39 - Risk-based management and guidance for benzo(a)pyrene*

¹³ Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4.* Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission.

7.3 Management Limits for Petroleum Hydrocarbons

Management limits for petroleum hydrocarbons (as presented in Schedule B1 of NEPM 2013) were considered (if required) following evaluation of human health and ecological risks, and risks to groundwater.

8 RESULTS

8.1 Summary of Data (QA/QC) Evaluation

The data evaluation is presented in the appendices. In summary, EIS are of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

8.2 Subsurface Conditions

A summary of the subsurface conditions encountered during the investigation is presented in the table below. Reference should be made to the borehole logs attached in the appendices for further details.

Table 8-1: Summary of Subsurface Conditions

Profile	Description
Fill	Fill was encountered at the surface or beneath the pavement in all boreholes (with the exception of BH13) and extended to depths of approximately 0.1 to 0.8m. The fill typically comprised clayey silt, silty clay, silty sandy clay, sandy clay, silty sand, silty gravelly sand, clayey sand, peaty sand, silty clayey sand, silty gravel and sandy gravel with inclusions of ash, slag, organic material, igneous and sandstone gravel, sub-rounded pebbles, asphaltic fragments brick and tile fragments and root fibres. Odours or staining were not observed in the fill soils during the investigation. FCF was not observed in the fill material during the investigation.
Natural Soil	Natural soil was encountered in all boreholes at depths ranging from approximately 1.4m to 3.8m. Odours or staining were not observed in the natural soils during the investigation.
Groundwater	Groundwater seepage was encountered in the BH5 after retrieval of the push tube. The standing Water Level (SWL) was approximately 0.8m shortly after completion of the borehole. All other boreholes remained dry on completion of drilling and a short time after. EIS note that this seepage may be due to a leaking infrastructure rather than actual groundwater due to the lack of seepage in other boreholes.

8.3 Field Screening

PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. The results ranged from 0ppm to 16ppm equivalent isobutylene. These results indicate that relatively low concentrations of PID detectable VOCs were present within some samples. The highest PID reading was associated with a surface sample from BH1 (0 – 0.2m).

8.4 Soil Laboratory Results

The soil laboratory results are compared to the relevant SAC in the attached report tables. A summary of the results assessed against the SAC is presented below:

8.4.1 Human Health and Environmental (Ecological) Assessment

Table 8-2: Summary of Soil Laboratory Results – Human Health and Environmental (Ecological)

Analyte	Results Compared to SAC
Heavy Metals	All heavy metals results were below the SAC.
TRH	Two elevated concentrations of TRH (C₁₀-C₁₆) (F2) above the human health SAC (HSL for vapour intrusion risks) were encountered in the fill in BH17 (0-0.1m) and BH19 (0-0.1m) at concentrations of 900mg/kg and 190mg/kg respectively. Following a silica gel clean-up, TRH (C₁₀-C₁₆) (F2) result in BH19 was below the human health SAC at a concentration of 73mg/kg. However, TRH (C₁₀-C₁₆) (F2) in BH17 remained above the human health SAC at a concentration of 340mg/kg. The concentrations were below the direct contact SAC. Elevated concentrations of TRH (C₁₀-C₁₆) (F2) and TRH (C₁₆-C₃₄) (F3) above the ecological/environmental SAC were encountered in BH17 (0-0.1m) and BH19 (0-0.1m). TRH (C₁₆-C₃₄) (F3) above the ecological/environmental SAC were also encountered in BH4 (0-0.2m), BH15 (0-0.1), BH18 (0-0.1m) and in a field duplicate sample of BH2 (0-0.1m).
BTEX	All BTEX results were below the SAC.
PAHs	One carcinogenic PAH result in BH2 (0-0.2m) (and it's duplicated, DUP1) exceeded the HIL-A criterion.
OCPs and OPPs	All OCP and OPP results were below the SAC. All pesticide concentrations were below the laboratory PQLs.
PCBs	All PCB results were below the SAC. All PCB concentrations were below the laboratory PQLs.
Asbestos	All asbestos results were below the SAC (i.e. asbestos was below the HSL-A criteria and was also absent in the samples analysed for the investigation).

8.4.2 Management Limits

The TRH (>C₁₆-C₃₄) (F3) concentration of 3,700mg/kg in the BH17 (0-0.1m) sample exceeded the management limit criterion of 2,500mg/kg. The TRH silica gel analysis on this sample resulted in a TRH (>C₁₆-C₃₄) concentration of 580mg/kg which was well below the management limit criterion.

9 DISCUSSION AND CONCLUSIONS

9.1 Tier 1 Risk Assessment and Review of CSM

For a contaminant to represent a risk to a receptor, the following three conditions must be present:

1. Source – The presence of a contaminant;
2. Pathway – A mechanism or action by which a receptor can become exposed to the contaminant; and
3. Receptor – The human or ecological entity which may be adversely impacted following exposure to contamination.

If one of the above components is missing, the potential for adverse risks is relatively low.

The site history assessment and walkover inspection identified a number of potential sources of contamination. The sampling and analysis was used to assess whether contamination was present, and potential risks associated with the CoPC have been assessed.

The preliminary assessment indicated that BTEX, pesticides, heavy metals, PCBs and asbestos are unlikely to be widespread in soil at the site at concentrations that pose a risk as these CoPC were not identified at concentrations above the SAC. Carcinogenic PAH and TRH (F2) were identified during the assessment at concentrations above the SAC and risks associated with these contaminants are discussed further below.

9.1.1 PAHs

Carcinogenic PAHs were identified above the HIL-A SAC in a surface sample from BH2 (0-0.2). It is considered likely that the PAHs are associated with ash within the fill matrix. As the carcinogenic PAH exceedance was identified at the surface, there is considered to be a complete SPR linkage for this contaminant during a sensitive land use scenario (i.e. a childcare or primary school). However, it is noted that the exceedance of 3.1mg/kg in the primary sample and 3.5mg/kg in the duplicate of this sample are only marginally above the sensitive land use (HIL-A) SAC of 3mg/kg. Further investigation and statistical analysis would be likely to demonstrate that the presence of PAHs at these concentrations do not pose an unacceptable risk.

Due to the lack of PAH detections in surrounding boreholes and the fact that there were no PAHs detected in the underlying natural soils in BH2 (0.2-0.5), it would be reasonable to assume that the PAH impacts are relatively localised and pose a low risk of migration to groundwater.

9.1.2 TRHs

TRH (F2) was identified in BH17 and BH19 above the HSL-A/B SAC. EIS are of the opinion that the elevated TRHs are at least partially due to the presence of organic material based on a review of the TRH chromatograms for BH17 (0-0.1) and BH19 (0-0.1). EIS also consulted with the organic chemist at Envirolab who advised that there was obvious organic interference in the analysis. The presence of eucalyptus trees, leaf litter and tree sap at the site can result in interference presenting as elevated TRH concentrations.

Following a silica gel clean-up (which reduces interference from polar compounds), concentrations of TRHs in BH19 were below the HSL-A/B criterion. However, TRH (F2) in BH17 was still above the HSL-A/B criterion.

Based on the weight of evidence collected during the preliminary assessment, the vapour intrusion risks from TRHs in soil are likely to be low given that the source of TRHs is unlikely to be petroleum. However, further characterisation of these risks will be required.

TRH (F2) and TRH (F3) were identified in surficial fill in BH17 and BH19, and TRH (F3) in BH4, BH15, BH18 and a field duplicate sample of BH2 concentrations above the EIL SAC. EIS are of the opinion that the elevated TRHs in BH4 are likely to be associated with the presence of asphalt fragments in the soil and therefore the soil at this location poses a negligible ecological risk. The remaining TRH concentrations that were above the EIL SAC were within treed areas and the TRHs are likely to be from organic interference as discussed previously. On this basis, the environmental/ecological risks associated with TRHs at BH17, BH19, BH15 and BH18 are negligible.

9.2 Decision Statements

The decision statements are addressed below:

Did the site inspection, or does the historical information identify potential contamination sources/AEC at the site?

Yes. The CSM identified the following AEC:

- Imported fill material;
- Fuel storage in maintenance shed located in the north-east corner of the site;
- Historical agricultural use (planting and nursery operations);
- Potential use of pesticides and herbicides; and
- Potential hazardous materials in existing and former buildings.

Are any results above the SAC?

TRH (F2) and carcinogenic PAHs were identified in fill above the human health SAC. TRH (F2) and TRH (F3) were also identified above the ecological/environmental SAC.

Do potential risks associated with contamination exist, and if so, what are they?

Risks associated with the TRHs and PAHs encountered at concentrations above the SAC were assessed to be low or negligible. Given the preliminary nature of the assessment, including the low sampling density, there is a risk of unidentified contamination at the site. This risk can be mitigated via completing additional detailed (Stage 2) investigation.

Is remediation of further investigation required?

Based on the results of the preliminary assessment, remediation is not required at this stage. A detailed (Stage 2) investigation will be required to confirm whether remediation is necessary in the context of any proposed development.

Is the site characterisation sufficient to provide adequate confidence in the above decisions?

Yes.

Is the site suitable for the proposed development, or can the site be made suitable subject to further characterisation and/or remediation?

Contamination that would preclude future development of the site was not encountered during the preliminary assessment. EIS are of the opinion that the site can be made suitable for the proposed primary school or secondary school development subject to further investigation, risk assessment, and (if required) remediation/validation.

9.3 Data Gaps

The assessment has identified the following data gaps:

1. The sampling density was approximately 57% of the minimum sampling density recommended for hotspot identification, as outlined in the NSW EPA Sampling Design Guidelines (1995) for a site area of approximately 25,000m². A minimum of 15 additional sampling locations would be required to meet the guidelines for a Stage 2 Detailed Site Investigation (DSI). It is recommended that any further investigation is undertaken from test pits to provide a better visual assessment of the soil;
2. Groundwater sampling was outside the scope of the preliminary assessment. The potential for on-site activities to have resulted in significant groundwater contamination is considered to be relatively low (based on the site observations and soil analysis results). However, an investigation will be required to assess the potential for contamination impacts associated with the service station to the south-east of the site;
3. Chemical storage within the Hazchem sheds has the potential to leach through concrete slabs through historical leaks or spills. Additional sampling would be required around the edges of building slabs and within the building footprint to better characterise these areas; and
4. The potential presence of hazardous building materials within the existing buildings has not been assessed.

10 CONCLUSIONS AND RECOMMENDATIONS

The preliminary assessment included site history assessment and limited soil sampling. Soil contamination concentrations were generally low, however there were some minor elevations above the human health and ecological/environmental criteria for TRHs and PAHs.

The history assessment identified that the site has been utilised for horticultural activities. Agricultural/horticultural activities is listed as potentially contaminating activity in Table 1 of the Department of Urban Affairs and Planning, Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land (1998). Section 3.4.1 of these guidelines indicate that a detailed (Stage 2) investigation is required for such sites.

Based on the results of the screening, EIS recommend that:

1. A Stage 2 Detailed Site Investigation (DSI) be completed to address data gaps 1 to 3 inclusive; and
2. A Hazmat survey of the onsite structures/buildings be completed prior to the commencement of any demolition works.

EIS consider that the report objectives outlined in Section 1.2 have been addressed.

EIS are of the opinion that notification of site contamination to the EPA under the EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)¹⁴ is not currently required based on the findings of this assessment.

¹⁴ NSW EPA, (2015). *Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997* (referred to as Duty to Report Contamination)

11 LIMITATIONS

The report limitations are outlined below:

- EIS accepts no responsibility for any unidentified contamination issues at the site. Any unexpected problems/subsurface features that may be encountered during development works should be inspected by an environmental consultant as soon as possible;
- Previous use of this site may have involved excavation for the foundations of buildings, services, and similar facilities. In addition, unrecorded excavation and burial of material may have occurred on the site. Backfilling of excavations could have been undertaken with potentially contaminated material that may be discovered in discrete, isolated locations across the site during construction work;
- This report has been prepared based on site conditions which existed at the time of the investigation; scope of work and limitation outlined in the EIS proposal; and terms of contract between EIS and the client (as applicable);
- The conclusions presented in this report are based on investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances, visual observations of the site and immediate surrounds and documents reviewed as described in the report;
- Subsurface soil and rock conditions encountered between investigation locations may be found to be different from those expected. Groundwater conditions may also vary, especially after climatic changes;
- The investigation and preparation of this report have been undertaken in accordance with accepted practice for environmental consultants, with reference to applicable environmental regulatory authority and industry standards, guidelines and the assessment criteria outlined in the report;
- Where information has been provided by third parties, EIS has not undertaken any verification process, except where specifically stated in the report;
- EIS has not undertaken any assessment of off-site areas that may be potential contamination sources or may have been impacted by site contamination, except where specifically stated in the report;
- EIS accept no responsibility for potentially asbestos containing materials that may exist at the site. These materials may be associated with demolition of pre-1990 constructed buildings or fill material at the site;
- EIS have not and will not make any determination regarding finances associated with the site;
- Additional investigation work may be required in the event of changes to the proposed development or landuse. EIS should be contacted immediately in such circumstances;
- Material considered to be suitable from a geotechnical point of view may be unsatisfactory from a soil contamination viewpoint, and vice versa; and
- This report has been prepared for the particular project described and no responsibility is accepted for the use of any part of this report in any other context or for any other purpose.

Important Information About This Report

These notes have been prepared by EIS to assist with the assessment and interpretation of this report.

The Report is based on a Unique Set of Project Specific Factors

This report has been prepared in response to specific project requirements as stated in the EIS proposal document which may have been limited by instructions from the client. This report should be reviewed, and if necessary, revised if any of the following occur:

- The proposed land use is altered;
- The defined subject site is increased or sub-divided;
- The proposed development details including size, configuration, location, orientation of the structures or landscaped areas are modified;
- The proposed development levels are altered, eg addition of basement levels; or
- Ownership of the site changes.

EIS/J&K will not accept any responsibility whatsoever for situations where one or more of the above factors have changed since completion of the assessment. If the subject site is sold, ownership of the assessment report should be transferred by EIS to the new site owners who will be informed of the conditions and limitations under which the assessment was undertaken. No person should apply an assessment for any purpose other than that originally intended without first conferring with the consultant.

Changes in Subsurface Conditions

Subsurface conditions are influenced by natural geological and hydrogeological process and human activities. Groundwater conditions are likely to vary over time with changes in climatic conditions and human activities within the catchment (e.g. water extraction for irrigation or industrial uses, subsurface waste water disposal, construction related dewatering). Soil and groundwater contaminant concentrations may also vary over time through contaminant migration, natural attenuation of organic contaminants, ongoing contaminating activities and placement or removal of fill material. The conclusions of an assessment report may have been affected by the above factors if a significant period of time has elapsed prior to commencement of the proposed development.

This Report is based on Professional Interpretations of Factual Data

Site assessments identify actual subsurface conditions at the actual sampling locations at the time of the investigation. Data obtained from the sampling and subsequent laboratory analyses, available site history information and published regional information is interpreted by geologists, engineers or environmental scientists and opinions are drawn about the overall subsurface conditions, the nature and extent of contamination, the likely impact on the proposed development and appropriate remediation measures.

Actual conditions may differ from those inferred, because no professional, no matter how qualified, and no subsurface exploration program, no matter how comprehensive, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than an assessment indicates. Actual conditions in areas not sampled may differ from predictions. Nothing can be done to prevent the unanticipated, but steps can be taken to help minimise the impact. For this reason, site owners should retain the services of their consultants throughout the development stage of the project, to identify variances, conduct additional tests which may be needed, and to recommend solutions to problems encountered on site.

Assessment Limitations

Although information provided by a site assessment can reduce exposure to the risk of the presence of contamination, no environmental site assessment can eliminate the risk. Even a rigorous professional assessment may not detect all contamination on a site. Contaminants may be present in areas that were not surveyed or sampled, or may migrate to areas which showed no signs of contamination when sampled. Contaminant analysis cannot possibly cover every type of contaminant which may occur; only the most likely contaminants are screened.

Misinterpretation of Site Assessments by Design Professionals

Costly problems can occur when other design professionals develop plans based on misinterpretation of an assessment report. To minimise problems associated with misinterpretations, the environmental consultant should be retained to work with appropriate professionals to explain relevant findings and to review the adequacy of plans and specifications relevant to contamination issues.

Logs Should not be Separated from the Assessment Report

Borehole and test pit logs are prepared by environmental scientists, engineers or geologists based upon interpretation of field conditions and laboratory evaluation of field samples. Logs are normally provided in our reports and these should not be re-drawn for inclusion in site remediation or other design drawings, as subtle but significant drafting errors or omissions may occur in the transfer process. Photographic reproduction can eliminate this problem, however contractors can still misinterpret the logs during bid preparation if separated from the text of the assessment. If this occurs, delays, disputes and unanticipated costs may result. In all cases it is necessary to refer to the rest of the report to obtain a proper understanding of the assessment. Please note that logs with the 'Environmental Log' header are not suitable for geotechnical purposes as they have not been peer reviewed by a Senior Geotechnical Engineer.

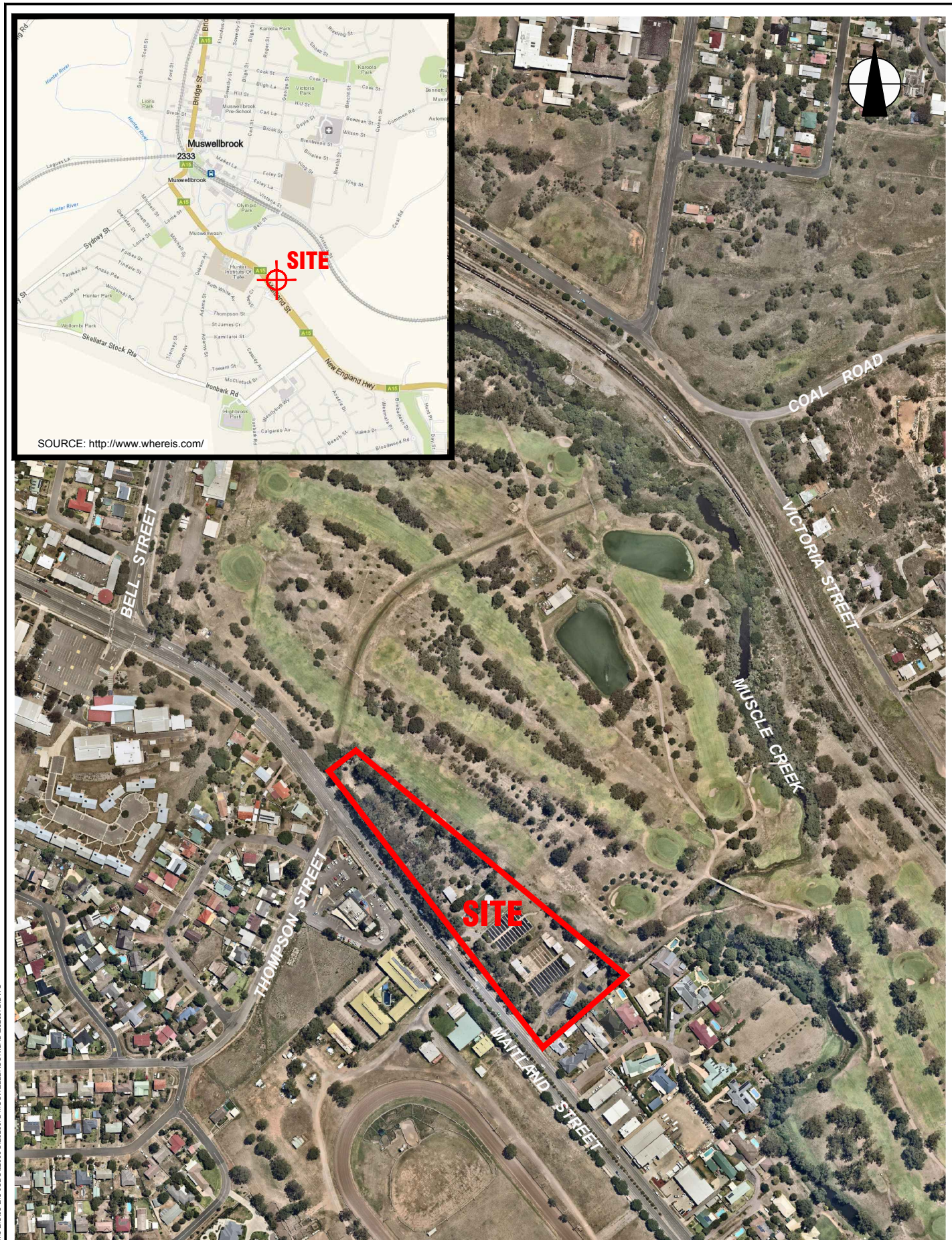
To reduce the likelihood of borehole and test pit log misinterpretation, the complete assessment should be available to persons or organisations involved in the project, such as contractors, for their use. Denial of such access and disclaiming responsibility for the accuracy of subsurface information does not insulate an owner from the attendant liability. It is critical that the site owner provides all available site information to persons and organisations such as contractors.

Read Responsibility Clauses Closely

Because an environmental site assessment is based extensively on judgement and opinion, it is necessarily less exact than other disciplines. This situation has resulted in wholly unwarranted claims being lodged against consultants. To help prevent this problem, model clauses have been developed for use in written transmittals. These are definitive clauses designed to indicate consultant responsibility. Their use helps all parties involved recognise individual responsibilities and formulate appropriate action. Some of these definitive clauses are likely to appear in the environmental site assessment, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to any questions.



Appendix A: Report Figures



SOURCE: <http://www.whereis.com/>

AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 13 JAN 2019.

Title:		SITE LOCATION PLAN	
Location:		LOT 100, MAITLAND STREET MUSWELLBROOK, NSW	
Report No:		E32307B	Figure No: 1
JKEnvironments			



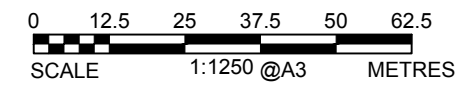
This plan should be read in conjunction with the Environmental report.



AERIAL IMAGE SOURCE: MAPS.AU.NEARMAP.COM, 13 JAN 2019.

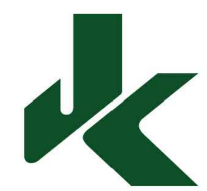
LEGEND

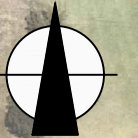
- APPROXIMATE SITE BOUNDARY
- BH (Fill Depth) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
- × F FIBRE CEMENT FRAGMENT (FCF)



This plan should be read in conjunction with the Environmental report.

Title:		SAMPLE AND SITE FEATURES PLAN	
Location:		LOT 100, MAITLAND STREET MUSWELLBROOK, NSW	
Report No:		E32307B	Figure No: 2
JKEnvironments			





BH19	BH20(DUP1)		0-0.1
	>C ₁₆ -C ₃₄ (F3)		420
	INITIAL		0-0.1
	SILICA GEL CLEAN-UP		0-0.1
>C ₁₀ -C ₁₆ (F2)		190	73
>C ₁₆ -C ₃₄ (F3)		1200	250
>C ₁₀ -C ₁₆ (F2)		190	73

BH18		0-0.1
>C ₁₆ -C ₃₄ (F3)		700

BH17	INITIAL		SILICA GEL CLEAN-UP
	0-0.1		0-0.1
	>C ₁₀ -C ₁₆ (F2)		900
	>C ₁₆ -C ₃₄ (F3)		3700
>C ₁₀ -C ₁₆ (F2)		900	340

BH15		0-0.1
>C ₁₆ -C ₃₄ (F3)		400

BH4		0-0.2
>C ₁₆ -C ₃₄ (F3)		770

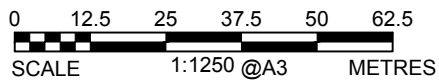
BH2		0-0.2
CARCINOGENIC PAHs		3.1

LEGEND

- APPROXIMATE SITE BOUNDARY
- BH (Fill Depth) BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
- ✗ HWF FIBRE CEMENT FRAGMENT (FCF) SURFACE

SAMPLE ID	DEPTH (metres)
CHEMICAL	CONCENTRATION

- SOIL CONTAMINATION ABOVE SAC FOR HUMAN HEALTH RISK (mg/kg)
- SOIL CONTAMINATION ABOVE SAC FOR ENVIRONMENTAL RISK (mg/kg)



This plan should be read in conjunction with the Environmental report.

Title:

SITE CONTAMINATION DATA

Location:

LOT 100, MAITLAND STREET
MUSWELLBROOK, NSW

Report No:

E32307B

Figure No:

3

JKEnvironments





Appendix B: Laboratory Summary Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC:	Ambient Background Concentration	PCBs:	Polychlorinated Biphenyls
ACM:	Asbestos Containing Material	PCE:	Perchloroethylene (Tetrachloroethylene or Tetrachloroethene)
ADWG:	Australian Drinking Water Guidelines	pH_{KCL}:	pH of filtered 1:20, 1M KCL extract, shaken overnight
AF:	Asbestos Fines	pH_{ox}:	pH of filtered 1:20 1M KCL after peroxide digestion
ANZECC:	Australian and New Zealand Environment Conservation Council	PQL:	Practical Quantitation Limit
B(a)P:	Benzo(a)pyrene	RS:	Rinsate Sample
CEC:	Cation Exchange Capacity	RSL:	Regional Screening Levels
CRC:	Cooperative Research Centre	SAC:	Site Assessment Criteria
CT:	Contaminant Threshold	SCC:	Specific Contaminant Concentration
EILs:	Ecological Investigation Levels	S_{Cr}:	Chromium reducible sulfur
ESLs:	Ecological Screening Levels	S_{POS}:	Peroxide oxidisable Sulfur
FA:	Fibrous Asbestos	SSA:	Site Specific Assessment
GIL:	Groundwater Investigation Levels	SSHSLs:	Site Specific Health Screening Levels
HILs:	Health Investigation Levels	TAA:	Total Actual Acidity in 1M KCL extract titrated to pH6.5
HSLs:	Health Screening Levels	TB:	Trip Blank
HSL-SSA:	Health Screening Level-Site Specific Assessment	TCA:	1,1,1 Trichloroethane (methyl chloroform)
NA:	Not Analysed	TCE:	Trichloroethylene (Trichloroethene)
NC:	Not Calculated	TCLP:	Toxicity Characteristics Leaching Procedure
NEPM:	National Environmental Protection Measure	TPA:	Total Potential Acidity, 1M KCL peroxide digest
NHMRC:	National Health and Medical Research Council	TS:	Trip Spike
NL:	Not Limiting	TRH:	Total Recoverable Hydrocarbons
NSL:	No Set Limit	TSA:	Total Sulfide Acidity (TPA-TAA)
OCP:	Organochlorine Pesticides	UCL:	Upper Level Confidence Limit on Mean Value
OPP:	Organophosphorus Pesticides	USEPA:	United States Environmental Protection Agency
PAHs:	Polycyclic Aromatic Hydrocarbons	VOCC:	Volatile Organic Chlorinated Compounds
ppm:	Parts per million	WHO:	World Health Organisation

Table Specific Explanations:

HIL Tables:

- The chromium results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- Carcinogenic PAHs is a toxicity weighted sum of analyte concentrations for a specific list of PAH compounds relative to B(a)P. It is also referred to as the B(a)P Toxic Equivalence Quotient (TEQ).
- Statistical calculations are undertaken using ProUCL (USEPA). Statistical calculation is usually undertaken using data from fill samples.

EIL/ESL Table:

- ABC Values for selected metals have been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with high traffic have been quoted).

TABLE A																						
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.																						
HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'																						
All data in mg/kg unless stated otherwise			HEAVY METALS							PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES	
			Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor			Chlorpyrifos
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			100	20	100	6000	300	40	400	7400	300	3	10	270	300	6	50	240	6	160	1	Detected/Not Detected
Sample Reference	Sample Depth	Sample Description																				
BH1	0-0.2	FILL: silty sandy clay	5	<0.4	16	16	41	<0.1	12	74	0.38	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH2	0-0.2	FILL: sandy gravel	5	<0.4	7	13	5	<0.1	28	28	14.5	3.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH2	0.2-0.5	Silty CLAY	NA	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH3	0-0.2	FILL: silty gravel	<4	<0.4	7	20	17	<0.1	24	59	1.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH4	0-0.2	FILL: sandy gravel	<4	<0.4	16	13	12	<0.1	19	37	0.2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH4	0.2-0.5	Silty CLAY	22	<0.4	16	10	12	<0.1	14	44	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH5	0-0.2	FILL: silty sand	6	<0.4	11	11	9	<0.1	10	130	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH5	0.4-0.6	FILL: sandy gravel	4	<0.4	19	15	9	<0.1	23	42	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH6	0-0.2	FILL: silty gravelly sand	9	<0.4	12	12	16	<0.1	14	260	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH6	0.8-1.0	Silty CLAY	<4	<0.4	17	11	10	<0.1	7	22	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH7	0-0.2	FILL: silty sand	6	<0.4	14	12	19	<0.1	13	63	0.58	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH8	0-0.2	FILL: silty sand	<4	<0.4	12	20	8	<0.1	16	68	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH9	0-0.2	FILL: sandy gravel	<4	<0.4	6	17	2	<0.1	45	14	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH9	0.2-0.6	FILL: silty gravelly sand	<4	<0.4	14	13	5	<0.1	19	41	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH10	0-0.2	FILL: silty clay	5	<0.4	18	11	16	<0.1	12	32	0.25	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH11	0-0.3	FILL: clayey sand	<4	<0.4	14	18	7	<0.1	16	53	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH12	0-0.3	FILL: sandy clay	6	<0.4	17	16	11	<0.1	16	44	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH12	0.4-0.6	Silty CLAY	<4	<0.4	13	8	6	<0.1	11	12	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH13	0-0.2	Silty CLAY	4	<0.4	18	22	16	<0.1	9	54	0.26	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH14	0-0.1	FILL: silty clay	<4	<0.4	22	13	10	<0.1	18	39	0.25	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH15	0-0.1	FILL: gravelly sand	<4	<0.4	16	10	14	<0.1	12	36	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH15	1.2-1.5	Silty CLAY	<4	<0.4	19	13	9	<0.1	17	26	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH16	0-0.1	FILL: clayey silt	<4	<0.4	17	10	8	<0.1	13	17	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH17	0-0.1	FILL: clayey sand	4	<0.4	11	13	22	<0.1	12	57	0.7	<0.5	<1	<1	<1	<1	<1	<1	<1	<1	<1	NA
BH18	0-0.1	FILL: clayey sand	5	<0.4	19	13	14	<0.1	17	46	0.25	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH18	1.2-1.5	Silty CLAY	<4	<0.4	16	8	6	<0.1	9	20	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BH19	0-0.1	FILL: peaty sand	<4	<0.4	13	14	29	<0.1	11	740	0.69	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
BH20	0-0.1	FILL: silty clayey sand	4	<0.4	17	12	28	<0.1	11	48	2	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
DUP1	NA	FILL: sandy gravel	5	<0.4	11	13	5	<0.1	27	44	19.6	3.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
DUP2	NA	FILL: sandy gravel	5	<0.4	19	17	8	<0.1	28	56	<0.05	<0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HWF1	Surface	Material	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
HWF2	Surface	Material	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Not Detected
Total Number of Samples			29	29	29	29	29	29	29	29	30	30	21	21	21	21	21	21	21	21	21	2
Maximum Value			22	<0.4	22	22	41	<0.1	45	740	19.6	3.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NC
Concentration above the SAC			VALUE																			

TABLE B SOIL LABORATORY RESULTS COMPARED TO HSLs All data in mg/kg unless stated otherwise												
					C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					HSL-A/B:LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category								
BH1	0-0.2	FILL: silty sandy clay	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	16
BH2	0-0.2	FILL: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	5
BH3	0-0.2	FILL: silty gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	4
BH4	0-0.2	FILL: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	4
BH4	0.2-0.5	Silty CLAY	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	3
BH5	0-0.2	FILL: silty sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	3
BH5	0.4-0.6	FILL: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	4
BH6	0-0.2	FILL: silty gravelly sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	2
BH6	0.8-1.0	Silty CLAY	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	2
BH7	0-0.2	FILL: silty sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	2
BH8	0-0.2	FILL: silty sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1
BH9	0-0.2	FILL: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	3
BH9	0.2-0.6	FILL: silty gravelly sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH10	0-0.2	FILL: silty clay	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	1
BH11	0-0.3	FILL: clayey sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH12	0-0.3	FILL: sandy clay	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH12	0.4-0.6	Silty CLAY	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH13	0-0.2	Silty CLAY	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH14	0-0.1	FILL: silty clay	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH15	0-0.1	FILL: gravelly sand	0m to < 1m	Sand	<25	62	<0.2	<0.5	<1	<1	<1	0
BH15	1.2-1.5	Silty CLAY	1m to <2m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH16	0-0.1	FILL: clayey silt	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH17	0-0.1	FILL: clayey sand	0m to < 1m	Sand	<25	900	<0.2	<0.5	<1	<1	<1	0
BH17 (silica gel clean-up)	0-0.1	FILL: clayey sand	0m to < 1m	Sand	NA	340	NA	NA	NA	NA	NA	0
BH17	1.2-1.5	Silty CLAY	1m to <2m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH18	0-0.1	FILL: clayey sand	0m to < 1m	Sand	<25	63	<0.2	<0.5	<1	<1	<1	0
BH18	1.2-1.5	Silty CLAY	1m to <2m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH19	0-0.1	FILL: peaty sand	0m to < 1m	Sand	<25	190	<0.2	<0.5	<1	<1	<1	0
BH19 (silica gel clean-up)	0-0.1	FILL: peaty sand	0m to < 1m	Sand	NA	73	NA	NA	NA	NA	NA	0
BH19	1.3-1.5	Silty CLAY	1m to <2m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
BH20	0-0.1	FILL: silty clayey sand	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	0
DUP1	–	FILL: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
DUP2	–	FILL: sandy gravel	0m to < 1m	Sand	<25	<50	<0.2	<0.5	<1	<1	<1	NA
Total Number of Samples					31	33	31	31	31	31	31	31
Maximum Value					<PQL	900	<PQL	<PQL	<PQL	<PQL	<PQL	16
Concentration above the SAC												
The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below												

SITE ASSESSMENT CRITERIA												
					C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	
NEPM 2013 HSL Land Use Category					HSL-A/B:LOW/HIGH DENSITY RESIDENTIAL							
Sample Reference	Sample Depth	Sample Description	Depth Category	Soil Category								
BH1	0-0.2	FILL: silty sandy clay	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH2	0-0.2	FILL: sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH3	0-0.2	FILL: silty gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH4	0-0.2	FILL: sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH4	0.2-0.5	Silty CLAY	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH5	0-0.2	FILL: silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH5	0.4-0.6	FILL: sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH6	0-0.2	FILL: silty gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH6	0.8-1.0	Silty CLAY	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH7	0-0.2	FILL: silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH8	0-0.2	FILL: silty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH9	0-0.2	FILL: sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH9	0.2-0.6	FILL: silty gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH10	0-0.2	FILL: silty clay	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH11	0-0.3	FILL: clayey sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH12	0-0.3	FILL: sandy clay	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH12	0.4-0.6	Silty CLAY	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH13	0-0.2	Silty CLAY	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH14	0-0.1	FILL: silty clay	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH15	0-0.1	FILL: gravelly sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH15	1.2-1.5	Silty CLAY	1m to <2m	Sand	70	240	0.5	220	NL	60	NL	
BH16	0-0.1	FILL: clayey silt	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH17	0-0.1	FILL: clayey sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH17 (silica gel clean-up)	0-0.1	FILL: clayey sand	0m to < 1m	Sand	NA	110	NA	NA	NA	NA	NA	
BH17	1.2-1.5	Silty CLAY	1m to <2m	Sand	70	240	0.5	220	NL	60	NL	
BH18	0-0.1	FILL: clayey sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH18	1.2-1.5	Silty CLAY	1m to <2m	Sand	70	240	0.5	220	NL	60	NL	
BH19	0-0.1	FILL: peaty sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
BH19 (silica gel clean-up)	0-0.1	FILL: peaty sand	0m to < 1m	Sand	NA	110	NA	NA	NA	NA	NA	
BH19	1.3-1.5	Silty CLAY	1m to <2m	Sand	70	240	0.5	220	NL	60	NL	
BH20	0-0.1	FILL: silty clayey sand	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
DUP1	–	FILL: sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3	
DUP2	–	FILL: sandy gravel	0m to < 1m	Sand	45	110	0.5	160	55	40	3	

TABLE C SOIL LABORATORY RESULTS COMPARED TO NEPM 2013 EILs AND ESLs All data in mg/kg unless stated otherwise																							
Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																			
				pH	CEC (cmol/kg)	Clay Content (% clay)	AGED HEAVY METALS-EILs						EILs		ESLs								
				Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₈ (F2)	>C ₁₈ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P			
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	Sample Depth	Sample Description	Soil Texture																				
BH1	0-0.2	FILL: silty sandy clay	Fine	NA	NA	NA	5	16	16	41	12	74	<0.1	<0.1	<25	<50	290	150	<0.2	<0.5	<1	<1	0.08
BH2	0-0.2	FILL: sandy gravel	Coarse	NA	NA	NA	5	7	13	5	28	28	<0.1	<0.1	<25	<50	210	160	<0.2	<0.5	<1	<1	2.2
BH2	0.2-0.5	Silty CLAY	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.05
BH3	0-0.2	FILL: silty gravel	Coarse	NA	NA	NA	<4	7	20	17	24	59	<0.1	<0.1	<25	<50	200	110	<0.2	<0.5	<1	<1	0.2
BH4	0-0.2	FILL: sandy gravel	Coarse	NA	NA	NA	<4	16	13	12	19	37	<0.1	<0.1	<25	<50	770	700	<0.2	<0.5	<1	<1	<0.05
BH4	0.2-0.5	Silty CLAY	Fine	NA	NA	NA	22	16	10	12	14	44	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH5	0-0.2	FILL: silty sand	Coarse	NA	NA	NA	6	11	11	9	10	130	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH5	0.4-0.6	FILL: sandy gravel	Coarse	NA	NA	NA	4	19	15	9	23	42	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH6	0-0.2	FILL: silty gravelly sand	Coarse	6.8	8.1	NA	9	12	12	16	14	260	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH6	0.8-1.0	Silty CLAY	Fine	NA	NA	NA	<4	17	11	10	7	22	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH7	0-0.2	FILL: silty sand	Coarse	NA	NA	NA	6	14	12	19	13	63	<0.1	<0.1	<25	<50	280	230	<0.2	<0.5	<1	<1	0.08
BH8	0-0.2	FILL: silty sand	Coarse	NA	NA	NA	<4	12	20	8	16	68	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH9	0-0.2	FILL: sandy gravel	Coarse	NA	9.8	NA	<4	6	17	2	45	14	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH9	0.2-0.6	FILL: silty gravelly sand	Coarse	NA	NA	NA	<4	14	13	5	19	41	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH10	0-0.2	FILL: silty clay	Fine	NA	NA	NA	5	18	11	16	12	32	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.05
BH11	0-0.3	FILL: clayey sand	Coarse	NA	NA	NA	<4	14	18	7	16	53	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH12	0-0.3	FILL: sandy clay	Fine	NA	NA	NA	6	17	16	11	16	44	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH12	0.4-0.6	Silty CLAY	Fine	NA	NA	NA	<4	13	8	6	11	12	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH13	0-0.2	Silty CLAY	Fine	NA	NA	NA	4	18	22	16	9	54	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.06
BH14	0-0.1	FILL: silty clay	Fine	NA	NA	NA	<4	22	13	10	18	39	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	0.05
BH15	0-0.1	FILL: gravelly sand	Coarse	NA	NA	NA	<4	16	10	14	12	36	<0.1	<0.1	<25	62	400	180	<0.2	<0.5	<1	<1	<0.05
BH15	1.2-1.5	Silty CLAY	Fine	NA	NA	NA	<4	19	13	9	17	26	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH16	0-0.1	FILL: clayey silt	Fine	NA	NA	NA	<4	17	10	8	13	17	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH17	0-0.1	FILL: clayey sand	Coarse	NA	NA	NA	4	11	13	22	12	57	<0.1	<1	<25	900	3700	1300	<0.2	<0.5	<1	<1	<0.05
BH17 (silica gel clean-up)	0-0.1	FILL: clayey sand	Coarse	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	340	580	<100	NA	NA	NA	NA	NA
BH17	1.2-1.5	Silty CLAY	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	NA
BH18	0-0.1	FILL: clayey sand	Coarse	NA	NA	NA	5	19	13	14	17	46	<0.1	<0.1	<25	63	700	420	<0.2	<0.5	<1	<1	0.05
BH18	1.2-1.5	Silty CLAY	Fine	NA	NA	NA	<4	16	8	6	9	20	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
BH19	0-0.1	FILL: peaty sand	Coarse	6.6	46	NA	<4	13	14	29	11	740	<0.1	<0.1	<25	190	1200	660	<0.2	<0.5	<1	<1	0.09
BH19 (silica gel clean-up)	0-0.1	FILL: peaty sand	Coarse	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	73	250	<100	NA	NA	NA	NA	NA
BH19	1.3-1.5	Silty CLAY	Fine	NA	NA	NA	NA	NA	NA	NA	NA	NA	<1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	NA
BH20	0-0.1	FILL: silty clayey sand	Coarse	NA	NA	NA	4	17	12	28	11	48	<0.1	<0.1	<25	<50	200	150	<0.2	<0.5	<1	<1	0.2
DUP1	NA	FILL: sandy gravel	Coarse	NA	NA	NA	5	11	13	5	27	44	<0.1	<0.1	<25	<50	420	350	<0.2	<0.5	<1	<1	2.2
DUP2	NA	FILL: sandy gravel	Coarse	NA	NA	NA	5	19	17	8	28	56	<0.1	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.05
Total Number of Samples				2	3	0	29	29	29	29	29	29	31	21	31	33	33	33	31	31	31	31	30
Maximum Value				6.8	46	<PQL	22	22	22	41	45	740	<PQL	<PQL	<PQL	900	3700	1300	<PQL	<PQL	<PQL	<PQL	2.2
Concentration above the SAC				VALUE																			
The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below																							

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																			
				pH	CEC (cmol/kg)	Clay Content (% clay)	AGED HEAVY METALS-EILs						EILs		ESLs								
							Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₈ (F2)	>C ₁₈ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
POL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	8	18	104	5	77	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	Sample Depth	Sample Description	Soil Texture																				
BH1	0-0.2	FILL: silty sandy clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	33
BH2	0-0.2	FILL: sandy gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH2	0.2-0.5	Silty CLAY	Fine	NA	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	33
BH3	0-0.2	FILL: silty gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH4	0-0.2	FILL: sandy gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH4	0.2-0.5	Silty CLAY	Fine	NA	NA	NA	100	198	78	1204	35	147	170	--	180	120	1300	5600	60	105	125	45	33
BH5	0-0.2	FILL: silty sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH5	0.4-0.6	FILL: sandy gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	--	180	120	300	2800	50	85	70	105	33
BH6	0-0.2	FILL: silty gravelly sand	Coarse	6.8	8.1	NA	100	198	208	1204	175	477	170	180	180	120	300	2800	50	85	70	105	33
BH6	0.8-1.0	Silty CLAY	Fine	NA	NA	NA	100	198	78	1204	35	147	170	--	180	120	1300	5600	60	105	125	45	33
BH7	0-0.2	FILL: silty sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH8	0-0.2	FILL: silty sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH9	0-0.2	FILL: sandy gravel	Coarse	NA	9.8	NA	100	198	78	1204	175	147	170	180	180	120	300	2800	50	85	70	105	33
BH9	0.2-0.6	FILL: silty gravelly sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	--	180	120	300	2800	50	85	70	105	33
BH10	0-0.2	FILL: silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	33
BH11	0-0.3	FILL: clayey sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH12	0-0.3	FILL: silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	33
BH12	0.4-0.6	Silty CLAY	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	33
BH13	0-0.2	FILL: silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	33
BH14	0-0.1	FILL: silty clay	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	33
BH15	0-0.1	FILL: gravelly sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH15	1.2-1.5	Silty CLAY	Fine	NA	NA	NA	100	198	78	1204	35	147	170	--	180	120	1300	5600	60	105	125	45	33
BH16	0-0.1	FILL: clayey silt	Fine	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	1300	5600	60	105	125	45	33
BH17	0-0.1	FILL: clayey sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH17 (silica gel clean-up)	0-0.1	FILL: clayey sand	Coarse	NA	NA	NA	--	--	--	--	--	--	--	--	--	120	300	2800	--	--	--	--	--
BH17	1.2-1.5	Silty CLAY	Fine	NA	NA	NA	--	--	--	--	--	--	170	--	180	120	1300	5600	60	105	125	45	--
BH18	0-0.1	FILL: clayey sand	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
BH18	1.2-1.5	Silty CLAY	Fine	NA	NA	NA	100	198	78	1204	35	147	170	--	180	120	1300	5600	60	105	125	45	33
BH19	0-0.1	FILL: peaty sand	Coarse	6.6	46	NA	100	198	248	1204	565	957	170	180	180	120	300	2800	50	85	70	105	33
BH19 (silica gel clean-up)	0-0.1	FILL: peaty sand	Coarse	NA	NA	NA	--	--	--	--	--	--	--	--	--	120	300	2800	--	--	--	--	--
BH19	1.3-1.5	Silty CLAY	Fine	NA	NA	NA	--	--	--	--	--	--	170	--	180	120	1300	5600	60	105	125	45	--
BH20	0-0.1	FILL: silty clayey sand	Coarse	NA	NA	NA	--	1204	35	147	170	180	180	180	120	300	2800	50	85	70	105	33	
DUP1	NA	FILL: sandy gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	180	180	120	300	2800	50	85	70	105	33
DUP2	NA	FILL: sandy gravel	Coarse	NA	NA	NA	100	198	78	1204	35	147	170	--	180	120	300	2800	50	85	70	105	33

TABLE D SOIL LABORATORY RESULTS COMPARED TO MANAGEMENT LIMITS All data in mg/kg unless stated otherwise						
			C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2)	>C ₁₆ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE			
Sample Reference	Sample Depth	Soil Texture				
BH1	0-0.2	Fine	<25	<50	290	150
BH2	0-0.2	Coarse	<25	<50	210	160
BH3	0-0.2	Coarse	<25	<50	200	110
BH4	0-0.2	Coarse	<25	<50	770	700
BH4	0.2-0.5	Fine	<25	<50	<100	<100
BH5	0-0.2	Coarse	<25	<50	<100	<100
BH5	0.4-0.6	Coarse	<25	<50	<100	<100
BH6	0-0.2	Coarse	<25	<50	<100	<100
BH6	0.8-1.0	Fine	<25	<50	<100	<100
BH7	0-0.2	Coarse	<25	<50	280	230
BH8	0-0.2	Coarse	<25	<50	<100	<100
BH9	0-0.2	Coarse	<25	<50	<100	<100
BH9	0.2-0.6	Coarse	<25	<50	<100	<100
BH10	0-0.2	Fine	<25	<50	<100	<100
BH11	0-0.3	Coarse	<25	<50	<100	<100
BH12	0-0.3	Fine	<25	<50	<100	<100
BH12	0.4-0.6	Fine	<25	<50	<100	<100
BH13	0-0.2	Fine	<25	<50	<100	<100
BH14	0-0.1	Fine	<25	<50	<100	<100
BH15	0-0.1	Coarse	<25	62	400	180
BH15	1.2-1.5	Fine	<25	<50	<100	<100
BH16	0-0.1	Fine	<25	<50	<100	<100
BH17	0-0.1	Coarse	<25	900	3700	1300
BH17 (silica gel clean-up)	0-0.1	Coarse	NA	340	580	<100
BH17	1.2-1.5	Fine	<25	<50	<100	<100
BH18	0-0.1	Coarse	<25	63	700	420
BH18	1.2-1.5	Fine	<25	<50	<100	<100
BH19	0-0.1	Coarse	<25	190	1200	660
BH19 (silica gel clean-up)	0-0.1	Coarse	NA	73	250	<100
BH19	1.3-1.5	Fine	<25	<50	<100	<100
BH20	0-0.1	Coarse	<25	<50	200	150
DUP1	NA	Coarse	<25	<50	420	350
DUP2	NA	Coarse	<25	<50	<100	<100
Total Number of Samples			31	33	33	33
Maximum Value			<PQL	900	3700	1300
Concentration above the SAC			VALUE			

MANAGEMENT LIMIT ASSESSMENT CRITERIA						
			C ₆ -C ₁₀ (F1)	>C ₁₀ -C ₁₆ (F2)	>C ₁₆ -C ₃₄ (F3)	>C ₃₄ -C ₄₀ (F4)
PQL - Envirolab Services			25	50	100	100
NEPM 2013 Land Use Category			RESIDENTIAL, PARKLAND & PUBLIC OPEN SPACE			
Sample Reference	Sample Depth	Soil Texture				
BH1	0-0.2	Fine	800	1000	3500	10000
BH2	0-0.2	Coarse	700	1000	2500	10000
BH3	0-0.2	Coarse	700	1000	2500	10000
BH4	0-0.2	Coarse	700	1000	2500	10000
BH4	0.2-0.5	Fine	800	1000	3500	10000
BH5	0-0.2	Coarse	700	1000	2500	10000
BH5	0.4-0.6	Coarse	700	1000	2500	10000
BH6	0-0.2	Coarse	700	1000	2500	10000
BH6	0.8-1.0	Fine	800	1000	3500	10000
BH7	0-0.2	Coarse	700	1000	2500	10000
BH8	0-0.2	Coarse	700	1000	2500	10000
BH9	0-0.2	Coarse	700	1000	2500	10000
BH9	0.2-0.6	Coarse	700	1000	2500	10000
BH10	0-0.2	Fine	800	1000	3500	10000
BH11	0-0.3	Coarse	700	1000	2500	10000
BH12	0-0.3	Fine	800	1000	3500	10000
BH12	0.4-0.6	Fine	800	1000	3500	10000
BH13	0-0.2	Fine	800	1000	3500	10000
BH14	0-0.1	Fine	800	1000	3500	10000
BH15	0-0.1	Coarse	700	1000	2500	10000
BH15	1.2-1.5	Fine	800	1000	3500	10000
BH16	0-0.1	Fine	800	1000	3500	10000
BH17	0-0.1	Coarse	700	1000	2500	10000
BH17 (silica gel clean-up)	0-0.1	Coarse	--	1000	2500	10000
BH17	1.2-1.5	Fine	800	1000	3500	10000
BH18	0-0.1	Coarse	700	1000	2500	10000
BH18	1.2-1.5	Fine	800	1000	3500	10000
BH19	0-0.1	Coarse	700	1000	2500	10000
BH19 (silica gel clean-up)	0-0.1	Coarse	--	1000	2500	10000
BH19	1.3-1.5	Fine	800	1000	3500	10000
BH20	0-0.1	Coarse	700	1000	2500	10000
DUP1	NA	Coarse	700	1000	2500	10000
DUP2	NA	Coarse	700	1000	2500	10000



TABLE E
SOIL LABORATORY RESULTS COMPARED TO DIRECT CONTACT CRITERIA
All data in mg/kg unless stated otherwise

Analyte		C ₆ -C ₁₀	>C ₁₀ -C ₁₆	>C ₁₆ -C ₃₄	>C ₃₄ -C ₄₀	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services		25	50	100	100	0.2	0.5	1	3	1	
CRC 2011 -Direct contact Criteria		4,400	3,300	4,500	6,300	100	14,000	4,500	12,000	1,400	
Site Use		RESIDENTIAL WITH ACCESSIBLE SOIL- DIRECT SOIL CONTACT									
Sample Reference	Sample Depth										
BH1	0-0.2	<25	<50	290	150	<0.2	<0.5	<1	<1	<1	16
BH2	0-0.2	<25	<50	210	160	<0.2	<0.5	<1	<1	<1	5
BH3	0-0.2	<25	<50	200	110	<0.2	<0.5	<1	<1	<1	4
BH4	0-0.2	<25	<50	770	700	<0.2	<0.5	<1	<1	<1	4
BH4	0.2-0.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	3
BH5	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	3
BH5	0.4-0.6	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	4
BH6	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	2
BH6	0.8-1.0	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	2
BH7	0-0.2	<25	<50	280	230	<0.2	<0.5	<1	<1	<1	2
BH8	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	1
BH9	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	3
BH9	0.2-0.6	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH10	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	1
BH11	0-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH12	0-0.3	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH12	0.4-0.6	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH13	0-0.2	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH14	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH15	0-0.1	<25	62	400	180	<0.2	<0.5	<1	<1	<1	0
BH15	1.2-1.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH16	0-0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH17	0-0.1	<25	900	3700	1300	<0.2	<0.5	<1	<1	<1	0
BH17 (silica gel clean-up)	0-0.1	NA	340	580	<100	NA	NA	NA	NA	NA	0
BH17	1.2-1.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH18	0-0.1	<25	63	700	420	<0.2	<0.5	<1	<1	<1	0
BH18	1.2-1.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH19	0-0.1	<25	190	1200	660	<0.2	<0.5	<1	<1	<1	0
BH19 (silica gel clean-up)	0-0.1	NA	73	250	<100	NA	NA	NA	NA	NA	0
BH19	1.3-1.5	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0
BH20	0-0.1	<25	<50	200	150	<0.2	<0.5	<1	<1	<1	0
DUP1	NA	<25	<50	420	350	<0.2	<0.5	<1	<1	<1	NA
DUP2	NA	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NA
Total Number of Samples		31	33	33	33	31	31	31	31	31	
Maximum Value		<PQL	900	3700	1300	<PQL	<PQL	<PQL	<PQL	<PQL	

Concentration above the SAC

VALUE

TABLE F
ASBESTOS QUANTIFICATION - LABORATORY RESULTS
HSL-A: Residential with garden/accessible soils; children's day care centers; preschools; and primary schools

FIELD DATA															LABORATORY DATA													
Date Sampled	Sample reference	Sample Depth	Visible ACM in top 100mm	Approx. Volume of Soil (L)	Soil Mass (g)	Mass ACM (g)	Mass Asbestos in ACM (g)	[Asbestos from ACM in soil] (%w/w)	Mass ACM <7mm (g)	Mass Asbestos in ACM <7mm (g)	[Asbestos from ACM <7mm in soil] (%w/w)	Mass FA (g)	Mass Asbestos in FA (g)	[Asbestos from FA in soil] (%w/w)	Lab Report Number	Sample reference	Sample Depth	Sample Mass (g)	Asbestos ID in soil (A54964) >0.1g/kg	Trace Analysis	Total Asbestos (g/kg)	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation (g)	FA and AF Estimation (g)	ACM >7mm Estimation %(w/w)	FA and AF Estimation %(w/w)		
SAC		No						0.01			0.001										0.01		0.01		0.001			
Bulk 10 L samples not collected															214627	BH2	0-0.2	686.24	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001
															214627	BH3	0-0.2	583.6	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001
															214627	BH5	0-0.2	733.36	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001
															214627	BH6	0-0.2	626.34	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001
															214627	BH8	0-0.2	409.32	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001
															214627	BH9	0-0.2	503.31	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001
															214627	BH12	0-0.3	521.15	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001
															214627	BH14	0-0.1	608.2	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001
															214627	BH15	0-0.1	809.61	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001
														214627	BH20	0-0.1	352.02	No asbestos detected at reporting limit of 0.1g/kg: Organic fibres detected		No asbestos detected	<0.1	No visible asbestos detected		–	–	<0.01	<0.001	

TABLE G
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS

All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	EnviroLab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH2 (0-0.2) Dup Ref = DUP1 EnviroLab Report: 214627	Arsenic	4	5	5	5.0	0
	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	7	11	9.0	44
	Copper	1	13	13	13.0	0
	Lead	1	5	5	5.0	0
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	28	27	27.5	4
	Zinc	1	28	44	36.0	44
	Naphthalene	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	0.5	0.8	0.7	46
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	0.1	0.2	0.2	67
	Anthracene	0.1	0.3	0.4	0.4	29
	Fluoranthene	0.1	0.7	1.2	1.0	53
	Pyrene	0.1	0.9	1.3	1.1	36
	Benzo(a)anthracene	0.1	0.4	0.8	0.6	67
	Chrysene	0.1	0.8	1.2	1.0	40
	Benzo(b,j+k)fluoranthene	0.2	3.3	4.4	3.9	29
	Benzo(a)pyrene	0.05	2.2	2.2	2.2	0
	Indeno(123-cd)pyrene	0.1	2.1	2.6	2.4	21
	Dibenzo(ah)anthracene	0.1	0.3	0.4	0.4	29
	Benzo(ghi)perylene	0.1	2.9	4.1	3.5	34
	Total OCPs	0.1	<0.1	<0.1	NC	NC
	Total OPPs	0.1	<0.1	<0.1	NC	NC
	Total PCBs	0.1	<0.1	<0.1	NC	NC
	TRH C ₆ -C ₁₀ (F1)	25	<25	<25	NC	NC
	TRH >C ₁₀ -C ₁₆ (F2)	50	<50	<50	NC	NC
	TRH >C ₁₆ -C ₃₄ (F3)	100	210	420	315.0	67
	TRH >C ₃₄ -C ₄₀ (F4)	100	160	350	255.0	75
	Benzene	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<2	NC	NC
	o-xylene	1	<1	<1	NC	NC

Explanation:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

Results > 10 times PQL = RPD value <= 50% are acceptable

Results between 5 & 10 times PQL = RPD value <= 75% are acceptable

Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria

VALUE

TABLE H
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
 All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	EnviroLab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH5 (0.4-0.6) Dup Ref = DUP2 EnviroLab Report: 214627	Arsenic	4	4	5	4.5	22
	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	19	19	19.0	0
	Copper	1	15	17	16.0	13
	Lead	1	9	8	8.5	12
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	23	28	25.5	20
	Zinc	1	42	56	49.0	29
	Naphthalene	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	<0.1	<0.1	NC	NC
	Anthracene	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	<0.1	<0.1	NC	NC
	Pyrene	0.1	<0.1	<0.1	NC	NC
	Benzo(a)anthracene	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.05	<0.05	<0.05	NC	NC
	Indeno(123-cd)pyrene	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	<0.1	<0.1	NC	NC
	TRH C6-C10 (F1)	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	<100	<100	NC	NC
	Benzene	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<2	NC	NC
	o-xylene	1	<1	<1	NC	NC

Explanation:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

- Results > 10 times PQL = RPD value <= 50% are acceptable
 - Results between 5 & 10 times PQL = RPD value <= 75% are acceptable
 - Results < 5 times PQL = RPD value <= 100% are acceptable
- If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria

VALUE

TABLE I
SOIL INTER-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
 All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	Envirolab VIC PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = BH8 (0-0.2) Dup Ref = DUP3 Envirolab Report: 214627 Envirolab VIC Report: 16444	Arsenic	4	4	<4	<4	NC	NC
	Cadmium	0.4	0.4	<0.4	<0.4	NC	NC
	Chromium	1	1	12	12	12.0	0
	Copper	1	1	20	27	23.5	30
	Lead	1	1	8	8	8.0	0
	Mercury	0.1	0.1	<0.1	<0.1	NC	NC
	Nickel	1	1	16	16	16.0	0
	Zinc	1	1	68	70	69.0	3
	Naphthalene	0.1	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	0.1	<0.1	<0.1	NC	NC
	Anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	0.1	<0.1	<0.1	NC	NC
	Pyrene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(a)anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.05	0.05	<0.05	<0.05	NC	NC
	Indeno(123-cd)pyrene	0.1	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	0.1	<0.1	<0.1	NC	NC
	TRH C6-C10 (F1)	25	25	<25	<25	NC	NC
	TRH >C10-C16 (F2)	50	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	100	<100	<100	NC	NC
	Benzene	0.2	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	1	<1	<1	NC	NC
	m+p-xylene	2	2	<2	<2	NC	NC
	o-xylene	1	1	<1	<1	NC	NC

Explanation:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

Results > 10 times PQL = RPD value <= 50% are acceptable

Results between 5 & 10 times PQL = RPD value <= 75% are acceptable

Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria

VALUE

TABLE J
SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL		TB1 ^s	TS1 ^s
			26/03/2019	26/03/2019
	mg/kg	µg/L	mg/kg	% Recovery
TRH C6-C10 (F1)	10	10	<25	NA
Benzene	1	0.2	<0.2	99%
Toluene	1	0.5	<0.5	94%
Ethylbenzene	1	1	<1	93%
m+p-xylene	2	2	<2	95%
o-xylene	1	1	<1	91%

Explanation:

^w Sample type (water)

^s Sample type (sand)

BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria

VALUE



Appendix C: Site Information and Site History



Lotsearch Environmental Risk and Planning Report



LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 22 Mar 2019 18:43:24

Reference: LS005526 EP

Address: Maitland Street, Muswellbrook, NSW 2333

Disclaimer:

The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features. You should obtain independent advice before you make any decision based on the information within the report. The detailed terms applicable to use of this report are set out at the end of this report.

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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
Premise match	Georeferenced to the site location / premise or part of site
General area or suburb match	Georeferenced with the confidence of the general/approximate area
Road match	Georeferenced to the road or rail
Road intersection	Georeferenced to the road intersection
Feature is a buffered point	Feature is a buffered point
Land adjacent to geocoded site	Land adjacent to Georeferenced Site
Network of features	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	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	NSW Department of Finance, Services & Innovation	22/03/2019	22/03/2019	Daily	-	-	-	-
Topographic Data	NSW Department of Finance, Services & Innovation	11/01/2019	11/01/2019	As required	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	14/03/2019	20/02/2019	Monthly	1000	0	1	5
Contaminated Land Records of Notice	Environment Protection Authority	11/03/2019	11/03/2019	Monthly	1000	0	0	0
Former Gasworks	Environment Protection Authority	04/03/2019	11/10/2017	Monthly	1000	0	0	1
National Waste Management Facilities Database	Geoscience Australia	05/02/2019	07/03/2017	Quarterly	1000	0	0	0
EPA PFAS Investigation Program	Environment Protection Authority	04/03/2019	04/03/2019	Monthly	2000	0	0	0
Defence PFAS Investigation & Management Program	Department of Defence	14/03/2019	14/03/2019	Monthly	2000	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	11/03/2019	16/11/2018	Monthly	2000	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority	13/12/2018	13/12/2018	Annually	1000	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	28/02/2019	28/02/2019	Monthly	1000	0	0	3
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority	28/02/2019	28/02/2019	Monthly	1000	1	1	1
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	28/02/2019	28/02/2019	Monthly	1000	0	0	3
UPSS Environmentally Sensitive Zones	Environment Protection Authority	14/04/2015	12/01/2010	As required	1000	1	1	1
UBD Business to Business Directory 1991 (Premise & Intersection Matches)	Hardie Grant			Not required	150	2	2	21
UBD Business to Business Directory 1991 (Road & Area Matches)	Hardie Grant			Not required	150	-	9	9
UBD Business Directory 1982 (Premise & Intersection Matches)	Hardie Grant			Not required	150	1	5	11
UBD Business Directory 1982 (Road & Area Matches)	Hardie Grant			Not required	150	-	9	9
UBD Business Directory 1970 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	7	11
UBD Business Directory 1970 (Road & Area Matches)	Hardie Grant			Not required	150	-	21	21
UBD Business Directory 1961 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1961 (Road & Area Matches)	Hardie Grant			Not required	150	-	27	27
UBD Business Directory 1950 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1950 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500	0	2	7
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500	-	12	16
Points of Interest	NSW Department of Finance, Services & Innovation	11/01/2019	11/01/2019	Quarterly	1000	0	0	34
Tanks (Areas)	NSW Department of Finance, Services & Innovation	11/01/2019	11/01/2019	Quarterly	1000	0	0	0
Tanks (Points)	NSW Department of Finance, Services & Innovation	11/01/2019	11/01/2019	Quarterly	1000	0	0	0

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Major Easements	NSW Department of Finance, Services & Innovation	11/01/2019	11/01/2019	Quarterly	1000	0	1	10
State Forest	NSW Department of Finance, Services & Innovation	18/01/2018	18/01/2018	As required	1000	1	1	1
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment & Heritage	16/01/2019	14/11/2018	Annually	1000	0	0	0
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000	1	1	2
Botany Groundwater Management Zones	NSW Department of Primary Industries	15/03/2018	01/10/2005	As required	1000	0	0	0
Groundwater Boreholes	NSW Dept. of Primary Industries - Water NSW; Commonwealth of Australia (Bureau of Meteorology)	24/07/2018	23/07/2018	Annually	2000	1	3	45
Geological Units 1:250,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	2	-	5
Geological Structures 1:250,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	0	-	5
Naturally Occurring Asbestos Potential	NSW Dept. of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	1000	0	0	0
Soil Landscapes	NSW Office of Environment & Heritage	12/08/2014		None planned	1000	1	-	2
Atlas of Australian Soils	CSIRO	19/05/2017	17/02/2011	As required	1000	1	1	2
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning and Environment	19/03/2019	09/11/2018	Weekly	500	0		
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000	1	1	1
Dryland Salinity - National Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	1000	1	1	1
Dryland Salinity Potential of Western Sydney	NSW Office of Environment & Heritage	12/05/2017	01/01/2002	None planned	1000	-	-	-
Mining Subsidence Districts	NSW Department of Finance, Services & Innovation	13/07/2017	01/07/2017	As required	1000	0	0	1
SEPP State Significant Precincts	NSW Department of Planning and Environment	19/03/2019	04/07/2014	Weekly	1000	0	0	0
Environmental Planning Instrument Land Zoning	NSW Department of Planning and Environment	19/03/2019	08/02/2019	Weekly	1000	1	6	27
Commonwealth Heritage List	Australian Government Department of the Environment and Energy - Heritage Branch	16/01/2019	31/07/2018	Unknown	1000	0	0	0
National Heritage List	Australian Government Department of the Environment and Energy - Heritage Branch	16/01/2019	28/09/2018	Unknown	1000	0	0	0
State Heritage Register - Curtilages	NSW Office of Environment & Heritage	16/01/2019	09/11/2018	Quarterly	1000	0	0	1
Environmental Planning Instrument Heritage	NSW Department of Planning and Environment	19/03/2019	18/01/2019	Weekly	1000	0	0	14
Bush Fire Prone Land	NSW Rural Fire Service	26/02/2019	01/11/2018	Quarterly	1000	0	0	2
Eastern Bushland Database (North Region)	NSW Office of Environment & Heritage	24/07/2016	01/01/1991	None planned	1000	0	0	0
Ramsar Wetlands of Australia	Commonwealth of Australia Department of the Environment	08/10/2014	24/06/2011	As required	1000	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	0	0	1
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	0	0	3
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	22/03/2019	22/03/2019	Weekly	10000	-	-	-

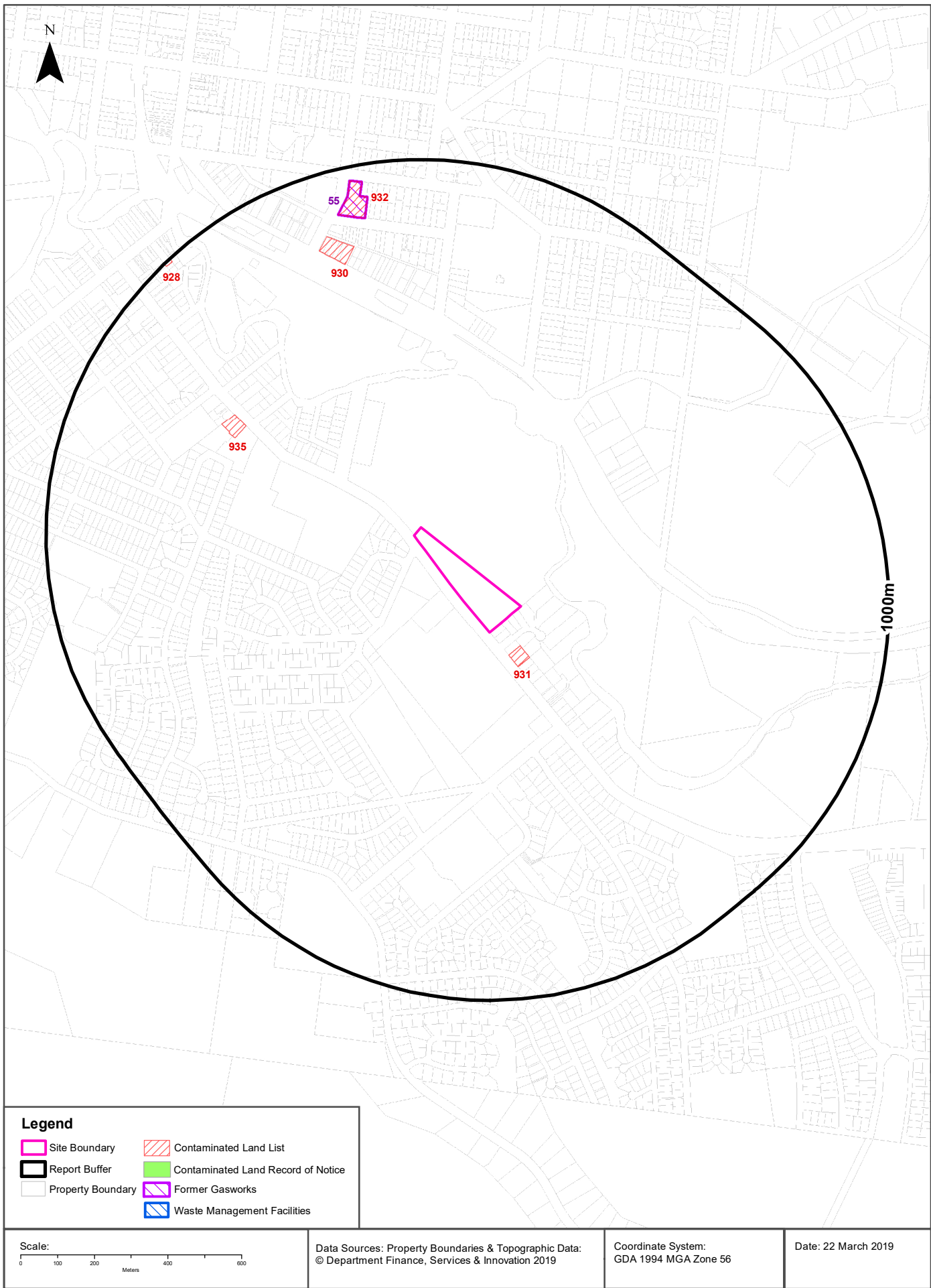
Aerial Imagery 2018

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Contaminated Land & Waste Management Facilities

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Contaminated Land & Waste Management Facilities

Lot 62, Maitland Street, Muswellbrook, NSW 2333

List of NSW contaminated sites notified to EPA

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

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist (m)	Direction
931	Caltex Muswellbrook Service Station	84-86 Maitland Street	Muswellbrook	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	80m	South East
935	United Branded (Former Mobil) Service Station Muswellbrook	49-51 Maitland Street	Muswellbrook	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	544m	North West
930	Former Caltex Depot	47-50 Victoria Street	Muswellbrook	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	745m	North
932	Former Gasworks	Cnr Carl St and Foley Street	Muswellbrook	Gasworks	Regulation under CLM Act not required	Current EPA List	Premise Match	854m	North
928	Caltex Service Station	12-16 Sydney Street	Muswellbrook	Service Station	Regulation under CLM Act not required	Current EPA List	Premise Match	990m	North West

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.

EPA site management class	Explanation
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

© State of New South Wales through the Environment Protection Authority

Contaminated Land & Waste Management Facilities

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority
Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit
<http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm>

Former Gasworks

Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
55	Carl Street, Muswellbrook	Muswellbrook Shire Council	Contact council	Premise Match	854m	North

Former Gasworks Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

National Waste Management Site Database

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

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist (m)	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

PFAS Investigation Sites

Lot 62, Maitland Street, Muswellbrook, NSW 2333

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Id	Site	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Defence PFAS Investigation & Management Program

Sites being investigated or managed by the Department of Defence for PFAS contamination within the dataset buffer:

Property ID	Base Name	Address	Loc Conf	Dist	Dir
N/A	No records in buffer				

Defence PFAS Investigation & Management Program Data Custodian: Department of Defence, Australian Government

Airservices Australia National PFAS Management Program

Sites being investigated or managed by Airservices Australia for PFAS contamination within the dataset buffer:

Map ID	Site Name	Impacts	Loc Conf	Dist	Dir
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

EPA Other Sites with Contamination Issues

Lot 62, Maitland Street, Muswellbrook, NSW 2333

EPA Other Sites with Contamination Issues

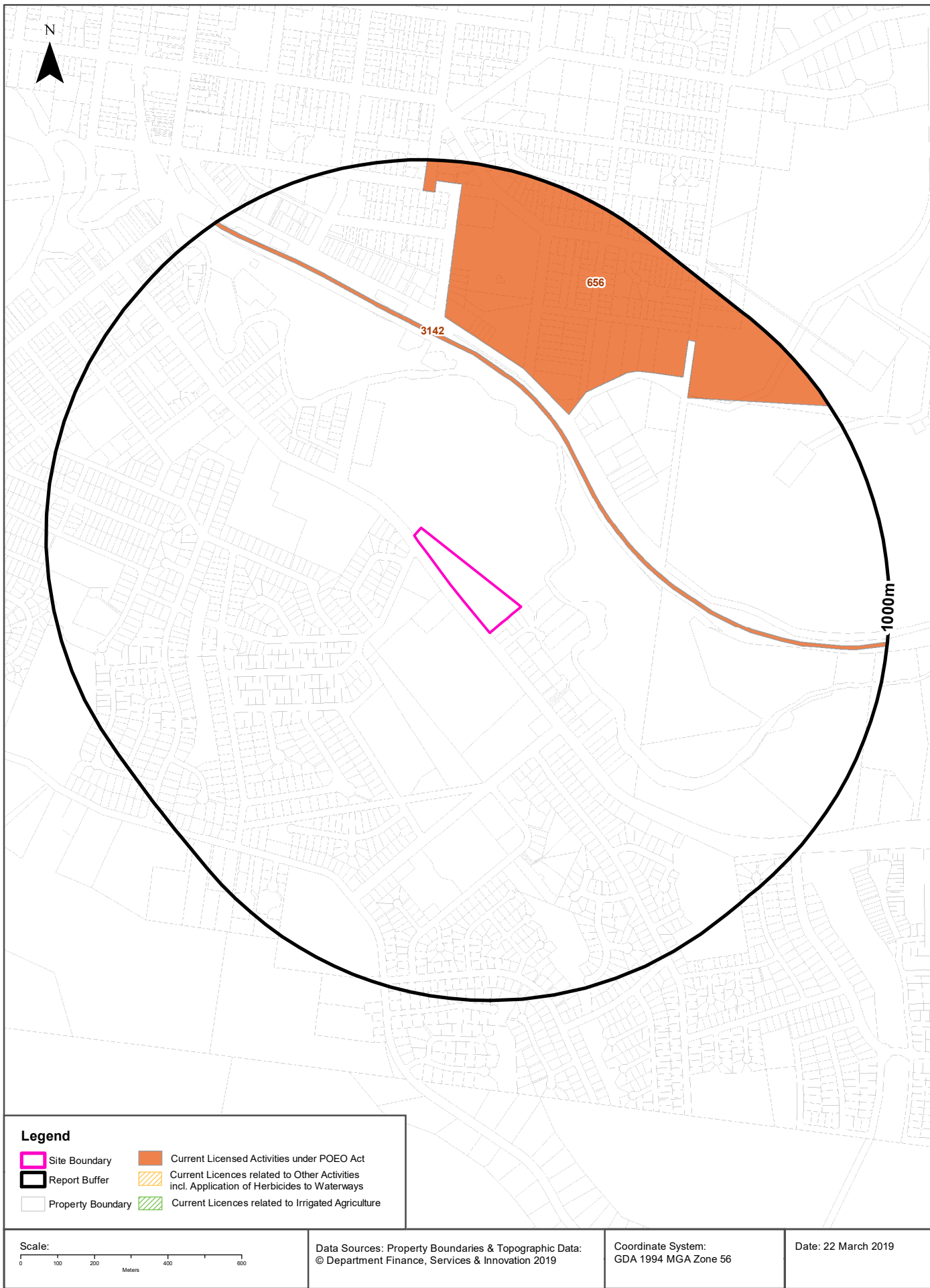
This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill
- Pasminco Lead Abatement Strategy Area

Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority



EPA Activities

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Licensed Activities under the POEO Act 1997

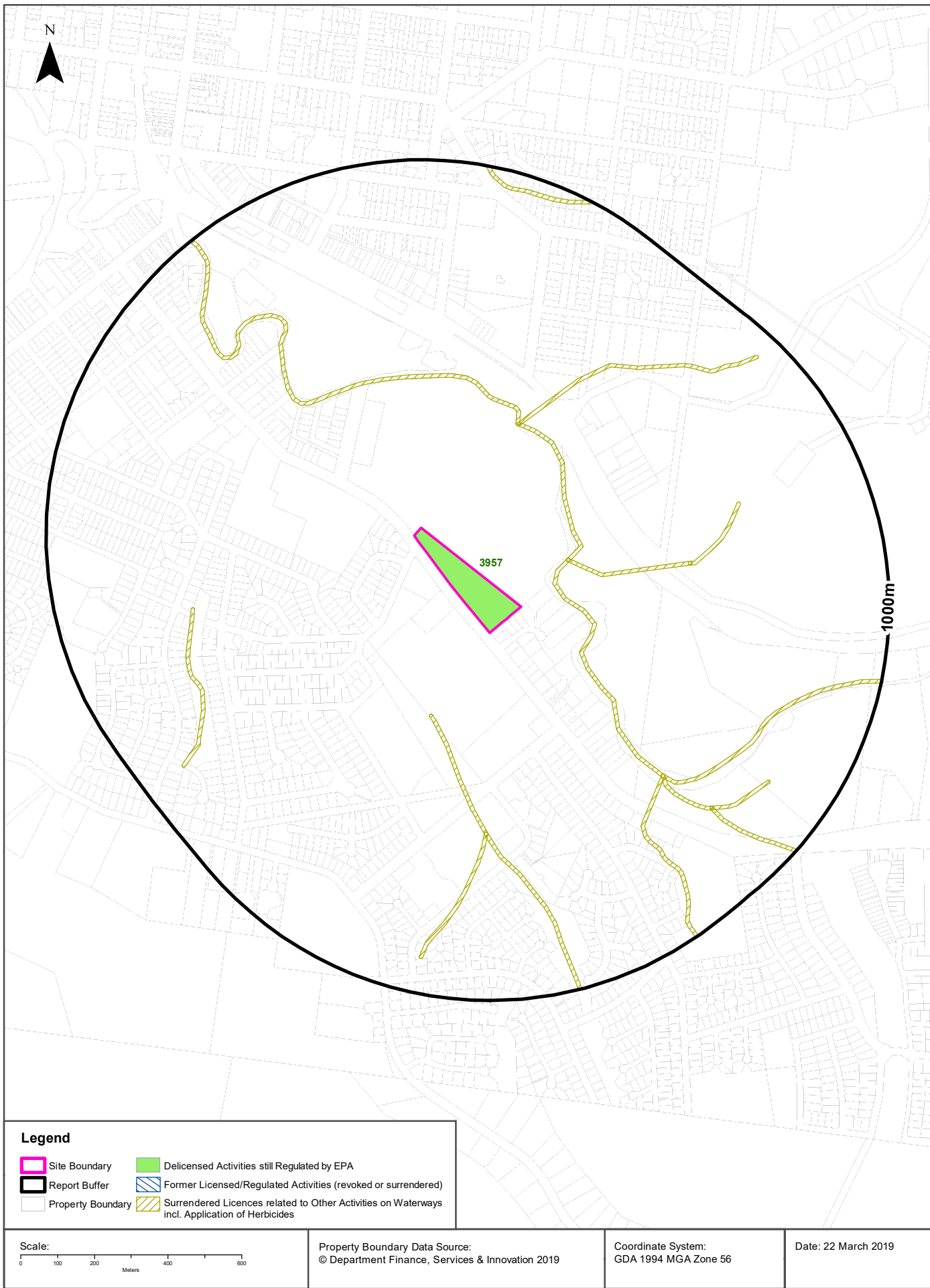
Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
3142	AUSTRALIAN RAIL TRACK CORPORATION LIMITED		Australian Rail Track Corporation (ARTC) network as defined by the ARTC Network Deeds within NSW., SYDNEY, NSW 2001		Railway systems activities	Network of Features	327m	North East
656	MUSWELLBROOK COAL COMPANY LTD	MUSWELLBROOK COLLIERY HOLDING	COAL ROAD	MUSWELLBROOK	Coal works	Premise Match	490m	North East
656	MUSWELLBROOK COAL COMPANY LTD	MUSWELLBROOK COLLIERY HOLDING	COAL ROAD	MUSWELLBROOK	Mining for coal	Premise Match	490m	North East

POEO Licence Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Delicensed & Former Licensed EPA Activities
Lot 62, Maitland Street, Muswellbrook, NSW 2333



EPA Activities

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Delicensed Activities still regulated by the EPA

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

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
3957	FORESTRY CORPORATION OF NEW SOUTH WALES		LOWER NORTH EAST REGION (L.N.E.R) STATE FORESTS AND CROWN-TIMBER LANDS (EX.PLANTATIONS) WITHIN THE L.N.E.R. SHOWN ON MAP 1 - L.N.E.R. FOREST AGREEMENT		Logging operations	General Area/ Suburb Match	0m	Onsite

Delicensed Activities Data Source: Environment Protection Authority

© State of New South Wales through the 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 dataset buffer:

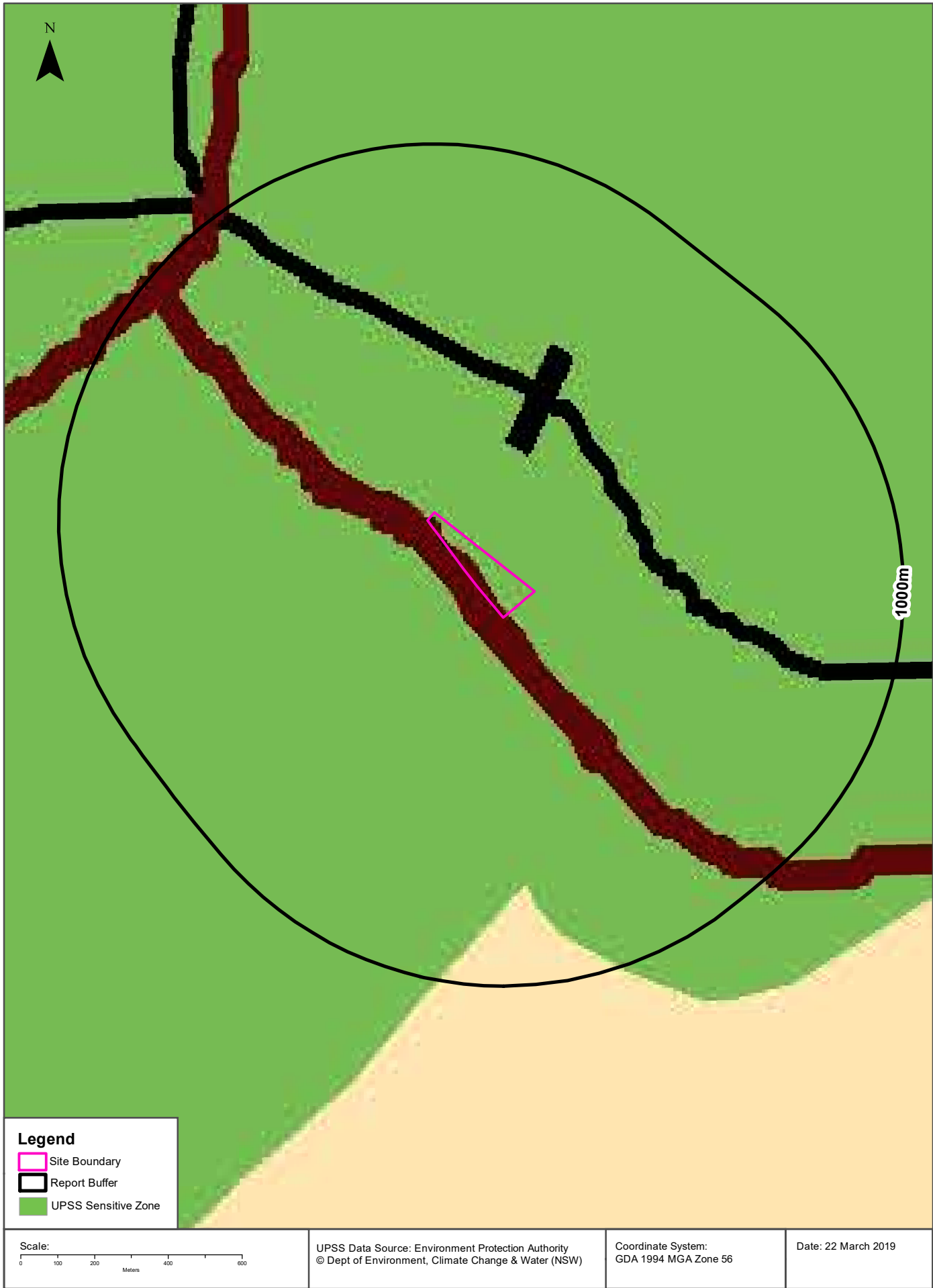
Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	105m	-
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	105m	-
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	105m	-

Former Licensed Activities Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

UPSS Sensitive Zones

Lot 62, Maitland Street, Muswellbrook, NSW 2333

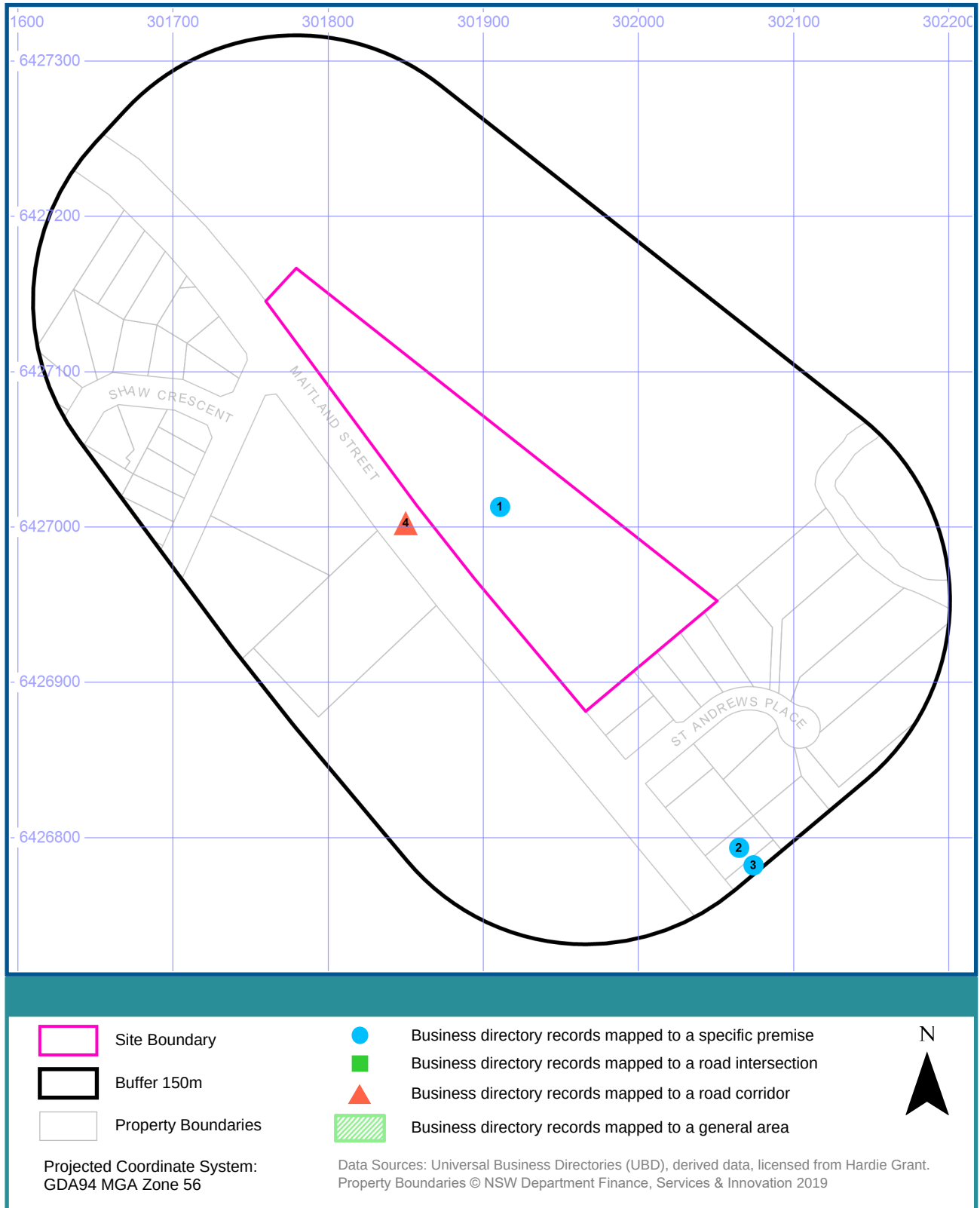


Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333



1991 Business to Business Directory Records



Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333

1991 Business to Business Directory Records Premise or Road Intersection Matches

Records from the 1991 UBD Business to Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
1	GARDEN SUPPLIES-RETAIL.	Forestry Commission Nursery., 72 Maitland St, Muswellbrook	79969	Premise Match	0m	On-site
	NURSERYMEN	Forestry Commission Nursery., 72 Maitland St, Muswellbrook	80271	Premise Match	0m	On-site
2	ENGINEERS-HYDRAULIC.	Pirtek Fluid Connectors Pty. Ltd., 88 Maitland Rd., Muswellbrook	79918	Premise Match	121m	South East
	HOSE &/OR HOSE FITTINGS MFRS. &/OR DIST. &/OR W/SALERS	Pirtek Fluid Connectors Pty. Ltd., 88 Maitland Rd., Muswellbrook	80050	Premise Match	121m	South East
	HYDRAULIC EQUIPMENT MFRS. &/OR IMPS. &/OR DIST.	Pirtek Fluid Connectors Pty. Ltd., 88 Maitland Rd., Muswellbrook	80070	Premise Match	121m	South East
	HYDRAULIC EQUIPMENT SERVICING.	Pirtek Fluid Connectors Pty. Ltd., 88 Maitland Rd., Muswellbrook	80072	Premise Match	121m	South East
	HYDRAULIC HOSE MFRS. &/OR DIST.	Pirtek Fluid Connectors Pty. Ltd., 88 Maitland Rd., Muswellbrook	80075	Premise Match	121m	South East
	PNEUMATIC EQUIPMENT &/OR MACHINERY MFRS. &/OR DIST.	Pirtek Fluid Connectors Pty Ltd., 88 Maitland Rd, Muswellbrook	80319	Premise Match	121m	South East
	AGRICULTURAL MACHINERY REPAIRS.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	79600	Premise Match	121m	South East
	ELECTRIC MOTOR MFRS. &/OR IMPS. &/OR DIST.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	79874	Premise Match	121m	South East
	ENGINE - DIESEL &/OR PETROL - MFRS. &/OR IMPS. &/OR DIST.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	79891	Premise Match	121m	South East
	ENGINEERS PIPE LINE.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	79906	Premise Match	121m	South East
	FILTER MFRS. &/OR DIST.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	79930	Premise Match	121m	South East
	PIPE &/OR PIPE FITTINGS MFRS. &/OR DIST.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	80308	Premise Match	121m	South East
	PIPE &/OR PIPE FITTINGS MFRS. &/OR DIST. - VITRIFIED CLAY.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	80310	Premise Match	121m	South East
	PUMP & PUMPING EQUIPMENT MFRS. &/OR DIST.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	80340	Premise Match	121m	South East
	PUMP & PUMPING PLANT INSTALLATION &/OR MAINTENANCE.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	80343	Premise Match	121m	South East
	PUMP REPAIR SPECIALISTS.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St, Muswellbrook	80344	Premise Match	121m	South East
	IRRIGATION SYSTEMS & EQUIPMENT MFRS. &/OR DIST. &/OR INSTALLERS.	Southern Cross Machinery (North) Pty Ltd., 88 Maitland St., Muswellbrook	80104	Premise Match	121m	South East

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
3	CAFES, TEA ROOMS &/OR COFFEE LOUNGES.	Esso Service Station & Cafe., 90 Maitland Rd, Muswellbrook	79735	Premise Match	141m	South East
	MOTOR GARAGES & SERVICE STATIONS.	Esso Service Station & Cafe., 90 Maitland Rd, Muswellbrook	80217	Premise Match	141m	South East

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1991 Business to Business Directory Records Road or Area Matches

Records from the 1991 UBD Business to Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
4	ASSOCIATIONS &/OR SOCIETIES	Basketball Association., Maitland St, Muswellbrook	79634	Road Match	0m
	ASSOCIATIONS &/OR SOCIETIES	Squash Club., Maitland Rd, Muswellbrook	79629	Road Match	0m
	ASSOCIATIONS &/OR SOCIETIES	Upper Hunter Pastoral & Agricultural Assoc., Maitland St, Muswellbrook	79646	Road Match	0m
	ASSOCIATIONS &/OR SOCIETIES	Upper Hunter Trolling Club., Maitland St, Muswellbrook	79647	Road Match	0m
	MOTOR STEERING SPECIALISTS	Webbers Tyre & Brake Service., Maitland St, Muswellbrook	80246	Road Match	0m
	MOTOR WHEEL ALIGNING & BALANCING SERVICES.	Webbers Tyre & Brake Service., Maitland St, Muswellbrook	80252	Road Match	0m
	TYRE DEALERS &/OR RETREADERS &/OR VULCANISERS.	Webbers Tyre & Brake Service., Maitland St, Muswellbrook	80486	Road Match	0m
	BATTERY MFRS. &/OR DIST.	Webbers Tyre & Brake Service., Maitland St, Muswellbrook	79677	Road Match	0m
	MOTOR ACCESSORIES-RETAIL.	Webbers Tyre & Brake Service., Maitland St, Muswellbrook	80186	Road Match	0m

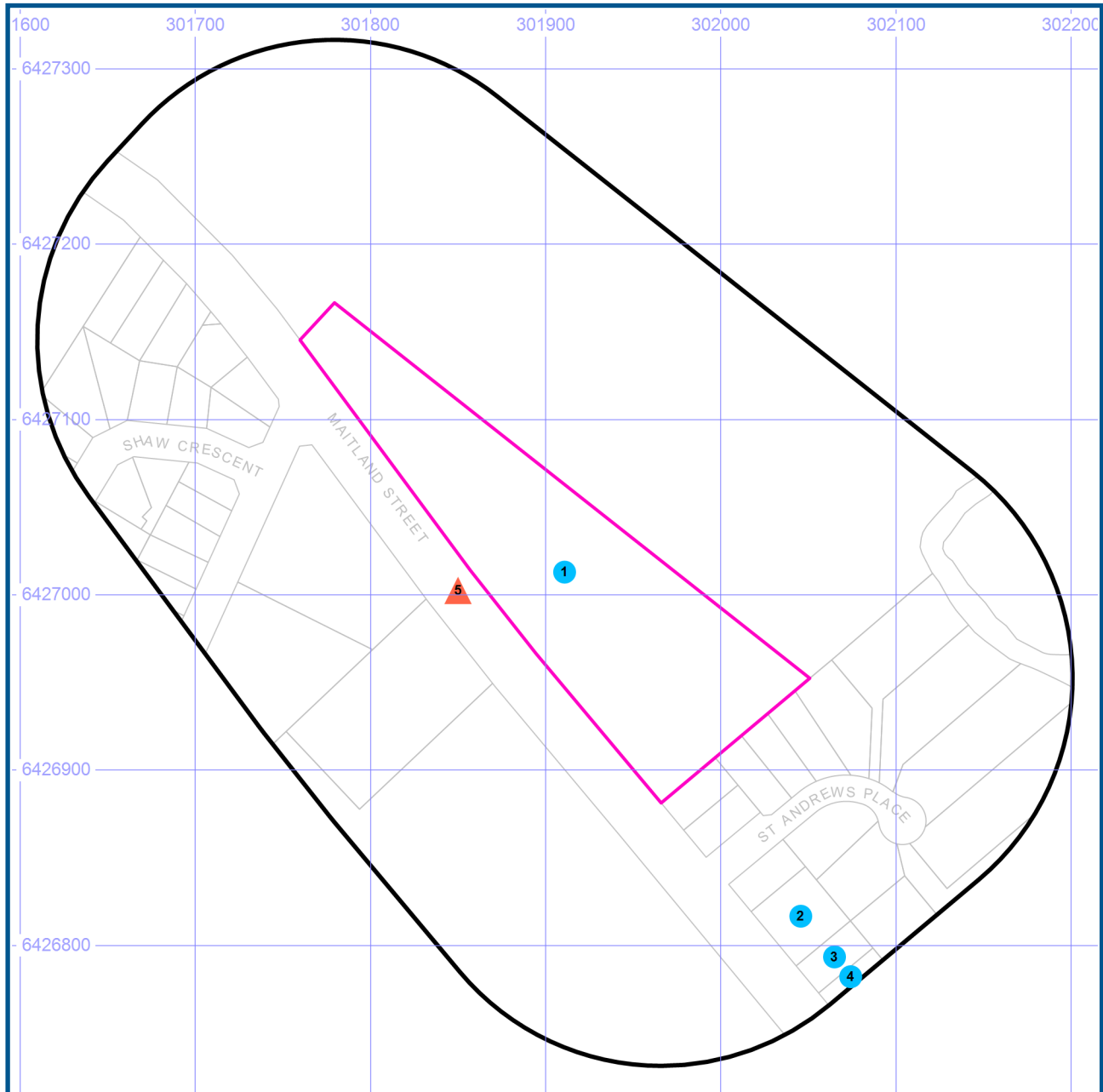
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Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333



1982 Business Directory Records



- Site Boundary
- Buffer 150m
- Property Boundaries

Projected Coordinate System:
GDA94 MGA Zone 56

- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- Business directory records mapped to a road corridor
- Business directory records mapped to a general area

Data Sources: Universal Business Directories (UBD), derived data, licensed from Hardie Grant.
Property Boundaries © NSW Department Finance, Services & Innovation 2019



Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333

1982 Business Directory Records Premise or Road Intersection Matches

Records from the 1982 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
1	NURSERYMEN.	Forestry Commission Nursery, 72 Maitland St Muswellbrook	169619	Premise Match	0m	On-site
2	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Bonds Auto Repairs, 84 Maitland St Muswellbrook	169580	Premise Match	80m	South East
	MOTOR PAINTERS &/OR PANEL BEATERS.	Bonds Auto Repairs, 84 Maitland St Muswellbrook	169604	Premise Match	80m	South East
	MOTOR TOWING SERVICES.	Bonds Auto Repairs, 84 Maitland St Muswellbrook	169611	Premise Match	80m	South East
	MOTOR ACCESSORIES &/OR SPARE PARTS - RETAIL,	Bonds Auto Repairs, 84 Maitland St., Muswellbrook	169557	Premise Match	80m	South East
3	ELECTRICAL CONTRACTORS - LICENSED.	Grieve, T. D. & Co., 88 Maitland St Muswellbrook	169417	Premise Match	121m	South East
	ELECTRIC GENERATING EQUIPMENT MFRS. &/OR IMPS. &/OR DIST.	Muswellbrook Electrical Services Pty. Ltd., 88 Maitland St Muswellbrook	169413	Premise Match	121m	South East
	ELECTRIC MOTOR MFRS. &/OR DIST.	Muswellbrook Electrical Services Pty. Ltd., 88 Maitland St Muswellbrook	169415	Premise Match	121m	South East
	IRRIGATION SYSTEMS &/OR EQUIPMENT MR &/OR DIST.	Southern Cross Machinery Pty. Ltd., 88 Maitland St Muswellbrook	169511	Premise Match	121m	South East
4	CAFES, TEA ROOMS &/OR COFFEE LOUNGES.	Esso Service Station & Cafe, 90 Maitland Rd., Muswellbrook	169325	Premise Match	141m	South East
	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Esso Service Station & Cate, 90 Maitland Rd Muswellbrook	169583	Premise Match	141m	South East

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1982 Business Directory Records Road or Area Matches

Records from the 1982 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
5	ASSOCIATIONS &/OR SOCIETIES.	Basketball Association, Maitland St Muswellbrook	169232	Road Match	0m

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
5	BATTERY MFRS. &/OR DIST.	Webbers Tyre & Brake Service Pty. Ltd., Maitland St Muswellbrook	169281	Road Match	0m
	MOTOR ACCESSORIES &/OR SPARE PARTS -RETAIL,	Webbers Tyre & Brake Service Pty. Ltd., Maitland St Muswellbrook	169566	Road Match	0m
	ASSOCIATIONS &/OR SOCIETIES.	Muswellbrook Squash Club, Maitland Rd Muswellbrook	169245	Road Match	0m
	ASSOCIATIONS &/OR SOCIETIES.	Upper Hunter Pastoral & Agricultural Assoc., Maitland St Muswellbrook	169260	Road Match	0m
	ASSOCIATIONS &/OR SOCIETIES.	Upper Hunter Trotting Club, Maitland St Muswellbrook	169261	Road Match	0m
	EARTH MOVING EQUIPMENT MAINTENANCE &/OR REPAIRS.	Webbers Tyre & Brake Service Pty. Ltd., Maitland St Muswellbrook	169406	Road Match	0m
	MOTOR STEERING SPECIALISTS.	Webbers Tyre & Brake Service Pty. Ltd., Maitland St Muswellbrook	169610	Road Match	0m
	TYRE DEALERS, RETREADERS A/OR VULCANIZERS.	Webbers Tyre & Brake Service Pty. Ltd., Maitland St., Muswellbrook	169749	Road Match	0m

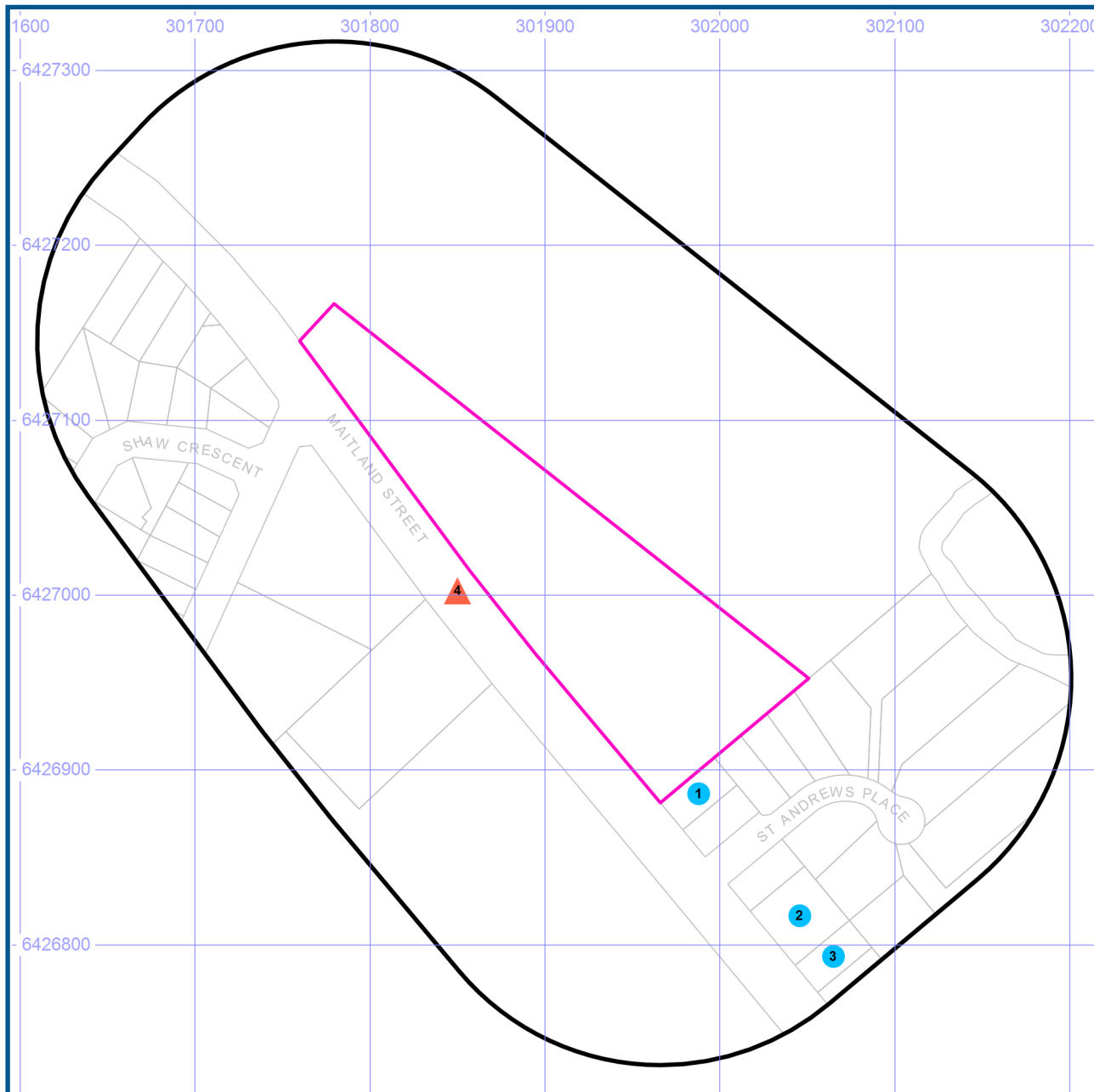
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Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333



1970 Business Directory Records



- Site Boundary
- Buffer 150m
- Property Boundaries

Projected Coordinate System:
GDA94 MGA Zone 56

- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- Business directory records mapped to a road corridor
- Business directory records mapped to a general area

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Property Boundaries © NSW Department Finance, Services & Innovation 2019



Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333

1970 Business Directory Records Premise or Road Intersection Matches

Records from the 1970 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
1	MOTOR PAINTERS & PANEL BEATERS	Muswellbrook Motor Body Repairs, 76 Maitland St., Muswellbrook	641414	Premise Match	0m	South East
2	MOTOR CAR & TRUCKS DEALERS-NEW & USED	Sinderberry's Garage, 84-86 Maitland St., Muswellbrook	641383	Premise Match	80m	South East
	MOTOR ACCESSORIES & SPARE PARTS DEALERS	Sinderberry's Garage, 84-86 Maitland St., Muswellbrook	641372	Premise Match	80m	South East
	MOTOR GARAGES & ENGINEERS	Sinderberry's Garage, 84-86 Maitland St., Muswellbrook	641396	Premise Match	80m	South East
	MOTOR PAINTERS & PANEL BEATERS	Sinderberry's Garage, 84-86 Maitland St., Muswellbrook	641416	Premise Match	80m	South East
	MOTOR TOWING SERVICES	Sinderberry's Garage, 84-86 Maitland St., Muswellbrook	641425	Premise Match	80m	South East
	MOTOR WRECKERS	Sinderberry's Garage, 84-86 Maitland St., Muswellbrook	641428	Premise Match	80m	South East
3	BUILDERS & BUILDING CONTRACTORS	Wakefield, R. G. Pty. Ltd., 88 Maitland St., Muswellbrook	641127	Premise Match	121m	South East
	CONCRETE CONTRACTORS-CONSTRUCTIONAL	Wakefield, R. G. Pty. Ltd., 88 Maitland St., Muswellbrook	641175	Premise Match	121m	South East
	FLOOR SANDING & POLISHING CONTRACTORS	Wakefield, R. G. Pty. Ltd., 88 Maitland St., Muswellbrook	641233	Premise Match	121m	South East
	HARDWARE & BUILDERS' SUPPLIES	Wakefield, R. G. Pty. Ltd., 88 Maitland St., Muswellbrook	641284	Premise Match	121m	South East

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1970 Business Directory Records Road or Area Matches

Records from the 1970 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
4	MOTOR CAR & TRUCKS DEALERS-NEW & USED	Arnall's Auto Service, Maitland St., Muswellbrook	641378	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Arnall's Auto Service, Maitland St., Muswellbrook	641387	Road Match	0m
	MOTOR PAINTERS & PANEL BEATERS	Arnall's Auto Service, Maitland St., Muswellbrook	641412	Road Match	0m
	MOTOR TOWING SERVICES	Arnall's Auto Service, Maitland St., Muswellbrook	641422	Road Match	0m

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
4	WELDERS-ELECTRIC &/OR OXY	Arnall's Auto Service, Maitland St., Muswellbrook	641551	Road Match	0m
	CRANES-MOBILE-PROPRIETORS &/OR HIRERS	Cox & Hazell Pty. Ltd., Maitland St., Muswellbrook	641177	Road Match	0m
	EARTH MOVING MACHINERY HIRERS	Cox & Hazell Pty. Ltd., Maitland St., Muswellbrook	641204	Road Match	0m
	HAULAGE CONTRACTORS	Cox & Hazell Pty. Ltd., Maitland St., Muswellbrook	641285	Road Match	0m
	CAFES, TEA ROOMS & COFFEE LOUNGES	Esso Service Station, Maitland St., Muswellbrook	641140	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Esso Service Station, Maitland St., Muswellbrook	641419	Road Match	0m
	NURSERYMEN	Forestry Commission Nursery, Maitland St., Muswellbrook	641435	Road Match	0m
	CAMPING GROUNDS & CARAVAN PARKS	Hillside Caravan Park, Maitland St., Muswellbrook	641150	Road Match	0m
	MOTOR OIL & SPIRIT DEPOTS	Mobiloil Australia Ltd., Maitland St., Muswellbrook	641406	Road Match	0m
	SCHOOLS & COLLEGES-PRIVATE & PUBLIC	Muswellbrook South Public School, Maitland St., Muswellbrook	641493	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Osborn, R. Pty. Ltd., Maitland St., Muswellbrook	641394	Road Match	0m
	ELECTRICAL CONTRACTORS-LICENSED	Upper Hunter County Council, Market St, Muswellbrook	641210	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Watson, R. & N. J., Maitland Rd., Muswellbrook	641401	Road Match	0m
	MOTOR ACCESSORIES & SPARE PARTS DEALERS	Watson, R. & N. J., Maitland St., Muswellbrook	641374	Road Match	0m
	MOTOR CAR & TRUCKS DEALERS-NEW & USED	Watson, R. & N. J., Maitland St., Muswellbrook	641384	Road Match	0m
	BATTERY DISTRIBUTORS	Webber's Tyre Service Pty. Ltd., Maitland St., Muswellbrook	641104	Road Match	0m
	TYRE DEALERS, RETREADERS & VULCANISERS	Webber's Tyre Service Pty. Ltd., Maitland St., Muswellbrook	641539	Road Match	0m

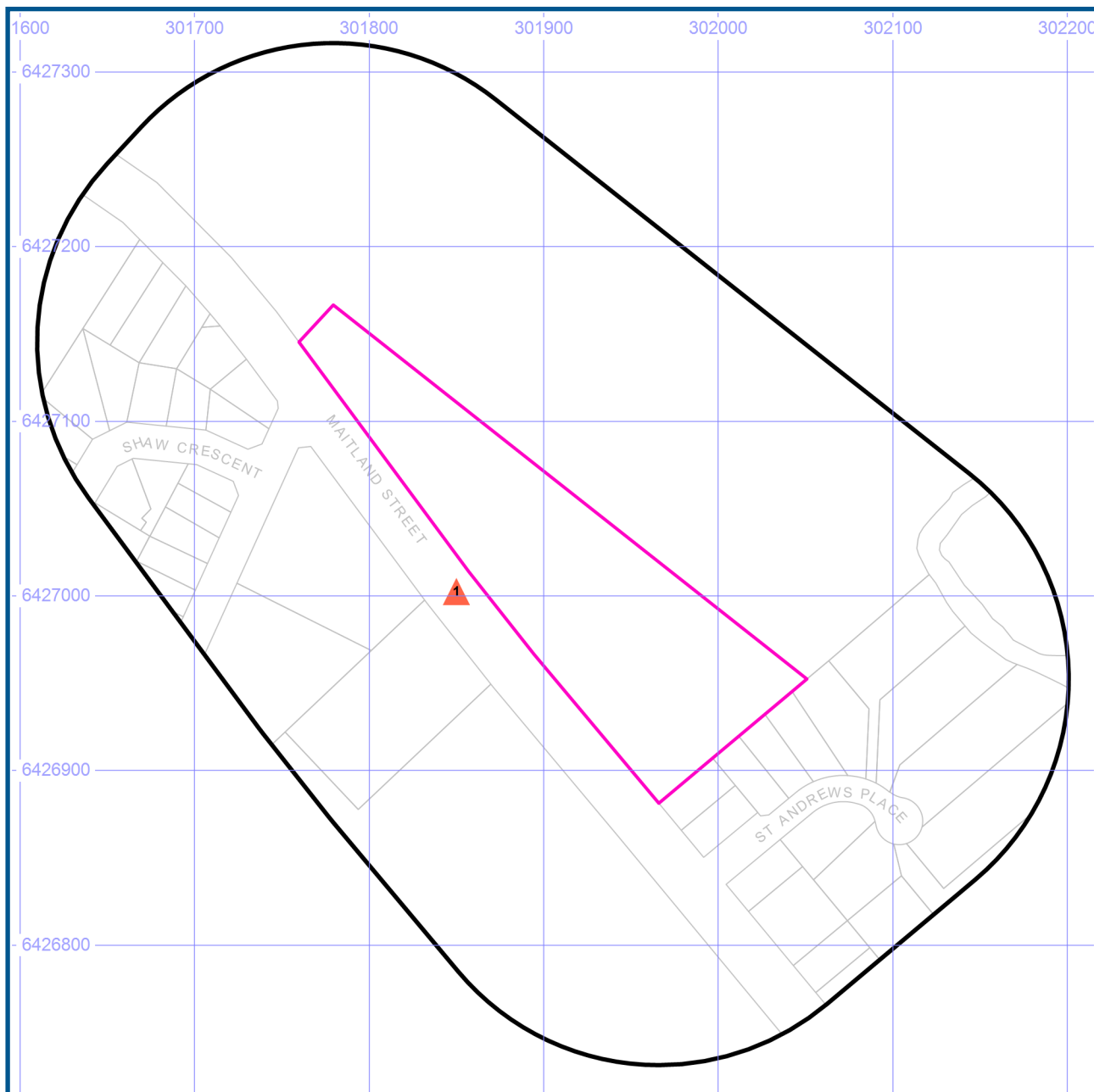
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Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333



1961 Business Directory Records



-  Site Boundary
-  Buffer 150m
-  Property Boundaries

-  Business directory records mapped to a specific premise
-  Business directory records mapped to a road intersection
-  Business directory records mapped to a road corridor
-  Business directory records mapped to a general area



Projected Coordinate System:
GDA94 MGA Zone 56

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Property Boundaries © NSW Department Finance, Services & Innovation 2019

Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333

1961 Business Directory Records Premise or Road Intersection Matches

Records from the 1961 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

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1961 Business Directory Records Road or Area Matches

Records from the 1961 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
1	CAFES, TEA ROOMS, COFFEE LOUNGES, ETC.	Atlantic Service Station, Maitland St., Muswellbrook	165284	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Atlantic Service Station, Maitland St., Muswellbrook	165560	Road Match	0m
	MOTOR ACCESSORIES & SPARE PARTS DEALERS	Auto Service, Maitland St., Muswellbrook	165506	Road Match	0m
	MOTOR BODY BUILDERS &/OR REPAIRERS	Auto Service, Maitland St., Muswellbrook	165510	Road Match	0m
	MOTOR CAR & TRUCKS DEALERS-NEW & USED	Auto Service, Maitland St., Muswellbrook	165512	Road Match	0m
	MOTOR ELECTRICIANS	Auto Service, Maitland St., Muswellbrook	165525	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Auto Service, Maitland St., Muswellbrook	165526	Road Match	0m
	MOTOR PAINTERS & PANEL BEATERS	Auto Service, Maitland St., Muswellbrook	165554	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Auto Service, Maitland St., Muswellbrook	165561	Road Match	0m
	WELDERS-ELECTRIC &/OR OXY	Auto Service, Maitland St., Muswellbrook	165661	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Hogan, B., Maitland St., Muswellbrook	165532	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Hogan, B., Maitland St., Muswellbrook	165563	Road Match	0m
	NURSERYMEN	King's Nursery, Maitland St., Muswellbrook	165576	Road Match	0m
	MOTOR WRECKERS	Morris, L., Maitland Rd., Muswellbrook	165570	Road Match	0m

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
1	MOTOR PAINTERS & PANEL BEATERS	Morris, L., Maitland St., Muswellbrook	165558	Road Match	0m
	WELDERS-ELECTRIC &/OR OXY	Morris, L., Maitland St., Muswellbrook	165668	Road Match	0m
	TYRE DEALERS, RETREADERS & VULCANISERS	Muswellbrook Tyre Service Pty. Ltd., Maitland Rd., Muswellbrook	165656	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Osborne, R., Maitland St., Muswellbrook	165566	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Osborne, R., Maitland St., Muswellbrook	165538	Road Match	0m
	CARRIERS & CARTAGE CONTRACTORS	Osborne, R., Maitland St., Muswellbrook	165309	Road Match	0m
	ENGINEERS-GENERAL, MFRG. & MECHANICAL	Osborne, R., Maitland St., Muswellbrook	165367	Road Match	0m
	TYRE DEALERS, RETREADERS & VULCANISERS	Osborne, R., Maitland St., Muswellbrook	165657	Road Match	0m
	ROAD TRANSPORT SERVICES-N.S.W.	Osborne, Reg, Maitland St., Muswellbrook	165609	Road Match	0m
	AGRICULTURAL MACHINERY DEALERS	Sleep, Bower and Robb, Maitland St., Muswellbrook	165224	Road Match	0m
	INSURANCE AGENTS	Sleep, Bower and Robb, Maitland St., Muswellbrook	165454	Road Match	0m
	MOTOR CAR & TRUCKS DEALERS-NEW & USED	Sleep, Bower and Robb, Maitland St., Muswellbrook	165522	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Sleep, Bower and Robb, Maitland St., Muswellbrook	165539	Road Match	0m

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Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333

1950 Business Directory Records Premise or Road Intersection Matches

Records from the 1950 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
	No records in buffer					

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1950 Business Directory Records Road or Area Matches

Records from the 1950 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Map Id	Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
	No records in buffer				

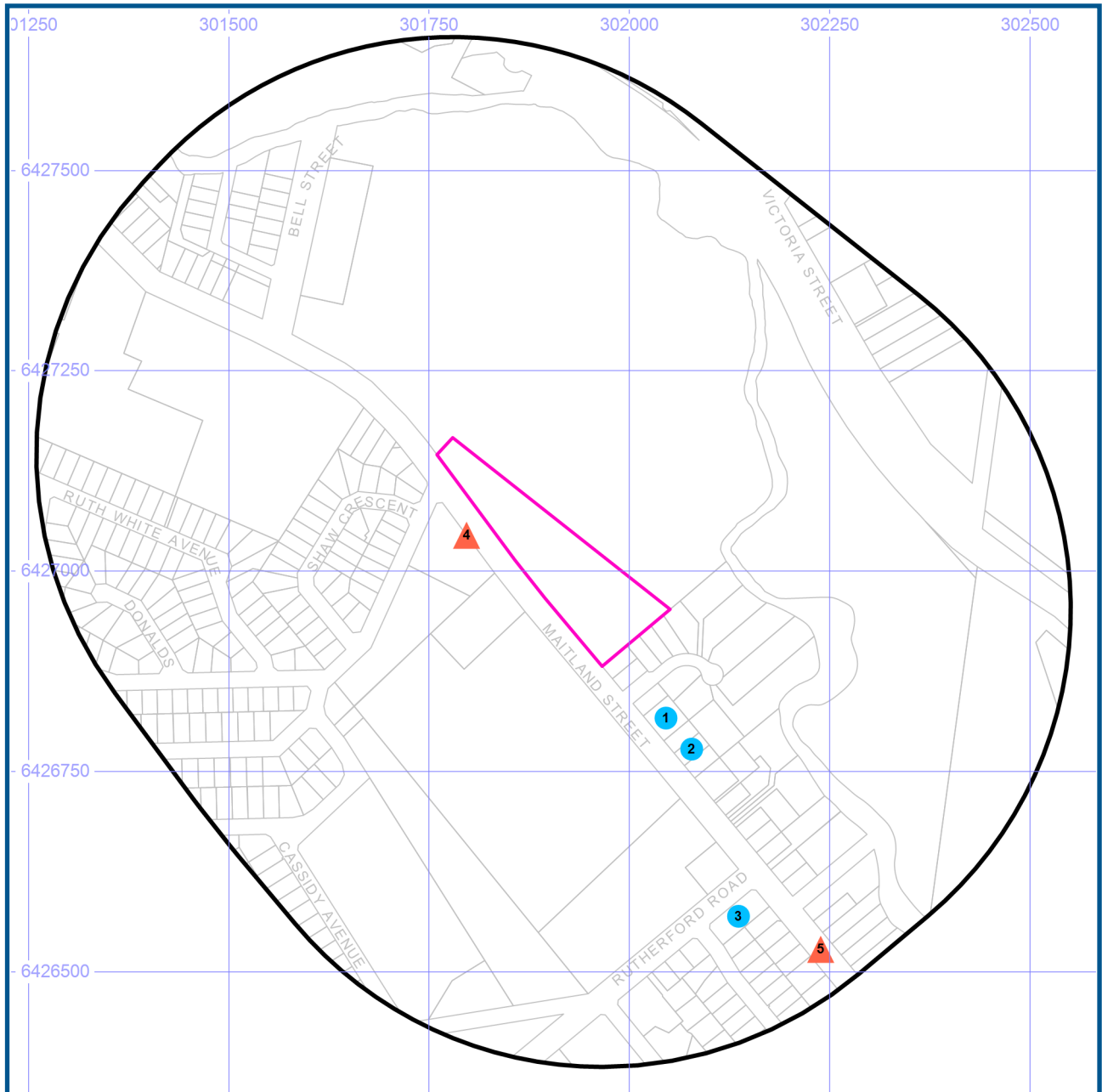
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Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Dry Cleaners, Motor Garages & Service Stations



- Site Boundary
- Buffer 500m
- Property Boundaries

Projected Coordinate System:
GDA94 MGA Zone 56

- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- ▲ Business directory records mapped to a road corridor
- Business directory records mapped to a general area

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Historical Business Directories

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Property Boundary or Road Intersection	Direction
1	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Bonds Auto Repairs, 84 Maitland St Muswellbrook	169580	1982	Premise Match	80m	South East
	MOTOR GARAGES & ENGINEERS	Sinderberry's Garage, 84-86 Maitland St., Muswellbrook	641396	1970	Premise Match	80m	South East
2	MOTOR GARAGES & SERVICE STATIONS.	Esso Service Station & Cafe., 90 Maitland Rd, Muswellbrook	80217	1991	Premise Match	141m	South East
	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Esso Service Station & Cate, 90 Maitland Rd Muswellbrook	169583	1982	Premise Match	141m	South East
3	MOTOR GARAGES & SERVICE STATIONS.	Muswellbrook Motors, 113 Maitland Rd., Muswellbrook	80211	1991	Premise Match	335m	South East
	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Muswellbrook Toyota, 113 Maitland St Muswellbrook	169591	1982	Premise Match	335m	South East
	MOTOR GARAGES & ENGINEERS	Scotts Motors, 113-115 Maitland St., Muswellbrook	641395	1970	Premise Match	335m	South East

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Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published.

Map Id	Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
4	MOTOR GARAGES & ENGINEERS	Arnul's Auto Service, Maitland St., Muswellbrook	641387	1970	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Esso Service Station, Maitland St., Muswellbrook	641419	1970	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Osborne, R. Pty. Ltd., Maitland St., Muswellbrook	641394	1970	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Watson, R. & N. J., Maitland Rd., Muswellbrook	641401	1970	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Atlantic Service Station, Maitland St., Muswellbrook	165560	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Auto Service, Maitland St., Muswellbrook	165526	1961	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Auto Service, Maitland St., Muswellbrook	165561	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Hogan, B., Maitland St., Muswellbrook	165532	1961	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Hogan, B., Maitland St., Muswellbrook	165563	1961	Road Match	0m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Osborne, R., Maitland St., Muswellbrook	165566	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Osborne, R., Maitland St., Muswellbrook	165538	1961	Road Match	0m
	MOTOR GARAGES & ENGINEERS	Sleep, Bower and Robb, Maitland St., Muswellbrook	165539	1961	Road Match	0m
5	MOTOR GARAGES & SERVICE STATIONS.	Solo Service Station., New England Hwy, Muswellbrook	80222	1991	Road Match	393m
	MOTOR GARAGES &/OR ENGINEERS &/OR SERVICE STATIONS.	Golden Fleece Service Station & Restaurant, New England Highway Muswellbrook	169584	1982	Road Match	393m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Golden Fleece Service Station & Restaurant, New England Hwy., Muswellbrook	641420	1970	Road Match	393m
	MOTOR SERVICE STATIONS-PETROL, OILS, ETC.	Golden Fleece Service Station & Cafe, New England Highway., Muswellbrook	165562	1961	Road Match	393m

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Aerial Imagery 2013

Lot 62, Maitland Street, Muswellbrook, NSW 2333



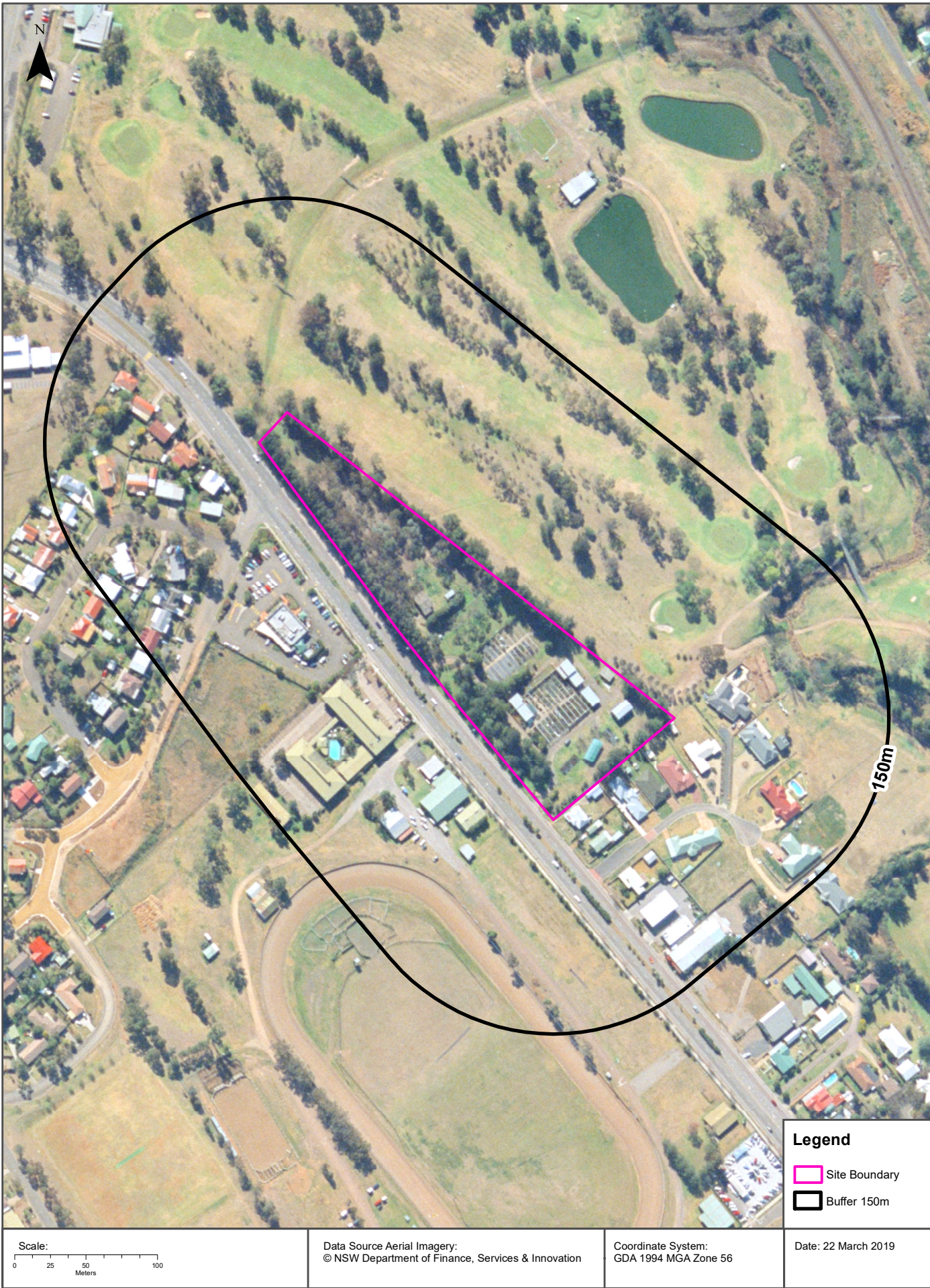
Aerial Imagery 2008

Lot 62, Maitland Street, Muswellbrook, NSW 2333



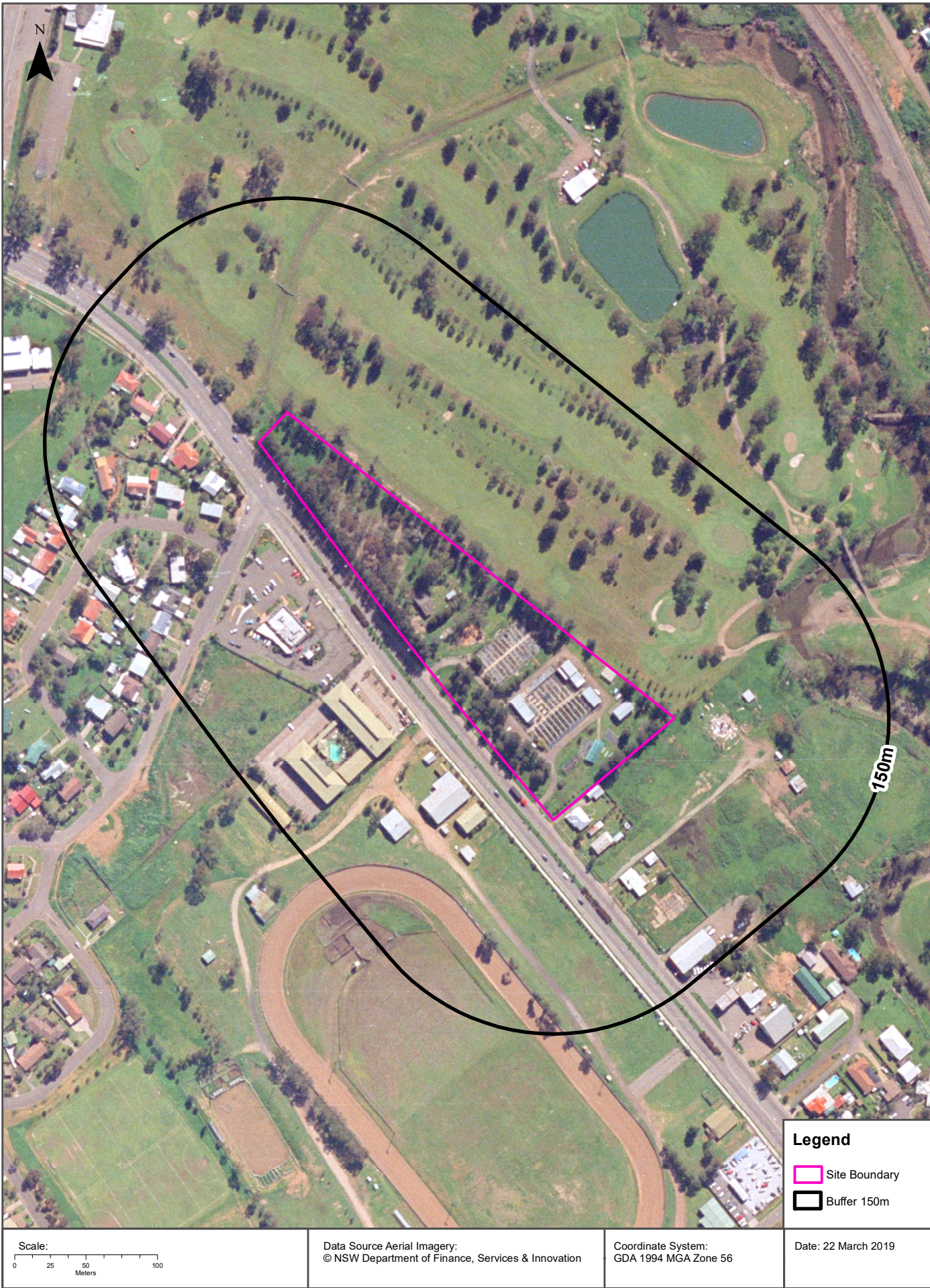
Aerial Imagery 2003

Lot 62, Maitland Street, Muswellbrook, NSW 2333



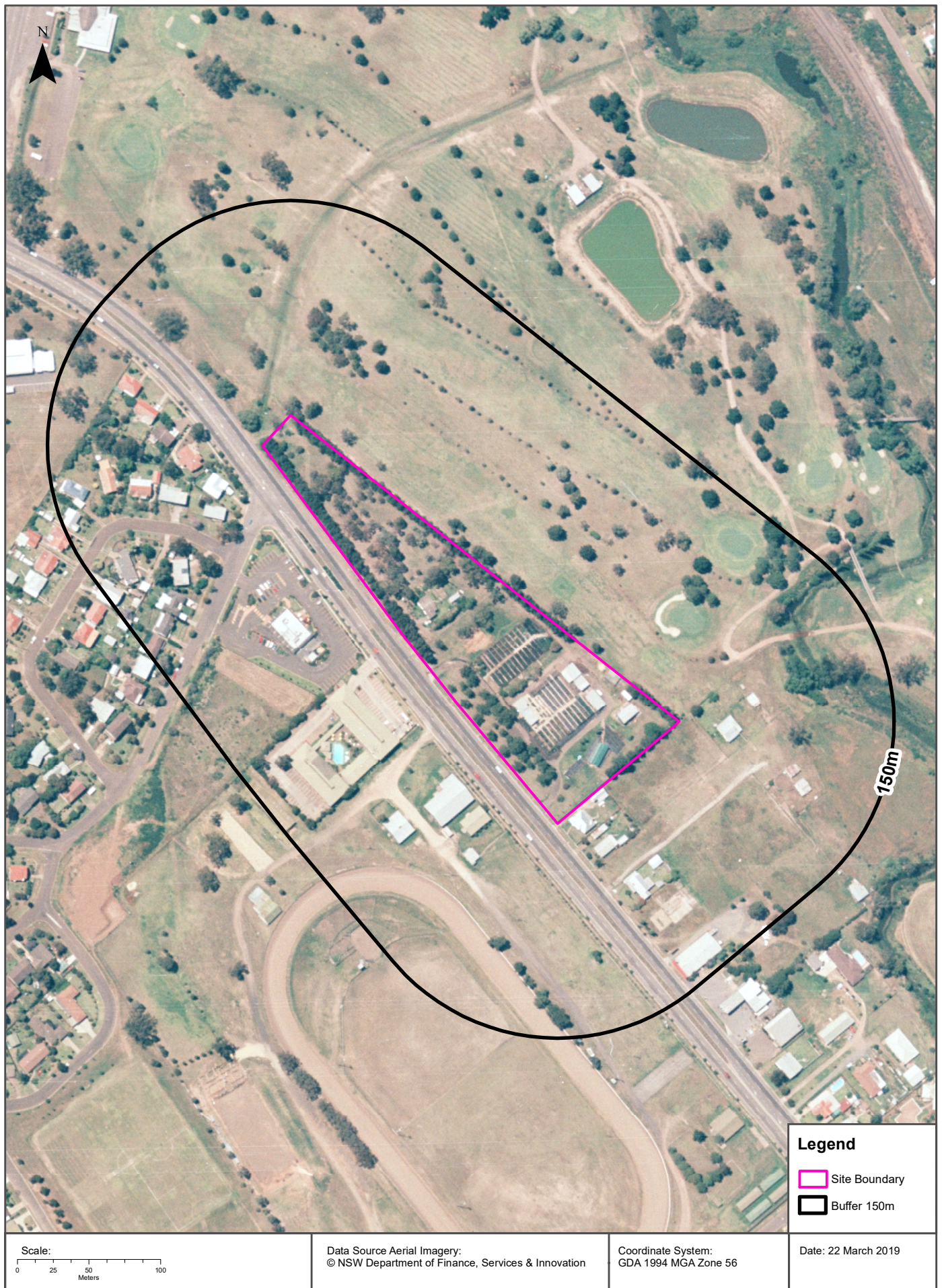
Aerial Imagery 1998

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Aerial Imagery 1993

Lot 62, Maitland Street, Muswellbrook, NSW 2333



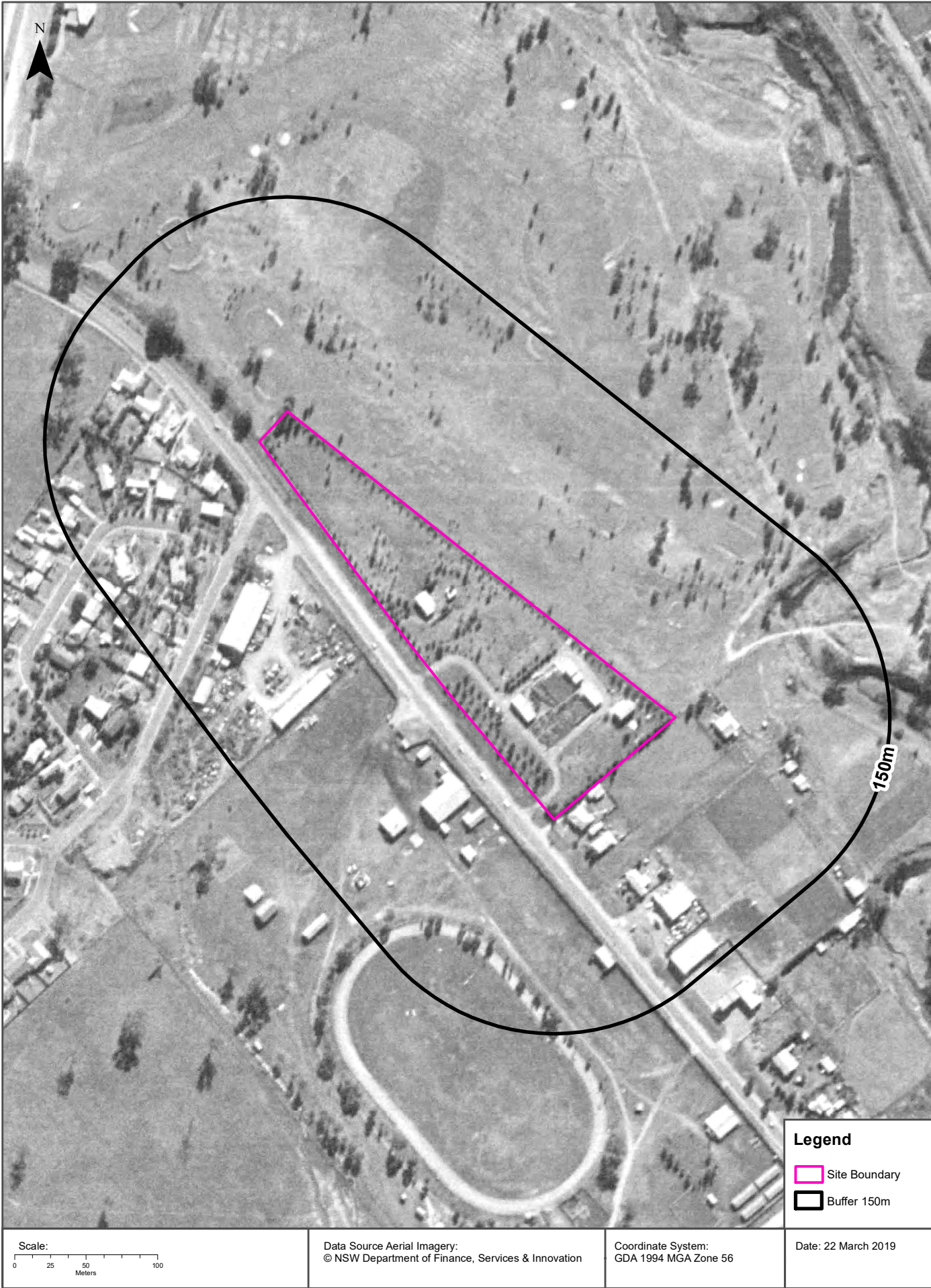
Aerial Imagery 1989

Lot 62, Maitland Street, Muswellbrook, NSW 2333



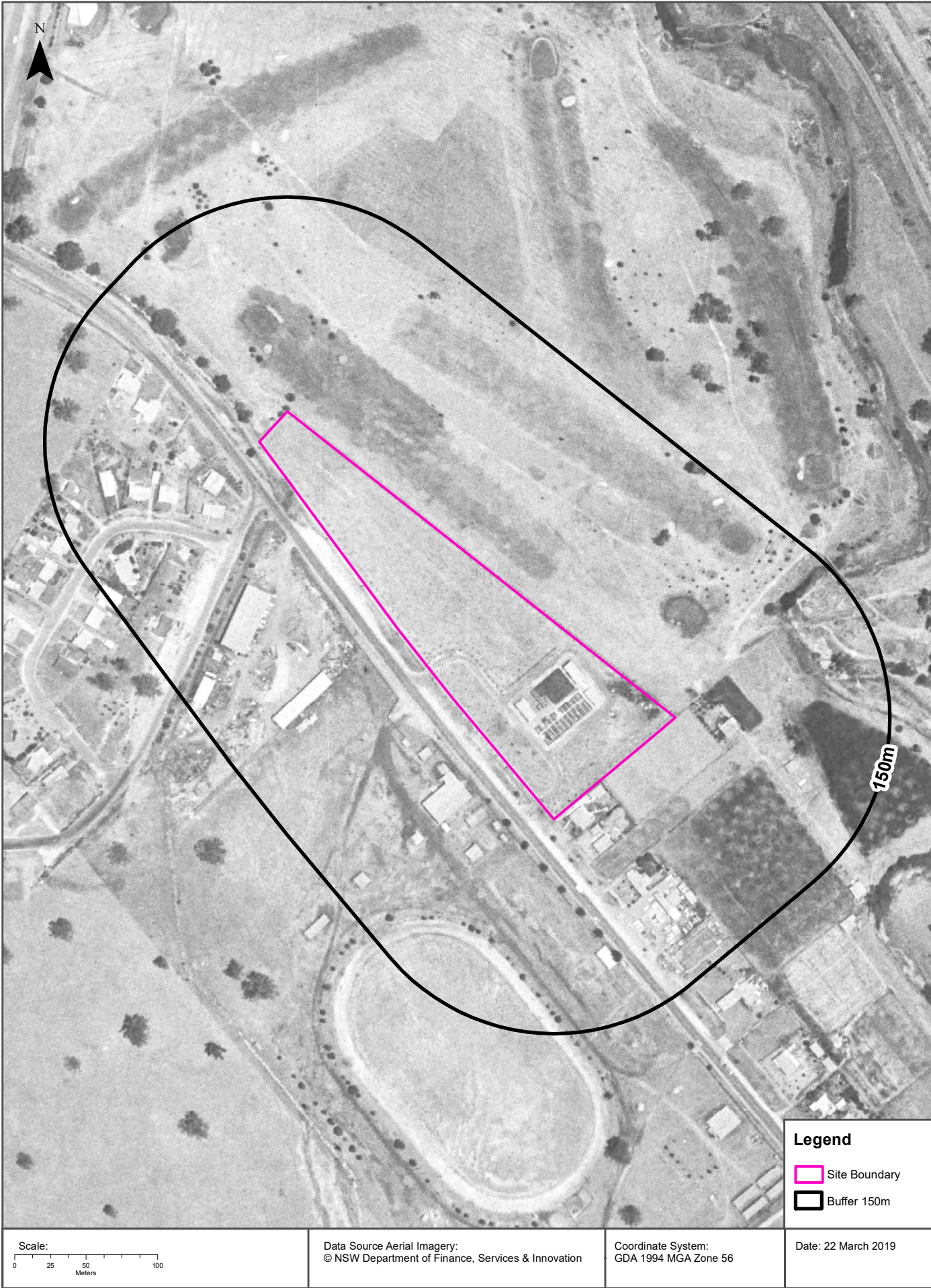
Aerial Imagery 1974

Lot 62, Maitland Street, Muswellbrook, NSW 2333



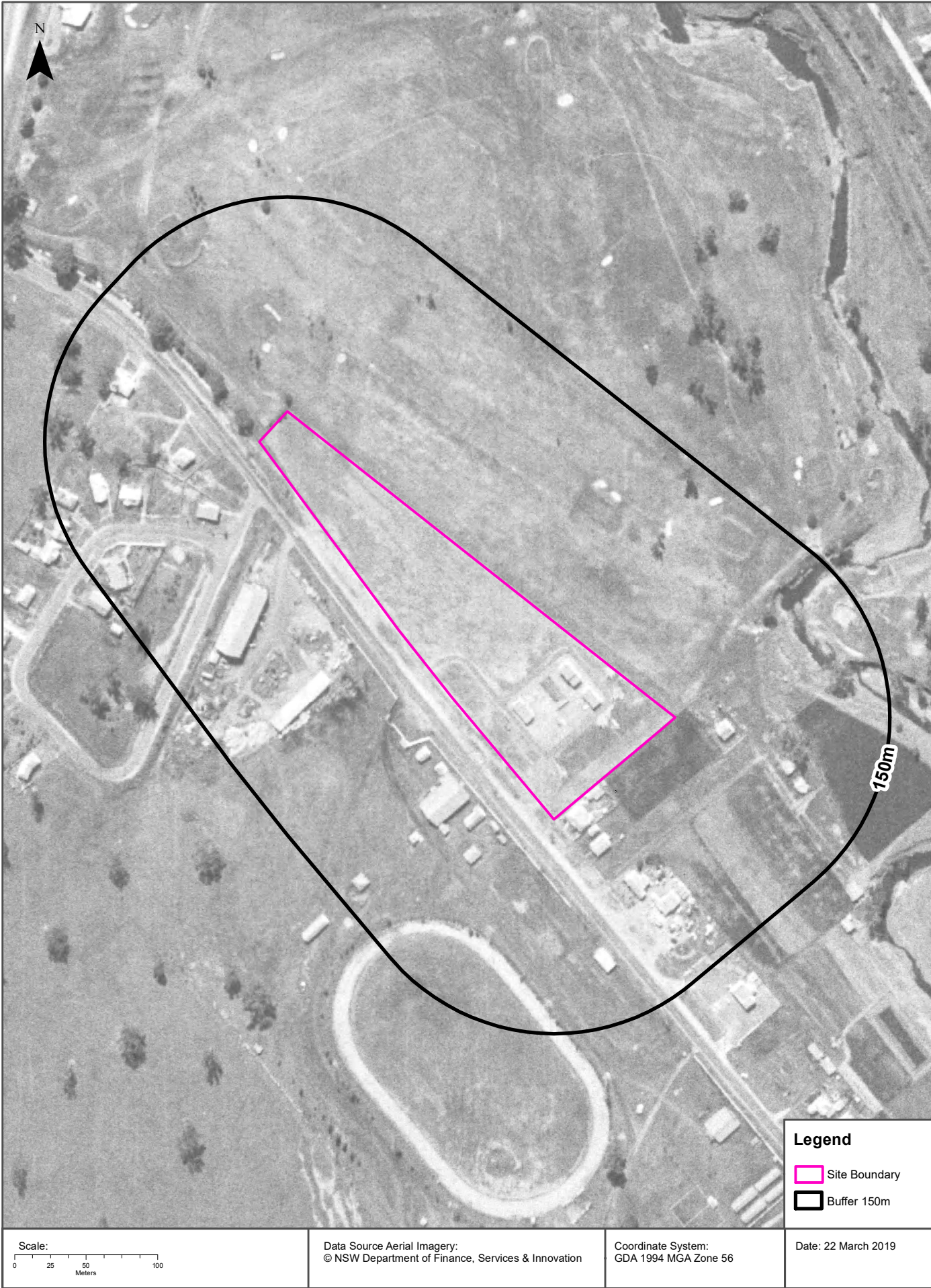
Aerial Imagery 1967

Lot 62, Maitland Street, Muswellbrook, NSW 2333



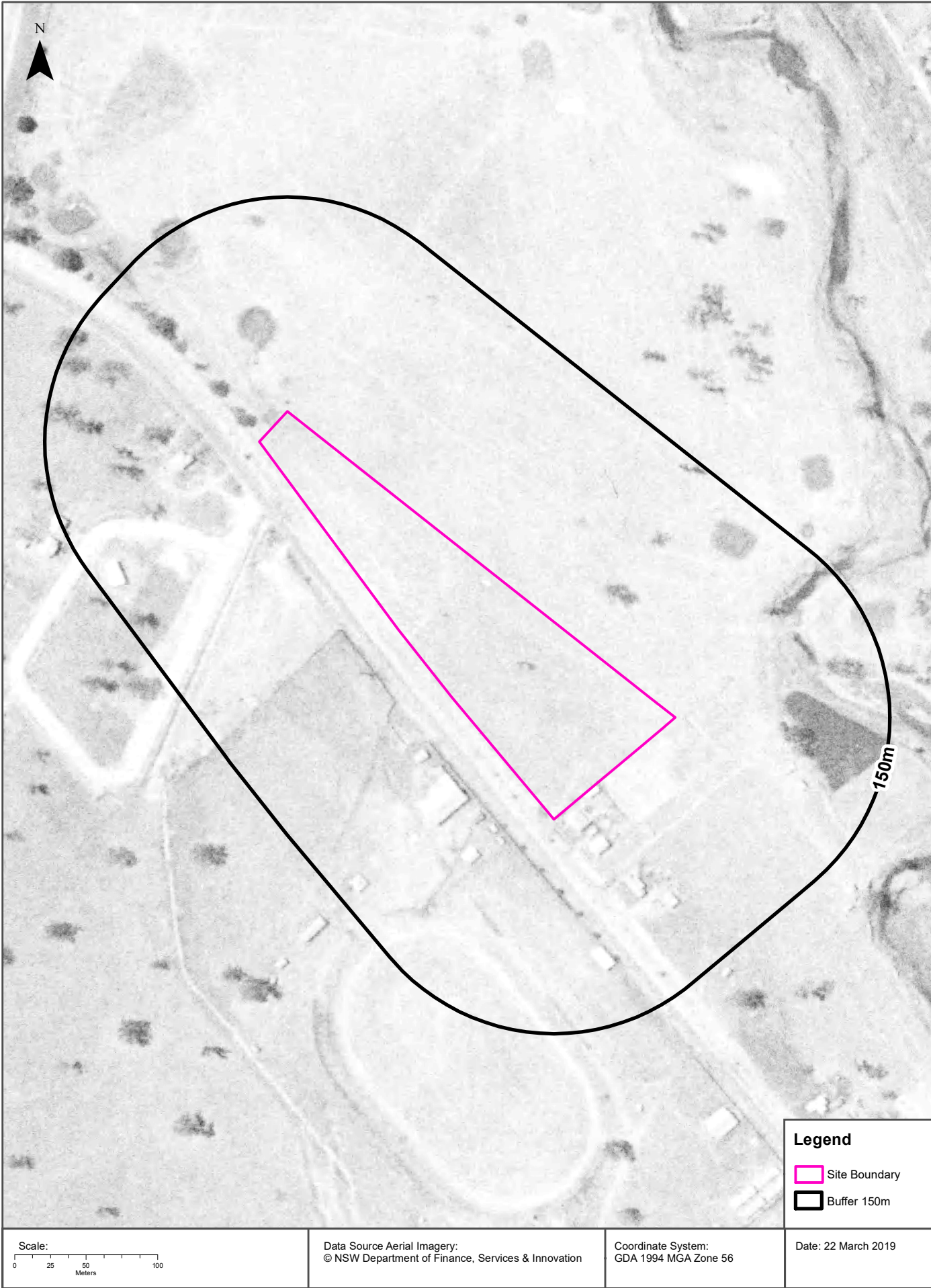
Aerial Imagery 1964

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Aerial Imagery 1958

Lot 62, Maitland Street, Muswellbrook, NSW 2333



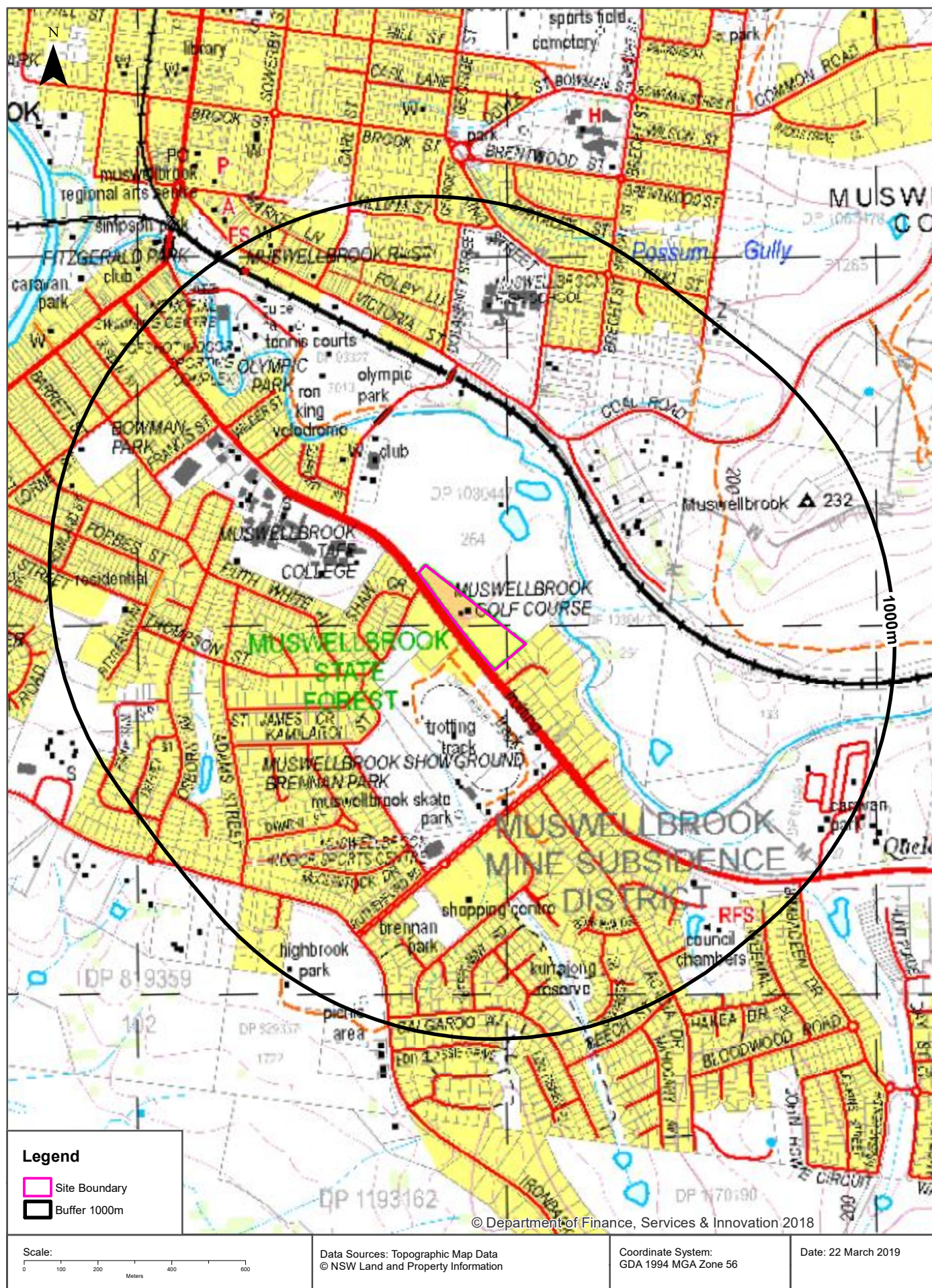
Aerial Imagery 1938

Lot 62, Maitland Street, Muswellbrook, NSW 2333



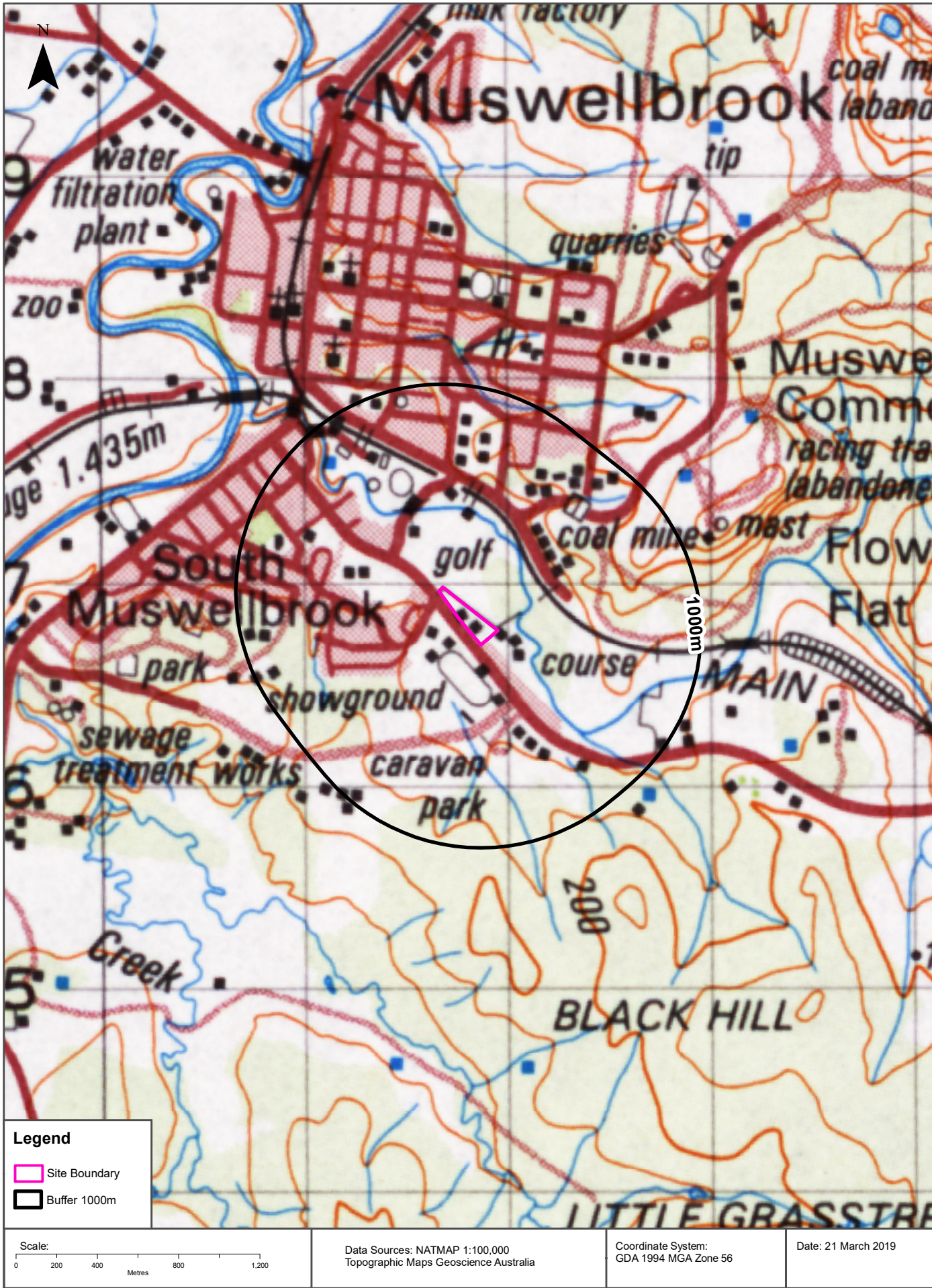
Topographic Map 2015

Lot 62, Maitland Street, Muswellbrook, NSW 2333



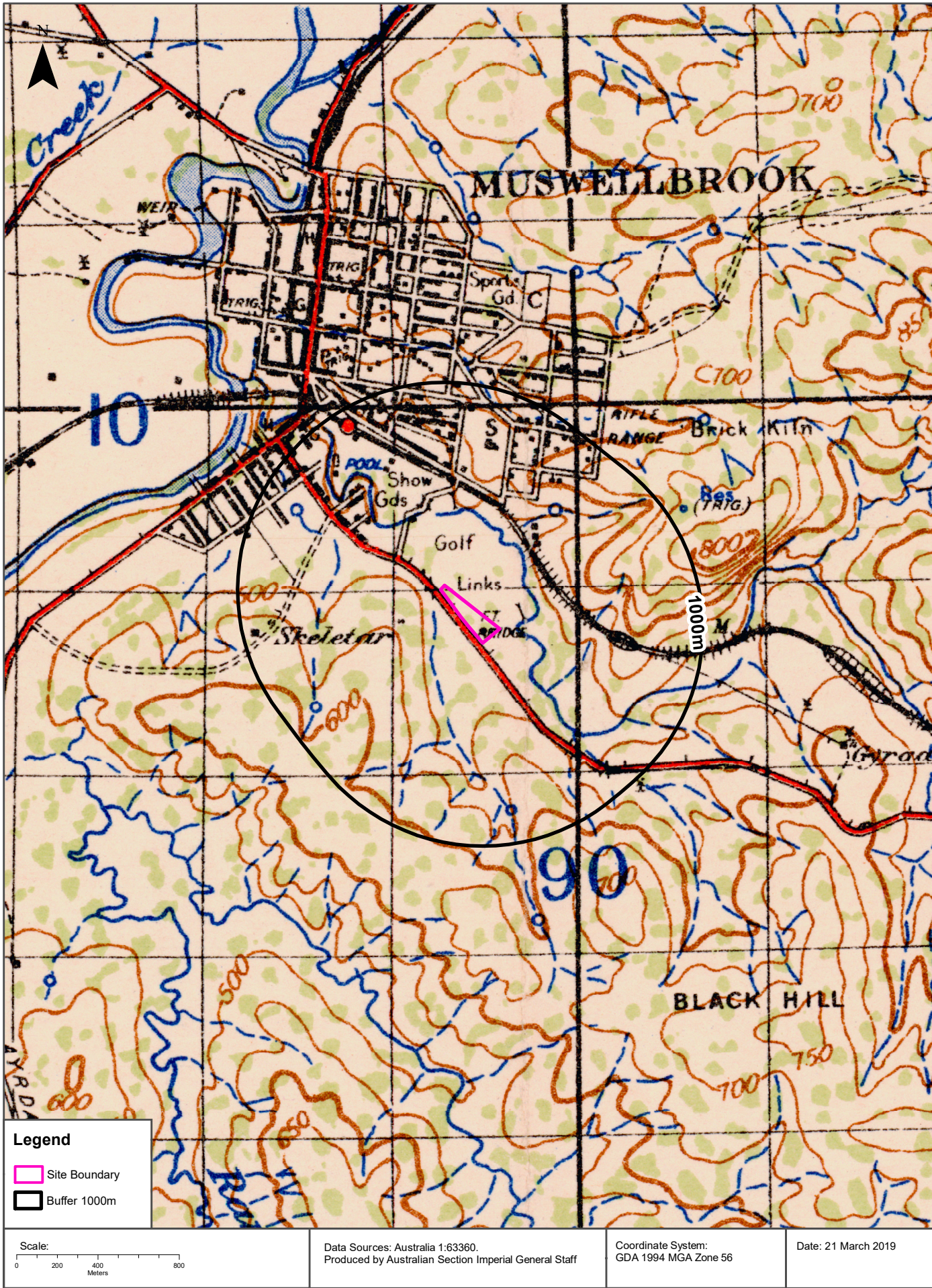
Historical Map 1978

Lot 62, Maitland Street, Muswellbrook, NSW 2333



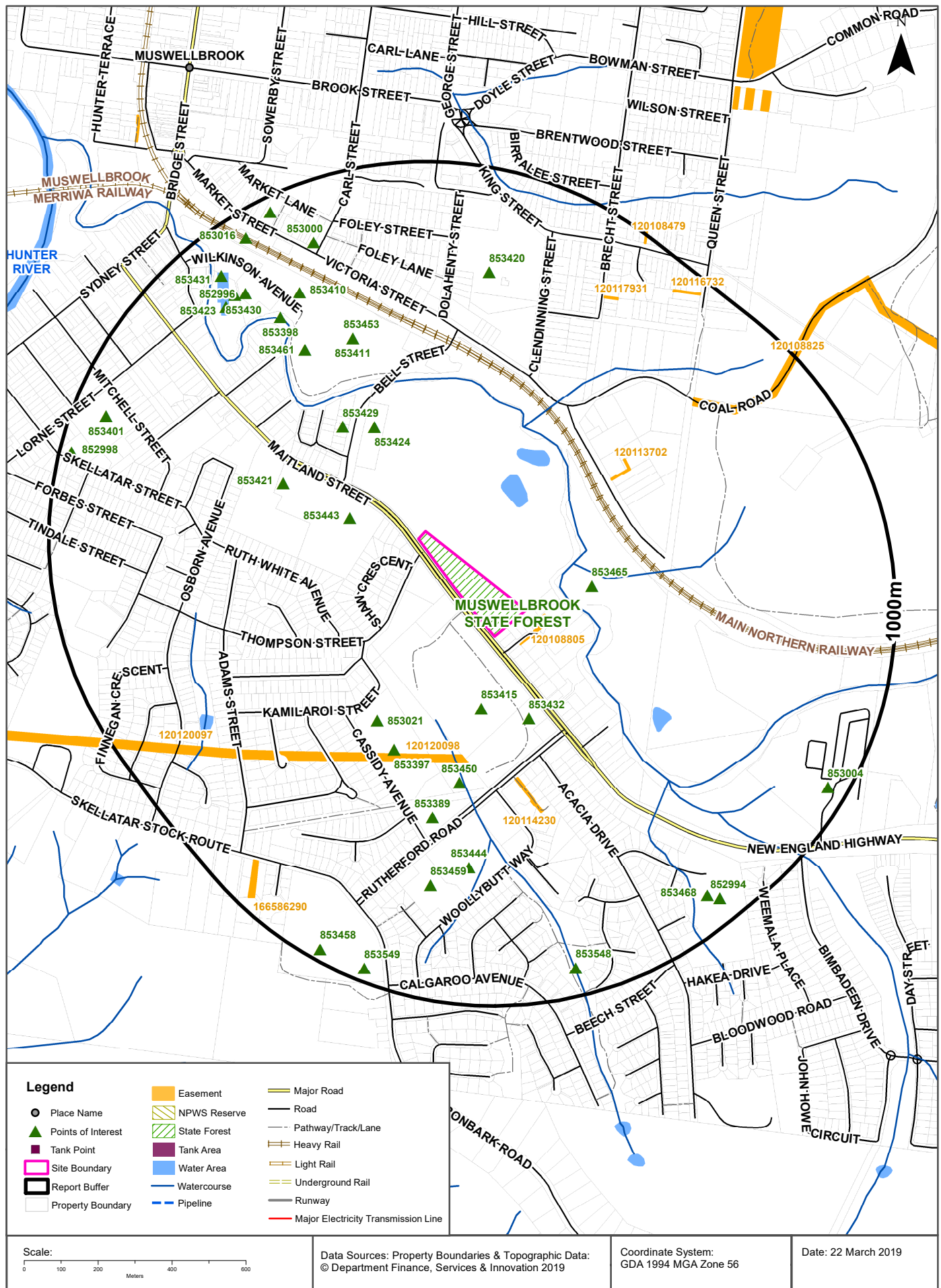
Historical Map c.1941

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Topographic Features

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Topographic Features

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
853465	Golf Course	MUSWELLBROOK GOLF COURSE	189m	East
853443	TAFE College	MUSWELLBROOK TAFE COLLEGE	194m	North West
853415	Trotting Track	MUSWELLBROOK PACEWAY	199m	South
853432	Showground	MUSWELLBROOK SHOWGROUND	240m	South East
853424	Club	MUSWELLBROOK GOLF CLUB	314m	North West
853429	Place Of Worship	SEVENTH DAY ADVENTIST CHURCH	361m	North West
853021	Retirement Village	CALVARY MUSWELLBROOK RETIREMENT COMMUNITY	389m	South West
853421	Primary School	MUSWELLBROOK SOUTH PUBLIC SCHOOL	395m	North West
853450	Sports Court	MUSWELLBROOK SKATE PARK	407m	South
853397	Park	BRENNAN PARK	409m	South West
853389	Sports Centre	MUSWELLBROOK INDOOR SPORTS CENTRE	517m	South
853411	Sports Field	Sports Field	558m	North West
853453	Park	OLYMPIC PARK	558m	North West
853461	Cycling Track	RON KING VELODROME	589m	North West
853444	Shopping Centre	Shopping Centre	629m	South
853459	Park	BRENNAN PARK	695m	South
853398	Park	OLYMPIC PARK	699m	North West
853420	High School	MUSWELLBROOK HIGH SCHOOL	722m	North
853410	Sports Court	TENNIS COURTS	730m	North West
852996	Community Facility	MUSWELLBROOK RSL BOWLING CLUB	807m	North West
853423	Swimming Pool	Swimming Pool	812m	North West
853430	Sports Centre	TOPSHOT INDOOR SPORTING COMPLEX	820m	North West
853000	Community Facility	MUSWELLBROOK PCYC	838m	North West
853431	Sports Centre	WHITE MEMORIAL SWIMMING CENTRE	885m	North West
853468	Local Government Chambers	MUSWELLBROOK SHIRE COUNCIL	906m	South East
853401	Park	BOWMAN PARK	907m	North West
853548	Park	KURRAJONG RESERVE	923m	South
853016	Railway Station	MUSWELLBROOK RAILWAY STATION	930m	North West
852994	Firestation - Bush	MUSWELLBROOK FIRE CONTROL CENTRE	934m	South East
853004	Tourist Park / Home Village	PINAROO LEISURE PARK	946m	South East

Map Id	Feature Type	Label	Distance	Direction
853446	Place Of Worship	CHRISTIAN FAMILY CENTRE	960m	North West
853549	Picnic Area	HIGHBROOK PARK	964m	South
852998	Community Facility	BOWMAN PARK COMMUNITY CENTRE	967m	West
853458	Sports Field	HIGHBROOK PARK	968m	South West

Topographic Data Source: © Land and Property Information (2015)

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Topographic Features

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Tanks (Areas)

What are the Tank Areas located within the dataset 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 dataset 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 Data Source: © Land and Property Information (2015)

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Major Easements

What Major Easements exist within the dataset 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
120108805	Primary	Undefined		48m	South East
120120098	Primary	Undefined		333m	South
120114230	Primary	Undefined		387m	South
120113702	Primary	Undefined		420m	North East
120120097	Primary	Undefined		471m	South West
120108825	Primary	Undefined		714m	North East
120117931	Primary	Undefined		795m	North East
166586290	Secondary	Easement for Access		882m	South West
120116732	Primary	Undefined		924m	North East
120108479	Primary	Undefined		978m	North East

Easements Data Source: © Land and Property Information (2015)

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Topographic Features

Lot 62, Maitland Street, Muswellbrook, NSW 2333

State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
975	MUSWELLBROOK	0m	Onsite

State Forest Data Source: © NSW Department of Finance, Services & Innovation (2018)

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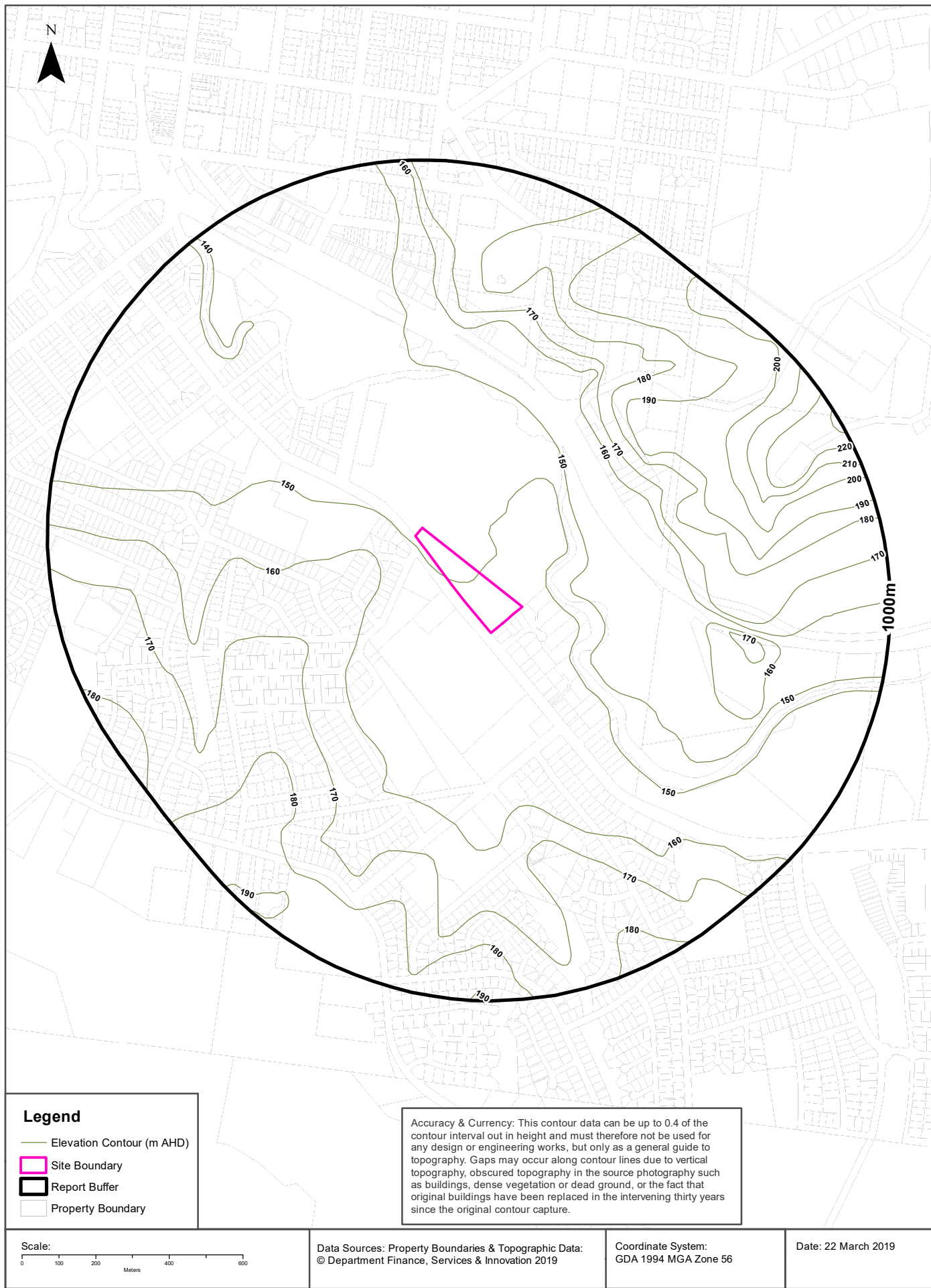
National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the dataset buffer?

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

NPWS Data Source: © NSW Department of Finance, Services & Innovation (2018)

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Hydrogeology & Groundwater

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Hydrogeology

Description of aquifers on-site:

Description
Porous, extensive highly productive aquifers

Description of aquifers within the dataset buffer:

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

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

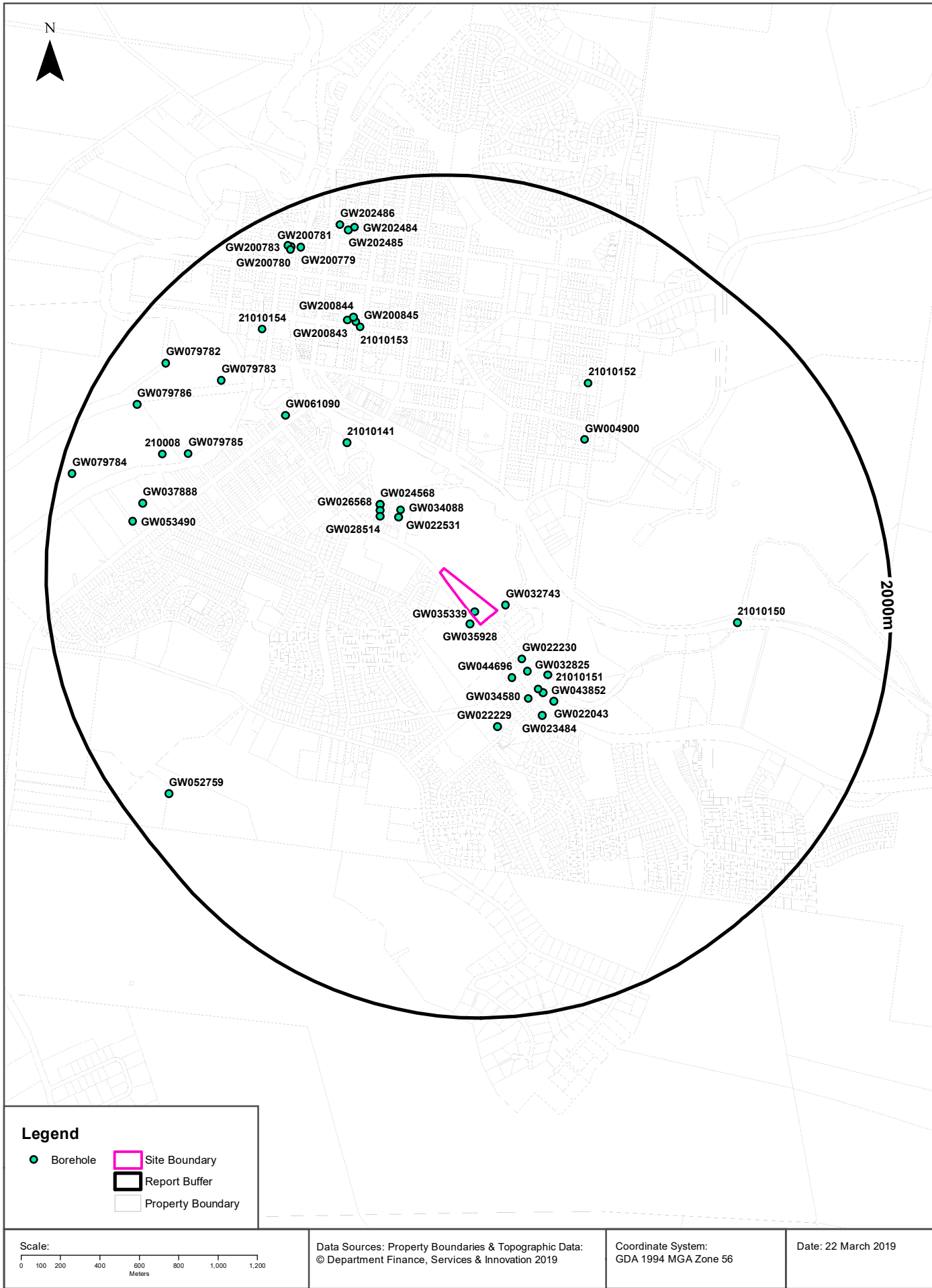
Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Botany Groundwater Management Zones

Groundwater management zones relating to the Botany Sand Beds aquifer within the dataset buffer:

Management Zone No.	Restriction	Distance	Direction
N/A	No records in buffer		

Botany Groundwater Management Zones Data Source : NSW Department of Primary Industries



Hydrogeology & Groundwater

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Groundwater Boreholes

Boreholes within the dataset buffer:

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW035 339	20BL028 292	Bore open thru rock	Other Govt	Waste Disposal	Waste Disposal		01/08/1972	9.10						0m	Onsite
GW035 928	20BL028 663	Well	Private	Waste Disposal	Waste Disposal		01/02/1973	0.00	8.10					39m	South
GW032 743	20BL103 397	Well	Private	Waste Disposal	Waste Disposal		01/04/1968	5.70						51m	East
GW022 230	20BL014 496	Well	Private	Waste Disposal	Waste Disposal		01/01/1965	6.70	6.70					272m	South East
GW044 696	20BL103 177	Well	Private	Waste Disposal	Domestic		01/07/1975	7.30						315m	South East
GW032 825	20BL102 410	Well	Private	Waste Disposal	Waste Disposal			6.00						337m	South East
GW022 531		Well	Private		Not Known		01/01/1965	6.10						345m	North West
GW034 088	20BL025 492	Well	Private	Waste Disposal	Waste Disposal		01/06/1971	7.30						367m	North West
GW028 514	20BL015 427	Well	Private	Waste Disposal	Waste Disposal		01/06/1965	1.20						415m	North West
210101 51					UNK								150.3 0	417m	South East
GW028 513	20BL015 371	Well	Private	Waste Disposal	Waste Disposal		01/06/1965	1.20						436m	North West
GW029 528	20BL020 852	Well	Private	Waste Disposal	Waste Disposal		01/05/1967	6.40	6.40					442m	South East
GW034 580	20BL027 602	Well	Private	Waste Disposal	Waste Disposal			9.10						449m	South East
GW024 568	20BL015 372	Well	Private	Waste Disposal	Waste Disposal		01/08/1965	6.10	6.10					458m	North West
GW026 568	20BL019 509	Bore	Private	Waste Disposal	Waste Disposal		01/01/1967	7.60	7.60					458m	North West
GW043 852	20BL100 163	Well	Private	Waste Disposal	Waste Disposal		01/05/1967	6.00						471m	South East
GW022 229	20BL014 497	Well	Private	Waste Disposal	Waste Disposal		01/08/1963	10.10	10.10					526m	South
GW022 043	20BL014 498	Well	Private	Waste Disposal	Waste Disposal		01/08/1964	0.00	6.10					539m	South East
GW023 484	20BL016 438	Well	Private	Waste Disposal	Waste Disposal		01/01/1965	7.60						559m	South East
210101 41					UNK								147.4 3	805m	North West
GW004 900		Bore	Private		Not Known	ST HELIERS	01/01/1912	57.90	57.90					957m	North East
GW061 090	20BL132 969	Bore	Private	Domestic	Domestic		01/07/1985	18.30	18.30	1001-3000 ppm				1118m	North West
210101 52					UNK								190.5 1	1193m	North East
210101 50					UNK								156.5 0	1222m	East
210101 53					UNK								158.9 6	1297m	North
GW200 845	20BL172 312	Bore	Private	Monitoring Bore	Monitoring Bore		06/10/2009	4.20	4.20		2.00			1328m	North

GW No.	Licence No	Work Type	Owner Type	Authorised Purpose	Intended Purpose	Name	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
GW200 843	20BL172 312	Bore	Private	Monitoring Bore	Monitoring Bore		06/10/2009	4.20	4.20		2.00			1352m	North West
GW200 844	20BL172 312	Bore	Private	Monitoring Bore	Monitoring Bore		06/10/2009	4.20	4.20		2.00			1355m	North
GW079 785		Bore			Monitoring Bore		22/04/1992	13.20	13.20				143.6 5	1413m	North West
GW079 783		Bore			Monitoring Bore		22/04/1992	11.20	11.20				144.3 5	1477m	North West
210101 54					UNK								145.6 9	1525m	North West
210008					UNK								141.9 3	1531m	North West
GW037 888	20BL100 892, 20WA20 8039	Well	Private	Recreation (groundwater)	Recreation (groundwater r)		01/06/1971	11.50	11.60					1549m	West
GW053 490	20BL120 126	Well	Private	Domestic, Irrigation, Stock	Irrigation		01/10/1981	6.70	22.00					1580m	West
GW079 782		Bore	NSW Office of Water		Monitoring Bore		01/04/1992	13.00	13.00				144.8 7	1751m	North West
GW079 786		Bore			Monitoring Bore		23/04/1992	12.00	12.00				143.4 2	1759m	North West
GW052 759	20BL109 134, 20WA20 7601	Bore	Private	Domestic	Domestic		01/01/1979	4.60	4.60					1773m	South West
GW202 485	20BL173 282	Bore	Private	Monitoring Bore	Monitoring Bore		07/09/2012	7.50	7.50		3.90	0.010		1785m	North
GW200 779	20BL170 314	Bore	Private	Test Bore	Test Bore		12/05/2006	11.50	11.50		9.00			1785m	North West
GW202 484	20BL173 282	Bore	Private	Monitoring Bore	Monitoring Bore		06/09/2012	7.50	7.50		5.80	0.010		1791m	North
GW200 780	20BL170 314	Bore	Private	Test Bore	Monitoring Bore		12/05/2010	12.00	12.00		10.2 0			1795m	North West
GW200 781	20BL170 314	Bore	Private	Test Bore	Monitoring Bore		12/05/2006	13.00	13.00		9.80			1809m	North West
GW200 783	20BL170 314	Bore	Private	Test Bore	Monitoring Bore		12/05/2006	12.50			9.60	9.600		1820m	North West
GW202 486	20BL173 282	Bore	Private	Monitoring Bore	Monitoring Bore		07/09/2012	10.00	10.50		5.20	0.020		1824m	North
GW079 784		Bore			Monitoring Bore		22/04/1992	13.80	13.80				143.7 4	1932m	West

Borehole Data Source : NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation for all bores prefixed with GW. All other bores © Commonwealth of Australia (Bureau of Meteorology) 2015. Creative Commons 3.0 © Commonwealth of Australia <http://creativecommons.org/licenses/by/3.0/au/deed.en>

Hydrogeology & Groundwater

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Driller's Logs

Drill log data relevant to the boreholes within the dataset buffer:

Groundwater No	Drillers Log	Distance	Direction
GW035928	0.00m-7.62m Clay 7.62m-8.07m Gravel River	39m	South
GW029528	0.00m-0.30m Soil 0.30m-1.52m Clay 1.52m-6.40m Sand Gravel	442m	South East
GW024568	0.00m-4.27m Loam 4.27m-5.18m Sand 5.18m-6.10m Sand Gravel	458m	North West
GW026568	0.00m-0.61m Topsoil 0.61m-3.05m Clay 3.05m-6.10m Shale 6.10m-6.71m Rock Soft 6.71m-7.62m Gravel	458m	North West
GW022229	0.00m-0.91m Soil 0.91m-3.05m Clay 3.05m-10.06m Sand Gravel	526m	South
GW022043	0.00m-0.30m Soil 0.30m-0.91m Clay 0.91m-1.22m Gravel 1.22m-1.83m Clay 1.83m-5.49m Loam Sandy 5.49m-6.10m Clay Stones	539m	South East
GW004900	0.00m-57.91m Soil Nominal 0.00m-57.91m Drift Nominal 0.00m-57.91m Conglomerate Hard Nominal	957m	North East
GW061090	0.00m-5.58m Loam 5.58m-11.88m Loam Sandy 11.88m-18.28m Sandstone Water Supply	1118m	North West
GW200845	0.00m-0.20m Concrete 0.20m-0.70m Fill 0.70m-2.00m Clay, sticky, light brown 2.00m-3.80m Clay, moist, light brown 3.80m-4.20m Clay, wet, light brown, coarse	1328m	North
GW200843	0.00m-0.20m Concrete 0.20m-0.70m Fill 0.70m-2.00m Clay, sticky, light brown 2.00m-3.80m Clay, moist, light brown 3.80m-4.20m Clay, wet, light brown, coarse	1352m	North West
GW200844	0.00m-0.20m Concrete 0.20m-0.70m Fill 0.70m-2.00m Clay, sticky, light brown 2.00m-3.80m Clay, moist, light brown 3.80m-4.20m Clay, wet, light brown, coarse grained	1355m	North
GW079785	0.00m-1.00m sandy loam, light brown 1.00m-4.00m silty sand, fine, light brown, silty minor clay 4.00m-5.00m sand, fine, light brown, silty minor clay 5.00m-6.00m sand, brown, minor clay 6.00m-7.00m gravelly sand, brown, minor clay 7.00m-8.00m sandy gravel, brown 8.00m-9.00m sand, brown, yellow/grey clay band 9.00m-10.00m clay, brown and sandy gravel 10.00m-11.00m gravel, up to 30 mm 11.00m-12.00m gravel, brown up to 20mm 12.00m-13.00m gravel, brown, up to 20mm 13.00m-13.20m bedrock, mid grey fine grained sandstone	1413m	North West

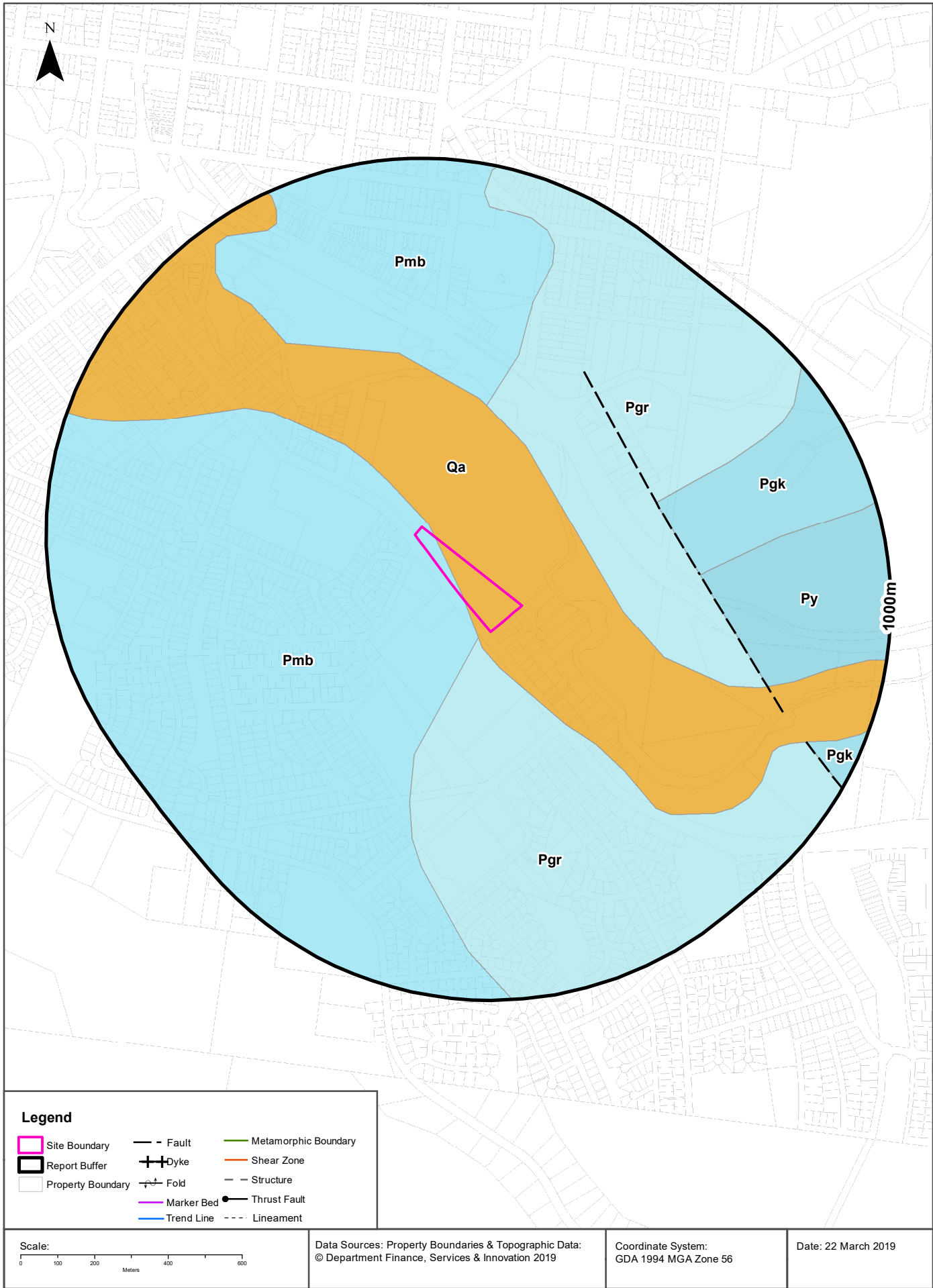
Groundwater No	Drillers Log	Distance	Direction
GW079783	0.00m-1.00m topsoil, brown silty loam 1.00m-2.00m clay, brown, slightly silty 2.00m-6.00m clay, brown silty 6.00m-7.00m sand, brown, clayey gravel up to 20mm 5% clay 40%, sand 2-6mm 25%, <2mm 30% 7.00m-8.00m gravel and some clayey sand 8.00m-9.00m sandy gravel, brown 9.00m-10.00m sandy gravel, brown 10.00m-11.20m gravel, brown, sandy, poorly sorted, minor fines	1477m	North West
GW037888	0.00m-5.48m Soil Black 5.48m-11.58m Gravel Sandy Water Supply	1549m	West
GW053490	0.00m-20.00m Loam 20.00m-22.00m Claystone 22.00m-22.01m Shale	1580m	West
GW079782	0.00m-1.00m Topsoil, brown, clayey loam 1.00m-5.00m clay, brown, minor fine sand and silt 5.00m-6.00m clay, brown, fine sandy 25% 6.00m-7.00m clay, brown, minor fine sand 7.00m-8.00m clay, brown, fine sandy 25% 8.00m-9.00m clay, brown, grey, also gravel up to 30mm 9.00m-10.00m gravel, clean, dry, up to 30mm, rounded 10.00m-11.00m gravel and sand, brown 11.00m-12.00m gravel, poorly sorted, minor clay and very fine sand 12.00m-13.00m gravel 13.00m-13.00m bedrock, dark grey siltstone	1751m	North West
GW079786	0.00m-1.00m topsoil, mid brown, silty loam 1.00m-2.00m clay, brown, light brown, fine sand and silt 2.00m-3.00m sandm fine, brown, some silt and clay 3.00m-4.00m sand, clayey, brown clay ~30% fine sand 4.00m-5.00m sand, fine, brown clayey and silty 5.00m-6.00m sand, brown 6.00m-7.00m sand, gravelly, light grey brown, gravel up to 10mm, occasionally up to 1mm 7.00m-8.00m sand, brown, occasional gravel up to 30mm 8.00m-9.00m sand, brown, minor fines 9.00m-10.00m gravel, sandy, brown, poorly sorted, gravel up to 40mm 10.00m-11.00m sand and gravel, probably in bands, gravel: sand 50:50 11.00m-12.00m sandy gravel, brown prroly sorted 12.00m-12.00m bedrock	1759m	North West
GW200779	0.00m-0.15m Topsoil: dark brown silty gravelly sand with rootlets 0.15m-1.60m Clay: Reddish brown, soft, dry, friable (Alluvium) 1.60m-4.50m Gravelly, Clay: dark brown, medium plasticity, dry, firm, gravels are fine, subrounded 4.50m-10.50m Gravel: fine to coarse gravel in clay matrix 10.50m-11.50m Clay: grey, very stiff clay, possible weathered shale	1785m	North West
GW202485	0.00m-0.50m Fill; Gravel 0.50m-7.50m Clay, Silty & River Gravels	1785m	North
GW202484	0.00m-0.20m Fill; Concrete 0.20m-0.50m Fill material 0.50m-7.50m Clay; with River Gravels	1791m	North
GW200780	0.00m-0.60m Topsoil : medium brown, fine, silty sandy topsoil with rare rounded coarse gravels and cobble 0.60m-4.50m Clay: (Alluvium) reddish brown, dry, firm, medium plasticity, uniform colour and consistency, becoming dark 4.50m-12.00m Gravel: Fine to coarse gravel in stiff clay matrix	1795m	North West
GW200781	0.00m-0.40m Fill: Gravel roadbase and dense grey/brown gravelly sand 0.40m-0.60m Clay: (Alluvium) dark brown, soft to firm, dry, slightly sandy, low plasticity 0.60m-5.50m Clay (Alluvium): dark brown/black, soft, slightly moist, medium plasticity, uniform colour and consistency. 5.50m-12.40m Gravel: fine to coarse gravel in stiff clay matrix 12.40m-13.00m Clay: grey, stiff clay	1809m	North West
GW202486	0.00m-0.03m Fill; Bitumen 0.03m-1.00m Clay; brown red 1.00m-10.50m Sandstone, weathered, red brown	1824m	North

Groundwater No	Drillers Log	Distance	Direction
GW079784	0.00m-1.00m topsoil, dark brown, silty, sand loam 1.00m-2.00m topsoil, as above but light brown 2.00m-3.00m clay, brown, slightly silty and clayey, brown, well sorted 3.00m-4.00m fine sand, slightly silty 4.00m-5.00m sand, brown, slightly silty 5.00m-6.00m silty sand, some clay bands, brown, fine 6.00m-7.00m sand, brown, also a clay band 7.00m-8.00m gravel, brown, sandy 8.00m-9.00m gravel, brownsandy 9.00m-10.00m gravel, minor fines of clay 10.00m-12.00m gravel, brown, well rounded, mod to low sphericity 12.00m-13.00m gravel, clean, up to 30mm 13.00m-13.80m gravel, brown, clayey, some yellow brown fine sandy clay streaks, probably weathered bedrock	1932m	West

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp
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Geology 1:250,000

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Geology

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Geological Units

What are the Geological Units onsite?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Pmb7	Conglomerate, sandstone, siltstone	Branxton Formation	Maitland Group		Palaeozoic			1:250,000
Qa7	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

What are the Geological Units within the dataset buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Pgk	Pellet claystone, siltstone, chert	Skeletar Formation	Greta Coal Measures		Palaeozoic			1:250,000
Pgr	Coal seams, siltstone, sandstone	Rowan Formation	Greta Coal Measures		Palaeozoic			1:250,000
Pmb	Conglomerate, sandstone, siltstone	Branxton Formation	Maitland Group		Palaeozoic			1:250,000
Py	Rhyolite, acid to basic volcanics and pyroclastics	Gyarran Volcanics			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 dataset 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

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

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

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Naturally Occurring Asbestos Potential

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Naturally Occurring Asbestos Potential

Naturally Occurring Asbestos Potential within the dataset 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

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Soils

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Soil Landscapes

What are the onsite Soil Landscapes?

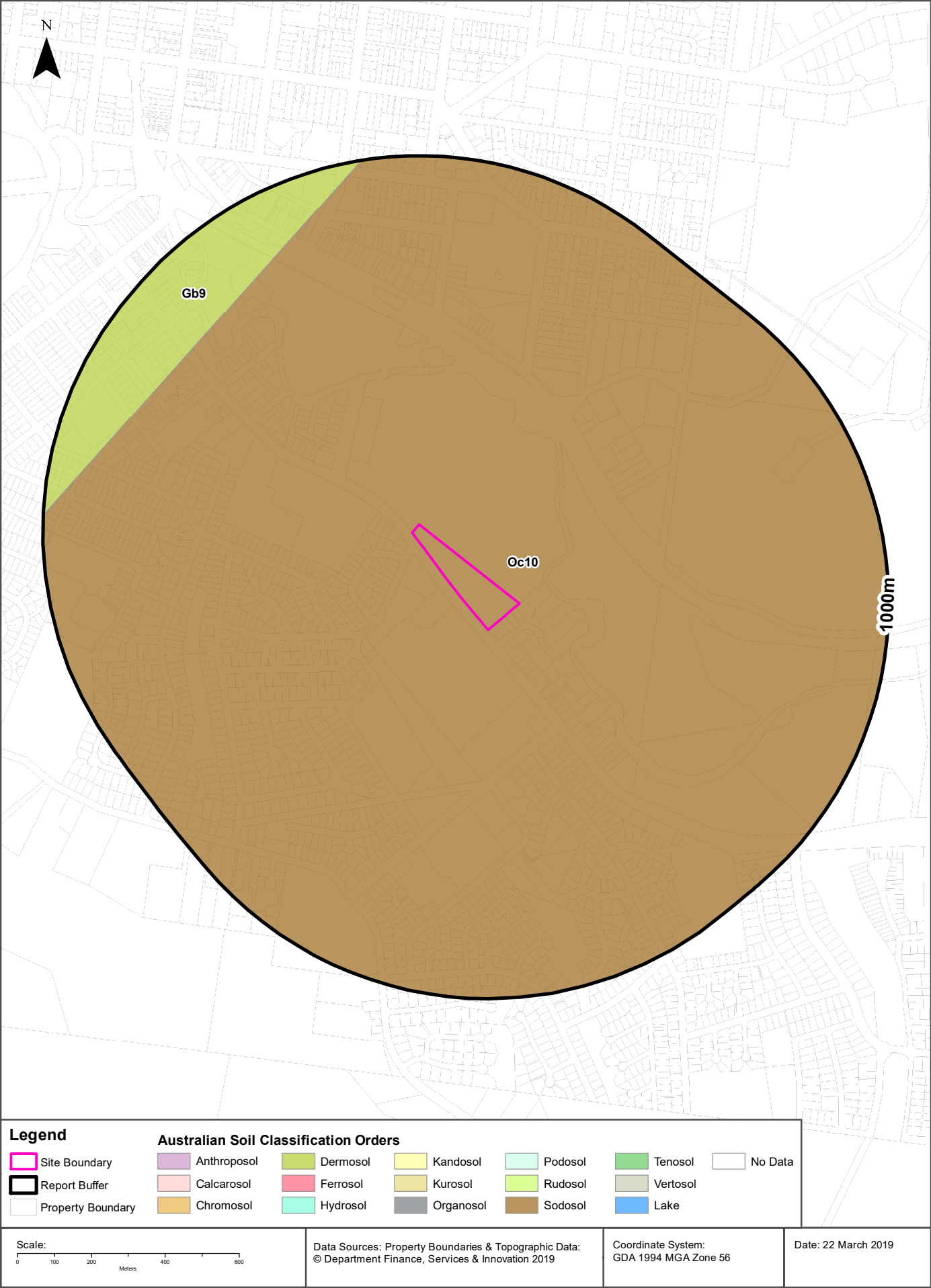
Soil Code	Name	Group	Process	Map Sheet	Scale
Ahu	HUNTER	ALLUVIAL SOILS		Singleton	1:250,000

What are the Soil Landscapes within the dataset buffer?

Soil Code	Name	Group	Process	Map Sheet	Scale
Ahu	HUNTER	ALLUVIAL SOILS		Singleton	1:250,000
YPrx	ROXBURGH	YELLOW PODZOLIC SOILS		Singleton	1:250,000

Soils Landscapes Data Source : NSW Office of Environment and Heritage

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Soils

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance
Oc10	Sodosol	Rolling to hilly country with some steep slopes, gently undulating hill-tops, low cliffs, and occasionally escarpments; traversed by flat to undulating valleys: chief soils are hard alkaline and neutral red brown, yellow, and dark soils: red (Dr2.33), (Dr2.23), (Dr2.43), (Dr2.32), (Dr2.22); brown (Db1.33) (Db1.43); yellow (Dy2.33), (Dy2.43), (Dy3.43), (Dy3.42); dark (Dd1.33), (Dd1.43), (Dd1.42) (Dr2.32) notably occurs on gravelly hill-tops. Associated are: the (Ug5) soils of unit Ke12, which forms soil complexes with the above (D) soils in some areas; some basaltic hills and knolls of (Ug5.1) (Ug5.3), (Db3.12), (Gn3.42), and (Um6) soils; some (Uf6.31) and/or (Gn3.13) soils; some (Um4.1 and/or (Um4.2) soils and possibly other shallow (Um) or (Uc) soils on steep slopes; (Dy3.41) (Dr3.41), and (Dr2.41) soils as for unit Tb41; and various (Um) and (Uc) soils along the streams where some salinity is evident. This unit is very broad and the soil pattern is complex. Northward it grades towards the soil conditions found in units Qb19 and Ob14, having similarities to unit Ob10 in the Murrurundi area. To the south-east it grades into unit Tb42, the boundary between the two units is indefinite.	0m
Gb9	Dermosol	River terraces and flood-plains: chief soils are dark friable loamy soils (Um6.11) locally underlain by either sandy or clayey substrata, and occurring on the middle river terraces. Associated are hard alkaline dark soils (Dd1.33 and Dd1.43), and/or friable dark soils (Dd3.12), and/or hard alkaline brown soils (Db1.33) on terrace remnants flanking the valley slopes; siliceous sands (Uc1.23) on low terraces adjoining the river; and local areas of various soils including (Ug5.15), (Ug5.16) and possibly (Ug5.4), (Db1), and (Dy) soils. Locally the (Ug5) soils may form soil complexes with the (Dd) and (Db) soils.	776m

Atlas of Australian Soils Data Source: CSIRO

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Acid Sulfate Soils

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Environmental Planning Instrument - Acid Sulfate Soils

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

Soil Class	Description	EPI Name
N/A		

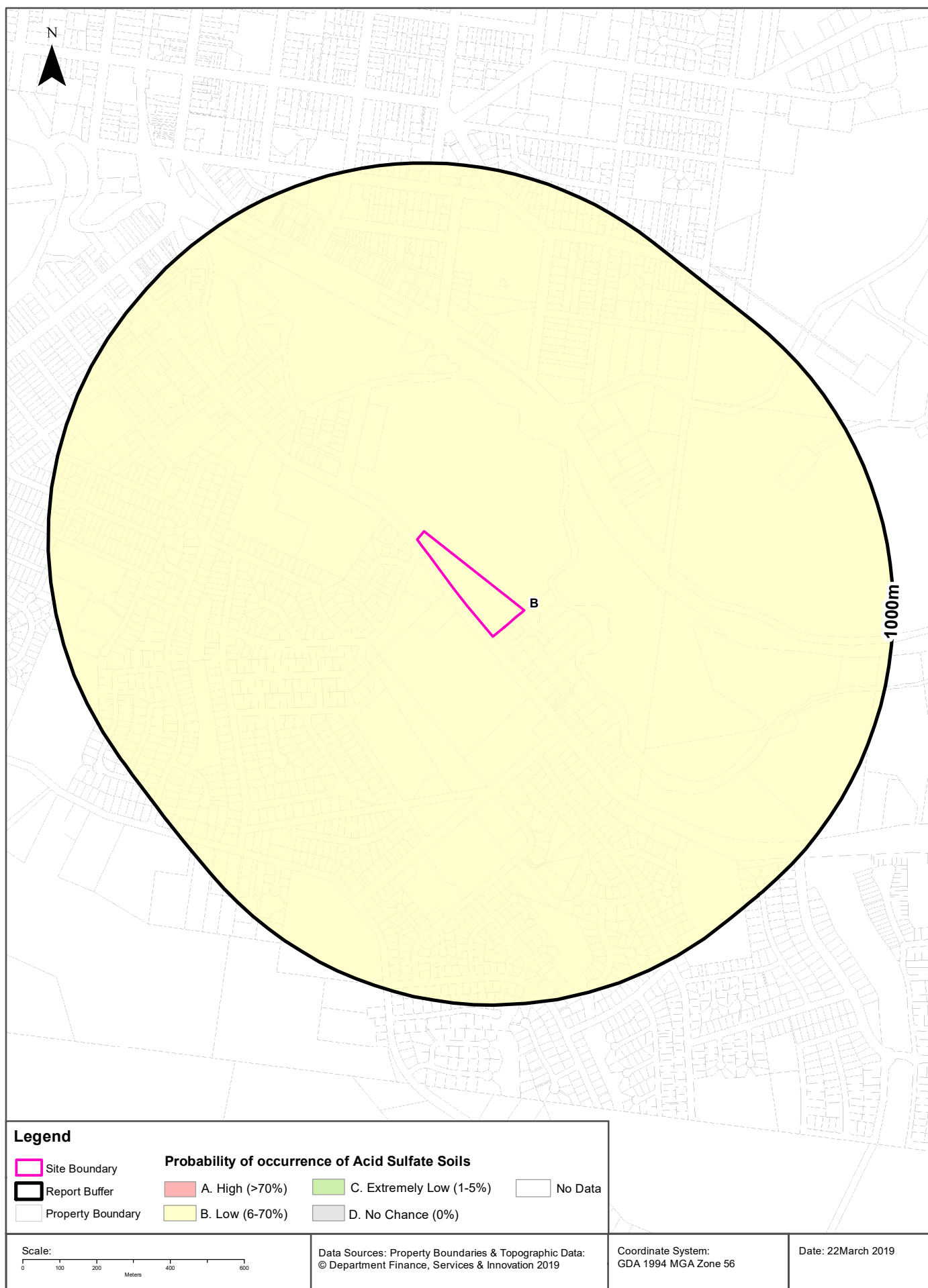
If the on-site Soil Class is 5, what other soil classes exist within 500m?

Soil Class	Description	EPI Name	Distance	Direction
N/A				

Acid Sulfate Data Source Accessed 23/10/2018: NSW Crown Copyright - Planning and Environment
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Atlas of Australian Acid Sulfate Soils

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Acid Sulfate Soils

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

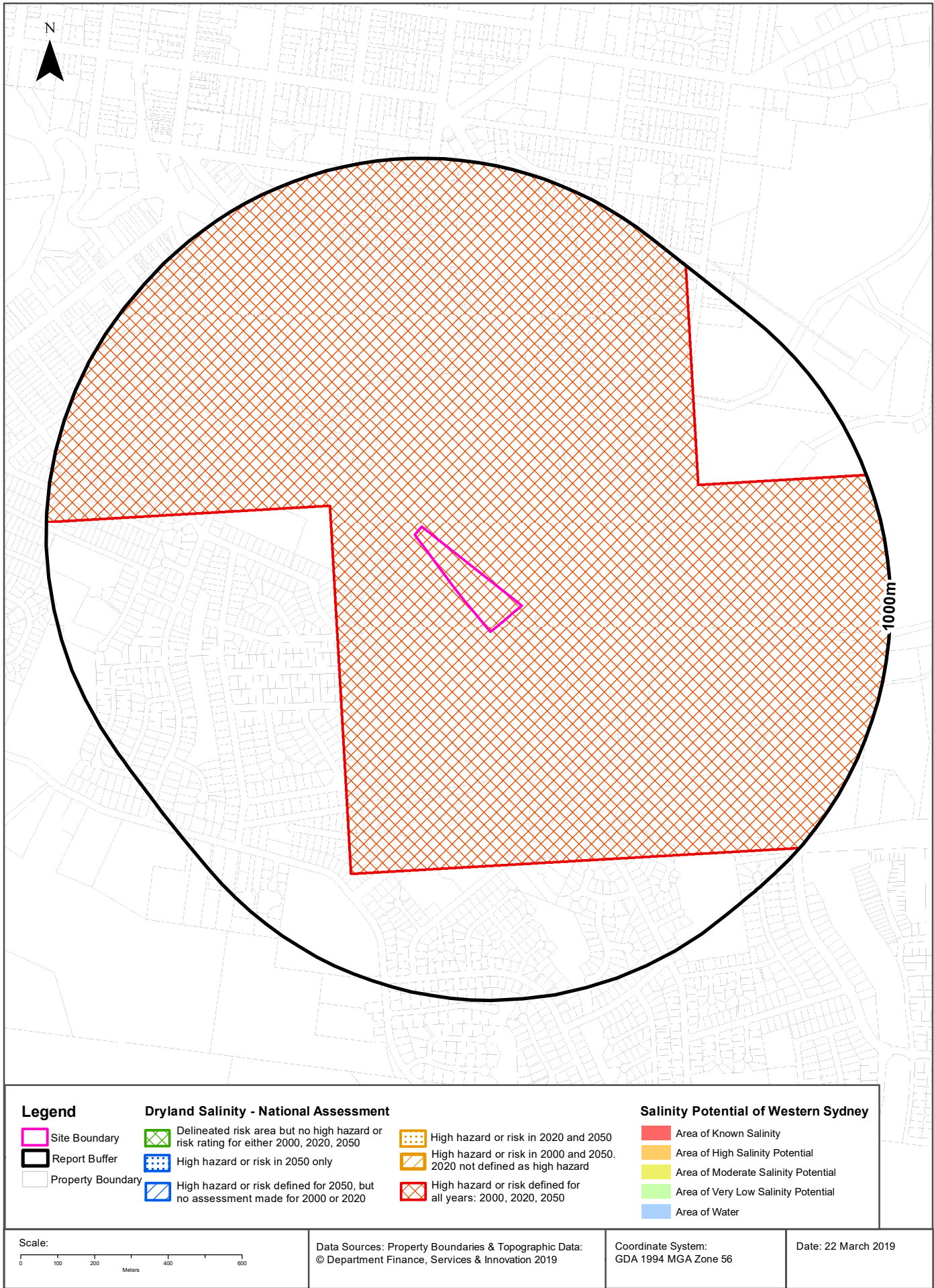
Class	Description	Distance
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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Dryland Salinity

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Dryland Salinity

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

Yes

Is there Dryland Salinity - National Assessment data within the dataset buffer?

Yes

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
High hazard or risk	High hazard or risk	High hazard or risk	0m	Onsite

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.

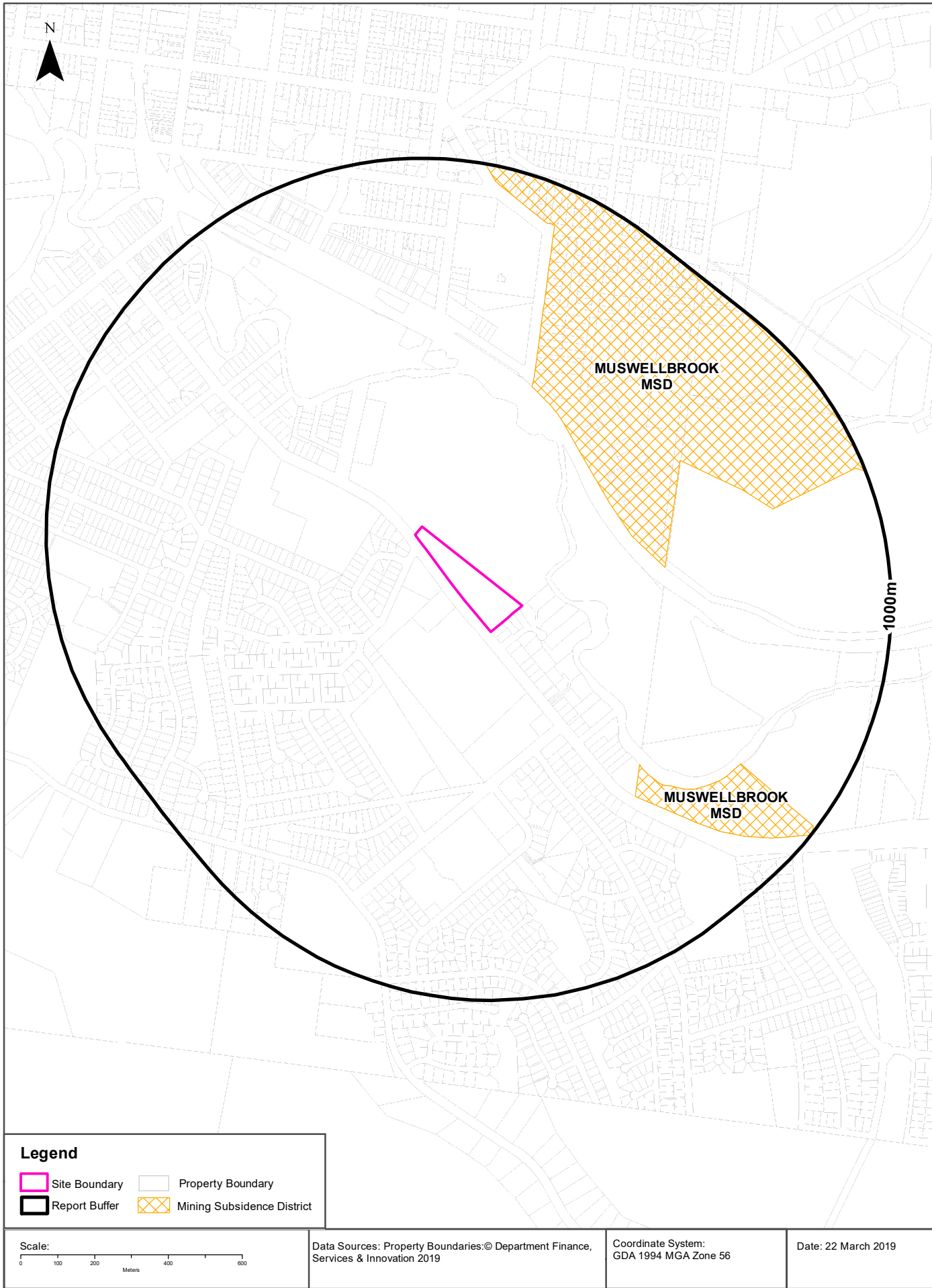
Dryland Salinity Potential of Western Sydney

Dryland Salinity Potential of Western Sydney within the dataset buffer?

Feature Id	Classification	Description	Distance	Direction
N/A	Outside Data Coverage			

Dryland Salinity Potential of Western Sydney Data Source : NSW Office of Environment and Heritage

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Mining Subsidence Districts

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
MUSWELLBROOK	352m	West

Mining Subsidence District Data Source: © Land and Property Information (2016)
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State Environmental Planning Policy

Lot 62, Maitland Street, Muswellbrook, NSW 2333

State Significant Precincts

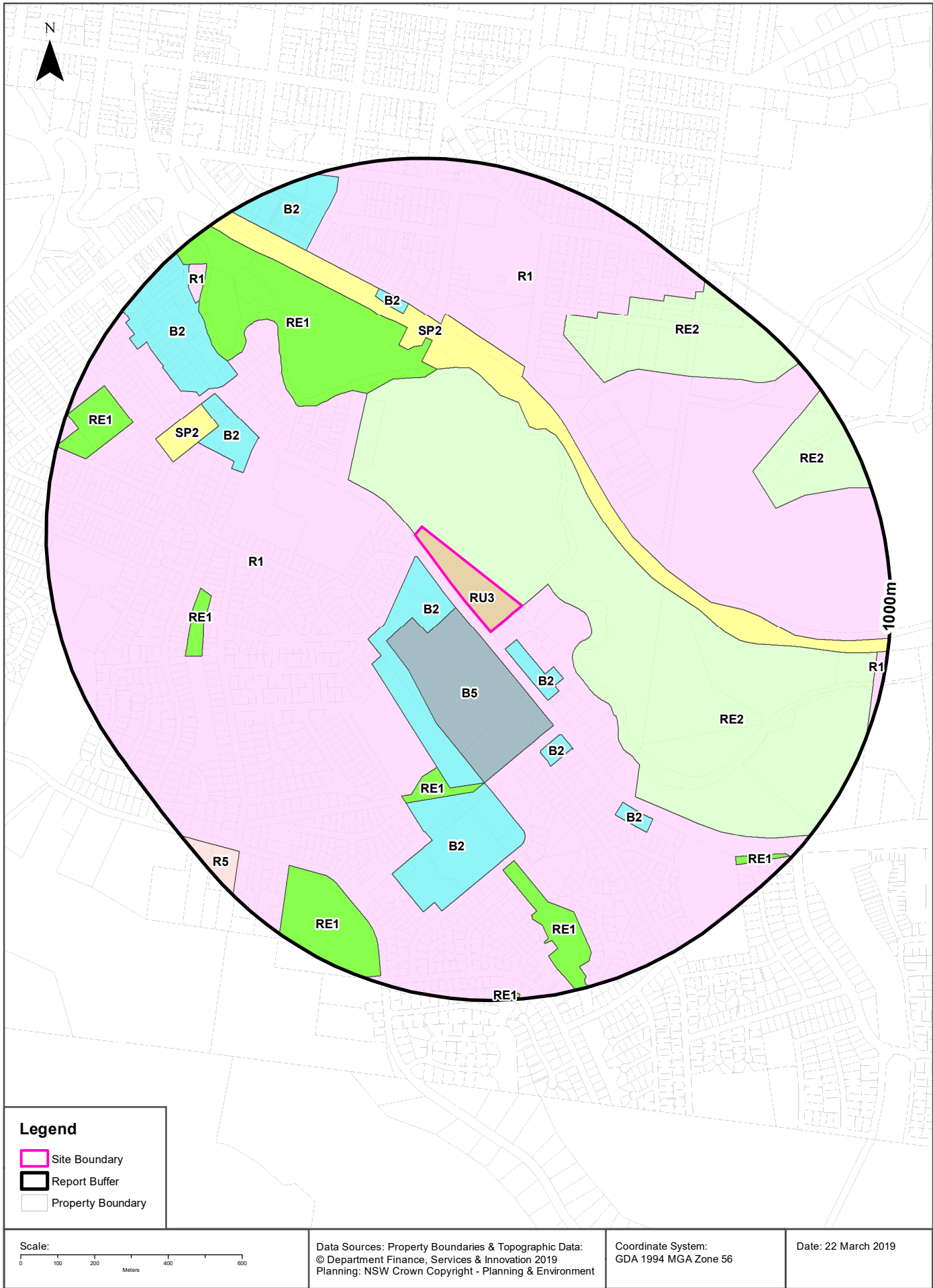
What SEPP State Significant Precincts exist within the dataset buffer?

Map Id	Precinct	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
N/A	No Records in Buffer							

State Environment Planning Policy Data Source: NSW Crown Copyright - Planning & Environment
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EPI Planning Zones

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Environmental Planning Instrument

Lot 62, Maitland Street, Muswellbrook, NSW 2333

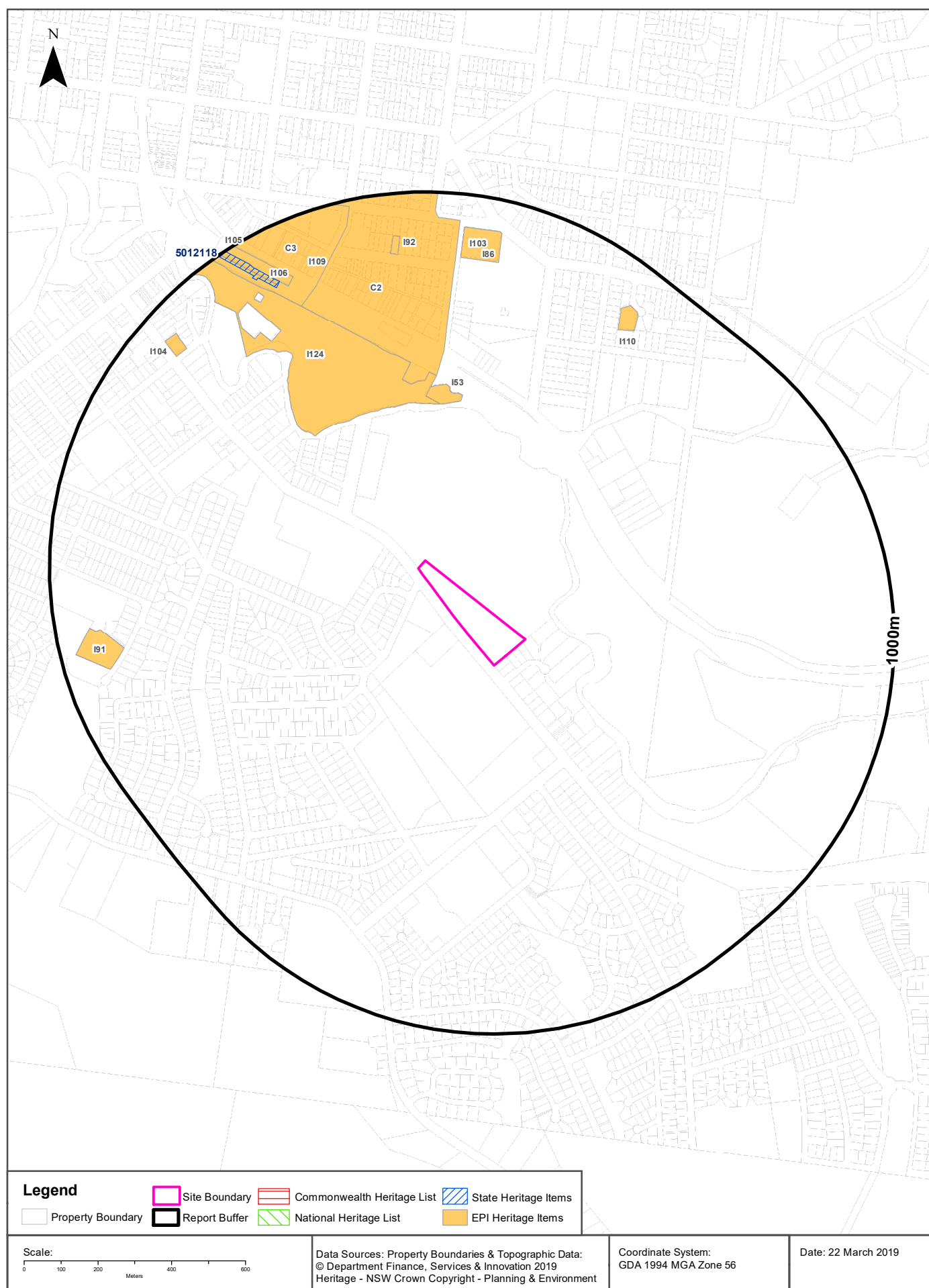
Land Zoning

What EPI Land Zones exist within the dataset buffer?

Zone	Description	Purpose	EPI Name	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RU3	Forestry		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	0m	Onsite
R1	General Residential		Muswellbrook Local Environmental Plan 2009	04/07/2014	04/07/2014	24/03/2016	Amendment No 11	0m	South East
RE2	Private Recreation		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	0m	East
B2	Local Centre		Muswellbrook Local Environmental Plan 2009	06/07/2012	15/06/2012	24/03/2016	Amendment No 7	30m	South West
B5	Business Development		Muswellbrook Local Environmental Plan 2009	06/07/2012	06/07/2012	24/03/2016	Amendment No 2	30m	South
B2	Local Centre		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	60m	South East
SP2	Infrastructure	Rail Infrastructure	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	313m	South West
B2	Local Centre		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	335m	South East
R1	General Residential		Muswellbrook Local Environmental Plan 2009	30/10/2015	30/10/2015	24/03/2016	Amendment No 12	352m	North
RE1	Public Recreation		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	393m	North West
RE1	Public Recreation		Muswellbrook Local Environmental Plan 2009	04/07/2014	04/07/2014	24/03/2016	Amendment No 11	395m	South
B2	Local Centre		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	409m	South
B2	Local Centre		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	495m	North West
RE1	Public Recreation		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	576m	West
B2	Local Centre		Muswellbrook Local Environmental Plan 2009	01/11/2013	01/11/2013	24/03/2016	Amendment No 10	582m	North
B2	Local Centre		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	584m	South East
SP2	Infrastructure	Defence	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	608m	North West
RE2	Private Recreation		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	614m	North East
RE1	Public Recreation		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	623m	South
B2	Local Centre		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	648m	North West
RE1	Public Recreation		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	797m	South West
B2	Local Centre		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	813m	North West
RE1	Public Recreation		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	823m	North West
R1	General Residential		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	863m	North West
RE1	Public Recreation		Muswellbrook Local Environmental Plan 2009	30/10/2015	30/10/2015	24/03/2016	Amendment No 12	893m	South East
R5	Large Lot Residential		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	906m	South West
RE1	Public Recreation		Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	24/03/2016	Amendment No 7	969m	South

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Lot 62, Maitland Street, Muswellbrook, NSW 2333



Heritage

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Commonwealth Heritage List

What are the Commonwealth Heritage List Items located within the dataset buffer?

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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National Heritage List

What are the National Heritage List Items located within the dataset buffer?

Note. Please click on Place Id to activate a hyperlink to online website.

Place Id	Name	Address	Place File No	Class	Status	Register Date	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: Australian Government Department of the Environment and Energy - Heritage Branch
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State Heritage Register - Curtilages

What are the State Heritage Register Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
5012118	Muswellbrook Railway Station and yard group	Main Northern railway, Muswellbrook	Muswellbrook	02/04/1999	01208	2820	843m	North West

Heritage Data Source: NSW Crown Copyright - Office of Environment & Heritage
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Environmental Planning Instrument - Heritage

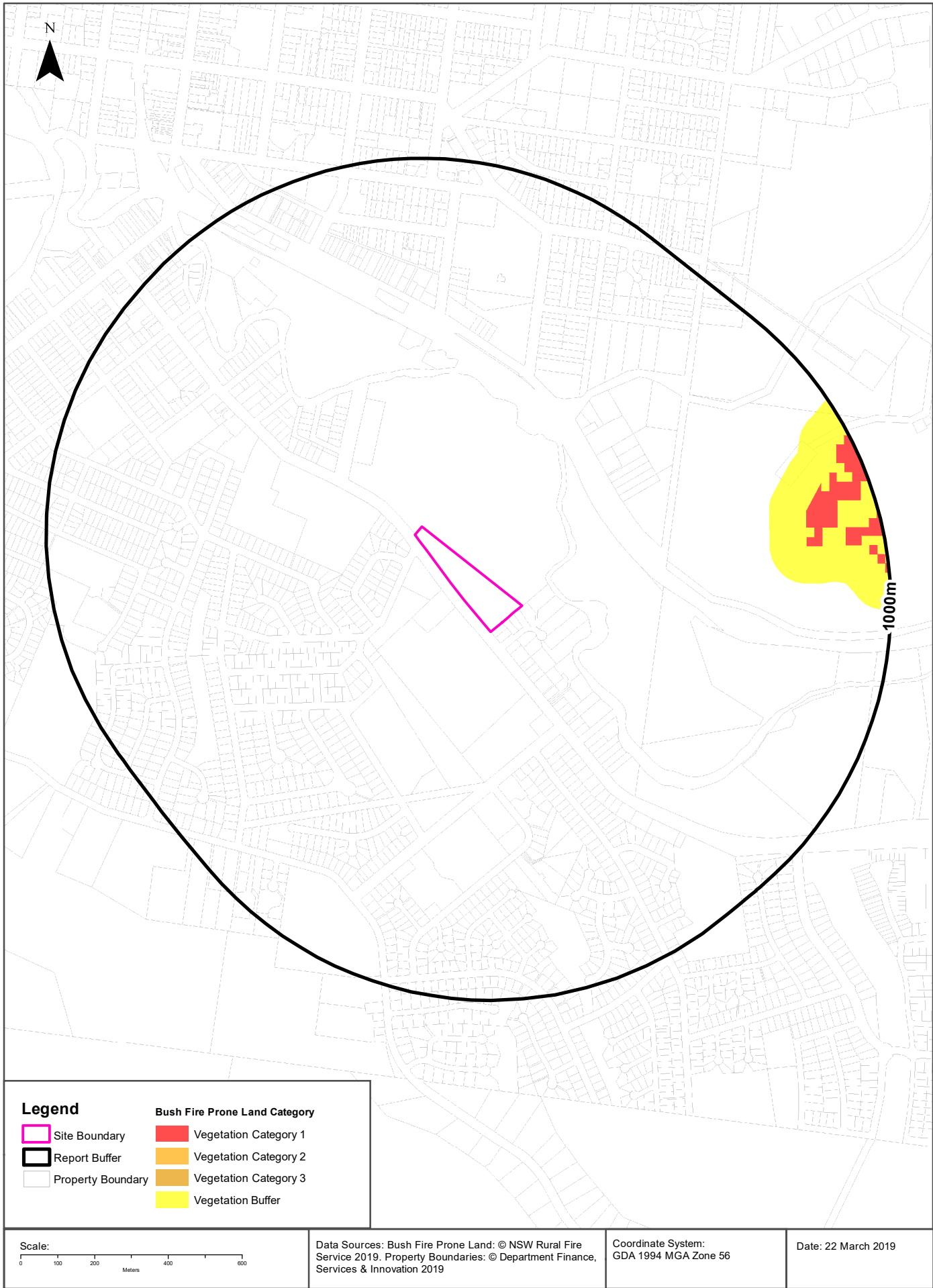
What are the EPI Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
I124	Fitzgerald/Olympic Park Gates	Item - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	426m	North West
I53	Railway Depot (Roundhouse)	Item - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	428m	North
C2	Residential Heritage Conservation Area	Conservation Area - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	481m	North

Map Id	Name	Classification	Significance	EPI Name	Published Date	Commenced Date	Currency Date	Distance	Direction
C3	Muswellbrook Business Heritage Conservation Area	Conservation Area - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	769m	North West
I110	House	Item - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	814m	North East
I109	Muswellbrook Hotel	Item - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	823m	North West
I91	"Skellatar" (St Mary's Catholic School)	Item - General	State	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	827m	West
I86	Muswellbrook Infants School	Item - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	828m	North
I103	Muswellbrook High School	Item - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	828m	North
I106	Railway Signal Box	Item - General	State	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	833m	North West
I105	Railway Station	Item - General	State	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	833m	North West
I92	Minch's Wine Shop	Item - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	834m	North
I105	Railway Station	Item - General	State	Muswellbrook Local Environmental Plan 2009	30/10/2015	30/10/2015	05/08/2016	849m	North West
I104	Hennot	Item - General	Local	Muswellbrook Local Environmental Plan 2009	15/06/2012	15/06/2012	05/08/2016	866m	North West

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Natural Hazards

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Bush Fire Prone Land

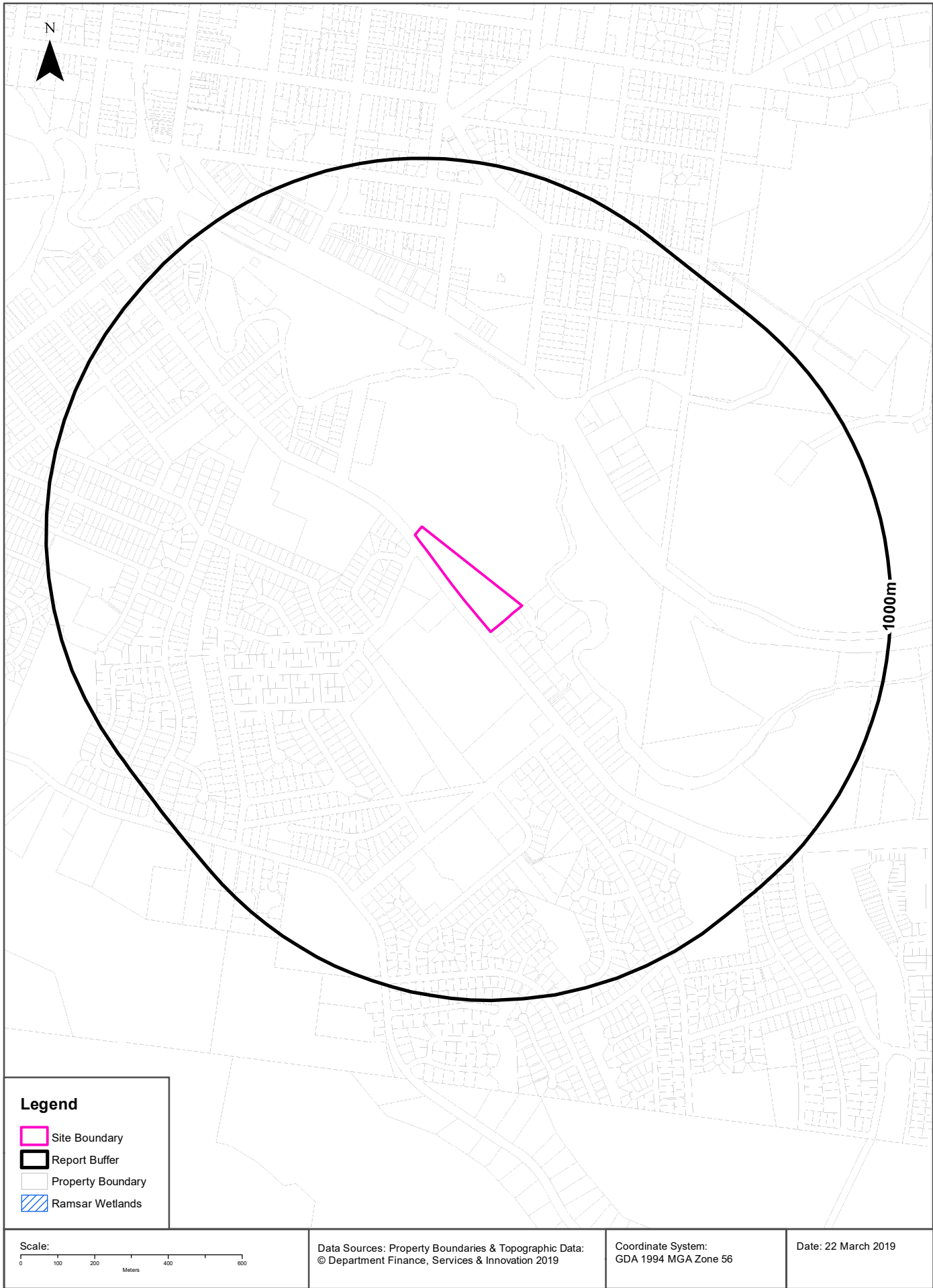
What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	687m	South West
Vegetation Category 1	787m	East

NSW Bush Fire Prone Land - © NSW Rural Fire Service under Creative Commons 4.0 International Licence

Ecological Constraints - Vegetation & Ramsar Wetlands

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Ecological Constraints

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Vegetation - Eastern Bushland Database (North Region)

What Vegetation exists within the dataset buffer?

MapId	Veg Code	Veg Desc	NVISCode	NVISDesc	Distance	Direction
N/A	No records within buffer					

Vegetation Data Source: NSW Office of Environment and Heritage

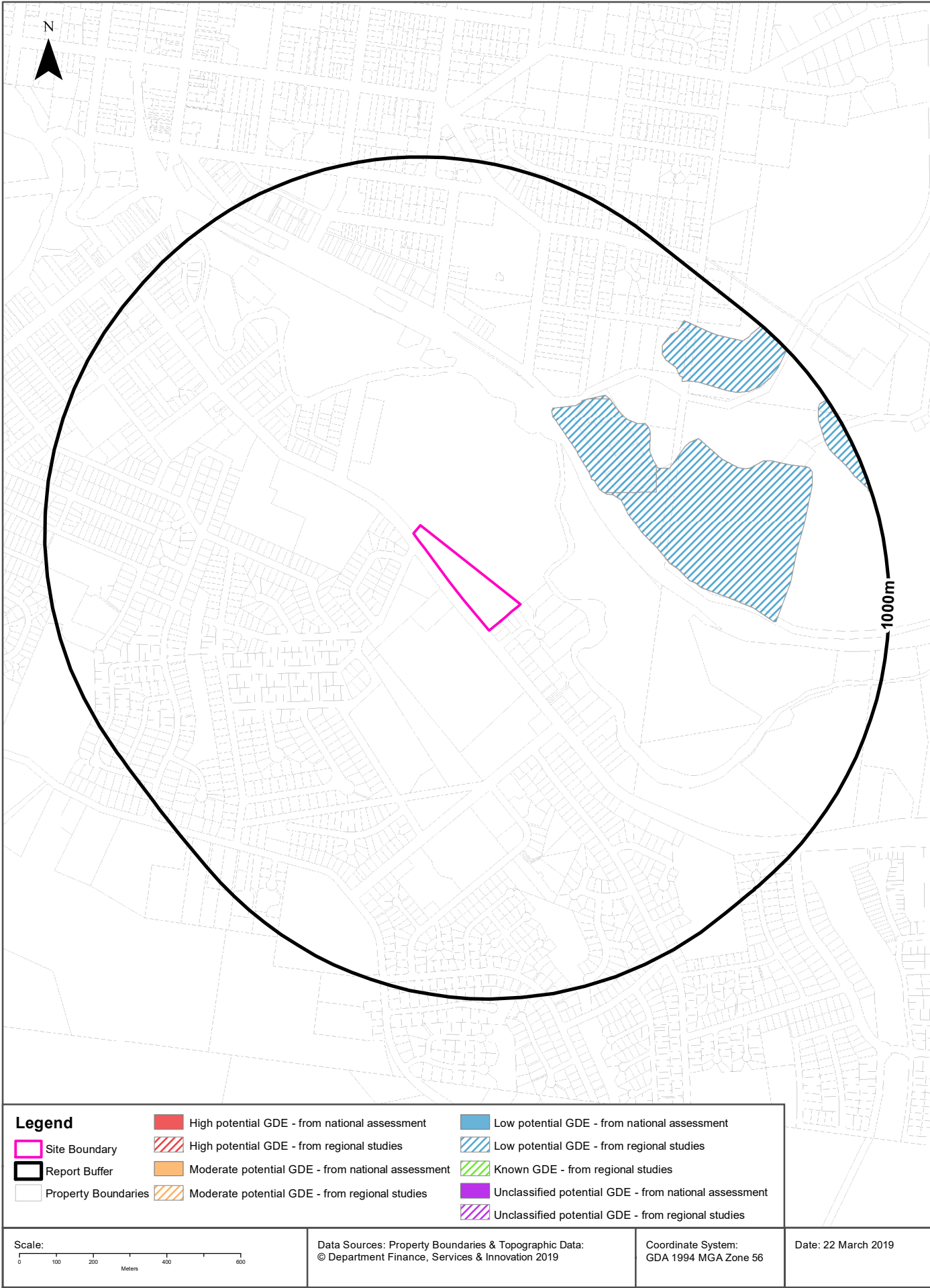
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Ramsar Wetlands

What Ramsar Wetland areas exist within the dataset 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

Lot 62, Maitland Street, Muswellbrook, NSW 2333

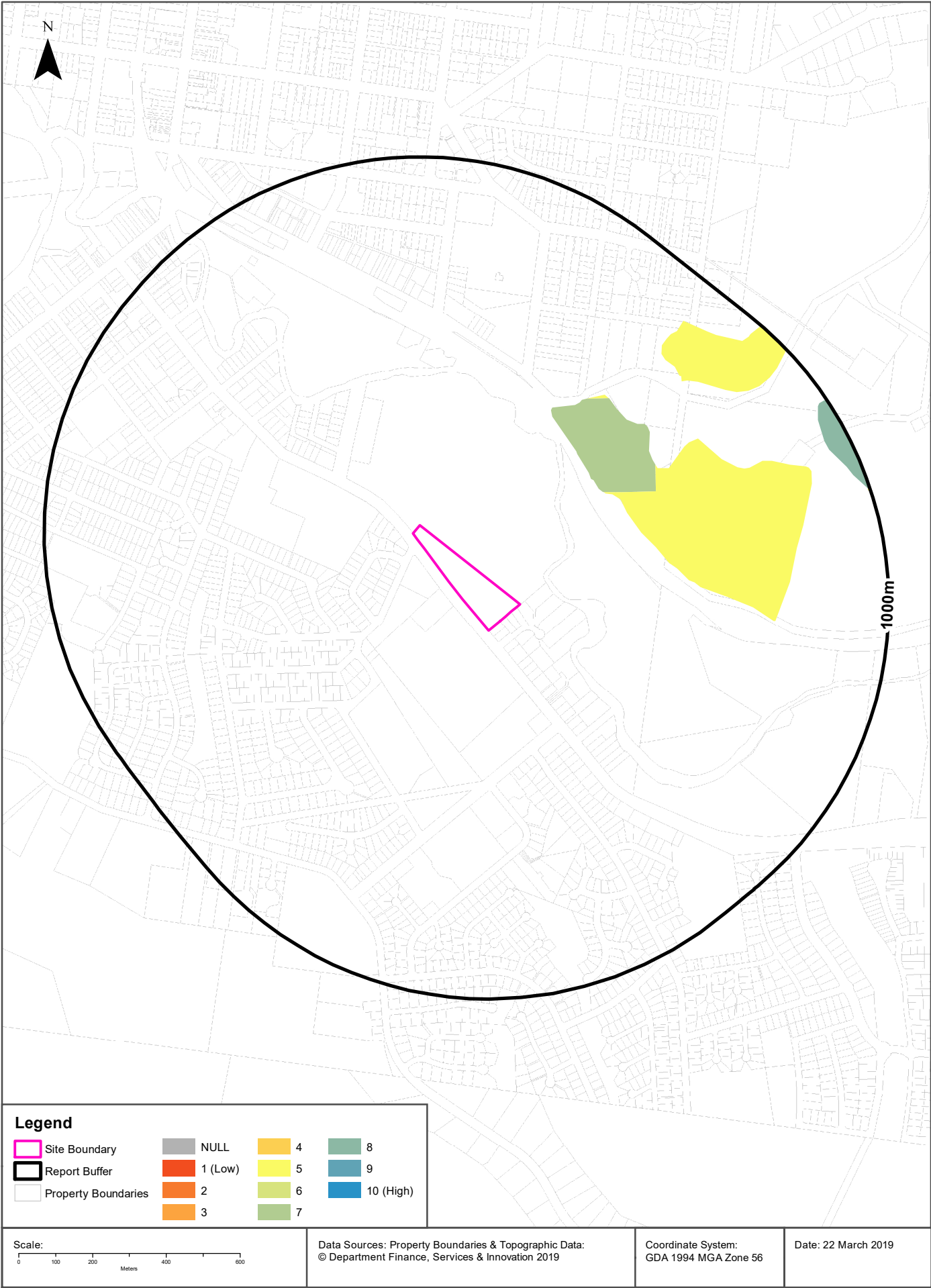
Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	Low potential GDE - from regional studies	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		378m

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology
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Ecological Constraints - Inflow Dependent Ecosystems Likelihood

Lot 62, Maitland Street, Muswellbrook, NSW 2333



Ecological Constraints

Lot 62, Maitland Street, Muswellbrook, NSW 2333

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	5	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		378m
Terrestrial	7	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		378m
Terrestrial	8	Plateau flank dissected into narrow strike ridges and valleys.	Vegetation		936m

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology
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Ecological Constraints

Lot 62, Maitland Street, Muswellbrook, NSW 2333

NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Anseranas semipalmata	Magpie Goose	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Not Sensitive	Critically Endangered	
Animalia	Aves	Ardea ibis	Cattle Egret	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Chthonicola sagittata	Speckled Warbler	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Circus assimilis	Spotted Harrier	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Falco subniger	Black Falcon	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needle-tail	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Lathamus discolor	Swift Parrot	Endangered	Category 3	Critically Endangered	
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Merops ornatus	Rainbow Bee-eater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Tyto tenebricosa	Sooty Owl	Vulnerable	Category 3	Not Listed	
Animalia	Mammalia	Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Not Sensitive	Endangered	
Animalia	Mammalia	Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Not Sensitive	Not Listed	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Mammalia	Miniopterus australis	Little Bentwing-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Mormopterus norfolkensis	Eastern Freetail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Myotis macropus	Southern Myotis	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Petaurus norfolkensis	Squirrel Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascogale tapoatafa	Brush-tailed Phascogale	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascogale cinereus	Koala	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Saccolaimus flaviventris	Yellow-bellied Sheath-tail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Vespertilio macrotis	Eastern Cave Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Reptilia	Delma impar	Striped Legless Lizard	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Acacia pendula	Weeping Myall, Boree	Endangered Population	Not Sensitive	Not Listed	
Plantae	Flora	Cymbidium canaliculatum	Tiger Orchid	Endangered Population	Category 2	Not Listed	
Plantae	Flora	Diuris tricolor	Pine Donkey Orchid	Endangered Population, Vulnerable	Category 2	Not Listed	
Plantae	Flora	Eucalyptus camaldulensis	River Red Gum	Endangered Population	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus glaucina	Slaty Red Gum	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Isotoma fluviatilis subsp. fluviatilis		Not Listed	Not Sensitive	Extinct	
Plantae	Flora	Lepidium hyssopifolium	Aromatic Peppergrass	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Prasophyllum petilum	Tarengo Leek Orchid	Endangered	Category 2	Endangered	

Data does not include NSW category 1 sensitive species.

NSW BioNet: © State of NSW and Office of Environment and Heritage

Data obtained 22/03/2019

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 - (a) any indirect, incidental, consequential, special or exemplary damages arising out of or in relation to the Report or these Terms; or
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 12. These Terms are subject to New South Wales law.



Land Title Records

BOX 1W
(DP1261496)



NEW SOUTH WALES
CERTIFICATE OF TITLE

REAL PROPERTY ACT, 1900



TORRENS TITLE REFERENCE	
100/1261496	
EDITION	DATE OF ISSUE
1	16/3/2020
CERTIFICATE AUTHENTICATION CODE	
4NL2-W2-YJWF	

I certify that the person described in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set forth in that Schedule) in the land within described subject to such exceptions, encumbrances, interests and entries as appear in the Second Schedule and to any additional entries in the Folio of the Register.

REGISTRAR GENERAL



LAND

LOT 100 IN DEPOSITED PLAN 1261496
AT MUSWELLBROOK.
LOCAL GOVERNMENT AREA: MUSWELLBROOK.
PARISH OF BROUGHAM COUNTY OF DURHAM
TITLE DIAGRAM: DP1261496

FIRST SCHEDULE

PACIFIC BROOK CHRISTIAN SCHOOL LTD

SECOND SCHEDULE

-
1. DP1112032 EASEMENT FOR SEWAGE RISING MAIN 5 METRE(S) WIDE
AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE
DIAGRAM
 2. AP319808 EASEMENT FOR PIPELINE 5 METRE(S) WIDE AFFECTING THE
PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM

**** END OF CERTIFICATE ****

ANY ATTEMPT TO ALTER THIS CERTIFICATE COULD RESULT IN HEAVY FINES OR IMPRISONMENT (S.141 REAL PROPERTY ACT).

Certificate of Title

Certificate of Title

ADVANCE LEGAL SEARCHERS PTY LTD

(ACN 147 943 842)
ABN 82 147 943 842

18/36 Osborne Road,
Manly NSW 2095

Telephone: +612 9977 6713
Mobile: 0412 169 809
Email: search@alsearchers.com.au

22nd March 2019

ENVIRONMENTAL INVESTIGATION SERVICES
PO BOX 976,
NORTH RYDE BC NSW 1670

Attention: Vittal Boggaram,

RE:

**Lot 62 Maitland Road,
Muswellbrook
Reference E32307B**

Current Search

Folio Identifier 62/1208238 (title attached)
DP 1208238 (plan attached)
Dated 21st March 2019
Registered Proprietor:
THE STATE OF NEW SOUTH WALES

Title Tree
Lot 62 DP 1208238

Folio Identifier 62/1208238

CA 174152

Crown Land

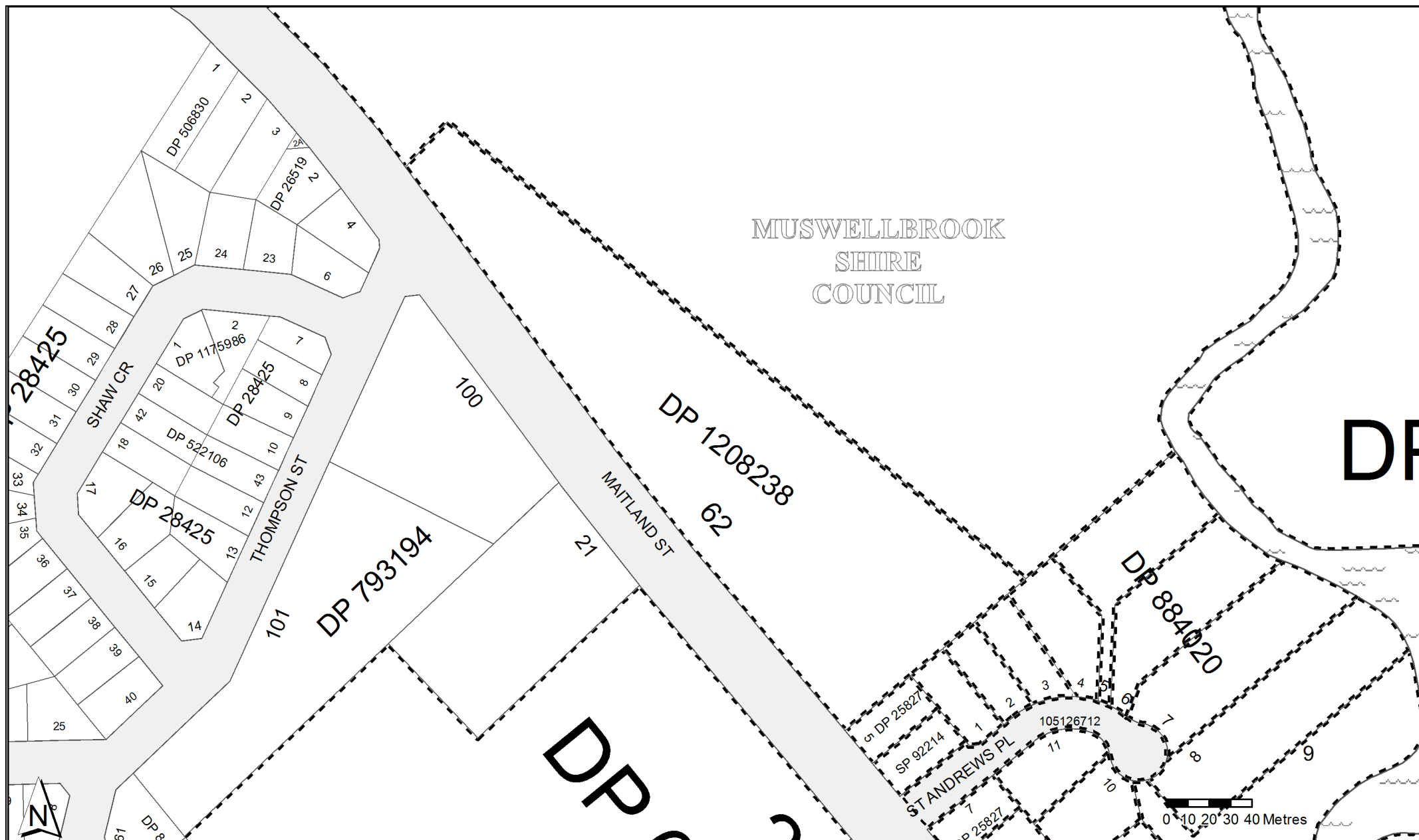
Government Gazette 23rd November 2018 Folio 8879

Government Gazette 28th June 1963 Folio's 1891 & 1892

Government Gazette 24th September 1884 Folio 6412

Summary of proprietor(s)
Lot 62 DP 1208238

Year	Proprietor(s)
	(Lot 62 DP 1208238)
2015 – todate	The State of New South Wales
	(Part State Forest Parish Brougham – Area 6 Acres 0 Roods 1 ½ Perches)
Prior – 2015	Crown Land
<i>(1963 – 2018)</i>	<i>(Appropriated for Tree Nursery and Experimental planting area, Part Muswellbrook State Forest vide Government Gazette 28th June 1963 Fol 1891-2)</i>
<i>(1884 – 1963)</i>	<i>(Resumed for Public Park vide Government Gazette 24th September 1884 Fol 6412)</i>



	Status	Surv/Comp	Purpose
DP25827 Lot(s): 5, 7			
 PLAN IS FOR MINERALS ONLY SP1189254	REGISTERED	COMPILATION	DEPARTMENTAL
DP528526 Lot(s): 41			
 PLAN IS FOR MINERALS ONLY SP1189254	REGISTERED	COMPILATION	DEPARTMENTAL
DP616590 Lot(s): 22			
 DP1243653	REGISTERED	SURVEY	EASEMENT
DP880784 Lot(s): 89			
 PLAN IS FOR MINERALS ONLY SP1189254	REGISTERED	COMPILATION	DEPARTMENTAL
DP884020 Lot(s): 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11			
 PLAN IS FOR MINERALS ONLY SP1189254	REGISTERED	COMPILATION	DEPARTMENTAL
DP1030447 Lot(s): 264			
 DP93315	HISTORICAL	COMPILATION	DEPARTMENTAL
 NSW GAZ. 03-12-2004			Folio : 8930
DECLARED CROWN LAND LOT 264 DP1030447. RESERVATION OF CROWN LAND (RESERVE NO. 1010588)			
DP1208238 Lot(s): 62			
 DP1112032	REGISTERED	SURVEY	EASEMENT
 NSW GAZ. 23-11-2018			Folio : 8879
REVOKE DEDICATION AS MUSWELLBROOK STATE FOREST NO. 975 OF LOT 62 DP1208238			
SP92214			
 DP25827	HISTORICAL	SURVEY	UNRESEARCHED
 DP1197004	HISTORICAL	SURVEY	REDEFINITION
 PLAN IS FOR MINERALS ONLY SP1189254	REGISTERED	COMPILATION	DEPARTMENTAL
Road Polygon Id(s): 105126712			
 PLAN IS FOR MINERALS ONLY SP1189254	REGISTERED	COMPILATION	DEPARTMENTAL

Caution: This information is provided as a searching aid only. Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For **ALL** **ACTIVITY PRIOR TO SEPTEMBER 2002** you must refer to the RGs Charting and Reference Maps.

Plan	Surv/Comp	Purpose
DP25827	SURVEY	UNRESEARCHED
DP26519	SURVEY	UNRESEARCHED
DP28425	SURVEY	UNRESEARCHED
DP229323	SURVEY	SUBDIVISION
DP506830	COMPILATION	SUBDIVISION
DP522106	COMPILATION	SUBDIVISION
DP528526	SURVEY	SUBDIVISION
DP616590	SURVEY	SUBDIVISION
DP793194	SURVEY	SUBDIVISION
DP843290	SURVEY	SUBDIVISION
DP857936	SURVEY	SUBDIVISION
DP880784	SURVEY	CONSOLIDATION
DP884020	SURVEY	SUBDIVISION
DP1030447	SURVEY	SUBDIVISION
DP1175986	SURVEY	SUBDIVISION
DP1175986	UNRESEARCHED	SUBDIVISION
DP1208238	COMPILATION	CROWN LAND CONVERSION
SP92214	COMPILATION	STRATA PLAN

Caution: This information is provided as a searching aid only. Whilst every endeavour is made to ensure that current map, plan and titling information is accurately reflected, the Registrar General cannot guarantee the information provided. For **ALL**

ACTIVITY PRIOR TO SEPTEMBER 2002 you must refer to the RGs Charting and Reference Maps.

Form 1

OFFICE USE ONLY

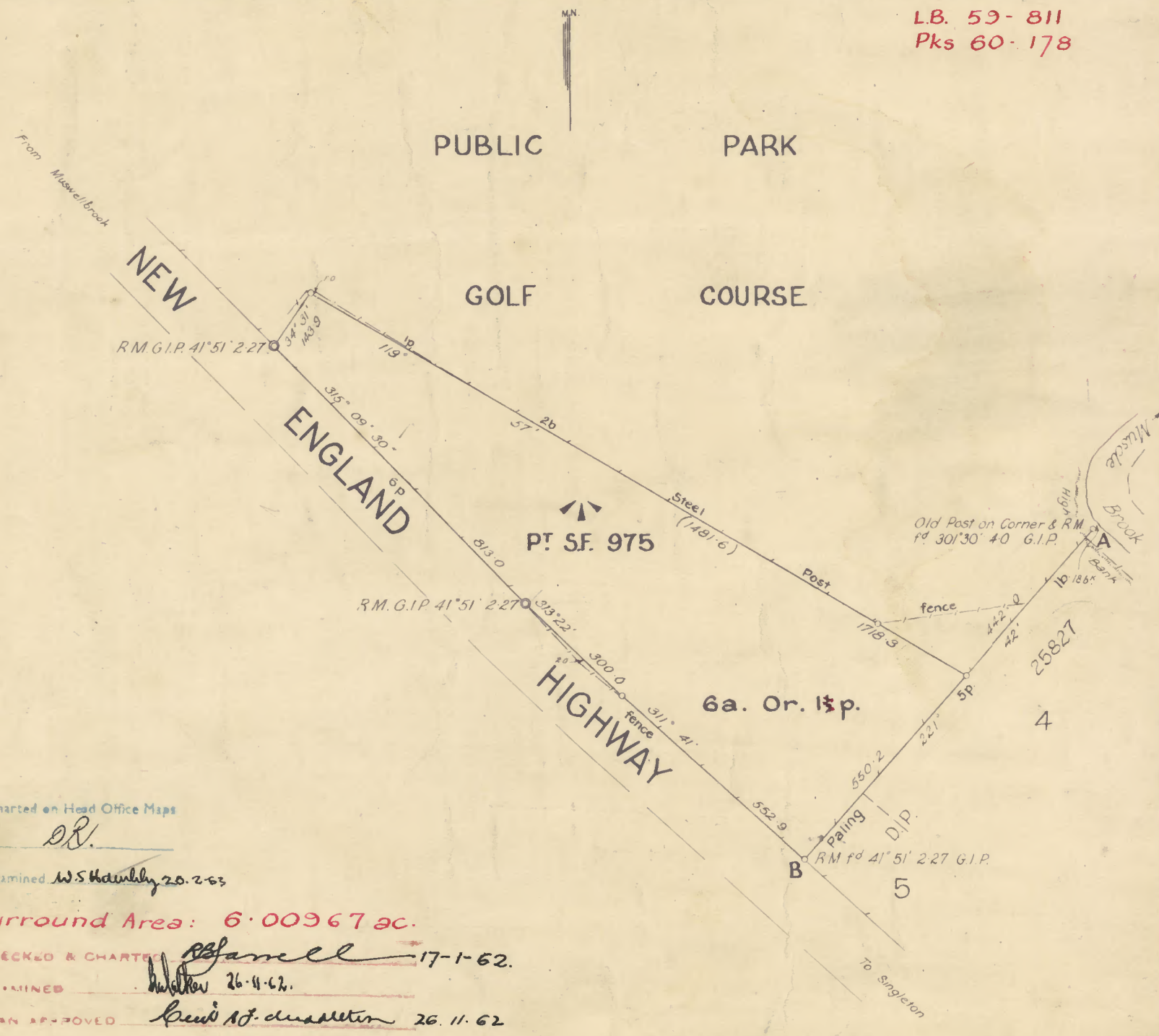
PLAN OF PART OF PUBLIC PARK TO BE
DEDICATED AS STATE FOREST
NOTATION PLAN

Original Plan not in this Department

Mun. Shire City.....Muswellbrook.....
Town or Locality.....Muswellbrook.....
Parish.....Brougham.....
County.....Durham.....10 Scale..3.Chains to an Inch

Registered:
C.A.:.....
Title System:.....
Purpose:
Ref. Map:
Last Plan:

LB. 59-811
Pks 60-178



Charted on Head Office Maps

Examined *W.S. Haulby* 20.2.63

Surround Area: 6.00967 ac.

CHECKED & CHARTED *R. J. Farrell* 17-1-62.

MINED *W. J. H. H. H. H.* 26.4.62.

PLAN APPROVED *Genl. H. H. H. H.* 26.11.62

Signatures, Seals and Statements of Dedications and Easements.

Within an area resumed for Public Park 24th September, 1884.
Pt. Muswellbrook State Forest N° 975 Decd° 28-6-63 (See M° 6962 M° 6)
Appropriated for Tree Nursery & Experimental Planting Area Gaz. 1-3-63. (see M° 6962 M° 6)

I, *Frank W. H. H. H.*.....
of *Town*.....
a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan is accurate and has been made (1) by me (2) under my immediate supervision in accordance with the Survey Practice Regulations, 1933 and was completed on *1.6.61*.....
Signature *P. W. H. H. H.*.....
Surveyor registered under Surveyors Act, 1929 as amended.
Datum Line of Azimuth *AB FB 50°* Page 15

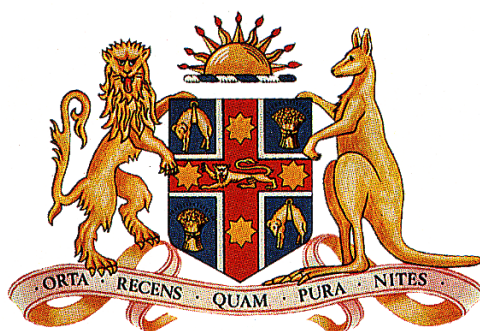
Approved by Council. I hereby certify that the requirements of the Local Government Act, 1919 (other than the requirements for registration of plans), have been complied with by the applicant in relation to the proposed subdivision and/or new roads set out herein.
Subdivision No.....Date.....
Council Clerk.....

PLAN MICROFILMED
NO ADDITIONS OR AMENDMENTS TO BE MADE

6961-3070 Ms. 6961 Md.



LP1Ref.: TC667



Government Gazette

of the State of

New South Wales

Number 125

Friday, 23 November 2018

The New South Wales Government Gazette is the permanent public record of official NSW Government notices. It also contains local council, private and other notices.

From 1 January 2018, each notice in the Government Gazette has a unique identifier that appears in square brackets at the end of the notice and that can be used as a reference for that notice (for example, [n2018-14]).

The Gazette is compiled by the Parliamentary Counsel's Office and published on the NSW legislation website (www.legislation.nsw.gov.au) under the authority of the NSW Government. The website contains a permanent archive of past Gazettes.

To submit a notice for gazettal – see Gazette Information.

GOVERNMENT NOTICES

Rural Fire Service Notices

TOTAL FIRE BAN ORDER

Prohibition on the Lighting, Maintenance and Use of Fires in the Open Air

Being of the opinion that it is necessary or expedient in the interests of public safety to do so, I direct by this order that the following parts of the State for the periods specified the lighting, maintenance or use of any fire in the open air is prohibited (subject to the exemptions specifically listed hereunder and further set out in the *Schedule of standard exemptions to total fire bans* published in the NSW Government Gazette No 16 of 9 February 2018):

Fire Weather Area	Classes of Exemption
Greater Hunter	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18

This direction shall apply for the periods specified hereunder:

00:01 hours to 23:59 hours on Thursday 22 November 2018.

SHANE FITZSIMMONS AFSM

Commissioner

By delegation from the Minister for Emergency Services

[n2018-3970]

Miscellaneous Instruments

FIRE BRIGADES ACT 1989

Order under Section 5 (2)

D. HURLEY, Governor

I, General The Honourable DAVID HURLEY, AC DSC (Ret'd), Governor of the State of New South Wales, with the advice of the Executive Council and in pursuance of section 5 (2) of the *Fire Brigades Act 1989*, do, by this my Order, vary the Orders published in the Government Gazette No 80 of 15 June 2007 and reconstitute the Tumbarumba Fire District in the following Schedule and declare that the provisions of the Fire Brigades Act shall apply to the area described in the Schedule.

Signed at Sydney, this 17th day of October 2018

DAVID HURLEY,
Governor

By His Excellency's Command

TROY GRANT MP,
Minister for Emergency Services

SCHEDULE

In this schedule, a reference to a local government area is a reference to that area with boundaries as at the date of publication of the Order in the Gazette.

Tumbarumba Fire District

Comprising the existing Fire District in Snowy Valley Council Local Government Area, additions and deletions as delineated on Map No. 466 kept in the office of Fire & Rescue NSW.

[n2018-3971]

Planning and Environment Notices

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 6 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant development under clause 6 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 19/11/18

Stephen O'Donoghue

A/Director

Resource and Energy Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Woodlawn Mine project' (07_0143), approved by a delegate for the Minister for Planning under section 75J of the Act on 4 July 2013 and as subsequently modified under section 75W.	All land identified in Schedule 1 of the approval to carry out the development known as the 'Woodlawn Mine project' (07_0143) as in force on the date of this Order.

[n2018-3972]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 6 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant development under clause 6 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 19/11/18

Stephen O'Donoghue

A/Director

Resource and Energy Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Boco Rock Wind Farm project' (09_0103), approved by the Minister for Planning under section 75J of the Act on 9 August 2010.	All land identified in Schedule 1 of the approval to carry out the development known as the 'Boco Rock Wind Farm project' (09_0103) as in force on the date of this Order.

[n2018-3973]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 6 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant development under clause 6 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 19/11/18

Stephen O'Donoghue
A/Director
Resource and Energy Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Baal Bone Coal Project' (09_0178), approved by a delegate of the Minister for Planning under section 75J of the Act on 14 January 2011 and as subsequently modified under section 75W.	All land identified in Schedule 1 of the approval to carry out the development known as the 'Baal Bone Coal Project' (09_0178), as in force on the date of this Order.

[n2018-3974]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 6 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant development under clause 6 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 19/11/18

Stephen O'Donoghue
A/Director
Resource and Energy Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Dargues Reef Gold Project' (10_0054), approved by order of the NSW Land and Environment Court under section 75J of the Act on 8 February 2012, as subsequently modified under section 75W of the Act.	All land identified in Schedule 1 of the approval to carry out the development known as the 'Dargues Reef Gold Project' (10_0054) as in force on the date of this Order.

[n2018-3975]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 6 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant development under clause 6 of Schedule 2 to the *Environmental Planning and*

Assessment (Savings, Transitional and Other Provisions) Regulation 2017, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 15.11.18

Jessie Evans
Acting Director
Resource Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land (as modified)
Development known as the 'Abel Coal Project' (MP 05_0136), approved by the Minister under section 75J of the Act on 7 June 2007, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Abel Coal Project' (MP 05_0136) as in force on the date of this Order.
Development known as the 'Appin Gas Drainage Project' (MP 08_0256), approved by the Minister under section 75J of the Act on 2 October 2009, as subsequently modified under 75W of the Act.	All land identified in Schedule 1 of the approval to carry out the development known as the 'Appin Gas Drainage Project' (MP 08_0256) as in force on the date of this Order.
Development known as the 'Appin Ventilation Shaft No. 6 Project' (MP 10_0079), approved by the Minister under section 75J of the Act on 4 May 2011, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Appin Ventilation Shaft No. 6 Project' (MP 10_0079) as in force on the date of this Order.
Development known as the 'East Appin 66kV Switching Station – West Cliff Coal Mine Project' (MP 06_0001), approved by the Minister under section 75J of the Act on 29 July 2006, as subsequently modified under 75W of the Act.	All land identified in Schedule 1 of the approval to carry out the development known as the 'East Appin 66kV Switching Station – West Cliff Coal Mine Project' (MP 06_0001) as in force on the date of this Order.
Development known as the 'Douglas North Electricity Substation – Appin Coal Mine Project' (MP 06_0287), approved by the Minister under section 75J of the Act on 6 July 2007, as subsequently modified under 75W of the Act.	All land identified in Schedule 1 of the approval to carry out the development known as the 'Douglas North Electricity Substation – Appin Coal Mine Project' (MP 06_0287) as in force on the date of this Order.
Development known as the 'Ashton Coal Mine – South East Open Cut Project' (MP 08_0182), approved by the Land and Environment Court under section 75J of the Act on 17 April 2015, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Ashton Coal Mine – South East Open Cut Project' (MP 08_0182) as in force on the date of this Order.
Development known as the 'Austar Coal Mine Project – Stage 3' (MP 08_0111), approved by the Minister under section 75J of the Act on 6 September 2009, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Austar Coal Mine Project – Stage 3' (MP 08_0111) as in force on the date of this Order.
Development known as the 'Awaba Colliery Mining Project' (MP 10_0038), approved by the Planning Assessment Commission of New South Wales under section 75J of the Act on 13 May 2011, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Awaba Colliery Mining Project' (MP 10_0038) as in force on the date of this Order.
Development known as the 'Bloomfield Coal Project' (MP 07_0087), approved by the Minister under section 75J of the Act on 3 September 2009, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Bloomfield Coal Project' (MP 07_0087) as in force on the date of this Order.
Development known as the 'Bulli Seam Operations Project' (MP 08_0150), approved by the Minister under section 75J of the Act on 22 December 2011, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Bulli Seam Operations Project' (MP 08_0150) as in force on the date of this Order.

Column 1 Development	Column 2 Land (as modified)
Development known as the 'Central Coast Sand Quarry Project' (MP 08_0173), approved by the Minister under section 75J of the Act on 1 August 2014	All land identified in Schedule 1 of the approval to carry out the development known as the 'Central Coast Sand Quarry Project' (MP 08_0173) as in force on the date of this Order.
Development known as the 'Drayton Mine Extension Project' (MP 06_0202), approved by the Minister under section 75J of the Act on 1 February 2008, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Drayton Mine Extension Project' (MP 06_0202) as in force on the date of this Order.
Development known as the 'Dunloe Park Sand Project' (MP 06_0030), approved by the Minister under section 75J of the Act on 24 November 2008	All land identified in Schedule 1 of the approval to carry out the development known as the 'Dunloe Park Sand Project' (MP 06_0030) as in force on the date of this Order.
Development known as the 'Duralie Extension Project' (MP 08_0203), approved by the Land and Environment Court under section 75J of the Act on 10 November 2011, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Duralie Extension Project' (MP 08_0203) as in force on the date of this Order.
Development known as the 'Fullerton Cove Sand Extraction Project' (MP 07_0145), approved by the Minister under section 75J of the Act on 18 July 2009, as subsequently modified under 75W of the Act.	All land identified in Schedule 1 of the approval to carry out the development known as the 'Fullerton Cove Sand Extraction Project' (MP 07_0145) as in force on the date of this Order.
Development known as the 'Grants Road Sand Quarry Extension Project' (MP 08_0099), approved by the Minister under section 75J of the Act on 25 July 2014, as subsequently modified under 75W of the Act.	All land identified in Schedule 1 of the approval to carry out the development known as the 'Grants Road Sand Quarry Extension Project' (MP 08_0099) as in force on the date of this Order.
Development known as the 'Green Valley Sand Project' (MP 08_0230), approved by the Minister under section 75J of the Act on 21 June 2013, as subsequently modified under 75W of the Act.	All land identified in Appendix 1 of the approval to carry out the development known as the 'Grants Road Sand Quarry Extension Project' (MP 08_0230) as in force on the date of this Order.

[n2018-3976]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 5 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant infrastructure under clause 5 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 20/11/18

Steve O'Donoghue

A/Director

Resource and Energy Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Marulan Power Station 1 Project' (07_0175), approved by the Minister for Planning under section 75O of the Act on 24 October 2009.	All land identified in Schedule 1 of the approval to carry out the development known as 'Marulan Power Station 1 Project' (07_0175), as in force on the date of this Order.

[n2018-3977]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 5 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant infrastructure under clause 5 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 20/11/18

Steve O'Donoghue

A/Director

Resource and Energy Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Marulan Power Station 2 Project' (07_0176), approved by the Minister for Planning under section 75O of the Act on 24 October 2009.	All land identified in Schedule 1 of the approval to carry out the development known as 'Marulan Power Station 2 Project' (07_0176), as in force on the date of this Order.

[n2018-3978]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 5 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant infrastructure under clause 5 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 20/11/18

Steve O'Donoghue

A/Director

Resource and Energy Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Tallawarra Stage B Gas Turbine Power Station Project' (07_0124), approved by the Minister for Planning under section 75J of the Act on 21 December 2010, as subsequently modified under section 75W of the Act.	All land identified in Schedule 1 of the approval to carry out the development known as 'Tallawarra Stage B Gas Turbine Power Station Project' (07_0124), as in force on the date of this Order.

[n2018-3979]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 6 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant development under clause 6 of Schedule 2 to the *Environmental Planning and Assessment Act 1979* (the Act).

Assessment (Savings, Transitional and Other Provisions) Regulation 2017, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 20/11/18

Steve O'Donoghue
A/Director
Resource and Energy Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Mount Piper Ash Placement Project' (09_0186), approved by a delegate of the Minister for Planning under section 75J of the Act on 16 February 2012.	All land identified in Schedule 1 of the approval to carry out the development known as Mount Piper Ash Placement Project' (09_0186), as in force on the date of this Order.

[n2018-3980]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 6 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant development under clause 6 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 20/11/18

Steve O'Donoghue
A/Director
Resource and Energy Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Wallerawang Ash Dam Project' (07_0005), approved by the Minister for Planning under section 75J of the Act on 26 November 2008, as subsequently modified under section 75W of the Act.	All land identified in Schedule 1 of the approval to carry out the development known as 'Wallerawang Ash Dam Project' (07_0005) as in force on the date of this Order.

[n2018-3981]

ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

Order under clause 6 of Schedule 2 to the Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017

Under delegation from the Minister for Planning, I declare the development specified in column 1 of the table in Schedule 1 to this Order on the land specified in the corresponding row in column 2 of the table in Schedule 1 to this Order to be State significant development under clause 6 of Schedule 2 to the *Environmental Planning and Assessment (Savings, Transitional and Other Provisions) Regulation 2017*, for the purposes of the *Environmental Planning and Assessment Act 1979* (the Act).

This Order takes effect upon publication in the New South Wales Government Gazette.

Dated: 10 September 2018

Chris Ritchie
Director
Industry Assessments

SCHEDULE 1

Column 1 Development	Column 2 Land
Development known as the 'Jacks Gully Alternative Waste Technology Facility' (MP 05_0098), approved by the Minister under section 75J of the Act on 7 September 2006 as subsequently modified under section 75W of the Act.	All land identified in Schedule 1 of the approval to carry out the development known as the 'Jacks Gully Alternative Waste Technology Facility' (MP 05_0098 MOD 4) as in force on the date of this Order.

[n2018-3982]

Roads and Maritime Notices

MARINE SAFETY ACT 1998

MARINE NOTICE

Section 12(2)

REGULATION OF VESSELS – EXCLUSION ZONE

Location

Lake Illawarra, Kanahooka – Koonawarra Bay, between Elizabeth Point and Kanahooka Point.

Duration

8.30am to 4.30pm – Saturday 1 and Sunday 2 December 2018.

Detail

A competitive water ski race will be conducted on the navigable waters of Lake Illawarra at the location specified above, involving the use of high speed powered vessels, persons being towed at speed using tow-lines and the possibility of persons in the water from time to time, presenting a significant potential hazard to other waterway users.

There will be support vessels present to manage the event and competing vessels.

An **EXCLUSION ZONE** is specified during the event which will be marked by buoys and patrolled by control vessels.

Unauthorised vessels and persons are strictly prohibited from entering the exclusion zone.

All vessel operators and persons in the vicinity of the event should keep a proper lookout, keep well clear of competing and support vessels and exercise extreme caution.

Penalties may apply (section 12(5) – *Marine Safety Act 1998*)

For full details visit the Roads and Maritime Services website – www.rms.nsw.gov.au/maritime

Marine Notice: SO1875

Date: 21 November 2018

Deon Voyer
Manager Operations South
Delegate

[n2018-3983]

ROADS ACT 1993

LAND ACQUISITION (JUST TERMS COMPENSATION) ACT 1991

Notice of Compulsory Acquisition and Dedication as Public Road of Land at Ashley and Moree in the Moree Plains Shire Council Area

Roads and Maritime Services by its delegate declares, with the approval of His Excellency the Governor, that the land described in the schedule below is acquired by compulsory process under the provisions of the *Land Acquisition (Just Terms Compensation) Act 1991* for the purposes of the *Roads Act 1993* and further dedicates the land as public road under Section 10 of the *Roads Act 1993*.

K DURIE

Manager, Compulsory Acquisition & Road Dedication
Roads and Maritime Services

Schedule

All those pieces or parcels of land situated in the Moree Plains Shire Council area, Parishes of Bogree and Carore and County of Courallie, shown as:

Lot 11 Deposited Plan 1237097, being part of the land in Certificate of Title 7012/1020966;

Lot 12 Deposited Plan 1237097, being part of the land in Certificate of Title 7011/1020966;

Lot 13 Deposited Plan 1237097, being part of the land in Certificate of Title 7005/1020968;

Lot 14 Deposited Plan 1237097, being part of the land in Certificate of Title 24/751751;
Lot 15 Deposited Plan 1237097, being part of the land in Certificate of Title 4/1114920;
Lot 16 Deposited Plan 1237097, being part of the land in Certificate of Title 3/1114920;
Lots 17 and 18 Deposited Plan 1237097, being part of the land in Certificate of Title 7302/1153270; and
Lot 19 Deposited Plan 1237097, being part of the land in Certificate of Title 7019/1060177;
excluding any existing easements from the compulsory acquisition of the land described above.
The land is said to be in the possession of the Crown and North West Local Land Services (reserve trust manager).
(RMS Papers: SF2018/282102; RO SF2017/261019)

[n2018-3984]

ROADS ACT 1993

Order – Sections 46, 48, 54 and 67

Kiama Municipal Council area

Declaration as Freeway of part of the Princes Highway at Jamberoo

I, the Minister for Roads, Maritime and Freight, pursuant to Sections 46, 48, 54 and 67 of the *Roads Act 1993*, by this order:

1. dedicate as public road the land described in the schedule under;
2. declare to be a main road the said public road described in the schedule;
3. declare to be a freeway the said main road described in the schedule; and
4. declare that access to the said freeway is restricted.

The Hon MELINDA PAVEY MP
Minister for Roads, Maritime and Freight

Schedule

All that piece or parcel of land situated in the Kiama Municipal Council area, Parish of Kiama and County of Camden, shown as:

Lot 443 Deposited Plan 1201831.

The above Lot is shown in RMS Plan 0001 236 AC 4014.

(RMS Papers: SF2018/274964; RO SF2013/137116)

[n2018-3985]

Mining and Petroleum Notices

Pursuant to section 136 of the *Mining Act 1992* and section 16 of the *Petroleum (Onshore) Act 1991*

NOTICE is given that the following applications have been received:

EXPLORATION LICENCE APPLICATIONS (ELA)

ELA5738, AUSTRALIAN CONSOLIDATED GOLD HOLDINGS PTY LTD, for Group 1, dated 7 November 2018.

ELA5739, AUSTRALIAN CONSOLIDATED GOLD HOLDINGS PTY LTD, for Group 1, dated 7 November 2018.

ELA5740, GLENN NORMAN CAMPBELL, for Group 6, dated 13 November 2018.

[n2018-3986]

NOTICE is given that the following applications have been granted:

EXPLORATION LICENCE (EL)

ELA5326, now EL8803, P.G.M. MANAGEMENT PTY. LTD, for Group 1, dated 29 October 2018.

ELA5512, now EL8803, P.G.M. MANAGEMENT PTY. LTD, for Group 1, dated 29 October 2018.

ELA5708, now EL8804, RIMFIRE PACIFIC MINING N.L, for Group 1, dated 31 October 2018.

ELA5709, now EL8805, RIMFIRE PACIFIC MINING N.L, for Group 1, dated 31 October 2018.

MINING LEASE (ML)

MLA443, now ML1775 (Act 1992), P & D WHYTE PTY LTD, to mine for gypsum, dated 29 October 2018.

[n2018-3987]

NOTICE is given that the following applications for renewal have been received:

EXPLORATION LICENCE (EL)

EL4458, NYMAGEE RESOURCES PTY LTD AND AUSMINDEX PTY LIMITED. Application for renewal received 7 November 2018.

EL6162, HERA RESOURCES PTY LIMITED. Application for renewal received 9 November 2018.

MINING LEASE (ML)

ML1440 (Act 1992), HILLGROVE MINES PTY LTD. Application for renewal received 7 November 2018.

ML1604 (Act 1992), HILLGROVE MINES PTY LTD. Application for renewal received 7 November 2018.

ML5643 (Act 1906), HILLGROVE MINES PTY LTD. Application for renewal received 12 November 2018.

ML6282 (Act 1906), HILLGROVE MINES PTY LTD. Application for renewal received 12 November 2018.

MINING PURPOSE LEASE (ML)

MPL146 (Act 1973), HILLGROVE MINES PTY LTD. Application for renewal received 12 November 2018.

[n2018-3988]

Notice is given that the following authorities have been renewed:

EXPLORATION LICENCE (EL)

EL7805, JERVOIS MINING LIMITED. Renewal effective on and from 7 October 2018.

Notice is given that the following applications for cancellation have been received:

EXPLORATION LICENCE (EL)

EL 8496, SILVER CITY MINERALS LIMITED. Request for cancellation was received on 7 November 2018.

Notice is given that the following applications for part cancellation have been received:

EXPLORATION LICENCE (EL)

EL 8454, SILVER CITY MINERALS LIMITED. Request for part cancellation was received on 9 November 2018.

[n2018-3989]

Primary Industries Notices

BIOSECURITY ACT 2015

Instrument of Appointment of Authorised Officers and Approval of Functions
– Department of Primary Industries and Local Land Services officers

I, Greg Vakaci, A/Director Biosecurity & Food Safety Compliance, in exercise of delegated authority of the Secretary and of the Secretary as Accreditation Authority under the *Biosecurity Act 2015* (the Act) make the following appointments and approvals:

- 1) Pursuant to section 361 of the Act, I appoint the persons listed in Column 1 of the table set out in Schedule 1 as authorised officers for the purposes of the Act.
- 2) Pursuant to section 195 of the Act, I approve those authorised officers listed in Column 1 of the table set out in Schedule 1 to exercise the functions of a biosecurity certifier as specified in Column 2 of the table.

Duration of appointment and approval:

The appointment and approval of each person listed in Schedule 1 will end on the earliest of the following dates:

- A. the date that is five years from the date of this instrument; or
- B. the date of revocation of this instrument, or an instrument of revocation of appointment of a person listed in Schedule 1 as an authorised officer; or
- C. the date that the person ceases to be employed by either the Department of Industry or the Local Land Services.

Dated this 21st day of November 2018

GREG VAKACI

Greg Vakaci

A/DIRECTOR

BIOSECURITY & FOOD SAFETY COMPLIANCE

(as delegate on behalf of the Secretary of the Department of Industry)

SCHEDULE 1

Column 1	Column 2
Name of person appointed as authorised officer	Approved functions of biosecurity certifier
Jessica Lyn Bourke	NIL Conditions
Phillip Leslie Andrew	NIL Conditions

[n2018-3990]

DRUG MISUSE AND TRAFFICKING ACT 1985

Erratum

The notice placed in the Government Gazette No. 109 of 26 October 2018

page 7710

Where the appointed name was published as listed, should read as per the following:

Published in Gazette No 109	Corrected appointed name
Thomas LEE Scott PHILLIP	Lee THOMAS Phillip SCOTT

[n2018-3991]

Crown Land Notices

1300 886 235 www.crownland.nsw.gov.au

NOTIFICATION OF DISPOSAL OF A CROWN ROAD

Section 152B Roads Act 1993

The road hereunder described has been disposed of under section 152B of the *Roads Act 1993*. In accordance with section 152H of that Act, the road comprised therein has ceased to be a Crown road and the rights of passage and access that previously existed in relation to the road are extinguished. Upon disposal, title to the land, comprising the former Crown road, is transferred to freehold.

The Hon Paul Toole, MP
Minister for Lands and Forestry

DESCRIPTION

Parish – Killendoo; County – Waradgery

Land District – Hay; LGA – Hay

Road Disposed: Lot 21 DP 1209480

File No: 13/14216

[n2018-3992]

ROADS ACT 1993

ORDER

Transfer of a Crown Road to a Council

IN pursuance of the provisions of Section 152I, *Roads Act 1993*, the Crown road specified in Column 1 is transferred to the Roads Authority specified in Column 2, hereunder, as from the date of publication of this notice and as from that date, the road specified in Column 1 ceases to be a Crown road.

The Hon Paul Toole, MP
Minister for Lands and Forestry

Column 1	Column 2
Crown public road west Lot 11 DP 1097074, Lot 12 DP 1097074, Lot 2 DP 771592, and Lot 2 DP 576100; Crown public road separating Lot 2 DP 576100 from Lot 2 DP 813207; Crown public road on south-west boundary Lot 2 DP 813207, Crown public road south Lot 1 DP 813207; Crown public road west Lot B DP 410 and Lot F DP 410; Crown public road east Lot 94 DP751369 and Lot 6 Sec 8 DP 751369 Parish Eaton County Clarence at Mylnford as shown by red colour.	Clarence Valley Council
Crown Lands Ref: W601264 – 18/08397 Councils Ref: Minute 14.087/15 – Map 3 Eaton	



Column 1	Column 2
Crown public road within and south Lot 84 DP 752822 Parish Ermington County Clarence as shown by red colour	Clarence Valley Council
Crown Lands Ref: W601264 – 18/08397 Councils Ref: Minute 14.087/15 – Map 1 Ermington	



Column 1	Column 2
Crown public road south-east Lot 2 DP 1215965 and being part of Hunters Road Parish Ewingar County Clarence as shown by red outline.	Clarence Valley Council
Crown Lands Ref: W601264 – 18/08397 Councils Ref: Minute 14.087/15 Map 1 Ewingar	



Column 1	Column 2
Crown public road adjoining southern boundary Lot 12 DP 818056 Parish Koolkhan County Clarence	Clarence Valley Council
Crown Lands Ref: W601264 – 18/08397 Councils Ref: Minute 14.087/15 – Map 1 Great Marlow/Koolkhan	

Column 1	Column 2
Crown public road separating Lot 1 DP 589741 from Lot 148 DP 751371 and within Lot 46 DP 1038848. Crown public road bounded by Lot 2 DP 2570843, Clarence River, Lot 350 DP 812706 and Council public road (Great Marlow Road) Parish Great Marlow County Clarence as shown by red outline.	Clarence Valley Council
Crown Lands Ref: W601264 – 18/08397 Councils Ref: Minute 14.087/15 – Map 2 Great Marlow	



Column 1	Column 2
Crown public road south Lot 163 DP 751371 and Lot 11 DP 1118027 Parish Great Marlow County Clarence	Clarence Valley Council
Crown Lands Ref: W601264 – 18/08397 Councils Ref: Minute 14.087/15 – Map 3 Great Marlow	

Column 1	Column 2
Crown public road separating Lot 16B DP 159079 from Lot 4-6 DP 21332 Parish Great Marlow County Clarence at Grafton	Clarence Valley Council
Crown Lands Ref: W601264 – 18/08397 Councils Ref: Minute 14.087/15 Map 4 Great Marlow	

[n2018-3993]

ALTERATION OF CONDITIONS OF A WESTERN LANDS LEASE

It is hereby notified that in pursuance of the provisions of Section 7.3 of the *Crown Land Management Act 2016*, the conditions of the undermentioned Western Lands Leases have been altered as shown.

The Hon Paule Toole, M.P.
Minister for Lands and Forestry

Parish – Varies

County – Kilfera

Land District – Balranald

LGA – Balranald

That the conditions of the Western Lands Leases listed in the schedule below has been altered effective 26 October 2018 from;

“that the lessee shall not obstruct or interfere with any reserves, roads or tracks or the lawful use thereof by any person” OR “that the lessee shall not obstruct or interfere with any reserves, roads or tracks or the use thereof by any person”

to the following extent;

“that the lessee shall not obstruct or interfere with any reserves or roads or the use thereof by any person”

Schedule

Western Lands Lease Number
3427
8880

File Reference: 18/02859

[n2018-3994]

NOTICE –

CROWN LAND TO BE USED OR OCCUPIED FOR OTHER PURPOSE UNDER S 2.18(2)(b)

Pursuant to section 2.18(2)(b) of the *Crown Land Management Act 2016*, the Crown land specified in Column 2 of the following Schedule is proposed to be used or occupied under a relevant interest granted for the purpose(s) specified in Column 1 of the following Schedule.

The Hon Paul Toole, MP
Minister for Lands and Forestry

Schedule

Column 1	Column 2
government purposes (relevant interest – Lease RX 598255)	Reserve No. 755740 Public Purpose: future public requirements Notified: 29 June 2007 File Reference: 16/06553-02

Schedule

Column 1	Column 2
government purposes (relevant interest – Lease RX 598255)	Reserve No. 1010608 Public Purpose: port facilities and services Notified: 14 January 2005 File Reference: 16/06553-02

[n2018-3995]

FORESTRY ACT 2012

REVOCATION OF DEDICATION

In pursuance of the provisions of clause 7 of Schedule 2 of the *Forestry Act 2012*, I, PAUL TOOLE, Minister for Lands and Forestry, being the Minister of the Crown charged with the administration of the *Forestry Act 2012*, having considered a report from the Forestry Corporation of New South Wales, DO HEREBY revoke the dedication of the hereinafter described land and declare the land is transferred to the Forestry Corporation of New South Wales.

PAUL TOOLE, MP
Minister for Lands and Forestry

EASTERN DIVISION

LAND DISTRICT OF TUMUT; TUMUT SHIRE COUNCIL AREA

TUMUT FORESTRY REGION

All those pieces or parcels of land situated in the Parish of Batlow, County of Wynyard, being Batlow State Forest No. 883, No. 2 Extension, dedicated 30 January 1953 comprising Lots 199, 373 and 374 in Deposited Plan 757214.

[F2016/0051]

[n2018-3996]

FORESTRY ACT 2012

REVOCATION OF DEDICATION

In pursuance of the provisions of clause 7 of Schedule 2 of the *Forestry Act 2012*, I, PAUL TOOLE, Minister for Lands and Forestry, being the Minister of the Crown charged with the administration of the *Forestry Act 2012*, having considered a report from the Forestry Corporation of New South Wales, DO HEREBY revoke the dedication of the hereinafter described land and declare the land is transferred to the Forestry Corporation of New South Wales.

PAUL TOOLE, MP
Minister for Lands and Forestry

EASTERN DIVISION

LAND DISTRICT OF MUSWELLBROOK; MUSWELLBROOK SHIRE COUNCIL AREA

CENTRAL FORESTRY REGION

All that piece or parcel of land situated in the Parish of Brougham, County of Durham, being Muswellbrook State Forest No. 975, dedicated 28 June 1963 comprising Lot 62 in Deposited Plan 1208238.

[F2012/00630]

[n2018-3997]

APPOINTMENT OF STATUTORY LAND MANAGER BOARD MEMBERS

Pursuant to clause 4(1) of Schedule 5 to the *Crown Land Management Act 2016*, the persons specified in Column 1 of the Schedule hereunder are appointed, for the terms of office specified in that Column, as board members for the statutory land manager specified opposite in Column 2, which has been appointed as Crown land manager of the land referred to in Column 3 of the Schedule.

It is a condition of the appointment that the board member must comply with the Department of Industry *Crown reserve code of conduct: For non-council Crown land managers and commons trusts* (as may be amended or replaced from time to time).

The Hon Paul Toole, MP
Minister for Lands and Forestry

Schedule

Column 1	Column 2	Column 3
Cherry Alexandra Hood (new member) For a term commencing the date this notice and expiring 11 February 2021.	Towrang Recreation Reserve Land Manager	Reserve No. 69316 Public Purpose: Public Recreation Notified: 21 June 1940 File Reference: GB80R213-003

[n2018-3998]

APPOINTMENT OF STATUTORY LAND MANAGER BOARD MEMBERS

Pursuant to clause 4(1) of Schedule 5 to the *Crown Land Management Act 2016*, the persons specified in Column 1 of the Schedule hereunder are appointed, for the terms of office specified in that Column, as board members for the statutory land manager specified opposite in Column 2, which has been appointed as Crown land manager of the land referred to in Column 3 of the Schedule.

It is a condition of the appointment that the board member must comply with the Department of Industry *Crown reserve code of conduct: For non-council Crown land managers and commons trusts* (as may be amended or replaced from time to time).

The Hon Paul Toole, MP
Minister for Lands and Forestry

Schedule

Column 1	Column 2	Column 3
Maurizio Ivan Salabert (new member) For a term commencing the date of this notice and expiring 20 March 2020.	Torrington War Memorial & Recreation Reserve Land Manager	Reserve No. 42203 Public Purpose: village purposes Notified: 27 Nov 1907 Reserve No. 52937 Public Purpose: public recreation Notified: 16 August 1918 Reserve No. 91188 Public Purpose: future public requirements Notified: 7 July 1978 File Reference: AE83R40-003

[n2018-3999]

APPOINTMENT OF STATUTORY LAND MANAGER BOARD MEMBERS

Pursuant to clause 4(1) of Schedule 5 to the *Crown Land Management Act 2016*, the persons specified in Column 1 of the Schedule hereunder are appointed, for the terms of office specified in that Column, as board members for the statutory land manager specified opposite in Column 2, which has been appointed as Crown land manager of the land referred to in Column 3 of the Schedule.

It is a condition of the appointment that the board member must comply with the Department of Industry *Crown reserve code of conduct: For non-council Crown land managers and commons trusts* (as may be amended or replaced from time to time).

The Hon Paul Toole, MP
Minister for Lands and Forestry

Schedule

Column 1	Column 2	Column 3
Paul Phillip Jasprizza (new member) For a term commencing the date of this notice and expiring 3 April 2021.	Tipperary Gully Recreation Reserve Land Manager	Dedication No. 530009 Public Purpose: public recreation Notified: 21 December 1894 File Reference: GB80R165

[n2018-4000]

ERRATUM

In the notice published in NSW Government Gazette No 66 of 29 June 2018, Folio 4066, under the heading “Appointment of Administrator to Manage a Reserve Trust” the reference to the following entries under Column 2 and related Column 3 reserve details of the Schedule, as detailed below are removed.

Column 2	Column 3
Petersham Park (P500070 and P500430) Reserve Trust	Public Park No. 500070 Public Purpose: public recreation Notified: 4 April 1906 Public Park No. 500430 Public Purpose: public recreation Notified: 7 May 1920

File No:

17/02470#14

The Hon Paul Toole, MP

Minister for Lands and Forestry

[n2018-4001]

APPOINTMENT OF STATUTORY LAND MANAGER BOARD MEMBERS

Pursuant to clause 4(1) of Schedule 5 to the *Crown Land Management Act 2016*, the persons specified in Column 1 of the Schedule hereunder are appointed, for the terms of office specified in that Column, as board members for the statutory land manager specified opposite in Column 2, which has been appointed as Crown land manager of the land referred to in Column 3 of the Schedule.

It is a condition of the appointment that the board member must comply with the Department of Industry *Crown reserve code of conduct: For non-council Crown land managers and commons trusts* (as may be amended or replaced from time to time).

The Hon Paul Toole, MP

Minister for Lands and Forestry

Schedule

Column 1	Column 2	Column 3
Vera Jean Tomlinson (re-appointment) Patrick Brian Tomlinson (re-appointment) Murray Ian Price (re-appointment) Nella Price (re-appointment) For a term commencing 28 November 2018 and expiring 27 November 2023.	Sally’s Flat Recreation Ground Land Manager	Reserve No. 50094 Public Purpose: Public Recreation Notified: 29 July 1914 File Reference: OE81R82-003

[n2018-4002]

APPOINTMENT OF STATUTORY LAND MANAGER BOARD MEMBERS

Pursuant to clause 4(1) of Schedule 5 to the *Crown Land Management Act 2016*, the persons specified in Column 1 of the Schedule hereunder are appointed, for the terms of office specified in that Column, as board members for the statutory land manager specified opposite in Column 2, which has been appointed as Crown land manager of the land referred to in Column 3 of the Schedule.

It is a condition of the appointment that the board member must comply with the Department of Industry *Crown reserve code of conduct: For non-council Crown land managers and commons trusts* (as may be amended or replaced from time to time).

The Hon Paul Toole, MP
Minister for Lands and Forestry

Schedule

Column 1	Column 2	Column 3
Emma Ann Nyman (new member) Katrina Margaret Swift (new member) Wendy Lea Rix (new member) Tanya Marie Barnes (new member) For a term commencing the date of this notice and expiring 22 November 2018.	Gunningbland Recreation Reserve Land Manager	Reserve No. 41974 Public Purpose: Public Recreation Notified: 4 September 1907 File Reference: OE81R69

[n2018-4003]

ERRATUM

In the notice published in NSW Government Gazette No 122 of 16 November 2018, folio's 8657 – 8662 under the heading NOTICE – CROWN LAND TO BE USED OR OCCUPIED FOR OTHER PURPOSE UNDER S 2.18(2)(b) the following relevant interests appeared in error.

Reserve No. 56146 Public Purpose: generally Notified: 11 May 1923

pumps site (relevant interest – Licence 571310)
 pipeline (relevant interest – Licence 571310)
 pump site (relevant interest – Licence 591403)
 pipeline (relevant interest – Licence 591403)
 pipeline (relevant interest – Licence 572347)
 reclamation (relevant interest – Licence 586906)
 ramp (relevant interest – Licence 586906)
 jetty (relevant interest – Licence 586906)
 slipway (relevant interest – Licence 596736)
 residence (relevant interest – Licence 596736)
 seawall (relevant interest – Licence 596736)
 reclamation (relevant interest – Licence 596736)
 ramp (relevant interest – Licence 596736)
 pontoon (relevant interest – Licence 596736)
 piles (relevant interest – Licence 596736)
 jetty (relevant interest – Licence 596736)
 seawall (relevant interest – Licence 585860)
 reclamation (relevant interest – Licence 585860)
 jetty (relevant interest – Licence 585860)

concrete ramp (relevant interest – Licence 585860)
seawall (relevant interest – Licence 588223)
reclamation (relevant interest – Licence 588223)
ramp (relevant interest – Licence 588223)
pontoon (relevant interest – Licence 588223)
jetty (relevant interest – Licence 588223)
slipway (relevant interest – Licence 566190)
seawall (relevant interest – Licence 566190)
reclamation (relevant interest – Licence 566190)
sliprails (relevant interest – Licence 579729)
seawall (relevant interest – Licence 579729)
reclamation (relevant interest – Licence 579729)
jetty (relevant interest – Licence 579729)
deck (relevant interest – Licence 579729)
steps (relevant interest – Licence 595932)
seawall (relevant interest – Licence 595932)
reclamation (relevant interest – Licence 595932)
ramp (relevant interest – Licence 595932)
slipway (relevant interest – Licence 588220)
jetty (relevant interest – Licence 588220)
steps (relevant interest – Licence 599739)
ramp (relevant interest – Licence 599739)
pontoon (relevant interest – Licence 599739)
jetty (relevant interest – Licence 599739)
seawall (relevant interest – Licence 573057)
reclamation (relevant interest – Licence 573057)
ramp (relevant interest – Licence 573057)
piles (relevant interest – Licence 573057)
boatshed (relevant interest – Licence 573057)
berthing area (relevant interest – Licence 573057)
sliprails (relevant interest – Licence 590725)
jetty (relevant interest – Licence 590725)

Reserve No. 1011268 Public Purpose: future public requirements Notified: 3 February 2006

pump site (relevant interest – Licence 571310)
pipeline (relevant interest – Licence 571310)
pump site (relevant interest – Licence 591403)
pipeline (relevant interest – Licence 591403)
pipeline (relevant interest – Licence 572347)
reclamation (relevant interest – Licence 586906)
ramp (relevant interest – Licence 586906)

jetty (relevant interest – Licence 586906)
slipway (relevant interest – Licence 596736)
seawall (relevant interest – Licence 596736)
residence (relevant interest – Licence 596736)
reclamation (relevant interest – Licence 596736)
ramp (relevant interest – Licence 596736)
pontoon (relevant interest – Licence 596736)
piles (relevant interest – Licence 596736)
jetty (relevant interest – Licence 596736)
seawall (relevant interest – Licence 585860)
reclamation (relevant interest – Licence 585860)
jetty (relevant interest – Licence 585860)
concrete ramp (relevant interest – Licence 585860)
seawall (relevant interest – Licence 588223)
reclamation (relevant interest – Licence 588223)
ramp (relevant interest – Licence 588223)
pontoon (relevant interest – Licence 588223)
jetty (relevant interest – Licence 588223)
slipway (relevant interest – Licence 566190)
seawall (relevant interest – Licence 566190)
reclamation (relevant interest – Licence 566190)
sliprails (relevant interest – Licence 579729)
seawall (relevant interest – Licence 579729)
reclamation (relevant interest – Licence 579729)
jetty (relevant interest – Licence 579729)
deck (relevant interest – Licence 579729)
steps (relevant interest – Licence 595932)
seawall (relevant interest – Licence 595932)
reclamation (relevant interest – Licence 595932)
ramp (relevant interest – Licence 595932)
slipway (relevant interest – Licence 588220)
jetty (relevant interest – Licence 588220)
steps (relevant interest – Licence 599739)
ramp (relevant interest – Licence 599739)
pontoon (relevant interest – Licence 599739)
jetty (relevant interest – Licence 599739)
seawall (relevant interest – Licence 573057)
reclamation (relevant interest – Licence 573057)
ramp (relevant interest – Licence 573057)
piles (relevant interest – Licence 573057)
boatshed (relevant interest – Licence 573057)

berthing area (relevant interest – Licence 573057)

sliprails (relevant interest – Licence 590725)

jetty (relevant interest – Licence 590725)

The gazettal date remains 09 November 2018.

The Hon. Paul Toole, MP
Minister for Lands and Forestry

[n2018-4004]

BC - DUBBO

NOTICE - CROWN LAND TO BE USED OR OCCUPIED FOR OTHER PURPOSE UNDER S 2.18(2)(b)

Pursuant to section 2.18(2)(b) of the Crown Land Management Act 2016, the Crown land specified in Column 2 of the following Schedule is proposed to be used or occupied under a relevant interest granted for the purpose(s) specified in Column 1 of the following Schedule.

The Hon Paul Toole, MP
Minister for Lands and Forestry

Column 1 environmental studies (relevant interest - Licence 597016) dam (relevant interest - Licence 597016) shed (relevant interest - Licence 597016) stockyard (relevant interest - Licence 597016) grazing (relevant interest - Licence 597016)	Schedule Column 2 Reserve No. 44274 Public Purpose: quarantine Notified: 25 August 1909 File Reference: 18/04081
Column 1 access to water (relevant interest - Licence 509435)	Schedule Column 2 Reserve No. 96006 Public Purpose: future public requirements Notified: 11 June 1982 File Reference: 13/00044
Column 1 pump site (relevant interest - Licence 595822) pipeline (relevant interest - Licence 595822)	Schedule Column 2 Reserve No. 96291 Public Purpose: future public requirements Notified: 27 August 1982 File Reference: 18/02878
Column 1 pump site (relevant interest - Licence RI572195) pipeline (relevant interest - Licence RI572195)	Schedule Column 2 Reserve No. 756922 Public Purpose: future public requirements Notified: 29 June 2007 File Reference: 16/07674
Column 1 grazing (relevant interest - Licence 592560)	Schedule Column 2 Reserve No. 96997 Public Purpose: environmental protection, future public requirements Notified: 7 October 1983 File Reference: 17/11669
Column 1 grazing (relevant interest - Licence 598593)	Schedule Column 2 Reserve No. 37362 Public Purpose: trigonometrical purposes Notified: 12 March 1904 File Reference: 18/06023
Column 1 communication facilities (relevant interest - Licence 601438)	Schedule Column 2 Reserve No. 140032 Public Purpose: public recreation

(relevant interest - Licence 601439)

Notified: 6 November 1987
File Reference: 08/6163

Column 1

communication facilities

(relevant interest - Licence 601477)

Schedule

Column 2

Reserve No. 86727

Public Purpose: quarry

Notified: 7 June 1968

File Reference: 08/6163

Column 1

pontoon

(relevant interest - Licence 586093)

ramp

(relevant interest - Licence 586093)

jetty

(relevant interest - Licence 586093)

Schedule

Column 2

Reserve No. 1012708

Public Purpose: access and public requirements, rural services, tourism purposes and environmental and heritage conservation

Notified: 19 January 2007

File Reference: 17/06677

Column 1

agriculture

(relevant interest - Licence RN 591476)

access

(relevant interest - Licence RN 591476)

dam

(relevant interest - Licence RN 591476)

Schedule

Column 2

Reserve No. 71389

Public Purpose: future public requirements

Notified: 29 December 1944

File Reference: 17/11009

Column 1

pump site

(relevant interest - Licence 591582)

pipeline

(relevant interest - Licence 591582)

grazing

(relevant interest - Licence 591582)

cultivation

(relevant interest - Licence 591582)

Schedule

Column 2

Reserve No. 96531

Public Purpose: access

Notified: 31 December 1982

File Reference: 17/10958

Column 1

sewerage pipeline

(relevant interest - Licence 592603)

Schedule

Column 2

Reserve No. 84334

Public Purpose: generally

Notified: 22 March 1963

File Reference: 17/11600

Column 1

concrete ramp

(relevant interest - Licence 558662)

seawall

(relevant interest - Licence 592230)

reclamation

(relevant interest - Licence 592230)

ramp

(relevant interest - Licence 592230)

pontoon

(relevant interest - Licence 592230)

steps

(relevant interest - Licence 584411)

sliprails

(relevant interest - Licence 584411)

reclamation

(relevant interest - Licence 584411)

Schedule

Column 2

Reserve No. 56146

Public Purpose: generally

Notified: 11 May 1923

File Reference: 17/11801

ramp
(relevant interest - Licence 584411)
pontoon
(relevant interest - Licence 584411)
jetty
(relevant interest - Licence 584411)
boatshed
(relevant interest - Licence 584411)
wharf
(relevant interest - Licence 588145)
reclamation
(relevant interest - Licence 588145)
reclamation
(relevant interest - Licence 592754)
ramp
(relevant interest - Licence 592754)
pontoon
(relevant interest - Licence 592754)
jetty
(relevant interest - Licence 592754)
pipeline
(relevant interest - Licence 595822)
pump site
(relevant interest - Licence 595822)
pipeline
(relevant interest - Licence 591582)
pipeline
(relevant interest - Licence 572195)
pump site
(relevant interest - Licence 598731)
pipeline
(relevant interest - Licence 598731)
pipeline
(relevant interest - Licence 585542)
pump site
(relevant interest - Licence 585542)
ramp
(relevant interest - Licence 583332)
pontoon
(relevant interest - Licence 592771)
walkway
(relevant interest - Licence 592771)
jetty
(relevant interest - Licence 586093)
pontoon
(relevant interest - Licence 586093)
ramp
(relevant interest - Licence 586093)
seawall
(relevant interest - Licence 581909)
pontoon
(relevant interest - Licence 581909)
reclamation
(relevant interest - Licence 581909)
ramp
(relevant interest - Licence 581909)
piles
(relevant interest - Licence 581909)
landing/platform
(relevant interest - Licence 581909)
jetty
(relevant interest - Licence 581909)
berthing area
(relevant interest - Licence 581909)
slipway
(relevant interest - Licence 592948)
seawall
(relevant interest - Licence 592948)
reclamation
(relevant interest - Licence 592948)
ramp
(relevant interest - Licence 592948)
pontoon

(relevant interest - Licence 592948)
piles
(relevant interest - Licence 592948)
jetty
(relevant interest - Licence 592948)
berthing area
(relevant interest - Licence 592948)
reclamation
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piles
(relevant interest - Licence 597209)
jetty
(relevant interest - Licence 597209)
deck
(relevant interest - Licence 597209)
boatshed
(relevant interest - Licence 597209)
reclamation
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pontoon
(relevant interest - Licence 592336)
piles
(relevant interest - Licence 592336)
jetty
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berthing area
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(relevant interest - Licence 596448)
jetty
(relevant interest - Licence 586648)
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seawall
(relevant interest - Licence 586553)
retaining wall
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reclamation
(relevant interest - Licence 586553)
jetty
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landing/platform
(relevant interest - Licence 582428)
jetty
(relevant interest - Licence 582428)
reclamation
(relevant interest - Licence 578697)
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(relevant interest - Licence 578697)
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(relevant interest - Licence 578697)
reclamation
(relevant interest - Licence 587061)
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seawall
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(relevant interest - Licence 564399)
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reclamation
(relevant interest - Licence 580469)
concrete ramp
(relevant interest - Licence 580469)
reclamation
(relevant interest - Licence 581936)
concrete ramp
(relevant interest - Licence 581936)
reclamation
(relevant interest - Licence 587978)
residence
(relevant interest - Licence 584741)
reclamation
(relevant interest - Licence 584741)
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sliprails
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seawall
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boatshed
(relevant interest - Licence 584741)
slipway
(relevant interest - Licence 596289)
jetty
(relevant interest - Licence 596289)
seawall
(relevant interest - Licence 558662)
reclamation
(relevant interest - Licence 558662)
jetty
(relevant interest - Licence 558662)

Schedule

Column 1
reclamation
(relevant interest - Licence 581909)
ramp
(relevant interest - Licence 581909)
seawall
(relevant interest - Licence 581909)
piles
(relevant interest - Licence 581909)

Column 2
Reserve No. 1011268
Public Purpose: future public requirements
Notified: 3 February 2006
File Reference: 17/11801

landing/platform
(relevant interest - Licence 581909)
pontoon
(relevant interest - Licence 581909)
jetty
(relevant interest - Licence 581909)
berthing area
(relevant interest - Licence 581909)
seawall
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reclamation
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ramp
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landing/platform

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landing/platform
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concrete ramp
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reclamation
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concrete ramp
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steps
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sliprails
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reclamation
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pontoon
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jetty
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boatshed
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wharf
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reclamation
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reclamation
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ramp
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pontoon
(relevant interest - Licence 592754)
jetty
(relevant interest - Licence 592754)
pipeline
(relevant interest - Licence 595822)
pump site
(relevant interest - Licence 595822)
pipeline
(relevant interest - Licence 591582)
pipeline
(relevant interest - Licence 585542)
pipeline
(relevant interest - Licence 572195)
pump site
(relevant interest - Licence 585542)
sewerage pipeline
(relevant interest - Licence 592603)
pump site
(relevant interest - Licence 598731)
pipeline
(relevant interest - Licence 598731)
mooring poles
(relevant interest - Licence 592830)
pontoon
(relevant interest - Licence 592830)
ramp
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pontoon
(relevant interest - Licence 592771)
walkway
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jetty
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pontoon
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ramp

(relevant interest - Licence 586093)

Water Notices

WATER ACT 1912

Lower Namoi Valley Flood Plain

NATURAL RESOURCES ACCESS REGULATOR

An application for approval of controlled works under Part 8 of the *Water Act 1912*, has been received as follows:

Merced Farming Pty Ltd for storages and levees near the Namoi River on Lot 57, DP 753937 on the property “Bellevue and Helebah” for the purpose of water storage and flood protection for farming (Reference: 90CW811075).

Written objections from any local occupier or statutory authority to the application specifying the grounds and how their interests are affected, must be lodged with the Natural Resources Access Regulator, PO Box 717, DUBBO NSW 2830 within 28 days of the date of this publication.

Any enquiries should be directed to (02) 6051 7746, David Finnimore, Water Regulation Officer.

[n2018-4006]

WATER ACT 1912

Lower Namoi Valley Flood Plain

NATURAL RESOURCES ACCESS REGULATOR

An application for approval of controlled works under Part 8 of the *Water Act 1912*, has been received as follows:

Merced Farming Pty Ltd and **Merced Holdings Pty Ltd** for storages, channels and levees near the Namoi River on the properties “Kangaloon”, “Athlone” and “Glencoe” for the purpose of water storage, conveyance and flood protection for farming on Lot 2 DP 528552, Lots 1 and 2 DP 505362, Lots 1, 2 and 3 DP 131118, Lots 1 and 2 DP 222049, Lots 16, 57, 58, 65, 66, 74, 75 76, 77, 93, 95, 118, 133, 147 and 148 DP753955, Lots & 11 and 12 DP 622177 (Reference: 90CW811089).

Written objections from any local occupier or statutory authority to the application specifying the grounds and how their interests are affected, must be lodged with the Natural Resources Access Regulator PO Box 717 DUBBO NSW 2830 within 28 days of the date of this publication.

Any enquiries should be directed to (02) 6051 7746, David Finnimore, Water Regulation Officer.

[n2018-4007]

Other Government Notices

ASSOCIATIONS INCORPORATION ACT 2009

Cancellation of association pursuant to section 74

ERRATUM

THE NOTICE that appeared in the New South Wales Government Gazette No 122 dated 16 November 2018 page 8667, cancelling the DUBBO MINI TROTting CLUB INCORPORATED, INC13001080 was published with an incorrect registration number.

The notice should read DUBBO MINI TROTting CLUB INCORPORATED, INC1301080.

This notice corrects this error

DATED this 19 November 2018

Jodie Matheson
Delegate of the Commissioner
NSW Fair Trading

[n2018-4008]

ASSOCIATIONS INCORPORATION ACT 2009

Cancellation of Registration pursuant to Section 76

TAKE NOTICE that the registration of the following associations is cancelled by this notice pursuant to section 76 of the *Associations Incorporation Act 2009*.

ANOTHER WAY HORNSBY SHIRE INCORPORATED	INC1200117
ARMIDALE BEETHOVEN FESTIVAL INCORPORATED	INC1200181
AUSTRALIA CHINA TIANJIN BUSINESS ASSOCIATION INCORPORATED	INC1200105
AUSTRALIAN STOCKYARD STANDARDS ASSOCIATION INCORPORATED	INC1200154
BACKYARD SOCCER INCORPORATED	INC1200142
BALLINA-BYRON FAMILY CENTRE INCORPORATED	Y1132900
BELLINGEN NEW ENERGY FESTIVAL INCORPORATED	INC9892524
BIRUBI CONCERT INCORPORATED	INC9895318
CARDIFF JUNIOR FOOTBALL CLUB INCORPORATED	Y1933808
CHINESE MEDICINE LIFESTYLE & WELLNESS ASSOCIATION OF AUSTRALIA INCORPORATED	INC1601759
CONDOBOLIN DISTRICT CRICKET ASSOC INC	Y1361832
COONABARABRAN MOTORCYCLE CLUB INCORPORATED	INC9894358
FACIAL BEAUTY INSTITUTE OF AUSTRALIA INCORPORATED	INC1200158
FATHER'S HEART CHRISTIAN MINISTRIES INCORPORATED	INC9887769
FORSTER TUNCURRY MUDCRABS WINTER SWIMMING CLUB INC	Y1341742
FRATER IN ARMA INCORPORATED	INC1200100
FRIENDS OF ANGUS HIGGINBOTHAM ASSOCIATION INCORPORATED	INC1200178
GLORY HOME ASSOCIATION INCORPORATED	INC1200146
GLOUCESTER WORKING DOG CLUB INCORPORATED	INC9889071
GODS CITY CHURCH INCORPORATED	INC1200448
GONG FLOORBALL INCORPORATED	INC1200155
HUMANITARIAN ASSOCIATION OF CROATIANS FROM HERZEGOVINA IN NSW INCORPORATED	INC9893029
INDEPENDENT NUMISMATIC ASSOCIATION OF AUSTRALIA INCORPORATED	INC1200130
INSIGHT PERU INCORPORATED	INC9895800

JUSTFEEDA 4X4 INCORPORATED	INC1200115
JUSTICE4SIX INCORPORATED	INC1200059
KYLE BAY NETBALL CLUB INCORPORATED	INC9890353
MACCABI NSW RUGBY CLUB INCORPORATED	INC9886016
MAITLAND VIETNAM VETERANS & SERVICES LEGION INCORPORATED	INC9889130
MOREE WATER-SKI CLUB INCORPORATED	INC9891364
NSW-FIJI GOLFERS ASSOCIATION INCORPORATED	INC1200161
OCEAN DREAM CULTURAL ART CENTRE OF AUSTRALIA INCORPORATED	INC9894479
PADDINGTON WOOLLAHRA J.R.L.F.C. INCORPORATED	INC9877358
PORT MOTOR MANIA-THE PORT FESTIVAL INCORPORATED	INC1200166
POWERFUL FUTURES INCORPORATED	INC1200176
PROGRESSIVE CHRISTIAN ALLIANCE NSW INCORPORATED	INC1200119
REDFERN RED SOX BASEBALL CLUB INC	INC9893624
ROH EMSEMBLE INCORPORATED	INC1200078
SALAM CARE INCORPORATED	INC1200137
SKYDIVE BYRON BAY INCORPORATED	INC1200094
SOUTHERN HOPE COMMUNITY ORGANISATION INCORPORATED	INC9893627
SWAN RESEARCH INSTITUTE INC	INC9876749
SYDNEY INTERNATIONAL EVENTING INCORPORATED	INC9879574
TALLEBUNG WATER USERS ASSOCIATION INCORPORATED	INC9887102
TARRA YIDO KOREAN SCHOOL INCORPORATED	INC1200112
TE WHAI O TE KOTAHI INCORPORATED	INC9892652
TEAM LIFE CYCLE INCORPORATED	INC9893686
THE SYDNEY COUNTY COUNCIL RIFLE CLUB INCORPORATED	Y2591608
THIRROUL 36ERS INCORPORATED	INC9893754
TOONGABBIE AND DISTRICT HISTORICAL SOCIETY INCORPORATED	Y2120806
TRIDEV SATSANG RAMAYAN AND CULTURAL MANDALI INCORPORATED	INC9879573
ULMARRA COMMERCIAL HOTEL SOCIAL CLUB INCORPORATED	INC9889076
UNISON INCORPORATED	INC9890069
WESTERN SYDNEY WANDERERS SUPPORTERS GROUP INCORPORATED	INC1200109
WOODSTOCK PLAYERS INCORPORATED	INC9879483
WRIGHT BROS AIRCRAFT PROJECT INCORPORATED	INC9877995
X-RAY THEATRE INCORPORATED	INC9879704

Cancellation is effective as at the date of gazettal.

Dated this 21st day of November 2018.

Christine Gowland
 Delegate of the Commissioner
 NSW Fair Trading

[n2018-4009]

CEMETERIES AND CREMATORIA ACT 2013

Cemeteries & Crematoria NSW has approved a code of practice

Notice is hereby given, under section 30(2) of the *Cemeteries and Crematoria Act 2013*, that Cemeteries & Crematoria NSW has approved the Cemetery and crematorium operator code of practice 2018: interment rights and general services made under section 28 of the *Cemeteries and Crematoria Act 2013*.

Dated 23 November 2018

Ria Pryce
A/g CEO
Cemeteries & Crematoria NSW

[n2018-4010]

CONVEYANCERS LICENSING ACT 2003**NOTIFICATION UNDER SECTION 64 (1) (b)**

I, Bjorn Borg, Director, Industry Standards & Bonds, Specialist Services, as a delegate of the Secretary, give notice, under section 64(1)(b) of the *Conveyancers Licensing Act 2003*, that the licensees specified in Column One of the Schedule, hold in an account kept at the authorised deposit-taking institution specified in Column Two of the Schedule, the amount of money specified in Column Three of the Schedule, for or on behalf of the person specified in Column Four of the Schedule.

If the money is not paid out of the trust account in which it is held within three months after the date of publication of this notice in the New South Wales Government Gazette, the person holding the money will be required to pay it to the Secretary.

BJORN BORG
Director, Industry Standards & Bonds,
Specialist Services,
Delegate of the Secretary
Department of Finance, Services & Innovation

SCHEDULE

Name of Licensee (Column One)	Name of authorised deposit taking institution (Column Two)	Amount (Column Three)	Name of person money is held for or on behalf of (Column Four)
Rigg Conveyancing Pty Ltd	Commonwealth Bank of Australia	\$1,000.00	Mark Bradbury & Georgia Bradbury
Michelle Lea Hartmann	St George Bank	\$1,031.81	Nutchareen Paiyaphosri

[n2018-4011]

DISTRICT COURT ACT 1973

District Court of New South Wales

Direction

Pursuant to section 173 of the *District Court Act 1973*, I direct that the District Court shall sit in its criminal jurisdiction at the place and time shown as follows:

Grafton Crime	10am	17 June 2019 (3 weeks) Special Fixture
---------------	------	--

Dated this 21st day of November 2018

Justice D Price AM
Chief Judge

[n2018-4012]

PARENTS AND CITIZENS ASSOCIATIONS INCORPORATION ACT 1976

Section 21 (1) (d)

NOTICE OF CANCELLATION OF INCORPORATION OF PARENTS AND CITIZENS ASSOCIATION

The incorporation under the *Parents and Citizens Associations Incorporation Act 1976* of the following association is hereby cancelled.

1. William Dean Public School

Rob Stokes
Minister for Education

[n2018-4013]

POINT TO POINT TRANSPORT (TAXIS AND HIRE VEHICLES) REGULATION 2017

Approval of requirements relating to information disclosure

Pursuant to clause 95(2) of the *Point to Point Transport (Taxis and Hire Vehicles) Regulation 2017* (the Regulation), I approve the following requirements for the providers of passenger services and booking services, who must ensure that personal information is kept, accessed and disclosed in accordance with these requirements:

- All access and use of the Industry Portal is required to be done strictly in accordance with the terms and conditions of use for the Industry Portal, as published on the website for the Point to Point Transport Commissioner.
- All access and use of the Driver Vehicle Dashboard (DVD) is required to be done strictly in accordance with the terms and conditions of use for the DVD, as published on the website for the Point to Point Transport Commissioner, including obtaining a person's consent before entering the person's details into the DVD.

Pursuant to clause 95(1) of the Regulation, personal information is information about a person who drives a taxi or hire vehicle, or a person who owns a taxi or hire vehicle used for the provision of transport by a passenger service and disclosed by the Commissioner to the providers of passenger services and booking services.

Dated: 1 November 2018

BARBARA WISE
Point to Point Transport Commissioner

[n2018-4014]

POISONS AND THERAPEUTIC GOODS REGULATION 2008

ORDER – Restoration of Drug Authority

Notice is hereby given, under clause 175(1) of the *Poisons and Therapeutic Goods Regulation 2008*, that a direction has been issued that the Order that took effect on and from 22 April 2015 for the withdrawal of authority of **Jocelyn Dunkak DAVIS (NMW0001804660)** of Cessnock NSW 2325, prohibiting her, as a nurse, from supplying or having possession of a drug of addiction, as authorised by clauses 101 and 103 of the Regulation shall cease to operate on and from 23 November 2018.

Dated 21 November 2018

ELIZABETH KOFF
Secretary
NSW Health

[n2018-4015]

RESTRICTED PREMISES ACT 1943

Rescission of Declaration

THE premises at 46 Sydenham Rd, Marrickville in the state of New South Wales (being the premises on the land comprised within Lot 7 of Deposited Plan 4510) are no longer premises to which Part 2 of the *Restricted Premises Act 1943* applies, with the Declaration previously made under the *Restricted Premises Act 1943* rescinded by the Supreme Court on Thursday 11 October 2018.

[n2018-4016]

TRANSPORT ADMINISTRATION ACT 1988

LAND ACQUISITION (JUST TERMS COMPENSATION) ACT 1991

Notice of Compulsory Acquisition of Land in the Local Government Area of Inner West

Sydney Metro by its delegate declares, with the approval of His Excellency the Governor, that the land described in the schedule below is acquired by compulsory process under the provisions of the *Land Acquisition (Just Terms Compensation) Act 1991* as authorised by Section 38C of the *Transport Administration Act 1988* for the purposes of the *Transport Administration Act 1988*.

Tom Gellibrand
Acting Chief Executive
Sydney Metro

SCHEDULE

All that piece of land situated in the Local Government Area of Inner West, Parish of Petersham and County of Cumberland, comprising Lot 2 in Deposited Plan 411281, being the whole of the land in Certificate of Title Volume 7822 Folio 90.

The land is said to be in the possession of Sydney Water Corporation.

(Sydney Metro Document Number: SM18/0000763)

[n2018-4017]

TRANSPORT ADMINISTRATION ACT 1988

LAND ACQUISITION (JUST TERMS COMPENSATION) ACT 1991

Notice of Compulsory Acquisition of Land in the Local Government Area of Sydney

Sydney Metro by its delegate declares, with the approval of His Excellency the Governor, that the land described in the schedule below is acquired by compulsory process under the provisions of the *Land Acquisition (Just Terms Compensation) Act 1991* as authorised by section 38C of the *Transport Administration Act 1988* for the purposes of the *Transport Administration Act 1988*.

Tom Gellibrand
Acting Chief Executive
Sydney Metro

SCHEDULE

All that piece of land situated in the Local Government Area of Sydney, Parish of St James and County of Cumberland, comprising Lot 1 in Deposited Plan 229365, Lot 2 in Deposited Plan 900055 and Lot 3 in Deposited Plan 74952, being the whole of land in Auto Consol 10548-99, said to be in the ownership of Sydney Metro ABN 12 354 063 515 **but excluding from the acquisition:**

- U778861 Lease to Alpha Distribution Ministerial Holding Corporation ABN 67 505 337 385 (pursuant to Change of Name AK971571) of Substation Premises No.3328 shown in plan with N609600. Expires 31-12-2041;
- (Sub) Lease AK971351 to Blue Asset Partner Pty Ltd (ACN 615 217 493), ERIC Alpha Asset Corporation 1 Pty Ltd (ACN 612 974 044), ERIC Alpha Asset Corporation 2 Pty Ltd (ACN 612 975 023), ERIC Alpha Asset Corporation 3 Pty Ltd (ACN 612 975 032) and ERIC Alpha Asset Corporation 4 Pty Ltd (ACN 612 975 078);
- Mortgage of Lease AK971502 in respect of (Sub) Lease AK971351 to ANZ Fiduciary Services Pty Ltd ACN 100 709 493; and
- (Sub Sub) Lease AK971352 to Blue Op Partner Pty Ltd (ACN 615 217 500), ERIC Alpha Operator Corporation 1 Pty Ltd (ACN 612 975 096), ERIC Alpha Operator Corporation 2 Pty Ltd (ACN 612 975 121), ERIC Alpha Operator Corporation 3 Pty Ltd (ACN 612 975 185) and ERIC Alpha Operator Corporation 4 Pty Ltd (ACN 612 975 210).

All that piece of land situated in the Local Government Area of Sydney, Parish of St James and County of Cumberland, comprising Lot 2 in Deposited Plan 509677, being the whole of land in Folio Identifier 2/509677, said to be in the ownership of Sydney Metro ABN 12 354 063 515.

All that piece of land situated in the Local Government Area of Sydney, Parish of St James and County of Cumberland, comprising Lot 2 in Deposited Plan 982663, being the whole of land in Folio Identifier 2/982663, said to be in the ownership of Sydney Metro ABN 12 354 063 515.

All that piece of land situated in the Local Government Area of Sydney, Parish of St James and County of Cumberland, comprising Lot 1 in Deposited Plan 982663, being the whole of land in Folio Identifier 1/982663, said to be in the ownership of Sydney Metro ABN 12 354 063 515.

All that piece of land situated in the Local Government Area of Sydney, Parish of St James and County of Cumberland, comprising Lot 3 in Deposited Plan 61187, being the whole of land in Folio Identifier 3/61187, said to be in the ownership of Sydney Metro ABN 12 354 063 515.

All that piece of land situated in the Local Government Area of Sydney, Parish of St James and County of Cumberland, comprising Lot 1 in Deposited Plan 74367, being the whole of land in Folio Identifier 1/74367, said to be in the ownership of Sydney Metro ABN 12 354 063 515.

All that piece of land situated in the Local Government Area of Sydney, Parish of St James and County of Cumberland, comprising Lot 1 in Deposited Plan 596474, being the whole of land in Folio Identifier 1/596474, said to be in the ownership of Sydney Metro ABN 12 354 063 515 **but excluding from the acquisition:**

- easement for overhang in stratum 0.13 metre(s) wide affecting the part(s) shown so burdened in in DP1042711; and
- easement for overhang in stratum 0.14 metre(s) wide affecting the part(s) shown so burdened in in DP1042711.

All that piece of land situated in the Local Government Area of Sydney, Parish of St James and County of Cumberland, comprising Lot 17 in Deposited Plan 1095869, being the whole of land in Folio Identifier 17/1095869, said to be in the ownership of Sydney Metro ABN 12 354 063 515 **but excluding from the acquisition:**

- AM862029 caveat by Alpha Distribution Ministerial Holding Corporation ABN 67 505 337 385 in respect of an equitable interest as grantee of an easement for electricity and other purposes

All that piece of land situated in the Local Government Area of Sydney, Parish of St Lawrence and County of Cumberland, comprising Lot 1 in Deposited Plan 59101, being the whole of land in Folio Identifier 1/59101, said to be in the ownership of Sydney Metro ABN 12 354 063 515.

All that piece of land situated in the Local Government Area of Sydney, Parish of St Lawrence and County of Cumberland, comprising Lot 1 in Deposited Plan 436359, being the whole of land in Folio Identifier 1/436359, said to be in the ownership of Sydney Metro ABN 12 354 063 515.

Sydney Metro Document Number: SM18/0000727
SM-18-00175145

[n2018-4018]

VEXATIOUS PROCEEDINGS ACT 2008

Notification of Orders Concerning Vexatious Litigant

Adriana Kostov

On 19 November 2018, Justice Fagan made the following Order(s) under s 8(7) of the *Vexatious Proceedings Act 2008* (NSW):

1. Adriana Kostov is prohibited from instituting proceedings in New South Wales.
2. The Registry of the Supreme Court is not to accept for filing, either online or in person, any document from Adriana Kostov in any proceeding which has already been commenced by her in any Division of the Supreme Court as at the date of these orders.
3. Any application pursuant to s 9 of the Vexatious Proceedings Act to vary these orders, to permit Adriana Kostov to file a document in a proceeding which has been commenced prior to this date, is to be made by notice of motion in the affected proceeding, supported by evidence and/or argument in writing. Any such application with respect to Common Law Division proceedings to be referred to the Common Law Division Civil List Judge.
4. Any application by Adriana Kostov pursuant to s 14 of the *Vexatious Proceedings Act 2008* for leave to institute fresh proceedings in the Common Law Division of this Court is upon filing, is to be referred to the Common Law Division Civil List Judge, and any application for leave to institute fresh proceedings in the Equity Division is to be referred to the Chief Judge in Equity.

[n2018-4019]

Professional Standards Act 1994

Notification pursuant to section 13

Pursuant to section 13 of the *Professional Standards Act 1994*, I authorise the publication of The Institute of Public Accountants Professional Standards Scheme. This interstate Scheme operates by way of mutual recognition in New South Wales and will commence on 1 January 2019.

MATT KEAN, MP

Minister for Innovation and Better Regulation

Professional Standards Act 2003 (VIC)

THE INSTITUTE OF PUBLIC ACCOUNTANTS PROFESSIONAL STANDARDS SCHEME

PREAMBLE

- A. The Institute of Public Accountants Ltd ("**IPA**") is an occupational association.
- B. The IPA has made an application to the Professional Standards Council ("**Council**"), appointed under the *Professional Standards Act 2003* (VIC) ("**Act**"), for a scheme under the Act in Victoria.
- C. The scheme is prepared by the IPA for the purposes of limiting occupational liability¹ to the extent to which such liability may be limited under the Act; improving occupational standards of professional persons; and protecting consumers of their services, per the objects of the Act.
- D. The scheme is to apply to all members of the IPA who are ordinarily residents in Australia and who hold a current Professional Practice Certificate² ("**PPC**"), and who are not otherwise exempted or excluded.
- E. The scheme does not affect damages which are below the monetary ceiling specified in the scheme for each person to whom the scheme applies. The scheme limits liability for damages to the monetary ceiling specified for that person, provided that the person has insurance as required under s.23 of the Act.
- F. The IPA has furnished the Council with a detailed list of the risk management strategies³ in respect of its members and the means by which those strategies will be implemented.
- G. The IPA will report annually to the Council on the implementation and monitoring of its risk management strategies, the effect of those strategies, and any changes proposed to be made to them.
- H. The IPA will report to the Council on such other matters as the Council may require pursuant to s.47 of the Act.
- I. The scheme is intended to commence on 1 January 2019 and remain in force for two (2) years from its commencement unless, prior to that time, it is revoked, its operation ceases, or it is extended.
- J. The scheme is intended to apply in all Australian states and territories.
- K. All participating members referred to in clause 2 of the scheme are subject disciplinary measures under the Constitution and By-Laws of the IPA and are also subject to the professional indemnity insurance requirements under the By-Laws of the IPA.

THE INSTITUTE OF PUBLIC ACCOUNTANTS PROFESSIONAL STANDARDS SCHEME

1 Occupational association

- 1.1 The Institute of Public Accountants Professional Standards Scheme ("**scheme**") is a scheme under the Act, prepared by the IPA whose business address is:

Level 6, 555 Lonsdale Street,
Melbourne, Victoria, 3000.

¹ **Occupational liability** has the same meaning as it has in the Act

² A Professional Practice Certificate (**PPC**) is a certification, issued by the IPA to eligible members, which allows IPA members to offer professional accounting and/or related services to the public. The application and approval process of obtaining a PPC is governed by the IPA By-Laws Chapter 9 which can be found at <https://www.publicaccountants.org.au/media/1517245/MASTER-By-Laws-V-25-rebrand.pdf>

³ These risk management strategies are detailed in the application submitted by the IPA to the Council (**Application**). The Application includes sections on continuing occupational education, code of ethics / practice, complaints and discipline system, quality assurance and audit, and risk management

2 Persons to Whom the Scheme Applies

2.1 The scheme applies to:

- a) all IPA members who hold a current PPC issued by the IPA other than such members who are, or at the time of any act giving rise to occupational liability were:
 - i. holders of an Australian Financial Services Licence granted in accordance with section 913B of the *Corporations Act 2001* (Cth) ("**AFS licence holder**"), not being a Limited Licence⁴; and
 - ii. Representatives⁵ of an AFS licence holder, not being a Limited Licence;
- and
- b) All persons to whom the scheme applies, by virtue of the Act⁶ and the corresponding provisions of the Acts of other jurisdictions in which the Scheme applies.

Each such participating member and person is referred to in the Scheme as a "participating member"

2.2 This scheme also applies to all persons to whom the scheme applied under either clause 2.1 at the time of any act or omission giving rise to occupational liability.

2.3 This scheme also applies to all persons to whom the scheme applies by virtue of ss20, 21 and 22 of the Act and the relevant provisions of the corresponding laws.

3 Exemption

- 3.1 No member to whom the scheme applies may be exempted from the scheme other than a member who, on application to the IPA Board of Directors⁷, is able to satisfy the Board that the member is also a participating member of another occupational association of accountants that is covered by a professional standards scheme, and has not been exempted from that scheme.

4 Jurisdiction

4.1 The scheme applies in Victoria in accordance with the Act.

4.2 In addition to Victoria, the scheme is intended to operate in the Australian Capital Territory, New South Wales, the Northern Territory, Queensland, South Australia, Tasmania, and Western Australia, in accordance with the professional standards legislation of those states and territories and subject to the requirements of that legislation, so that references to a provision of the Act, the application of the scheme to a liability, the limit of a liability under the Act or what constitutes Occupational Liability are intended to pick up the relevant provisions of the corresponding laws, applied mutatis mutandis, to the extent that is necessary for the application of the scheme in any of those jurisdictions as an interstate scheme.

4.3 Notwithstanding anything to the contrary contained in this scheme if, in particular circumstances giving rise to occupational liability, the liability of any person who is subject to this scheme is capped both by this scheme and also by any other scheme under professional standards legislation (whether of this jurisdiction or under the law of any other Australian state or territory) and, if the amount of such caps should differ, then the cap on the liability of such person arising from such circumstances which is higher shall be the applicable cap.

5 Limitation of liability

⁴ Limited Licence means a licence to provide only limited financial services as defined in regulations 7.8.12A and 7.8.14B of the *Corporations Regulations 2001* (Cth), as amended from time to time ("**Limited Licence**").

⁵ The term "Representatives" has the meaning that it has in section 910A of the *Corporations Act 2001* (Cth).

⁶ Sections 18 and 19 of the Act.

⁷ Details on how the IPA Board of Directors manages membership can be found in Chapter 3 of the IPA's Constitution, Chapter 3 of the IPA's By-Laws, and various IPA Membership policies.

5.1 Pursuant to s. 26 of the Act, and the relevant provisions of the corresponding laws, this scheme only affects the liability for damages arising from a single cause of action to the extent to which the liability results in damages⁸ exceeding \$2,000,000 (the **monetary ceiling**).

5.2 If a member who was at the time of the act or omission giving rise to occupational liability, a member to whom or to which the scheme applied, against whom a proceeding relating to occupational liability is brought, is able to satisfy the Court or tribunal that such member has the benefit of an insurance policy:

- (a) of a kind which complies with the IPA's requirements⁹;
- (b) which insures the member against that occupational liability; and
- (c) under which the amount payable in respect of that occupational liability is not less than the relevant monetary ceiling specified in this scheme.

then the member is not liable for damages in relation to that cause of action above the monetary ceiling defined in this scheme.

5.3 This scheme limits the occupational liability in respect of a cause of action founded on an act or omission occurring during the period when the scheme was in force with respect to any member to whom the scheme applied at the time the act or omission occurred.

6 Conferral of Discretionary Amount

6.1 Pursuant to s24 of the Act this scheme confers on the IPA a discretionary authority to specify, on application by a member to whom the scheme applies, a higher monetary ceiling (maximum amount of liability) not exceeding \$20 million in relation to that member either in all cases or in any specified case or class of case.

7 Duration

7.1 This scheme will be in force for a period of two (2) years from the date of commencement.

8 Commencement

8.1 In Victoria, this scheme will commence:

- (a) on 1 January 2019, if the scheme is published in the Government Gazette by or on 31 October 2018; or
- (b) on the first day two months after the scheme is published in the Government Gazette in any other case.

8.2 In New South Wales, the Northern Territory, Queensland, Tasmania and Western Australia, the scheme will commence:

- (a) on 1 January 2019, if the scheme is published in the Government Gazette by or on 31 December 2018; or
- (b) on the day immediately following the date of the scheme's publication in the Government Gazette in any other case.

8.3 In the Australian Capital Territory and in South Australia, the scheme will commence:

- (a) on the date provided for in the Minister's notice in relation to the scheme, if a date is provided; or
- (b) on the first day two months after the day on which notice was given in any other case.

⁸ Damages has the same meaning as it has in the Act.

⁹ The IPA requirements on insurance cover can be found in IPA By-Law 9 and the relevant IPA membership policies.

- 8.4 Clauses 8.1, 8.2 and 8.3 are subject to the provisions of the Act and the relevant provisions of the corresponding laws.

[n2018-4020]

COUNCIL NOTICES

ALBURY CITY COUNCIL

ROADS ACT 1993

Naming of Roads

Notice is hereby given that Albury City Council, pursuant to section 162 of the *Roads Act 1993*, has officially named the road(s) as shown hereunder:

Name	Locality
BEETHOVEN STREET	Springdale Heights
Description	
Beethoven Street extends northerly off Strauss Street in Springdale Heights. Access to Beethoven Street is approximately 185 metres East of Goldsworthy Street.	

FRANK ZAKNICH, GENERAL MANAGER, Albury City Council, PO Box 323, ALBURY NSW 2640

GNB Ref: 0244

[n2018-4021]

ARMIDALE REGIONAL COUNCIL

LOCAL GOVERNMENT ACT

SECTION 50

Vesting of Drainage Reserves in Council

NOTICE is hereby given by Armidale Regional Council pursuant to section 50 of the *Local Government Act 1993*, that the land described below is vested in Council as Drainage Reserves.

- Lot 12 DP 1201713
- Lot 113 DP 15733

Susan Law, Chief Executive Officer, Armidale Regional Council, PO Box 75A, ARMIDALE NSW 2350

File Ref: KS:ARC18/2980

[n2018-4022]

CAMPBELLTOWN CITY COUNCIL

ROADS ACT 1993

ERRATUM

In the notice referring to the Naming of Roads in the Campbelltown Local Government Area, NSW Government Gazette No 33 of 23 March 2018, page 1822, the road name Daintrees Circuit was assigned with the incorrect road type. The correct road type for this road name is Daintrees Street. This notice corrects this error.

LINDY DEITZ, General Manager, Campbelltown City Council, PO Box 57, CAMPBELLTOWN NSW 2560

[n2018-4023]

HAWKESBURY CITY COUNCIL

ROADS ACT 1993

Naming of Roads

Notice is hereby given that Hawkesbury City Council, pursuant to section 162 of the *Roads Act 1993*, has officially named the road(s) as shown hereunder:

Name	Locality
SCENIC WAY	North Richmond
Description	
Scenic Way is bounded by Belmont Grove North Richmond, Lots 17 – 19, 35 – 38 DP 1211770, Serenity Place North Richmond and Observation Close North Richmond.	

KU-RING-GAI COUNCIL**ROADS ACT 1993****Naming of Roads**

Notice is hereby given that Ku-ring-gai Council, pursuant to section 162 of the *Roads Act 1993*, has officially named the road(s) as shown hereunder:

Name	Locality
JEMIMAS PLACE	North Turramurra
Description	
New road in subdivision starting at Miowera Road North Turramurra then in an Easterly direction to cul-de-sac at end of road.	

JOHN MCKEE, General Manager, Ku-ring-gai Council, Locked Bag 1006, Gordon NSW 2072

GNB Ref: 0248

[n2018-4025]

LAKE MACQUARIE CITY COUNCIL**Roads Act 1993****Section 16****Dedication of Land as Public Road**

NOTICE is hereby given pursuant to section 16 of the *Roads Act 1993*, that the land described in the Schedule and shown shaded on the plan below is dedicated to the public as road.

MORVEN CAMERON, Chief Executive Officer, lake Macquarie City Council, Administration Building, Main Road, Speers Point NSW 2284.

SCHEDULE

Road of variable width located within DP 8479 known as Glendale Drive, Glendale between Lake Road and Main Road, Glendale.

The Plan

Parish – Kahibah; County – Northumberland; LGA – Lake Macquarie City Council



[n2018-4026]

LAKE MACQUARIE CITY COUNCIL

Roads Act 1993

Road Closure

NOTICE is hereby given under the provisions of the *Roads Act 1993*, that the land described in the Schedule below is closed and the lands comprised therein cease to be public road and the rights of passage and access that previously existed in relation to the road is extinguished. Upon closing, title of the land, comprised the former public road, vests in Lake Macquarie City Council and is classified as Operational Land.

MORVEN CAMERON, Chief Executive Officer, Lake Macquarie City Council, Administration Building, Main Road, Speers Point NSW 2284.

SCHEDULE

Lot 100 DP 1244992 – Land adjoining 12 Pannamena Crescent, Eleebana.

[n2018-4027]

PARKES SHIRE COUNCIL

ROADS ACT 1993

Naming of Roads

Notice is hereby given that Parkes Shire Council, pursuant to section 162 of the *Roads Act 1993*, has officially named the road(s) as shown hereunder:

Name	Locality
SUNNYBRAE LANE	Cookamidgera
Description	
Off Cooka Hills Road, heading south between Lot 3 DP716045 and Lot 179 DP750135 and terminating at the boundary with Lot 191 DP750135.	
Name	Locality
MCLENNAN LANE	Cookamidgera
Description	
Off Cooka Hills Road, heading south east adjacent the rail line, turning north between Lot 167 750135 and Lot 2 605437 for approximately 400 meters	

BEN HOWARD, Director Works and Services, Parkes Shire Council, 2 Cecile Street, PARKES NSW 2870

GNB Ref: 0247

[n2018-4028]

PORT STEPHENS COUNCIL

Roads Act 1993, Section 10

Dedication of Land as a Public Road

NOTICE is hereby given that pursuant to Section 10 of the *Roads Act 1993*, Council hereby dedicates to the public as road for widening Lot 2 DP 1225747 Government Road at Shoal Bay.

W WALLIS, General Manager, Port Stephens Council, 116 Adelaide Street, Raymond Terrace NSW 2324 Council file PSC2016-00474

[n2018-4029]

RANDWICK CITY COUNCIL

IMPOUNDING ACT 1993

Section 15A (1)

BOAT TRAILER IMPOUNDING AREA ORDER

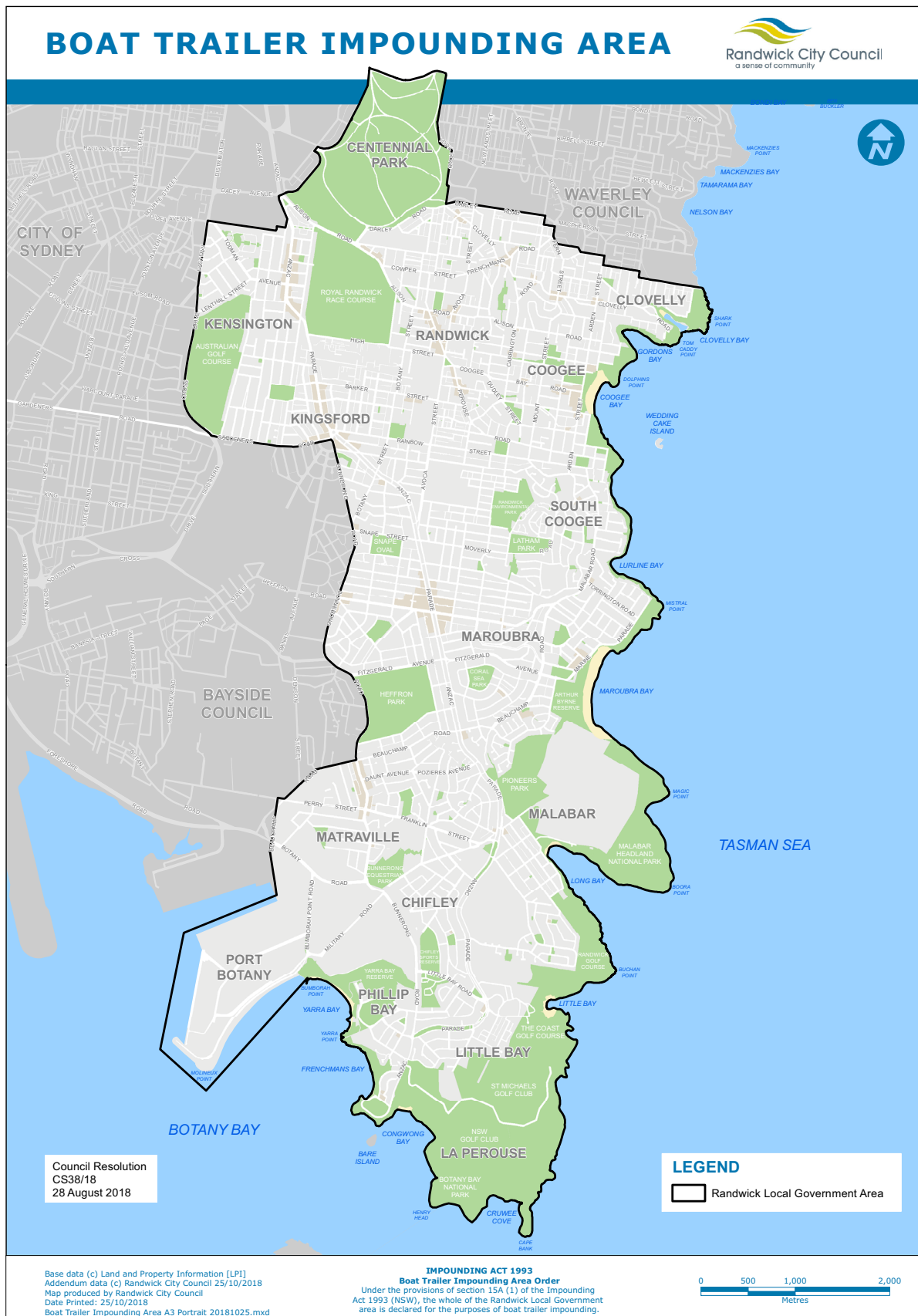
Notice is hereby given, under the provisions of section 15A (1) of the *Impounding Act 1993* (NSW), that the following area is to be declared for the purposes of boat trailer impounding.

The whole of the Randwick City Council local government area as outlined in the map (attached).

Dated this twenty-fifth day of October, 2018

JORDE FRANGOPLES

Acting General Manager, Randwick City Council



[n2018-4030]

SUTHERLAND SHIRE COUNCIL

HERITAGE ACT 1977

INTERIM HERITAGE ORDER NO.1

Under Section 25 of the *Heritage Act 1977* Sutherland Shire Council does by this order:

- I. make an interim heritage order to cover the item of the environmental heritage specified or described in Schedule 'A'; and
- II. declare that the Interim Heritage Order shall apply to the curtilage or site of such item, being the land described in Schedule 'B'

The Interim Heritage Order will lapse six months from the date that it is made unless the local council has passed a resolution before that date either:

- 1) in the case of an item which, in the Council's opinion, is of local significance, to place the item on the heritage schedule of a local environmental plan with appropriate provisions for protecting and managing the item; and
- 2) in the case of an item which in the Council's opinion, is of State heritage significance, nominate the item for inclusion on the State Heritage Register.

Manjeet Grewal
Acting General Manager
Sutherland Shire Council

20 November 2018

Schedule 'A'

House at 65 Hotham Road, Gymea

Schedule 'B'

LOT 24A DP 26995

[n2018-4031]

THE HILLS SHIRE COUNCIL

Roads Act 1993, Section 38E

NOTIFICATION OF CLOSING OF A PUBLIC ROAD

In pursuance of the provisions of the *Roads Act 1993*, the road hereunder described is closed and the lands comprised therein cease to be public road and the rights of passage and access that previously existed in relation to the road is extinguished. Upon closing, title to the land, comprising the former public road, vests in the body specified in the schedule hereunder.

GENERAL MANAGER, The Hills Shire Council, 3 Columbia Court, Norwest NSW 2153

SCHEDULE

On closing, the land within Lot 1 DP 1243115 remains vested in The Hills Shire Council as Operational Land for the purposes of the *Local Government Act 1993*.

Council Ref: RMRC0118

[n2018-4032]

UPPER LACHLAN SHIRE COUNCIL**ROADS ACT 1993****Naming of Roads**

Notice is hereby given that Upper Lachlan Shire Council, pursuant to section 162 of the *Roads Act 1993*, has officially named the road(s) as shown hereunder:

Name	Locality
GRAHAM CRESCENT	Crookwell
Description	
GRAHAM CRESCENT intersects McGeechan Street and continues in a easterly and westerly direction to two cul-de-sacs in Crookwell.	

Name	Locality
MCGEECHAN STREET	Crookwell
Description	
McGEECHAN STREET runs North – South in between McIntosh Road and Graham Crescent in Crookwell.	

JOHN BELL, General Manager, Upper Lachlan Shire Council, PO Box 42, GUNNING NSW 2581

GNB Ref: 0242

[n2018-4033]

PRIVATE NOTICES

NOTICE OF VOLUNTARY LIQUIDATION

The Corporations Law and in the matter of SALER PTY LIMITED A.C.N. 000 337 324

NOTICE is hereby given that at an extraordinary general meeting of the members of the company duly convened and held on the 19th day of November, 2018 the following resolutions were passed:

That the company be wound up voluntarily and that M/s F MacDonald be appointed liquidator for the purpose of such winding up.

Creditors of the company are required to prove their debts or claims within one month from the date of publication of this notice. Failing which they will be excluded from any distribution made and from objecting to any such distribution. Formal Proof of Debt forms are available on application to the Liquidator. Dated this 19th November 2018. F MacDonald, Liquidator, c/ K B Raymond & Co. 2/131 Clarence Street, Sydney, NSW 2000 (GPO Box 4684 Sydney NSW 2001), tel.: (02) 9299 6521.

[n2018-4034]

**NOTIFICATION OF RESUMPTION OF LAND UNDER
44 VICTORIA No. 16.**

NEW SOUTH WALES, } By His Excellency the Right Honorable
to wit. } Lord AUGUSTUS WILLIAM FREDERICK
SPENCER LOFTUS, Knight Grand Cross
of the Most Honorable Order of the
Bath, a Member of Her Majesty's Most
(L.S.) Honorable Privy Council, Governor and
AUGUSTUS LOFTUS, Commander-in-Chief of the Colony of
Governor. New South Wales and its Dependencies.

WHEREAS I, the Governor aforesaid, with the advice of the Executive Council of the said Colony, have duly sanctioned the establishment and construction of a public park at Musclevbrook, in the said Colony, and for the construction thereof public funds are lawfully available: Now, I, the Governor of the said Colony, with the advice of the Executive Council of the said Colony, in pursuance of the powers in this behalf given to or vested in me by the "Lands for Public Purposes Acquisition Act," do, by this notification published in the Gazette and in a newspaper, that is to say, in the "Upper Hunter Standard," circulated in the Police District wherein the said land is situated, declare that the land hereinafter described has been resumed for the public purposes hereinafter mentioned, that is to say, for and in connection with the construction of a public park, to the intent that upon the publication of this notification in the Gazette the legal estate in the said land shall forthwith be vested in the Minister for Public Works and his successors on behalf of Her Majesty, for the purpose of the said last-mentioned Act, for an estate of inheritance in fee simple in possession, freed and discharged from all trusts, obligations, estate, interest, contracts, charges, rights-of-way, or other easements whatsoever; and to the intent further that the legal estate therein, together with all powers incident thereto or conferred by the said Act, shall be vested

in the said Minister as a trustee with the powers stated in said last-mentioned Act: And I declare that the following is the description of the land hereinbefore referred to, that is to say:—

County of Durham, parish of Brougham, area 68 acres: Commencing at a point on the north side of the main road from Musclevbrook to Maitland bearing south 32 degrees 44 minutes east 4,869 links from the intersection of the eastern building line of Bridge-street, in the town of Musclevbrook, with the northern building line of William-street; and bounded thence on the south-west by the said north side of the road to Maitland bearing south-easterly 3,067 links; thence on the south-east by a line bearing north 42 degrees 18 minutes east 1,050 links to the proper left bank of Musclevbrook; thence on the south-east, north-east, and north by that bank of Musclevbrook bearing generally north-westerly about 53 chains; and thence on the west by a line bearing south 4 degrees 32 minutes west 1,189 links, to the point of commencement.

NOTE.—The bearings are all taken from magnetic north.

Given under my Hand and Seal, at Government House, Sydney, this twenty-third day of September, in the year of our Lord one thousand eight hundred and eighty-four, and in the forty-eighth year of Her Majesty's Reign.

By His Excellency's Command,

ALEX. STUART.

[6098]

GOD SAVE THE QUEEN!

SYDNEY:

Printed and Published by THOMAS RICHARDS, Government Printer, Phillip-street, 24th September, 1884.

[Price, 6d.]

CONSERVATION DEPARTMENT NOTICES

FORESTRY ACT, 1916-1957.—PROCLAMATION

(L.S.) E. W. WOODWARD, *Governor*.

I, Lieutenant-General Sir ERIC WINSLOW WOODWARD, Governor of the State of New South Wales and its Dependencies, in the Commonwealth of Australia, in pursuance of the provisions of the Forestry Act, 1916-1957, and with the advice of the Executive Council, do, by this my Proclamation, declare that the land described in the Schedule hereto is dedicated as a State Forest.

SCHEDULE

EASTERN DIVISION

LAND DISTRICT OF BRAIDWOOD; TALLAGANDA SHIRE; FORESTRY DISTRICT OF SOUTH COAST

Tallaganda State Forest No. 577, No. 8 Extension. An area of about 215 acres in the parish of Jinero, county of Murray, being the land within the following boundaries: Commencing on the more westerly western boundary of portion 124 at a south-eastern corner of Tallaganda State Forest No. 577, No. 1 Extension, dedicated 10th March, 1922, and bounded thence by part of that boundary, a closed road and part of the northern boundary and the western boundary of portion 14 southerly, westerly and again southerly to the north-western corner of Travelling Stock and Camping Reserve No. 29,553, notified 1st July, 1899; by the western boundary of that reserve southerly to a north-western side of the public road from Captain's Flat to Braidwood; by generally north-western and northern sides of that road generally westerly and south-westerly to the most westerly eastern boundary of Tallaganda State Forest No. 577, No. 1 Extension aforesaid; thence by that eastern and a generally southern boundary of that State Forest Extension northerly and generally easterly to the point of commencement. (2-20-58,581)

Signed and sealed at Sydney, this twenty-ninth day of May, 1963.

By His Excellency's Command,

A. G. ENTICKNAP.

(674) GOD SAVE THE QUEEN!

FORESTRY ACT, 1916-1957.—PROCLAMATION

(L.S.) E. W. WOODWARD, *Governor*.

I, Lieutenant-General Sir ERIC WINSLOW WOODWARD, Governor of the State of New South Wales and its Dependencies in the Commonwealth of Australia, in pursuance of the provisions of the Forestry Act, 1916-1957, and with the advice of the Executive Council, do, by this my Proclamation, declare that the land described in the First Schedule hereto is dedicated as a State Forest, and the reserve mentioned in the Second Schedule hereto is hereby revoked.

EASTERN DIVISION

LAND DISTRICT OF SCONE; SCONE SHIRE; NEWCASTLE FORESTRY DISTRICT

First Schedule

Stewart's Brook State Forest No. 276, No. 4 Extension. An area of about 25,240 acres in the parishes of Bronte and Prospero, county of Durham, being portions 39, 40 and 42, parish of Bronte, and portions 11, 12, 13, 14 and 25, parish of Prospero, delineated on plans catalogued D. 4,139 R., 4,140 R., 4,142 R., 3,917, 4,418 R., 4,135 R., 4,136 R. and 4,506 R.-2,083 in the Department of Lands, TOGETHER WITH the land within the following boundaries: Commencing on the eastern boundary of portion 10, parish of Prospero, at the north-western corner of portion 124, parish of Oldcastle, and bounded thence by part of that eastern boundary northerly to a point west of the south-western corner of portion 13, parish of Prospero; by a line easterly to that corner; by generally south-western boundaries of that portion and portion 11, parish of Began Began, county of Gloucester, generally south-easterly to the northern boundary of Trigonometrical Reserve No. 15,082, notified 23rd January, 1892; by part of that northern boundary and part of the western boundary of that reserve westerly and southerly to the northernmost north-eastern corner of Stewart's Brook State

Forest No. 276, dedicated 8th December, 1916, parish of Oldcastle; by boundaries of that State Forest generally south-westerly to the south-eastern corner of portion 78; by the eastern boundary of that portion and its prolongation northerly to the right bank of Stewart's Brook (North Arm); by that bank of that Brook downwards to its intersection with the southerly prolongation of the easterly boundary of portion 124 aforesaid; thence by that prolongation and the eastern and northern boundaries of that portion northerly and westerly to the point of commencement, AND ALSO the boundary road one chain wide separating portions 39 and 44 from portion 40, parish of Bronte, the part of the boundary road of variable width separating portion 25, parish of Prospero, from Moonan Brook east of the northerly prolongation of the eastern boundary of portion 21, the reserved roads one chain wide traversing portions 40 and 42, parish of Bronte, and portion 12, parish of Prospero; EXCLUSIVE, however, of the public road traversing portion 39, parish of Bronte.

Second Schedule

Timber Reserve No. 52,213, notified 22nd June, 1917, parish of Bronte, county of Durham—the whole, having an area of 12,320 acres and being within the abovedescribed area. (2-01-48,015)

Signed and sealed at Sydney, this fifth day of June, 1963.

By His Excellency's Command.

A. G. ENTICKNAP.

(719) GOD SAVE THE QUEEN!

FORESTRY ACT, 1916-1957.—PROCLAMATION

(L.S.) E. W. WOODWARD, *Governor*.

I, Lieutenant-General Sir ERIC WINSLOW WOODWARD, Governor of the State of New South Wales and its Dependencies, in the Commonwealth of Australia, in pursuance of the provisions of the Forestry Act, 1916-1957, and with the advice of the Executive Council, do, by this my Proclamation, declare that the land described in the Schedule hereto is dedicated as a State Forest.

SCHEDULE

EASTERN DIVISION

LAND DISTRICT OF TUMUT; TUMUT SHIRE; FORESTRY DISTRICT OF TUMUT

Bondo State Forest No. 967, No. 2 Extension. An area of about 1,114 acres in the parish of Tumorrana, county of Buccleuch, being portions 27, 28, 65, 67, 74 and 76 delineated on plans catalogued B. 2,100, 2,101, 1,658, 2,386, 2,387 and 2,433—1,713 at the Department of Lands; TOGETHER WITH the road separating portions 65 and 67 from portions 28 and 74; the road separating portion 76 from portions 63, 67 and 74; the road separating portions 66 from portions 27 and 28; the road separating portion 28 from portion 74; and the reserved road traversing portion 27. (4-31-80,340)

Signed and sealed at Sydney, this twenty-ninth day of May, 1963.

By His Excellency's Command,

A. G. ENTICKNAP.

(673) GOD SAVE THE QUEEN!

FORESTRY ACT, 1916-1957.—PROCLAMATION

(L.S.) E. W. WOODWARD, *Governor*.

I, Lieutenant-General Sir ERIC WINSLOW WOODWARD, Governor of the State of New South Wales and its Dependencies, in the Commonwealth of Australia, in pursuance of the provisions of the Forestry Act, 1916-1957, and with the advice of the Executive Council, do, by this my Proclamation, declare that the land described in the Schedule hereto is dedicated as a State Forest.

SCHEDULE

EASTERN DIVISION

LAND DISTRICT OF MUSWELLBROOK; MUSWELLBROOK MUNICIPALITY; FORESTRY DISTRICT OF NEWCASTLE

Muswellbrook State Forest No. 975. An area of 82 acres 2 roods 1½ perches, in two parts, in the parishes of Brougham and Rowan, county of Durham, being FIRSTLY, in the parish

of Brougham, the area of 6 acres 1½ perches delineated on plan catalogued Ms. 6,961 Md. R. in the Department of Lands and SECONDLY, in the parish of Rowan, the area of 76 acres 2 roods delineated on plan catalogued Ms. 6,962 Md. R. in the Department of Lands. (3-2-70,204)

Signed and sealed at Sydney, this twenty-ninth day of May, 1963.

By His Excellency's Command,

A. G. ENTICKNAP.

(671) GOD SAVE THE QUEEN!

FORESTRY ACT, 1916-1957.—PROCLAMATION

(L.S.) E. W. WOODWARD, *Governor*.

I, Lieutenant-General Sir ERIC WINSLOW WOODWARD, Governor of the State of New South Wales and its Dependencies, in the Commonwealth of Australia, in pursuance of the provisions of the Forestry Act, 1916-1957, and with the advice of the Executive Council, do, by this my Proclamation, declare that the land described in the Schedule hereto is dedicated as a State Forest.

SCHEDULE

EASTERN DIVISION

LAND DISTRICT OF CASINO; TENTERFIELD SHIRE; FORESTRY DISTRICT OF CASINO

Bald Knob State Forest No. 120, No. 2 Extension. An area of about 114 acres in the parish of Woodenbong, county of Buller, being the land within the following boundaries: Commencing on the western boundary of portion 62 at the north-eastern corner of Woodenbong State Forest No. 346, dedicated 2nd March, 1917 and bounded thence by the generally north-western boundary of that State Forest, generally south-westerly to the most easterly south-eastern corner of portion 17; by the eastern, north-western and northern boundaries and the northerly prolongation of the western boundary of that portion, northerly, south-westerly, westerly and again northerly to the south-western corner of Bald Knob State Forest No. 120, dedicated 24th June, 1914; by the generally south-eastern boundary of that State Forest, generally north-easterly to the western boundary of portion 62 aforesaid; and thence by part of that boundary southerly to the point of commencement. (2-01-83,143)

Signed and sealed at Sydney, this twenty-ninth day of May, 1963.

By His Excellency's Command,

A. G. ENTICKNAP.

(672) GOD SAVE THE QUEEN!

FORESTRY ACT, 1916-1957.—PROCLAMATION

(L.S.) E. W. WOODWARD, *Governor*.

I, Lieutenant-General Sir ERIC WINSLOW WOODWARD, Governor of the State of New South Wales and its Dependencies, in the Commonwealth of Australia, in pursuance of the provisions of the Forestry Act, 1916-1957, and with the advice of the Executive Council, do, by this my Proclamation, declare that the land described in the Schedule hereto is dedicated as a State Forest.

SCHEDULE

EASTERN DIVISION

LAND DISTRICT OF TUMBARUMBA; TUMUT SHIRE; FORESTRY DISTRICT OF TUMUT

Green Hills State Forest No. 657, No. 11 Extension. An area of about 1,231 acres 2 roods in the parish of Hillas, county of Wynyard, being the lands delineated on plans catalogued Ms. 3,918 Wga. and Ms. 3,927 Wga. R. in the Department of Lands, TOGETHER WITH the road one chain wide separating the aforesaid lands and the reserved road one chain wide traversing the lands delineated on plan Ms. 3,927 Wga. R. (4-31-36,463)

Signed and sealed at Sydney, this twenty-second day of May, 1963.

By His Excellency's Command,

A. G. ENTICKNAP.

(675) GOD SAVE THE QUEEN!

WATER ACT, 1912-1955

THE following applications for licenses under the Water Act, 1912-1955, have been received from—

Ernest Milton Ford, for a pump on Pretty Gully, portions 33, 51 and 52, parish Ellerslie, county Buller, for irrigation of 38 acres. (63-3,952)

Clarence George Batcheldor, for a pump on Fish River Creek, parts portions 131 and 132, parish Oberon, county Westmoreland, for irrigation of 20 acres. (In lieu of previous notice published in Government Gazette No. 25 of 15th March, 1963.) (62-5,346)

Ernest Hedley Morris, for a pump on Macquarie River, part portion 34, parish Peel, county Roxburgh, for irrigation of 45 acres. (63-4,119)

Lenard Harrington Miners, for a pump on Allyn River, part portion 116, parish Holywell, county Durham, for irrigation of 30 acres. (63-3,624)

Bohuslav Karez, for a pump on Namoi River, Crown land west of portion 251, parish Wee Waa, county White, for irrigation of 30 acres. (In lieu of previous notice published in Government Gazette No. 16 of 22nd February, 1963.) (63-3,180)

Jeffrey Thomas Williams, for a pump on Murrumbidgee River, portions 36 and part 21 rem., parish Nerang, county Waradgery, for water supply for stock and irrigation of 400 acres. (63-3,951)

Allen Keith Lever, executor of will of A. L. Lever, deceased, for three dams on Richmond River, portions 23 and 28, parish Unumgar, county Rous, for conservation of water for stock. (63-4,138)

Keith Shephard, for a pump on Richmond River, part portion 10, parish Woram, county Richmond, for irrigation of 10 acres. (63-3,484)

Douglas Arthur Parker, for two pumps on St. Hilliers Brook or Sandy Creek, portions 47 and 52, parish Rowan, county Durham, for irrigation of 15 acres. (63-3,780)

Edward William Nebauer, for a pump on Gungal or Hall's Creek, portion 236, parish Wickham, county Brisbane, for irrigation of 20 acres. (63-3,763)

Eliza Jane Knobel, for a pump on Murrumbidgee River, portion 82, parish Benerambah, county Sturt, for irrigation of 200 acres. (63-3,962)

Anthony Bernard Kneipp, Peter Kevin Kneipp and Francis John Kneipp, for a pump on Dumaresq River, portion 5, parish Bowman, county Arrawatta, for irrigation of 10 acres. (63-4,226)

Alfred William Allen Johnson, for a dam and pump on unnamed watercourse and a pump on Woogoolga Creek, portion 10, parish Woogoolga, county Fitzroy, for conservation of water and irrigation of 7 acres. (63-4,229)

John Cecil O'Dea, for two pumps on Hawkesbury River, portions 131 and 129, parish Currency, county Cook, for irrigation of 140 acres. (63-4,131)

Merilyn Farms Pty. Ltd., for two pumps on unnamed watercourse, part portion 63, parish Narara, county Northumberland, for irrigation of 25 acres. (63-4,233)

Vittorio Erbeni, for a pump on Ironbark Creek, part R. 42,930, parish Popran, county Northumberland, for irrigation of 25 acres. (63-4,184)

The Steading Pty. Limited, for a pump on Hawkesbury River, portion 44, parish Kurrajong, county Cook, for irrigation of 91 acres. (62-4,148)

Objections to any of the applications, together with the grounds thereof, must reach me within the period of twenty-eight days fixed by the Act.

A. J. QUILTY, *Secretary*.

Water Conservation and Irrigation Commission,
(877) Box 2708, G.P.O., Sydney, 26th June, 1963.



NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 62/1208238

SEARCH DATE	TIME	EDITION NO	DATE
21/3/2019	2:22 PM	-	-

CERTIFICATE OF TITLE HAS NOT ISSUED

LAND

LOT 62 IN DEPOSITED PLAN 1208238
AT MUSWELLBROOK
LOCAL GOVERNMENT AREA MUSWELLBROOK
PARISH OF BROUGHAM COUNTY OF DURHAM
TITLE DIAGRAM DP1208238

FIRST SCHEDULE

THE STATE OF NEW SOUTH WALES (CA174152)

SECOND SCHEDULE (4 NOTIFICATIONS)

- * 1 LIMITED TITLE. LIMITATION PURSUANT TO SECTION 28T(4) OF THE REAL PROPERTY ACT, 1900. THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.
- * 2 THE LAND ABOVE DESCRIBED IS ADMINISTERED UNDER THE FORESTRY ACT 2012 BY THE FORESTRY CORPORATION OF NEW SOUTH WALES
- * 3 DEDICATED AS A STATE FOREST KNOWN AS MUSWELLBROOK STATE FOREST NO. 975 - SEE GOVERNMENT GAZETTE DATED 28-06-1963 FOLIOS 1891-1892
- * 4 DP1112032 EASEMENT FOR SEWAGE RISING MAIN 5 METRES WIDE AFFECTING THE PART OF THE LAND ABOVE DESCRIBED SHOWN SO BURDENED IN DP1112032

NOTATIONS

DP645211 NOTE: PROPOSED EASEMENT
THIS LAND MAY BE SUBJECT TO SUBSISTING INTERESTS THAT HAVE NOT BEEN RECORDED. BEFORE DEALING WITH THIS LAND INQUIRIES SHOULD BE MADE WITH FORESTRY CORPORATION OF NEW SOUTH WALES
AN892780 NOTE: REVOKE DEDICATION AS MUSWELL BROOK STATE FOREST NO. 975 OF LOT 62 DP1208238 VIDE GOV. GAZ. 23.11.2018 FOL. 8879

UNREGISTERED DEALINGS: R AP118443.

*** END OF SEARCH ***

advlegs

PRINTED ON 21/3/2019

Obtained from NSW LRS on 21 March 2019 01:22 PM AEST

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register.

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Section 10.7 Certificates

**PLANNING CERTIFICATE UNDER
SECTION 10.7 ENVIRONMENTAL PLANNING
AND ASSESSMENT ACT 1979**

Enquiries Planning
Contact 02 6549 3700
Receipt no. 1138668
Your reference Application

Date: 22 March 2019

Assessment: 75838

Cert No: 21792

Mr V Boggaram
PO Box 976
NORTH RYDE NSW 1670

Owner (as recorded by Council)

Forestry Corporation

Property Description: Maitland Street MUSWELLBROOK 2333
LOT: 62 DP: 1208238

Land to which the certificate relates

The land to which this certificate relates, being the lot or lots described on the application form, is shown in the Council's records as being situated at the street address described above. The information contained in this certificate relates only to the lot or lots described on this certificate. Separate planning certificates can be obtained upon application for the other lots, those certificates may contain different information than is contained in this certificate.

CERTIFICATE UNDER SECTION 10.7(2) ENVIRONMENTAL PLANNING & ASSESSMENT ACT
--

LOCAL ENVIRONMENTAL PLANS

PLANNING INSTRUMENT Muswellbrook Local Environmental Plan 2009

LAND USE ZONING RU3 Forestry

PERMITTED WITHOUT CONSENT

Uses authorised under the Forestry Act 2012 or under Part 5B (Private native forestry) of the Local Land Services Act 2013; Roads.

PERMITTED WITH CONSENT

Aquaculture Environmental facilities; Environmental protection works; Flood mitigation works; Intensive plant agriculture; Research stations.

PROHIBITED

Any development not specified above.

MINIMUM LAND DIMENSIONS FOR THE ERECTION OF A DWELLING

Under the provisions of the Muswellbrook Local Environmental Plan, 2009 the erection of a dwelling house on the land within zones: B2, B5, IN1, IN2, SP2, RE1, RE2, RU3, E1, W1 is PROHIBITED. Please refer to Muswellbrook Local Environmental Plan 2009 - Lot Size maps.

Date: 1 April 2019

Cert No: 21792

Under the provisions of the Muswellbrook Local Environmental Plan 2009, the minimum subdivision lot size IS NOT TO BE LESS than 600m².

WHETHER THE LAND INCLUDES OR COMPRISES CRITICAL HABITAT

The subject land has not been declared as critical habitat.

WHETHER THE LAND IS IN A CONSERVATION AREA

The subject land is not known to be in a conservation area.

WHETHER AN ITEM OF ENVIRONMENTAL HERITAGE IS SITUATED ON THE LAND

The land is NOT affected by any known or listed heritage item.

STATE ENVIRONMENTAL PLANNING POLICIES (EXEMPT & COMPLYING DEVELOPMENT CODES 2008)

CERTIFICATE UNDER SECTION 10.7(2) IDENTIFYING THE INFORMATION SET OUT IN CLAUSE 3 OF SCHEDULE 4 OF THE ENVIRONMENTAL PLANNING & ASSESSMENT REGULATIONS
--

Part 3 General Housing Code

Not applicable to the land to which this certificate relates.

Part 3A Rural Housing Code

YES. Complying development specified in the Rural Housing Code may be carried out on this land in certain circumstances pursuant to Clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Part 4 Housing Alterations Code

YES. Complying development specified in the Housing Alterations Code may be carried out on this land in certain circumstances pursuant to Clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Part 4A General Development Code

Not applicable to the land to which this certificate relates.

Part 5 Commercial and Industrial Alterations Code

Not applicable to the land to which this certificate relates.

Part 5A Commercial and Industrial (New Buildings and Additions) Code

Not applicable to the land to which this certificate relates.

Part 6 Subdivision Code

YES. Complying development specified in the Subdivision Code may be carried out on this land in certain circumstances pursuant to Clause 1.19 of State Environmental Planning Policy (Exempt and

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Complying Development Codes) 2008.

Part 7 Demolition Code

YES. Complying development specified in the Demolition Code may be carried out on this land in certain circumstances pursuant to Clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

Part 8 Fire Safety Code

YES. Complying development specified in the Fire Safety Code may be carried out on this land in certain circumstances pursuant to Clause 1.19 of State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

STATE ENVIRONMENTAL PLANNING POLICIES

The following State Environmental Planning Policies apply to land within the Muswellbrook Shire LGA:-

No. 21. Caravan Parks - Ensures that where caravan parks or camping grounds are permitted under an environmental planning instrument, movable dwellings, as defined in the Local Government Act 1993, are also permitted. The policy ensures that development consent is required for new caravan parks and camping grounds and for additional long-term sites in existing caravan parks.

No. 30. Intensive Agriculture - Requires development consent for cattle feedlots having a capacity of 50 or more cattle or piggeries having a capacity of 200 or more pigs. The policy sets out information and public notification requirements to ensure there are effective planning control over this export-driven rural industry. The policy does not alter if, and where, such development is permitted, or the functions of the consent authority.

No. 33. Hazardous and Offensive Development - Provides new definitions for 'hazardous industry', 'hazardous storage establishment', 'offensive industry' and 'offensive storage establishment'. The definitions apply to all planning instruments, existing and future. The new definitions enable decisions to approve or refuse a development to be based on the merit of proposal. The consent authority must carefully consider the specifics the case, the location and the way in which the proposed activity is to be carried out. The policy also requires specified matters to be considered for proposals that are 'potentially hazardous' or 'potentially offensive' as defined in the policy. For example, any application to carry out a potentially hazardous or potentially offensive development is to be advertised for public comment, and applications to carry out potentially hazardous development must be supported by a preliminary hazard analysis (PHA).

No. 36. Manufactured Home Estates - Helps establish well-designed and properly serviced manufactured home estates (MHEs) in suitable locations. Affordability and security of tenure for residents are important aspects. To enable the immediate development of estates, the policy allows MHEs to be located on certain land where caravan parks are permitted. There are however, criteria that a proposal must satisfy before the local council can approved development.

No. 44. Koala Habitat Protection - Encourages the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline.

No. 55. Remediation of Land - Introduces state-wide planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed

Date: 1 April 2019

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use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals.

No. 62. Sustainable Aquaculture - The policy implements the regional strategies already developed by creating a simple approach to identify and categorise aquaculture development on the basis of its potential environmental impact. The SEPP also identifies aquaculture development as a designated development only where there are potential environmental risks.

No. 64. Advertising and Signage - Aims to improve the amenity of urban and natural settings by managing the impact of outdoor advertising. The policy responds to growing concerns from the community, the advertising industry and local government that existing controls and guidelines were not effective. SEPP No. 64 offers the comprehensive provisions and consistent approach needed. SEPP 64 – Advertising and Signage: Explanatory Information should be read in conjunction with the policy.

No. 65. Design Quality of Residential Flat Development - Raises the design quality of residential flat development across the state through the application of a series of design principles. The policy provides for the establishment of Design Review Panels to provide independent expert advice to councils on the merit of residential flat development. The accompanying regulation requires the involvement of a qualified designer throughout the design, approval and construction stages.

SEPP (Housing for Seniors or People with a Disability) 2004 - Encourage the development of high quality accommodation for our ageing population and for people who have disabilities - housing that is in keeping with the local neighbourhood

SEPP (Building Sustainability Index: BASIX) 2004 - This SEPP operates in conjunction with Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004 to ensure the effective introduction of BASIX in NSW. The SEPP ensures consistency in the implementation of BASIX throughout the State by overriding competing provisions in other environmental planning instruments and development control plans, and specifying that SEPP 1 does not apply in relation to any development standard arising under BASIX.

SEPP (Infrastructure) 2007 - Provides a consistent planning regime for infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. The SEPP supports greater flexibility in the location of infrastructure and service facilities along with improved regulatory certainty and efficiency.

SEPP (Mining, Petroleum Production and Extractive Industries) 2007 - This Policy aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State. The Policy establishes appropriate planning controls to encourage ecologically sustainable development.

SEPP (Miscellaneous Consent Provisions) 2007 - Provides for the erection of temporary structures and the use of places of public entertainment while protecting public safety and local amenity. The SEPP supports the transfer of the regulation of places of public entertainment and temporary structures (such as tents, marquees and booths) from the Local Government Act 1993 to the Environmental Planning and Assessment Act 1979.

SEPP (Rural Lands) 2008 - The aim of this policy is to facilitate the orderly and economic use and development of rural lands for rural and related purposes.

SEPP (Exempt and Complying Development Codes) 2008 – This policy streamlines assessment processes for development that complies with specified development standards. The policy provides

Date: 1 April 2019

Cert No: 21792

exempt codes that have State-wide application, identifying, in the General Exempt Development Code, types of development that are of minimal environmental impact that may be carried out without the need for development consent.

SEPP (Affordable Rental Housing) 2009 – The aims of this policy are to provide a consistent planning regime for the provision of affordable rental housing; facilitate the effective delivery of new affordable rental housing by providing incentives by way of expanding zoning permissibility, floor space ratio bonuses and non-discretionary development standards; facilitate the retention and mitigate the loss of existing affordable rental housing; employ a balanced approach between obligations for retaining and mitigating the loss of existing affordable rental housing, and incentives for the development of new affordable rental housing; facilitate an expanding role for not-for-profit-providers of affordable rental housing; support local business centres by providing affordable rental housing for workers close to places of work; and facilitate the development of housing for the homeless and other disadvantaged people who may require support services, including group homes and supportive accommodation.

SEPP (State and Regional Development) 2011 – The aims of this policy are to identify development that is State significant development; identify development that is State significant infrastructure and critical State significant infrastructure; and confer functions on joint regional planning panels to determine development applications.

Further details regarding these State Environmental Planning Policies and the circumstances in which they may apply to the subject and can be found on the Department of Planning's website.

REGIONAL PLANNING INSTRUMENTS

Hunter Regional Plan 2036
Upper Hunter Strategic Land Use Regional 2012

DEVELOPMENT CONTROL PLANS

This land is affected by the following Development Control Plans:
Muswellbrook Shire Development Control Plan 2009

COASTAL PROTECTION

The land IS NOT affected by the operations of Sections 38 and 39 of the *Coastal Protection Act 1979*.

MINE SUBSIDENCE

The land IS NOT WITHIN a Mine Subsidence District proclaimed under section 15 of the Mine Subsidence Compensation Act, 1961.

ROAD WIDENING AND ROAD REALIGNMENT

The subject land IS NOT affected by any road widening or road realignment under:

- (a) Division 2 of Part 3 of the Roads Act 1993, or
- (b) Any environmental planning instrument, or
- (c) Any resolution of the council.

COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

The land IS NOT affected by a policy adopted by the council, or 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

Date: 1 April 2019

Cert No: 21792

likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

The Hunter River Flood Study 2014 shows the land to be affected by flooding. Development on the land is subject to flood related development controls.

LAND RESERVED FOR ACQUISITION

There are NOT any environmental planning instruments; deemed environmental planning instruments or draft environmental planning instruments applying to the land that provide for the acquisition of the land by a public authority, as referred to in section 27 of the Environmental Planning and Assessment Act 1979.

CONTRIBUTIONS PLANS

The Muswellbrook Section 94 Contributions Plan 2001 and Muswellbrook Section 94A Contributions Plan 2009 apply to all land within the Muswellbrook Shire Local Government Area.

BIODIVERSITY CERTIFIED LAND

The land IS NOT biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995)

BIOBANKING AGREEMENTS

The land IS NOT affected by a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995*.

NATIVE VEGETATION CLEARING SET ASIDES

The land IS NOT affected by a set aside area under Section 60ZC of the *Local Land Services Act 2013*.

MATTERS RELATING TO THE MANAGEMENT OF CONTAMINATED LAND

- (a) The land to which this certificate relates is NOT within land declared to be significantly contaminated land under the Contaminated Land Management Act 2008 at the date when the certificate is issued.
- (b) The land to which this certificate relates is NOT subject to a management order under the Contaminated Land Management Act 2008 at the date when the certificate is issued.
- (c) The land to which this certificate relates is NOT the subject of approved voluntary management proposal the subject of the Environment Protection Authority's agreement under the Contaminated Land Management Act 2008 at the date when the certificate is issued.
- (d) The land to which this certificate relates is NOT the subject to an ongoing maintenance order under the Contaminated Land Management Act 2008 at the date when the certificate is issued.
- (e) The land to which this certificate relates has NOT been the subject of a site audit statement provided to Muswellbrook Shire Council.

Date: 1 April 2019

Cert No: 21792

BUSH FIRE PRONE LAND

The land IS NOT bushfire prone land.

PROPERTY VEGETATION PLANS

Council has NOT been notified of the existence of such a plan or if the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies.

ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

Council has NOT been notified of any order made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.

DIRECTIONS UNDER PART 3A

There is NOT a direction by the Minister in force under section 75P (2) (c1) of the Act in relation to prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act.

SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR SENIORS HOUSING

There is NOT a current site compatibility certificate (of which the council is aware), issued under clause 25 of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land.

SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

There is NOT a valid site compatibility certificate (of which the council is aware), issued under clause 19 of State Environmental Planning Policy (Infrastructure) 2007 in respect of proposed development on the land.

SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

There is NOT a current site compatibility certificate for affordable rental housing (of which the council is aware), issued under clause 37 of State Environmental Planning Policy (Affordable Rental Housing) 2007 in respect of proposed development on the land.

PAPER SUBDIVISION INFORMATION

There is NOT an adopted development plan or subdivision order that applies to the land.

SITE VERIFICATION CERTIFICATE

There is NOT a current site verification certificate (of which the council is aware), issued under clause 17C of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007, in relation to the land.

LOOSE-FILL ASBESTOS INSULATION

There are NO residential premises located on this land that are listed on the register that are required to be maintained under Division 1A of Part 8 of the *Home Building Act 1989*.



Date: 1 April 2019

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AFFECTED BUILDING NOTICES AND BUILDING PRODUCT RECTIFICATION ORDERS

- (a) There are NO building product rectification order of which the council is aware that is in force in respect of the land and has not been fully complied with, and
- (b) There are NO notice of intention to make a building product rectification order of which the council is aware has been given in respect of the land and is outstanding.

The accuracy and currency of the details provided by agencies external to Council have not be verified by Muswellbrook Shire Council and should be verified by the applicant.

ADDITIONAL INFORMATION PURSUANT TO SECTION 10.7(5) OF THE ACT

Council is unaware of any other relevant matters that may affect the land.

For further information, please contact
Planning, Environment & Regulatory Services
on (02) 6549 3700.

F Plesman
General Manager

Per:





Appendix D: Borehole Logs

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client:

PACIFIC BROOK CHRISTIAN SCHOOL LTD

Project:

PROPOSED NEW SCHOOL

Location:

LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW

Job No.:

E32307B

Method:

PUSHTUBE

R.L. Surface:

Date:

26/3/19

Datum:

Plant Type:

EZIPROBE

Logged/Checked by:

H.W./T.H.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/Weathering	Strength/Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL DB									
DRY ON COMPLETION						0		-	FILL: Silty sandy clay, low to medium plasticity, brown, with root fibres, trace of igneous gravel.	w<PL			GRASS COVER
								CI-CH	Silty CLAY: medium to high plasticity, light brown, trace of sub rounded igneous gravel.	w<PL			ALLUVIAL
						2			Silty CLAY: medium to high plasticity, dark grey, trace of fine grained sand, sub rounded igneous gravel, fine to medium grained sandstone gravel and ash.	w<PL			
						3							
								SC	Clayey SAND: medium to coarse grained, brown, trace of igneous gravel.	D			
						4			END OF BOREHOLE AT 3.8m				PUSHTUBE REFUSAL
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 26/3/19 Datum:													
Plant Type: EZIPROBE Logged/Checked by: H.W./T.H.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLET ION						0			FILL: Sandy gravel, igneous, angular, dark grey, trace of ash.	M			
									Silty CLAY: medium to high plasticity, grey, trace of ash.	w≈PL			ALLUVIAL
						1			Silty CLAY: low to medium plasticity, brown, trace of fine grained sand and ash.				
						2			END OF BOREHOLE AT 1.5m				
						3							
						4							
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B			Method: PUSHTUBE				R.L. Surface:						
Date: 26/3/19			Datum:										
Plant Type: EZIPROBE			Logged/Checked by: H.W./T.H.										
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0		-	FILL: Silty gravel, igneous, angular, dark grey, with slag, trace of root fibres.	D			GRASS COVER
						1		CI-CH	Silty CLAY: medium to high plasticity, yellow brown, trace of ironstone gravel and ash.	w<PL			POSSIBLY NATURAL
						2			END OF BOREHOLE AT 1.5m				
						3							
						4							
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 26/3/19 Datum:													
Plant Type: EZIPROBE Logged/Checked by: H.W./T.H.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0		-	FILL: Sandy gravel, igneous, angular, dark grey, with asphalt fragments.	D			
								CL-CI	Silty CLAY: low to medium plasticity, brown, with fine grained sand, trace of igneous gravel and root fibres.	w<PL			
						1		CI-CH	Silty CLAY: medium to high plasticity, light brown, trace of ironstone gravel, root fibres and ash.	w<PL			ALLUVIAL
									END OF BOREHOLE AT 1.5m				
						2							
						3							
						4							
						5							
						6							
						7							

JKEnvironments

ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client:

PACIFIC BROOK CHRISTIAN SCHOOL LTD

Project:

PROPOSED NEW SCHOOL

Location:

LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW

Job No.:

E32307B

Method:

PUSHTUBE

R.L. Surface:

Date:

26/3/19

Datum:

Plant Type:

EZIPROBE

Logged/Checked by:

H.W./T.H.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL DB									
						0		-	FILL: Silty sand, fine to medium grained, brown, trace of fine to medium grained sandstone gravel.	M			
									FILL: Sandy gravel, igneous, angular, dark grey, with slag.	M			INSUFFICIENT SAMPLE ALLUVIAL
							1		CI-CH	Silty CLAY: medium to high plasticity, grey, trace of fine to medium grained sandstone gravel and ash.			
									END OF BOREHOLE AT 1.5m				
						2							
						3							
						4							
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 26/3/19 Plant Type: EZIPROBE Logged/Checked by: H.W./T.H. Datum:													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
						0		-	FILL: Silty gravelly sand, fine to medium grained, yellow brown, with igneous gravel, trace of brick and tile fragments.	D			GRASS COVER
						1		CI-CH	Silty CLAY: medium to high plasticity, grey and brown, trace of fine to medium grained sandstone gravel and root fibres.	w<PL			ALLUVIAL
						2			END OF BOREHOLE AT 1.5m				
						3							
						4							
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 27/3/19 Datum:													
Plant Type: EZIPROBE Logged/Checked by: H.W./T.H.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0		-	FILL: Silty sand, fine to medium grained, brown, trace of igneous gravel and root fibres.	D			GRASS COVER
						1		CI-CH	Silty CLAY: medium to high plasticity, light brown, trace of igneous gravel and root fibres.	w<PL			ALLUVIAL
						2			END OF BOREHOLE AT 1.5m				
						3							
						4							
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 27/3/19 Datum: Plant Type: EZIPROBE Logged/Checked by: H.W./T.H.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0		-	FILL: Silty sand, fine to medium grained, brown, with igneous gravel and root fibres, trace of ash.	D			GRASS COVER
						1		CI-CH	Silty CLAY: medium to high plasticity, brown, trace of ash.	w≈PL			ALLUVIAL
						2			END OF BOREHOLE AT 1.5m				
						3							
						4							
						5							
						6							
						7							

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ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 27/3/19 Datum:													
Plant Type: EZIPROBE Logged/Checked by: H.W./T.H.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0		-	FILL: Sandy gravel, igneous, angular, black, with slag, trace of root fibres.	D			GRASS COVER
									FILL: Silty gravelly sand, fine to medium grained, yellow brown, trace of igneous and shale gravel and root fibres.	D			
						1		CI-CH	Silty CLAY: medium to high plasticity, brown, trace of root fibres and ash.	w<PL			ALLUVIAL
									END OF BOREHOLE AT 1.5m				
						2							
						3							
						4							
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 27/3/19 Datum: Plant Type: EZIPROBE Logged/Checked by: H.W./T.H.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0		-	FILL: Silty clay, low to medium plasticity, dark brown, trace of root fibres and ash.	w<PL			GRASS COVER
						1		CI-CH	Silty CLAY: medium to high plasticity, light brown, trace of igneous gravel, root fibres and ash.	w<PL			ALLUVIAL
						2			END OF BOREHOLE AT 1.5m				
						3							
						4							
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 27/3/19 Datum:													
Plant Type: EZIPROBE Logged/Checked by: H.W./T.H.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0		-	FILL: Clayey sand, fine to medium grained, brown, trace of root fibres.	M			GRASS COVER
						1		CI-CH	Silty CLAY: medium to high plasticity, light brown, trace of root fibres and ash.	w<PL			ALLUVIAL
						2			END OF BOREHOLE AT 1.4m				
						3							
						4							
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 27/3/19 Datum: Plant Type: EZIPROBE Logged/Checked by: H.W./T.H.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
DRY ON COMPLETION						0		-	FILL: Sandy clay, low to medium plasticity, dark brown, trace of igneous gravel and root fibres.	w≈PL			GRASS COVER
						1		CI-CH	Silty CLAY: medium to plasticity, light grey, trace of igneous gravel, root fibres and ash.	w<PL			ALLUVIAL
						2			END OF BOREHOLE AT 1.5m				
						3							
						4							
						5							
						6							
						7							

Environmental logs are not to be used for geotechnical purposes

Client: PACIFIC BROOK CHRISTIAN SCHOOL LTD Project: PROPOSED NEW SCHOOL Location: LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW													
Job No.: E32307B Method: PUSHTUBE R.L. Surface:													
Date: 27/3/19 Datum:													
Plant Type: EZIPROBE Logged/Checked by: H.W./T.H.													
Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL									
						0		CI-CH	Silty CLAY: medium to high plasticity, light brown, trace of sub rounded igneous gravel, root fibres and ash.	w<PL			ALLUVIAL
						1							
						2			END OF BOREHOLE AT 1.5m				
						3							
						4							
						5							
						6							
						7							

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ENVIRONMENTAL LOG

Environmental logs are not to be used for geotechnical purposes

Client:

PACIFIC BROOK CHRISTIAN SCHOOL LTD

Project:

PROPOSED NEW SCHOOL

Location:

LOT 100, MAITLAND STREET, MUSWELLBROOK, NSW

Job No.:

E32307B

Method:

PUSHTUBE

R.L. Surface:

Date:

27/3/19

Datum:

Plant Type:

EZIPROBE

Logged/Checked by:

H.W./T.H.

Groundwater Record	SAMPLES				Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
	ES	ASS	ASB	SAL DB									
						0		- CI-CH	FILL: Silty clayey sand, fine grained, brown, trace of root fibres. Silty CLAY: medium to high plasticity, light brown, trace of sub rounded igneous gravel fibres.	M w<PL			LEAF LITTER COVER ALLUVIAL
						1							
						2							
						3		CL-CI	Gravelly CLAY: low to medium plasticity, yellow brown, sub rounded igneous gravel.	w<PL			
						3		SM	Silty SAND: fine to medium grained, brown, with low to medium plasticity clay nodules.	M			
						4			END OF BOREHOLE AT 3.7m				
						5							
						6							
						7							



ENVIRONMENTAL LOGS EXPLANATION NOTES

INTRODUCTION

These notes have been provided to amplify the environmental report in regard to classification methods, field procedures and certain matters relating to the logging of soil and rock. Not all notes are necessarily relevant to all reports.

Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies include gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 'Geotechnical Site Investigations'. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geoenvironmental practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) are referred to as 'laminite'.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the

structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from “feel” and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term ‘mud’ encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is

described in Australian Standard 1289.6.3.1–2004 (R2016) ‘*Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)*’.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the ‘N’ value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as

N = 13
4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

N > 30
15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as ‘N_c’ on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

The borehole or test pit logs presented herein are an interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than ‘straight line’ variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if reliable water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse environmental characteristics or behaviour. If the volume and nature of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classification and rock strengths indicated on the environmental logs unless noted in the report.

SYMBOL LEGENDS

SOIL



FILL



TOPSOIL



CLAY (CL, CI, CH)



SILT (ML, MH)



SAND (SP, SW)



GRAVEL (GP, GW)



SANDY CLAY (CL, CI, CH)



SILTY CLAY (CL, CI, CH)



CLAYEY SAND (SC)



SILTY SAND (SM)



GRAVELLY CLAY (CL, CI, CH)



CLAYEY GRAVEL (GC)



SANDY SILT (ML, MH)



PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK



CONGLOMERATE



SANDSTONE



SHALE/MUDSTONE



SILTSTONE



CLAYSTONE



COAL



LAMINITE



LIMESTONE



PHYLLITE, SCHIST



TUFF



GRANITE, GABBRO



DOLERITE, DIORITE



BASALT, ANDESITE



QUARTZITE

OTHER MATERIALS



BRICKS OR PAVERS



CONCRETE



ASPHALTIC CONCRETE



CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 60% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm)	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $C_u > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

$$C_u = \frac{D_{60}}{D_{10}} \quad \text{and} \quad C_c = \frac{(D_{30})^2}{D_{10} D_{60}}$$

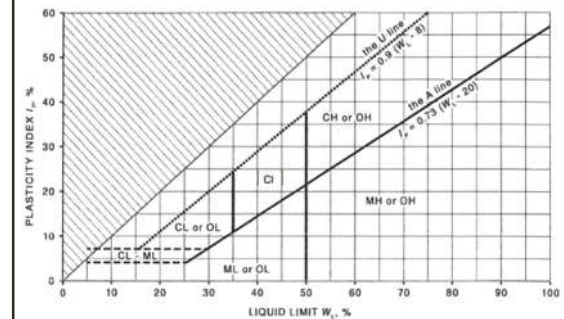
Where D_{10} , D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

- For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.
- Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.
- Clay soils with liquid limits $> 35\%$ and $\leq 50\%$ may be classified as being of medium plasticity.
- The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
fine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	—	—	—	—

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour





LOG SYMBOLS

Log Column	Symbol	Definition		
Groundwater Record		Standing water level. Time delay following completion of drilling/excavation may be shown.		
		Extent of borehole/test pit collapse shortly after drilling/excavation.		
		Groundwater seepage into borehole or test pit noted during drilling or excavation.		
Samples	ES	Sample taken over depth indicated, for environmental analysis.		
	U50	Undisturbed 50mm diameter tube sample taken over depth indicated.		
	DB	Bulk disturbed sample taken over depth indicated.		
	DS	Small disturbed bag sample taken over depth indicated.		
	ASB	Soil sample taken over depth indicated, for asbestos analysis.		
	ASS	Soil sample taken over depth indicated, for acid sulfate soil analysis.		
	SAL	Soil sample taken over depth indicated, for salinity analysis.		
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. ‘Refusal’ refers to apparent hammer refusal within the corresponding 150mm depth increment.		
	N _c =	5	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. ‘R’ refers to apparent hammer refusal within the corresponding 150mm depth increment.	
		7		
		3R		
	VNS = 25 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).		
Moisture Condition (Fine Grained Soils)	w > PL	Moisture content estimated to be greater than plastic limit.		
	w ≈ PL	Moisture content estimated to be approximately equal to plastic limit.		
	w < PL	Moisture content estimated to be less than plastic limit.		
	w ≈ LL	Moisture content estimated to be near liquid limit.		
	w > LL	Moisture content estimated to be wet of liquid limit.		
	(Coarse Grained Soils)	D	DRY – runs freely through fingers.	
		M	MOIST – does not run freely but no free water visible on soil surface.	
W		WET – free water visible on soil surface.		
Strength (Consistency) Cohesive Soils	VS	VERY SOFT – unconfined compressive strength ≤ 25kPa.		
	S	SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa.		
	F	FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa.		
	St	STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa.		
	VSt	VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa.		
	Hd	HARD – unconfined compressive strength > 400kPa.		
	Fr	FRIABLE – strength not attainable, soil crumbles.		
	()	Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.		
Density Index/ Relative Density (Cohesionless Soils)		Density Index (I_D) Range (%)	SPT ‘N’ Value Range (Blows/300mm)	
	VL	VERY LOOSE	≤ 15	0 – 4
	L	LOOSE	> 15 and ≤ 35	4 – 10
	MD	MEDIUM DENSE	> 35 and ≤ 65	10 – 30
	D	DENSE	> 65 and ≤ 85	30 – 50
	VD	VERY DENSE	> 85	> 50
	()	Bracketed symbol indicates estimated density based on ease of drilling or other assessment.		
Hand Penetrometer Readings	300	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.		
	250			



Log Column	Symbol	Definition
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T ₆₀	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as:
	RESIDUAL	– soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock.
	EXTREMELY WEATHERED	– soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock.
	ALLUVIAL	– soil deposited by creeks and rivers.
	ESTUARINE	– soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents.
	MARINE	– soil deposited in a marine environment.
	AEOLIAN	– soil carried and deposited by wind.
	COLLUVIAL	– soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits.
	LITTORAL	– beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
Residual Soil		RS		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered		XW		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered	Distinctly Weathered (Note 1)	HW	DW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately Weathered		MW		The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered		SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: 'Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores'. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.



Appendix E: Laboratory Reports & COC Documents

CERTIFICATE OF ANALYSIS 214627

Client Details

Client	Environmental Investigation Services
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E32307B, Muswellbrook</u>
Number of Samples	60 SOIL, 2 MATERIAL
Date samples received	29/03/2019
Date completed instructions received	29/03/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	05/04/2019
Date of Issue	05/04/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Asbestos Approved By

Analysed by Asbestos Approved Identifier: Lucy Zhu
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Jeremy Faircloth, Operations Manager, Sydney
 Ken Nguyen, Reporting Supervisor
 Lucy Zhu, Senior Asbestos Analyst
 Matthew Tang, Asbestos Supervisor
 Nancy Zhang, Laboratory Manager, Sydney

Authorised By



Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		214627-1	214627-6	214627-9	214627-11	214627-14
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	26/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	86	96	90	86	86

vTRH(C6-C10)/BTEXN in Soil

Our Reference		214627-15	214627-17	214627-19	214627-22	214627-24
Your Reference	UNITS	BH5	BH6	BH7	BH8	BH9
Depth		0.4-0.6	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	85	90	89	93	95

vTRH(C6-C10)/BTEXN in Soil

Our Reference		214627-25	214627-27	214627-30	214627-32	214627-33
Your Reference	UNITS	BH9	BH10	BH11	BH12	BH12
Depth		0.2-0.6	0-0.2	0-0.3	0-0.3	0.4-0.6
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	95	80	93	97

vTRH(C6-C10)/BTEXN in Soil

Our Reference		214627-35	214627-37	214627-39	214627-41	214627-43
Your Reference	UNITS	BH13	BH14	BH15	BH16	BH17
Depth		0-0.2	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	89	91	88	94	86

vTRH(C6-C10)/BTEXN in Soil

Our Reference		214627-45	214627-47	214627-49	214627-55	214627-56
Your Reference	UNITS	BH18	BH19	BH20	DUP1	DUP2
Depth		0-0.1	0-0.1	0-0.1	-	-
Date Sampled		27/03/2019	27/03/2019	27/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	94	93	96	91	78

vTRH(C6-C10)/BTEXN in Soil

Our Reference		214627-61	214627-62
Your Reference	UNITS	TB1	TS1
Depth		-	-
Date Sampled		26/03/2019	27/03/2019
Type of sample		SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019
TRH C ₆ - C ₉	mg/kg	<25	[NA]
TRH C ₆ - C ₁₀	mg/kg	<25	[NA]
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	[NA]
Benzene	mg/kg	<0.2	99%
Toluene	mg/kg	<0.5	94%
Ethylbenzene	mg/kg	<1	93%
m+p-xylene	mg/kg	<2	95%
o-Xylene	mg/kg	<1	91%
naphthalene	mg/kg	<1	[NA]
Total +ve Xylenes	mg/kg	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	87	93

svTRH (C10-C40) in Soil

Our Reference		214627-1	214627-6	214627-9	214627-11	214627-14
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	26/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	220	<100
TRH C ₂₉ - C ₃₆	mg/kg	290	190	180	770	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	250	210	200	770	<100
TRH >C ₃₄ -C ₄₀	mg/kg	120	160	110	700	<100
Total +ve TRH (>C10-C40)	mg/kg	370	370	310	1,500	<50
Surrogate o-Terphenyl	%	94	96	98	100	99

svTRH (C10-C40) in Soil

Our Reference		214627-15	214627-17	214627-19	214627-22	214627-24
Your Reference	UNITS	BH5	BH6	BH7	BH8	BH9
Depth		0.4-0.6	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	05/04/2019	05/04/2019	05/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	380	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	280	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	230	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	510	<50	<50
Surrogate o-Terphenyl	%	95	86	91	90	89

svTRH (C10-C40) in Soil

Our Reference		214627-25	214627-27	214627-30	214627-32	214627-33
Your Reference	UNITS	BH9	BH10	BH11	BH12	BH12
Depth		0.2-0.6	0-0.2	0-0.3	0-0.3	0.4-0.6
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	05/04/2019	05/04/2019	05/04/2019	05/04/2019	05/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	110	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	91	95	96	97	95

svTRH (C10-C40) in Soil

Our Reference		214627-35	214627-37	214627-39	214627-41	214627-43
Your Reference	UNITS	BH13	BH14	BH15	BH16	BH17
Depth		0-0.2	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	05/04/2019	05/04/2019	05/04/2019	05/04/2019	05/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	530
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	180	<100	2,500
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	360	<100	2,400
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	62	<50	900
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	62	<50	900
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	400	<100	3,700
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	180	<100	1,300
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	630	<50	5,900
Surrogate o-Terphenyl	%	90	87	97	94	#

svTRH (C10-C40) in Soil

Our Reference		214627-45	214627-47	214627-49	214627-55	214627-56
Your Reference	UNITS	BH18	BH19	BH20	DUP1	DUP2
Depth		0-0.1	0-0.1	0-0.1	-	-
Date Sampled		27/03/2019	27/03/2019	27/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	05/04/2019	05/04/2019	05/04/2019	05/04/2019	05/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	50	120	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	260	640	<100	190	<100
TRH C ₂₉ - C ₃₆	mg/kg	690	1,000	230	340	<100
TRH >C ₁₀ -C ₁₆	mg/kg	63	190	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	63	190	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	700	1,200	200	420	<100
TRH >C ₃₄ -C ₄₀	mg/kg	420	660	140	350	<100
Total +ve TRH (>C10-C40)	mg/kg	1,200	2,100	340	760	<50
Surrogate o-Terphenyl	%	99	125	91	89	93

PAHs in Soil						
Our Reference		214627-1	214627-6	214627-9	214627-11	214627-14
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	26/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.5	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1	0.2	<0.1	<0.1
Anthracene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.7	0.2	<0.1	<0.1
Pyrene	mg/kg	0.1	0.9	0.2	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	0.4	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	0.8	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	3.3	0.4	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.07	2.2	0.2	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	2.1	0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.3	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	2.9	0.1	0.2	<0.1
Total +ve PAH's	mg/kg	0.3	14	1.5	0.2	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	3.1	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	3.1	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	3.1	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	99	97	93	100	105

PAHs in Soil						
Our Reference		214627-15	214627-17	214627-19	214627-22	214627-24
Your Reference	UNITS	BH5	BH6	BH7	BH8	BH9
Depth		0.4-0.6	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.2	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.08	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	0.5	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	97	106	94	103	98

PAHs in Soil						
Our Reference		214627-25	214627-27	214627-30	214627-32	214627-33
Your Reference	UNITS	BH9	BH10	BH11	BH12	BH12
Depth		0.2-0.6	0-0.2	0-0.3	0-0.3	0.4-0.6
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<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
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	104	103	100	100	104

PAHs in Soil						
Our Reference		214627-35	214627-37	214627-39	214627-41	214627-43
Your Reference	UNITS	BH13	BH14	BH15	BH16	BH17
Depth		0-0.2	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.1	<0.1	<0.1	0.2
Pyrene	mg/kg	0.1	0.1	<0.1	<0.1	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.06	0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.3	0.3	<0.05	<0.05	0.61
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	103	98	109	99	109

PAHs in Soil						
Our Reference		214627-45	214627-47	214627-49	214627-55	214627-56
Your Reference	UNITS	BH18	BH19	BH20	DUP1	DUP2
Depth		0-0.1	0-0.1	0-0.1	-	-
Date Sampled		27/03/2019	27/03/2019	27/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	0.8	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.1	0.2	0.2	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Fluoranthene	mg/kg	0.1	0.2	0.4	1.2	<0.1
Pyrene	mg/kg	0.1	0.2	0.4	1.3	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	0.8	<0.1
Chrysene	mg/kg	<0.1	0.1	0.2	1.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.3	4.4	<0.2
Benzo(a)pyrene	mg/kg	0.05	0.09	0.2	2.2	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.1	2.6	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	0.1	4.1	<0.1
Total +ve PAH's	mg/kg	0.2	0.66	1.9	20	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	3.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	3.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	3.5	<0.5
Surrogate p-Terphenyl-d14	%	102	107	109	100	103

Organochlorine Pesticides in soil						
Our Reference		214627-1	214627-6	214627-9	214627-11	214627-14
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	26/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	106	95	100	99	104

Organochlorine Pesticides in soil

Our Reference		214627-17	214627-19	214627-22	214627-24	214627-27
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	108	104	100	114

Organochlorine Pesticides in soil						
Our Reference		214627-30	214627-32	214627-35	214627-37	214627-39
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0-0.3	0-0.3	0-0.2	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	100	101	99	98

Organochlorine Pesticides in soil						
Our Reference		214627-41	214627-43	214627-45	214627-47	214627-49
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
HCB	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	127	92	99	88

Organochlorine Pesticides in soil		
Our Reference		214627-55
Your Reference	UNITS	DUP1
Depth		-
Date Sampled		26/03/2019
Type of sample		SOIL
Date extracted	-	02/04/2019
Date analysed	-	04/04/2019
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	91

Organophosphorus Pesticides

Our Reference		214627-1	214627-6	214627-9	214627-11	214627-14
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	26/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	106	95	100	99	104

Organophosphorus Pesticides

Our Reference		214627-17	214627-19	214627-22	214627-24	214627-27
Your Reference	UNITS	BH6	BH7	BH8	BH9	BH10
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	108	104	100	114

Organophosphorus Pesticides

Our Reference		214627-30	214627-32	214627-35	214627-37	214627-39
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0-0.3	0-0.3	0-0.2	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	100	101	99	98

Organophosphorus Pesticides

Our Reference		214627-41	214627-43	214627-45	214627-47	214627-49
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	127	92	99	88

Organophosphorus Pesticides		
Our Reference		214627-55
Your Reference	UNITS	DUP1
Depth		-
Date Sampled		26/03/2019
Type of sample		SOIL
Date extracted	-	02/04/2019
Date analysed	-	04/04/2019
Azinphos-methyl (Guthion)	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyrifos	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Surrogate TCMX	%	91

PCBs in Soil						
Our Reference	UNITS	214627-1	214627-6	214627-9	214627-11	214627-14
Your Reference		BH1	BH2	BH3	BH4	BH5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	26/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	106	95	100	99	104

PCBs in Soil						
Our Reference	UNITS	214627-17	214627-19	214627-22	214627-24	214627-27
Your Reference		BH6	BH7	BH8	BH9	BH10
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	108	104	100	114

PCBs in Soil						
Our Reference		214627-30	214627-32	214627-35	214627-37	214627-39
Your Reference	UNITS	BH11	BH12	BH13	BH14	BH15
Depth		0-0.3	0-0.3	0-0.2	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	101	100	101	99	98

PCBs in Soil						
Our Reference		214627-41	214627-43	214627-45	214627-47	214627-49
Your Reference	UNITS	BH16	BH17	BH18	BH19	BH20
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	04/04/2019	04/04/2019	04/04/2019	04/04/2019	04/04/2019
Aroclor 1016	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	100	127	92	99	88

PCBs in Soil		
Our Reference		214627-55
Your Reference	UNITS	DUP1
Depth		-
Date Sampled		26/03/2019
Type of sample		SOIL
Date extracted	-	02/04/2019
Date analysed	-	04/04/2019
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCLMX	%	91

Acid Extractable metals in soil

Our Reference		214627-1	214627-6	214627-9	214627-11	214627-14
Your Reference	UNITS	BH1	BH2	BH3	BH4	BH5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	26/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	5	5	<4	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	7	7	16	11
Copper	mg/kg	15	13	20	13	11
Lead	mg/kg	32	5	17	12	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	11	28	24	19	10
Zinc	mg/kg	70	28	59	37	130

Acid Extractable metals in soil

Our Reference		214627-15	214627-17	214627-19	214627-22	214627-24
Your Reference	UNITS	BH5	BH6	BH7	BH8	BH9
Depth		0.4-0.6	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	4	9	6	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	19	12	14	12	6
Copper	mg/kg	15	12	12	20	17
Lead	mg/kg	9	16	19	8	2
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	23	14	13	16	45
Zinc	mg/kg	42	260	63	68	14

Acid Extractable metals in soil

Our Reference		214627-25	214627-27	214627-30	214627-32	214627-33
Your Reference	UNITS	BH9	BH10	BH11	BH12	BH12
Depth		0.2-0.6	0-0.2	0-0.3	0-0.3	0.4-0.6
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	<4	5	<4	6	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	17	14	17	13
Copper	mg/kg	13	10	18	16	8
Lead	mg/kg	5	15	7	11	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	19	11	16	16	11
Zinc	mg/kg	41	30	53	44	12

Acid Extractable metals in soil

Our Reference		214627-35	214627-37	214627-39	214627-41	214627-43
Your Reference	UNITS	BH13	BH14	BH15	BH16	BH17
Depth		0-0.2	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	4	<4	<4	<4	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	18	22	16	17	11
Copper	mg/kg	22	13	10	10	13
Lead	mg/kg	16	10	14	8	22
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	18	12	13	12
Zinc	mg/kg	54	39	36	17	57

Acid Extractable metals in soil

Our Reference		214627-45	214627-47	214627-49	214627-55	214627-56
Your Reference	UNITS	BH18	BH19	BH20	DUP1	DUP2
Depth		0-0.1	0-0.1	0-0.1	-	-
Date Sampled		27/03/2019	27/03/2019	27/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Arsenic	mg/kg	5	<4	4	5	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	19	13	16	11	19
Copper	mg/kg	13	14	12	13	17
Lead	mg/kg	14	29	26	5	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	17	11	11	27	28
Zinc	mg/kg	46	740	48	44	56

Moisture						
Our Reference	UNITS	214627-1	214627-6	214627-9	214627-11	214627-14
Your Reference		BH1	BH2	BH3	BH4	BH5
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	26/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Moisture	%	19	14	14	4.9	13

Moisture						
Our Reference	UNITS	214627-15	214627-17	214627-19	214627-22	214627-24
Your Reference		BH5	BH6	BH7	BH8	BH9
Depth		0.4-0.6	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Moisture	%	24	7.9	13	15	18

Moisture						
Our Reference	UNITS	214627-25	214627-27	214627-30	214627-32	214627-33
Your Reference		BH9	BH10	BH11	BH12	BH12
Depth		0.2-0.6	0-0.2	0-0.3	0-0.3	0.4-0.6
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Moisture	%	6.8	16	14	18	15

Moisture						
Our Reference	UNITS	214627-35	214627-37	214627-39	214627-41	214627-43
Your Reference		BH13	BH14	BH15	BH16	BH17
Depth		0-0.2	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Moisture	%	8.7	9.6	11	18	30

Moisture						
Our Reference		214627-45	214627-47	214627-49	214627-55	214627-56
Your Reference	UNITS	BH18	BH19	BH20	DUP1	DUP2
Depth		0-0.1	0-0.1	0-0.1	-	-
Date Sampled		27/03/2019	27/03/2019	27/03/2019	26/03/2019	26/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Date analysed	-	03/04/2019	03/04/2019	03/04/2019	03/04/2019	03/04/2019
Moisture	%	17	22	15	16	22

Asbestos ID - soils NEPM - ASB-001

Our Reference		214627-6	214627-9	214627-14	214627-17	214627-22
Your Reference	UNITS	BH2	BH3	BH5	BH6	BH8
Depth		0-0.2	0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		26/03/2019	26/03/2019	26/03/2019	26/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Sample mass tested	g	686.24	583.6	733.36	626.34	409.32
Sample Description	-	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001

Our Reference		214627-24	214627-32	214627-37	214627-39	214627-49
Your Reference	UNITS	BH9	BH12	BH14	BH15	BH20
Depth		0-0.2	0-0.3	0-0.1	0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date analysed	-	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
Sample mass tested	g	503.31	521.15	608.2	809.61	352.02
Sample Description	-	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks	Grey fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
		Organic fibres detected	Organic fibres detected	Organic fibres detected	Organic fibres detected	Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—	—	—	—
FA and AF Estimation*	g	—	—	—	—	—
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - materials			
Our Reference	UNITS	214627-59	214627-60
Your Reference		HWF1	HWF2
Depth		Surface	Surface
Date Sampled		27/03/2019	27/03/2019
Type of sample		MATERIAL	MATERIAL
Date analysed	-	01/04/2019	01/04/2019
Mass / Dimension of Sample	-	42x31x5mm	48x27x7mm
Sample Description	-	Beige fibre cement material	Beige fibre cement material
Asbestos ID in materials	-	No asbestos detected	No asbestos detected
		Organic fibres detected	Organic fibres detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) NOTE #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214627-6
Date extracted	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			04/04/2019	1	04/04/2019	04/04/2019		04/04/2019	04/04/2019
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	1	<25	<25	0	92	94
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	1	<25	<25	0	92	94
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	92	90
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	98	108
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	96	92
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	86	89
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	90	92
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	91	1	86	86	0	88	91

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	214627-55
Date extracted	-			[NT]	27	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			[NT]	27	04/04/2019	04/04/2019		04/04/2019	04/04/2019
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	27	<25	<25	0	111	90
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	27	<25	<25	0	111	90
Benzene	mg/kg	0.2	Org-016	[NT]	27	<0.2	<0.2	0	104	96
Toluene	mg/kg	0.5	Org-016	[NT]	27	<0.5	<0.5	0	114	94
Ethylbenzene	mg/kg	1	Org-016	[NT]	27	<1	<1	0	109	90
m+p-xylene	mg/kg	2	Org-016	[NT]	27	<2	<2	0	115	85
o-Xylene	mg/kg	1	Org-016	[NT]	27	<1	<1	0	118	90
naphthalene	mg/kg	1	Org-014	[NT]	27	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	27	95	85	11	103	89

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	49	02/04/2019	02/04/2019		[NT]	[NT]
Date analysed	-			[NT]	49	04/04/2019	04/04/2019		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	[NT]	49	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	[NT]	49	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	49	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	49	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	49	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	49	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	49	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	49	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	49	96	94	2	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214627-6
Date extracted	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			05/04/2019	1	04/04/2019	04/04/2019		04/04/2019	04/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	1	<50	<50	0	96	108
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	1	<100	<100	0	99	128
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	1	290	310	7	100	81
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	1	<50	<50	0	96	108
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	1	250	290	15	99	128
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	1	120	150	22	100	81
Surrogate o-Terphenyl	%		Org-003	86	1	94	107	13	93	105

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	214627-55
Date extracted	-			[NT]	27	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			[NT]	27	05/04/2019	05/04/2019		05/04/2019	05/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	[NT]	27	<50	<50	0	104	85
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	[NT]	27	<100	<100	0	103	80
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	[NT]	27	<100	<100	0	100	#
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	[NT]	27	<50	<50	0	104	85
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	[NT]	27	<100	<100	0	103	80
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	[NT]	27	<100	<100	0	100	#
Surrogate o-Terphenyl	%		Org-003	[NT]	27	95	94	1	104	92

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	49	02/04/2019	02/04/2019		[NT]	[NT]
Date analysed	-			[NT]	49	05/04/2019	05/04/2019		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	[NT]	49	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	[NT]	49	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	[NT]	49	230	220	4	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	[NT]	49	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	[NT]	49	200	200	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	[NT]	49	140	150	7	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	49	91	99	8	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214627-6
Date extracted	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			03/04/2019	1	03/04/2019	03/04/2019		03/04/2019	03/04/2019
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	98	89
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	106	98
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	111	103
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	0.1	0.1	0	101	104
Pyrene	mg/kg	0.1	Org-012	<0.1	1	0.1	0.1	0	96	94
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	0.1	0	106	89
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	0.07	0.08	13	114	108
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	103	1	99	108	9	99	89

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	214627-55
Date extracted	-			[NT]	27	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			[NT]	27	03/04/2019	03/04/2019		03/04/2019	03/04/2019
Naphthalene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	102	88
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	108	96
Phenanthrene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	114	98
Anthracene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	27	<0.1	0.1	0	106	84
Pyrene	mg/kg	0.1	Org-012	[NT]	27	<0.1	0.1	0	106	76
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	108	87
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-012	[NT]	27	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	27	<0.05	0.05	0	124	138
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	27	103	101	2	104	92

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	49	02/04/2019	02/04/2019		[NT]	[NT]
Date analysed	-			[NT]	49	03/04/2019	03/04/2019		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	49	0.2	0.1	67	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	49	0.4	0.4	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	49	0.4	0.3	29	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	49	0.1	0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	49	0.2	0.2	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	49	0.3	0.3	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	49	0.2	0.1	67	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	49	0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	49	0.1	0.1	0	[NT]	[NT]
Surrogate <i>p</i> -Terphenyl-d14	%		Org-012	[NT]	49	109	101	8	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214627-6
Date extracted	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			04/04/2019	1	04/04/2019	04/04/2019		04/04/2019	04/04/2019
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	97	101
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	86	108
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	86	99
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	91	104
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	96	117
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	92	109
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	114	133
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	97	108
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	86	96
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	85	96
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	98	1	106	104	2	85	109

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	214627-55
Date extracted	-			[NT]	27	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			[NT]	27	04/04/2019	04/04/2019		04/04/2019	04/04/2019
HCB	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	98	97
gamma-BHC	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	88	103
Heptachlor	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	86	95
delta-BHC	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	93	98
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	97	111
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	95	104
Dieldrin	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	116	126
Endrin	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	94	105
pp-DDD	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	70	76
Endosulfan II	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	80	103
Methoxychlor	mg/kg	0.1	Org-005	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	27	114	113	1	79	96

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	49	02/04/2019	02/04/2019		[NT]	[NT]
Date analysed	-			[NT]	49	04/04/2019	04/04/2019		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	49	88	88	0	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214627-6
Date extracted	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			04/04/2019	1	04/04/2019	04/04/2019		04/04/2019	04/04/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	95	109
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	86	119
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	91	112
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	101	114
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	75	114
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	118	120
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	93	125
Surrogate TCMX	%		Org-008	98	1	106	104	2	93	134

QUALITY CONTROL: Organophosphorus Pesticides					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	214627-55
Date extracted	-			[NT]	27	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			[NT]	27	04/04/2019	04/04/2019		04/04/2019	04/04/2019
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	90	120
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	85	106
Dimethoate	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	82	110
Fenitrothion	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	106	121
Malathion	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	78	117
Parathion	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	91	121
Ronnel	mg/kg	0.1	Org-008	[NT]	27	<0.1	<0.1	0	90	124
Surrogate TCMX	%		Org-008	[NT]	27	114	113	1	88	110

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	49	02/04/2019	02/04/2019		[NT]	[NT]
Date analysed	-			[NT]	49	04/04/2019	04/04/2019		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	49	88	88	0	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214627-6
Date extracted	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			04/04/2019	1	04/04/2019	04/04/2019		04/04/2019	04/04/2019
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	101	131
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	98	1	106	104	2	93	137

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	214627-55
Date extracted	-			[NT]	27	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			[NT]	27	04/04/2019	04/04/2019		04/04/2019	04/04/2019
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	27	<0.1	<0.1	0	103	132
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	27	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	27	114	113	1	88	110

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	49	02/04/2019	02/04/2019		[NT]	[NT]
Date analysed	-			[NT]	49	04/04/2019	04/04/2019		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	[NT]	49	88	88	0	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-10	214627-6
Date prepared	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			02/04/2019	1	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Arsenic	mg/kg	4	Metals-020	<4	1	5	5	0	107	102
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	113	100
Chromium	mg/kg	1	Metals-020	<1	1	14	16	13	110	100
Copper	mg/kg	1	Metals-020	<1	1	15	16	6	110	111
Lead	mg/kg	1	Metals-020	<1	1	32	41	25	105	93
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	96	93
Nickel	mg/kg	1	Metals-020	<1	1	11	12	9	106	110
Zinc	mg/kg	1	Metals-020	<1	1	70	74	6	106	92

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	214627-55
Date prepared	-			[NT]	27	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Date analysed	-			[NT]	27	02/04/2019	02/04/2019		02/04/2019	02/04/2019
Arsenic	mg/kg	4	Metals-020	[NT]	27	5	5	0	108	102
Cadmium	mg/kg	0.4	Metals-020	[NT]	27	<0.4	<0.4	0	112	100
Chromium	mg/kg	1	Metals-020	[NT]	27	17	18	6	110	97
Copper	mg/kg	1	Metals-020	[NT]	27	10	11	10	112	112
Lead	mg/kg	1	Metals-020	[NT]	27	15	16	6	108	87
Mercury	mg/kg	0.1	Metals-021	[NT]	27	<0.1	<0.1	0	94	96
Nickel	mg/kg	1	Metals-020	[NT]	27	11	12	9	106	108
Zinc	mg/kg	1	Metals-020	[NT]	27	30	32	6	106	81

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	49	02/04/2019	02/04/2019		[NT]	[NT]
Date analysed	-			[NT]	49	02/04/2019	02/04/2019		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	49	4	4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	49	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	49	16	17	6	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	49	12	12	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	49	26	28	7	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	49	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	49	11	11	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	49	48	48	0	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Note: All samples analysed as received. However, sample 214627-22 is below the minimum 500mL sample volume as per National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

TRH Soil C10-C40 NEPM - # Percent recovery for the surrogate is not possible to report as the high concentration of analytes in sample 43 has caused interference.

Percent recovery for the matrix is not possible to report as the high concentration of analytes in the sample/s 43,55ms have caused interference.

OC's, OP and PCB in Soil - The PQL has been raised due to interferences from analytes (other than those being tested) in sample 43.

CERTIFICATE OF ANALYSIS 214627-A

Client Details

Client	Environmental Investigation Services
Attention	Harley Wang
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E32307B, Muswellbrook</u>
Number of Samples	60 SOIL, 2 MATERIAL
Date samples received	29/03/2019
Date completed instructions received	08/04/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
 Samples were analysed as received from the client. Results relate specifically to the samples as received.
 Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	15/04/2019
Date of Issue	15/04/2019
NATA Accreditation Number 2901. This document shall not be reproduced except in full.	
Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Giovanni Agosti, Group Technical Manager
 Ken Nguyen, Reporting Supervisor
 Priya Samarawickrama, Senior Chemist
 Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		214627-A-12	214627-A-18	214627-A-40	214627-A-44	214627-A-46
Your Reference	UNITS	BH4	BH6	BH15	BH17	BH18
Depth		0.2-0.5	0.8-1.0	0.8-1.2	1.2-1.5	1.2-1.5
Date Sampled		26/03/2019	26/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	09/04/2019	09/04/2019	09/04/2019	09/04/2019	09/04/2019
Date analysed	-	12/04/2019	12/04/2019	12/04/2019	12/04/2019	12/04/2019
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	100	97	97	102

vTRH(C6-C10)/BTEXN in Soil

Our Reference		214627-A-48
Your Reference	UNITS	BH19
Depth		1.3-1.5
Date Sampled		27/03/2019
Type of sample		SOIL
Date extracted	-	09/04/2019
Date analysed	-	12/04/2019
TRH C ₆ - C ₉	mg/kg	<25
TRH C ₆ - C ₁₀	mg/kg	<25
vTPH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	116

svTRH (C10-C40) in Soil

Our Reference		214627-A-12	214627-A-18	214627-A-40	214627-A-44	214627-A-46
Your Reference	UNITS	BH4	BH6	BH15	BH17	BH18
Depth		0.2-0.5	0.8-1.0	0.8-1.2	1.2-1.5	1.2-1.5
Date Sampled		26/03/2019	26/03/2019	27/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	09/04/2019	09/04/2019	09/04/2019	09/04/2019	09/04/2019
Date analysed	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	81	90	91	93

svTRH (C10-C40) in Soil

Our Reference		214627-A-48
Your Reference	UNITS	BH19
Depth		1.3-1.5
Date Sampled		27/03/2019
Type of sample		SOIL
Date extracted	-	09/04/2019
Date analysed	-	11/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100
TRH >C ₁₀ -C ₁₆	mg/kg	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	91

sTPH in Soil (C10-C40)-Silica			
Our Reference		214627-A-43	214627-A-47
Your Reference	UNITS	BH17	BH19
Depth		0-0.1	0-0.1
Date Sampled		27/03/2019	27/03/2019
Type of sample		SOIL	SOIL
Date extracted	-	09/04/2019	09/04/2019
Date analysed	-	15/04/2019	15/04/2019
TPH C ₁₀ - C ₁₄	mg/kg	230	59
TPH C ₁₅ - C ₂₈	mg/kg	480	120
TPH C ₂₉ - C ₃₆	mg/kg	280	190
TPH >C ₁₀ -C ₁₆	mg/kg	340	73
TPH >C ₁₆ -C ₃₄	mg/kg	580	250
TPH >C ₃₄ -C ₄₀	mg/kg	<100	<100
Surrogate o-Terphenyl	%	77	80

PAHs in Soil						
Our Reference		214627-A-7	214627-A-12	214627-A-18	214627-A-40	214627-A-46
Your Reference	UNITS	BH2	BH4	BH6	BH15	BH18
Depth		0.2-0.5	0.2-0.5	0.8-1.0	0.8-1.2	1.2-1.5
Date Sampled		26/03/2019	26/03/2019	26/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	09/04/2019	09/04/2019	09/04/2019	09/04/2019	09/04/2019
Date analysed	-	11/04/2019	11/04/2019	11/04/2019	11/04/2019	11/04/2019
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<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
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	114	108	108	112	110

Acid Extractable metals in soil					
Our Reference		214627-A-12	214627-A-18	214627-A-40	214627-A-46
Your Reference	UNITS	BH4	BH6	BH15	BH18
Depth		0.2-0.5	0.8-1.0	0.8-1.2	1.2-1.5
Date Sampled		26/03/2019	26/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL
Date prepared	-	09/04/2019	09/04/2019	09/04/2019	09/04/2019
Date analysed	-	10/04/2019	10/04/2019	10/04/2019	10/04/2019
Arsenic	mg/kg	22	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	17	19	16
Copper	mg/kg	10	11	13	8
Lead	mg/kg	12	10	9	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	14	7	17	9
Zinc	mg/kg	44	22	26	20

Moisture						
Our Reference		214627-A-7	214627-A-12	214627-A-18	214627-A-40	214627-A-44
Your Reference	UNITS	BH2	BH4	BH6	BH15	BH17
Depth		0.2-0.5	0.2-0.5	0.8-1.0	0.8-1.2	1.2-1.5
Date Sampled		26/03/2019	26/03/2019	26/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	09/04/2019	09/04/2019	09/04/2019	09/04/2019	09/04/2019
Date analysed	-	10/04/2019	10/04/2019	10/04/2019	10/04/2019	10/04/2019
Moisture	%	18	11	14	12	13

Moisture			
Our Reference		214627-A-46	214627-A-48
Your Reference	UNITS	BH18	BH19
Depth		1.2-1.5	1.3-1.5
Date Sampled		27/03/2019	27/03/2019
Type of sample		SOIL	SOIL
Date prepared	-	09/04/2019	09/04/2019
Date analysed	-	10/04/2019	10/04/2019
Moisture	%	14	14

CEC				
Our Reference		214627-A-17	214627-A-24	214627-A-47
Your Reference	UNITS	BH6	BH9	BH19
Depth		0-0.2	0-0.2	0-0.1
Date Sampled		26/03/2019	27/03/2019	27/03/2019
Type of sample		SOIL	SOIL	SOIL
Date prepared	-	15/04/2019	15/04/2019	15/04/2019
Date analysed	-	15/04/2019	15/04/2019	15/04/2019
Exchangeable Ca	meq/100g	5.5	7.2	35
Exchangeable K	meq/100g	0.2	0.3	1.1
Exchangeable Mg	meq/100g	2.4	2.2	9.8
Exchangeable Na	meq/100g	<0.1	0.14	0.37
Cation Exchange Capacity	meq/100g	8.1	9.8	46

Misc Inorg - Soil			
Our Reference		214627-A-17	214627-A-47
Your Reference	UNITS	BH6	BH19
Depth		0-0.2	0-0.1
Date Sampled		26/03/2019	27/03/2019
Type of sample		SOIL	SOIL
Date prepared	-	14/04/2019	14/04/2019
Date analysed	-	14/04/2019	14/04/2019
pH 1:5 soil:water	pH Units	6.8	6.6

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-009	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Date analysed	-			12/04/2019	[NT]	[NT]	[NT]	[NT]	12/04/2019	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	98	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	97	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	102	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	96	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	105	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Date analysed	-			11/04/2019	[NT]	[NT]	[NT]	[NT]	11/04/2019	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	129	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	129	[NT]
Surrogate o-Terphenyl	%		Org-003	92	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Date analysed	-			15/04/2019	[NT]	[NT]	[NT]	[NT]	15/04/2019	[NT]
TPH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	112	[NT]
TPH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	101	[NT]
TPH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TPH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	112	[NT]
TPH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	101	[NT]
TPH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate o-Terphenyl	%		Org-003	87	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date extracted	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Date analysed	-			11/04/2019	[NT]	[NT]	[NT]	[NT]	11/04/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	126	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	94	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	105	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date prepared	-			09/04/2019	[NT]	[NT]	[NT]	[NT]	09/04/2019	[NT]
Date analysed	-			10/04/2019	[NT]	[NT]	[NT]	[NT]	10/04/2019	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	95	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	104	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: CEC					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			15/04/2019	[NT]	[NT]	[NT]	[NT]	15/04/2019	[NT]
Date analysed	-			15/04/2019	[NT]	[NT]	[NT]	[NT]	15/04/2019	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable K	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable Na	meq/100g	0.1	Metals-009	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate		Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	[NT]
Date prepared	-			14/04/2019	[NT]	[NT]	[NT]	[NT]	14/04/2019	[NT]
Date analysed	-			14/04/2019	[NT]	[NT]	[NT]	[NT]	14/04/2019	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

CERTIFICATE OF ANALYSIS 16444

Client Details

Client	Environmental Investigation Services
Attention	Vittal Boggaram
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	<u>E32307B</u>
Number of Samples	1 Soil
Date samples received	02/04/2019
Date completed instructions received	02/04/2019

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	08/04/2019
Date of Issue	08/04/2019
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Accredited for compliance with ISO/IEC 17025 - Testing. Tests not covered by NATA are denoted with *	

Results Approved By

Chris De Luca, Operations Manager

Authorised By



Pamela Adams, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		16444-1
Your Reference	UNITS	DUP3
Date Sampled		27/03/2019
Type of sample		Soil
Date extracted	-	03/04/2019
Date analysed	-	04/04/2019
vTRH C ₆ - C ₉	mg/kg	<25
vTRH C ₆ - C ₁₀	mg/kg	<25
TRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	96

TRH Soil C10-C40 NEPM		
Our Reference		16444-1
Your Reference	UNITS	DUP3
Date Sampled		27/03/2019
Type of sample		Soil
Date extracted	-	03/04/2019
Date analysed	-	04/04/2019
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50
TRH >C ₁₀ - C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	80

PAHs in Soil		
Our Reference		16444-1
Your Reference	UNITS	DUP3
Date Sampled		27/03/2019
Type of sample		Soil
Date extracted	-	03/04/2019
Date analysed	-	06/04/2019
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j&k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (Zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (Half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc (PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d ₁₄	%	98

Acid Extractable metals in soil		
Our Reference		16444-1
Your Reference	UNITS	DUP3
Date Sampled		27/03/2019
Type of sample		Soil
Date digested	-	03/04/2019
Date analysed	-	03/04/2019
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	12
Copper	mg/kg	27
Lead	mg/kg	8
Mercury	mg/kg	<0.1
Nickel	mg/kg	16
Zinc	mg/kg	70

Moisture		
Our Reference	UNITS	16444-1
Your Reference		DUP3
Date Sampled		27/03/2019
Type of sample		Soil
Date prepared	-	03/04/2019
Date analysed	-	04/04/2019
Moisture	%	18

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 12 hours.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
vTRH C ₆ - C ₉	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
vTRH C ₆ - C ₁₀	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	85	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	93	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	98	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: TRH Soil C10-C40 NEPM					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Date analysed	-			04/04/2019	[NT]	[NT]	[NT]	[NT]	04/04/2019	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	98	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
Surrogate o-Terphenyl	%		Org-003	82	[NT]	[NT]	[NT]	[NT]	79	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Date analysed	-			06/04/2019	[NT]	[NT]	[NT]	[NT]	06/04/2019	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Benzo(b,j&k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	100	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d ₁₄	%		Org-012	104	[NT]	[NT]	[NT]	[NT]	104	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date digested	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Date analysed	-			03/04/2019	[NT]	[NT]	[NT]	[NT]	03/04/2019	[NT]
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cadmium	mg/kg	0.4	Metals-020 ICP-AES	<0.4	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Vittal Boggaram

Sample Login Details

Your reference	E32307B, Muswellbrook
Envirolab Reference	214627
Date Sample Received	29/03/2019
Date Instructions Received	29/03/2019
Date Results Expected to be Reported	05/04/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	60 SOIL, 2 MATERIAL
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	17.0
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



EnviroLab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001	Asbestos ID - materials	On Hold
BH1-0-0.2	✓	✓	✓	✓	✓	✓	✓			
BH1-0.5-0.7										✓
BH1-1.6-1.8										✓
BH1-2.8-3.0										✓
BH1-3.6-3.8										✓
BH2-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓		
BH2-0.2-0.5										✓
BH2-1.2-1.5										✓
BH3-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓		
BH3-0.8-1.0										✓
BH4-0-0.2	✓	✓	✓	✓	✓	✓	✓			
BH4-0.2-0.5										✓
BH4-1.2-1.5										✓
BH5-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓		
BH5-0.4-0.6	✓	✓	✓				✓			
BH5-1.2-1.5										✓
BH6-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓		
BH6-0.8-1.0										✓
BH7-0-0.2	✓	✓	✓	✓	✓	✓	✓			
BH7-0.8-1.0										✓
BH7-1.3-1.5										✓
BH8-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓		
BH8-0.8-1.2										✓
BH9-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓		
BH9-0.2-0.6	✓	✓	✓				✓			
BH9-1.2-1.5										✓
BH10-0-0.2	✓	✓	✓	✓	✓	✓	✓			
BH10-0.8-1.0										✓
BH10-1.2-1.5										✓
BH11-0-0.3	✓	✓	✓	✓	✓	✓	✓			
BH11-1.0-1.4										✓
BH12-0-0.3	✓	✓	✓	✓	✓	✓	✓	✓		

Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils NEPM - ASB-001	Asbestos ID - materials	On Hold
BH12-0.4-0.6	✓	✓	✓				✓			
BH12-1.2-1.5										✓
BH13-0-0.2	✓	✓	✓	✓	✓	✓	✓			
BH13-1.2-1.5										✓
BH14-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓		
BH14-1.2-1.5										✓
BH15-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓		
BH15-0.8-1.2										✓
BH16-0-0.1	✓	✓	✓	✓	✓	✓	✓			
BH16-1.2-1.5										✓
BH17-0-0.1	✓	✓	✓	✓	✓	✓	✓			
BH17-1.2-1.5										✓
BH18-0-0.1	✓	✓	✓	✓	✓	✓	✓			
BH18-1.2-1.5										✓
BH19-0-0.1	✓	✓	✓	✓	✓	✓	✓			
BH19-1.3-1.5										✓
BH20-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓		
BH20-0.5-0.7										✓
BH20-1.5-1.6										✓
BH20-2.4-2.6										✓
BH20-2.8-2.9										✓
BH20-3.4-3.7										✓
DUP1	✓	✓	✓	✓	✓	✓	✓			
DUP2	✓	✓	✓				✓			
DUP4										✓
DUP5										✓
HWF1-Surface									✓	
HWF2-Surface									✓	
TB1	✓									
TS1	✓									

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**



Envirolab Services Pty Ltd

ABN 37 112 535 645

12 Ashley St Chatswood NSW 2067

ph 02 9910 6200 fax 02 9910 6201

customerservice@envirolab.com.au

www.envirolab.com.au

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Vittal Boggaram

Sample Login Details

Your reference	E32307B
Envirolab Reference	16444
Date Sample Received	02/04/2019
Date Instructions Received	02/04/2019
Date Results Expected to be Reported	09/04/2019

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	17.3
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams

Phone: 03 9763 2500

Fax: 03 9763 2633

Email: padams@envirolab.com.au

Analisa Mathrick

Phone: 03 9763 2500

Fax: 03 9763 2633

Email: amathrick@envirolab.com.au

Analysis Underway, details on the following page:



Envirolab Services Pty Ltd

ABN 37 112 535 645 - 002

25 Research Drive Croydon South VIC 3136

ph 03 9763 2500 fax 03 9763 2633

melbourne@envirolab.com.au

www.envirolab.com.au

Sample ID	VTRH(C6-C10)/BTEXN in Soil	TRH Soil C10-C40 NEPM	PAHs in Soil	Acid Extractable metals in soil
DUP3	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen		EIS Job E323078 Number: Date Results STANDARD Required: Page: 1/3		FROM:  JK Environments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Vittal Boggaram	
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Location: Muswellbrook							Sample Preserved in Esky on Ice									
Sampler: HW							Tests Required									
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 6a	Combo 3	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos (WA Method)	pH, CEC and Clay Content	COMBO6
26/3/19	1	BH1	0-0.2	G, A	16	F: Silty Sand Clay										X
	2		0.5-0.7	G	4	SILTY CLAY										
	3		1.6-1.8		4											
	4		2.8-3.0		4	↓										
	5	↓	3.6-3.8	↓	6	CLAY/SAND										
	6	BH2	0-0.2	G, A	5	F: Silty Sand										X
	7		0.2-0.5	G	2	F: Silty Clay										
	8	↓	1.2-1.5	↓	1	SILTY CLAY										
	9	BH3	0-0.2	G, A	4	F: Silty Sand										X
	10	↓	0.8-1.0	G	1	SILTY CLAY										
	11	BH4	0-0.2	G, A	4	F: Silty Sand										X
	12		0.2-0.5	G	3	F: Silty Clay										
	13	↓	1.2-1.5	↓	2	SILTY CLAY										
	14	BH5	0-0.2	G, A	3	F: Silty Sand								X		X
	15		0.4-0.6	G	4	F: Silty Sand			X							
	16	↓	1.2-1.5	↓	3	SILTY CLAY										
	17	BH6	0-0.2	G, A	2	F: Silty Sand								X		X
✓	18	↓	0.8-1.0	G	2	SILTY CLAY										
27/3/19	19	BH7	0-0.2	G, A	2	F: Silty Sand										X
	20		0.8-1.0	G	1	SILTY CLAY										
	21	↓	1.3-1.5	↓	1	↓										
	22	BH8	0-0.2	G, A	1	F: Silty Sand								X		X
	23	↓	0.8-1.2	G	2	SILTY CLAY										
	24	BH9	0-0.2	G, A	3	F: Silty Sand								X		X
✓	25	↓	0.2-0.6	G	0	F: Silty Sand			X							
Remarks (comments/detection limits required): 							Sample Containers: G - 250mg Glass Jar A - 500mL Ziplock Asbestos Bag									
Relinquished By: Vittal R-S							Date: 28/3/19		Time: 1720		Received By: K. Gore			Date: 29.3.19		

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen		EIS Job Number: E32307B Date Results Required: STANDARD Page: 2/3		FROM:  JK Environments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Vittal Boggaram	
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Location:		Muswellbrook					Sample Preserved in Esky on Ice									
Sampler:		HW					Tests Required									
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 6a	Combo 3	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos (WA Method)	pH, CEC and Clay Content	Combo 6
27/3/19	26	BH9	1.2-1.5	GA	2	SILTY CLAY										
	27	BH10	0-0.2	GA	1	F: SILTY CLAY										X
	28		0.8-1.0	G	0	SILTY CLAY										
	29	↓	1.2-1.5	↓	0	↓										
	30	BH11	0-0.3	GA	0	F: clayey sand										X
	31	↓	1.0-1.4	↓	0	SILTY CLAY										
	32	BH12	0-0.3	GA	0	F: sandy clay							X		X	
	33	↓	0.4-0.6	↓	0	SILTY CLAY		X								
	34	↓	1.2-1.5	↓	0	↓										
	35	BH13	0-0.2	GA	0	SILTY CLAY										X
	36	↓	1.2-1.5	↓	0	↓										
	37	BH14	0-0.1	GA	0	F: SILTY CLAY							X		X	
	38	↓	1.2-1.5	G	0	SILTY CLAY										
	39	BH15	0-0.1	GA	0	F: gravelly sand							X		X	
	40	↓	1.2-1.5	G	0	SILTY CLAY										
	41	BH16	0-0.1	GA	0	F: clayey silt										X
	42	↓	1.2-1.5	G	0	SILTY CLAY										
	43	BH17	0-0.1	GA	0	F: clayey sand										X
	44	↓	1.2-1.5	G	0	SILTY CLAY										
	45	BH18	0-0.1	GA	0	F: clayey sand										X
	46	↓	1.2-1.5	G	0	SILTY CLAY										
	47	BH19	0-0.1	GA	0	F: peaty sand										X
	48	↓	1.3-1.5	G	0	SILTY CLAY										
	49	BH20	0-0.1	GA	0	F: SILTY clayey sand							X		X	
↓	50	↓	0.5-0.7	G	0	SILTY CLAY										

* Depth on jar = 0.8-1.2

Remarks (comments/detection limits required):		Sample Containers: G - 250mg Glass Jar A - 500mL Ziplock Asbestos Bag	
Relinquished By: Vittal B-S	Date: 28/3/19	Time: 1720	Received By: K. Gore
			Date: 29.3.19

SAMPLE AND CHAIN OF CUSTODY FORM

TO: ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen		EIS Job Number: E323078 Date Results Required: STANDARD Page: 3/3		FROM:  JK Environments REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Vittal Boggaram	
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Location:		Muswellbrook					Sample Preserved in Esky on Ice											
Sampler:		HW					Tests Required											
Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 6a	Combo 3	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos (WA Method)	pH, CEC and Clay Content	Asbestos (detection)	COMB-06	
27/3/19	51	BH20	1.5-1.6	G	0	SILTY CLAY												
↓	52	↓	2.4-2.6	G	0	GRAVELLY CLAY												
↓	53	↓	2.8-2.9	↓	0	SILTY SAND												
↓	54	↓	3.4-3.7	↓	0	↓												
26/3/19	55	DUP1	—	G	—	Soil											X	
↓	56	DUP2	—	↓	—	↓			X									
27/3/19	→	DUP3	—	↓	—	↓			X	SEND TO VIC								
↓	57	DUP4	—	↓	—	↓												
↓	58	DUP5	—	↓	—	↓												
↓	59	HWF1	surface	A	—	Material										X		
↓	60	HWF2	surface	↓	—	material										X		
26/3/19	61	TB1	—	G	—	Sand							X					
27/3/19	62	TS1	—	G	—	Sand							X					

Remarks (comments/detection limits required):		Sample Containers: G - 250mg Glass Jar A - 500mL Ziplock Asbestos Bag	
Relinquished By: Vittal B-S	Date: 28/3/19	Time: 1720	Received By: K. Gne
			Date: 29.3.19

Andrew Fitzsimons

From: Andrew Fitzsimons
Sent: Monday, 8 April 2019 2:19 PM
To: Andrew Fitzsimons
Subject: FW: Results for Registration 214627 E32307B, Muswellbrook

From: Harley Wang [<mailto:HWang@jkenvironments.com.au>]
Sent: Monday, 8 April 2019 1:58 PM
To: Nancy Zhang <NZhang@envirolab.com.au>
Subject: RE: Results for Registration 214627 E32307B, Muswellbrook

Hi Nancy,

I need a few additional tests for this job.

Could you please arrange the additional analysis for below:

1. BH2 (0.2 – 0.5) Lab ref: 7 for PAHs;
2. BH17 (1.2 – 1.5) Lab ref: 44 for TRH/BTEX;
3. BH19 (1.3 – 1.5) Lab ref: 48 for TRH/BTEX;
4. BH9 (0 – 0.2) Lab ref: 24 for CEC;
5. BH6 (0 – 0.2) Lab ref: 17 for pH and CEC;
6. BH19 (0 – 0.1) Lab ref: 47 for pH and CEC; and
7. Combo 3 for:
 - BH4 (0.2 – 0.5) Lab ref: 12;
 - BH6 (0.8 – 1.0) Lab ref: 18;
 - BH15 (0.8 – 1.2) Lab ref: 40; and
 - BH18 (1.2 – 1.5) Lab ref: 46

Ref: 214627-A
TAT: std
Due: 15/4/19

Fit

In addition to the above, can I please get the **TRH chromatogram for BH17 (0 – 0.1) Lab ref: 43 and BH19 (0 – 0.1) Lab ref: 47** as soon as possible. **Standard TAT** for the additional tests please.

Regards,

Harley Wang
Environmental Scientist

T: +612 9888 5000
F: +612 9888 5001
HWang@jkenvironments.com.au
www.jkgroup.net.au

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Please note that all samples submitted to the Envirolab Group laboratories will be analysed under the Envirolab Group Terms and Conditions. The Terms and Conditions are accessible by clicking this link

From: Harley Wang <HWang@jkenvironments.com.au>
Sent: Monday, 8 April 2019 4:05 PM
To: Steven Luong <SLuong@envirolab.com.au>
Subject: RE: Results for Registration 214627 E32307B, Muswellbrook

Hi Steven,

Can I get a silica gel clean-up for TRH done for the same samples on a standard TAT please?

#43 & #47

Regards,

Harley Wang
Environmental Scientist

T: +612 9888 5000
F: +612 9888 5001
HWang@jkenvironments.com.au
www.jkgroup.net.au

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JKEnvironments



ENVIRONMENTAL INVESTIGATION SERVICES
CONSULTING ENVIRONMENTAL ENGINEERS AND SCIENTISTS
PO Box 976, North Ryde BC NSW 1670
115 Wicks Rd, Macquarie Park NSW 2113

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From: Steven Luong [<mailto:SLuong@envirolab.com.au>]
Sent: Monday, 8 April 2019 3:30 PM
To: Harley Wang <HWang@jkenvironments.com.au>



Appendix F: Report Explanatory Notes



Standard Sampling Procedure

These protocols specify the basic procedures to be used when sampling soils or groundwater for environmental site assessments undertaken by EIS. The purpose of these protocols is to provide standard methods for: sampling, decontamination procedures for sampling equipment, sample preservation, sample storage and sample handling. Deviations from these procedures must be recorded.

A. Soil Sampling

- Prepare a borehole/test pit log or made a note of the sample description for stockpiles.
- Layout sampling equipment on clean plastic sheeting to prevent direct contact with ground surface. The work area should be at a distance from the drill rig/excavator such that the machine can operate in a safe manner.
- Ensure all sampling equipment has been decontaminated prior to use.
- Remove any surface debris from the immediate area of the sampling location.
- Collect samples and place in glass jar with a Teflon seal. This should be undertaken as quickly as possible to prevent the loss of any volatiles. If possible, fill the glass jars completely.
- Collect samples for asbestos analysis and place in a zip-lock plastic bag.
- Label the sampling containers with the EIS job number, sample location (eg. BH1), sampling depth interval and date. If more than one sample container is used, this should also be indicated (eg. 2 = Sample jar 1 of 2 jars).
- Photoionisation detector (PID) screening of volatile organic compounds (VOCs) should be undertaken on samples using the soil sample headspace method. Headspace measurements are taken following equilibration of the headspace gasses in partly filled zip-lock plastic bags. PID headspace data is recorded on the borehole/test pit log and the chain of custody forms.
- Record the lithology of the sample and sample depth on the borehole/test pit log generally in accordance with AS1726-1993¹⁵.
- Store the sample in a sample container cooled with ice or chill packs. On completion of the sampling the sample container should be delivered to the lab immediately or stored in the refrigerator prior to delivery to the lab. All samples are preserved in accordance with the standards outlined in the report.
- Check for the presence of groundwater after completion of each borehole using an electronic dip metre or water whistle. Boreholes should be left open until the end of fieldwork where it is safe to do so. All groundwater levels in the boreholes should be rechecked on the completion of the fieldwork.
- Backfill the boreholes/test pits with the excavation cuttings or clean sand prior to leaving the site.

B. Decontamination Procedures for Soil Sampling Equipment

- All sampling equipment should be decontaminated between every sampling location. This excludes single use PVC tubing used for push tubes etc. Equipment and materials required for the decontamination include:
 - Phosphate free detergent (Decon 90);
 - Potable water;
 - Stiff brushes; and
 - Plastic sheets.
- Ensure the decontamination materials are clean prior to proceeding with the decontamination.
- Fill both buckets with clean potable water and add phosphate free detergent to one bucket.
- In the bucket containing the detergent, scrub the sampling equipment until all the material attached to the equipment has been removed.

¹⁵ Standards Australia, (1993), *Geotechnical Site Investigations*. (AS1726-1993)

- Rinse sampling equipment in the bucket containing potable water.
- Place cleaned equipment on clean plastic sheets.

If all materials are not removed by this procedure, high-pressure water cleaning is recommended. If any equipment is not completely decontaminated by both these processes, then the equipment should not be used until it has been thoroughly cleaned.

C. Decontamination Procedures for Groundwater Sampling Equipment

- All equipment associated with the groundwater sampling procedure (other than single-use items) should be decontaminated between every sampling location.
- The following equipment and materials are required for the decontamination procedure:
 - Phosphate free detergent;
 - Potable water;
 - Distilled water; and
 - Plastic Sheets or bulk bags (plastic bags).
- Fill one bucket with clean potable water and phosphate free detergent, and one bucket with distilled water.
- Flush potable water and detergent through pump head. Wash sampling equipment and pump head using brushes in the bucket containing detergent until all materials attached to the equipment are removed.
- Flush pump head with distilled water.
- Change water and detergent solution after each sampling location.
- Rinse sampling equipment in the bucket containing distilled water.
- Place cleaned equipment on clean plastic sheets.
- If all materials are not removed by this procedure that equipment should not be used until it has been thoroughly cleaned



QA/QC Definitions

The QA/QC terms used in this report are defined below. The definitions are in accordance with US EPA publication SW-846, entitled *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (1994)¹⁶ methods and those described in *Environmental Sampling and Analysis, A Practical Guide*, (1991)¹⁷.

A. Practical Quantitation Limit (PQL), Limit of Reporting (LOR) & Estimated Quantitation Limit (EQL)

These terms all refer to the concentration above which results can be expressed with a minimum 95% confidence level. The laboratory reporting limits are generally set at ten times the standard deviation for the Method Detection Limit for each specific analyte. For the purposes of this report the LOR, PQL, and EQL are considered to be equivalent.

When assessing laboratory data it should be borne in mind that values at or near the PQL have two important limitations: *“The uncertainty of the measurement value can approach, and even equal, the reported value. Secondly, confirmation of the analytes reported is virtually impossible unless identification uses highly selective methods. These issues diminish when reliably measurable amounts of analytes are present. Accordingly, legal and regulatory actions should be limited to data at or above the reliable detection limit”* (Keith, 1991).

B. Precision

The degree to which data generated from repeated measurements differ from one another due to random errors. Precision is measured using the standard deviation or Relative Percent Difference (RPD).

C. Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured (i.e. the proximity of an averaged result to the true value, where all random errors have been statistically removed). The assessment of accuracy for an analysis can be achieved through the analysis of known reference materials or assessed by the analysis of surrogates, field blanks, trip spikes and matrix spikes. Accuracy is typically reported as percent recovery.

D. Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is primarily dependent upon the design and implementation of the sampling program. Representativeness of the data is partially ensured by the avoidance of contamination, adherence to sample handling and analysis protocols and use of proper chain-of-custody and documentation procedures.

E. Completeness

Completeness is a measure of the number of valid measurements in a data set compared to the total number of measurements made and overall performance against DQIs. The following information is assessed for completeness:

- Chain-of-custody forms;
- Sample receipt form;
- All sample results reported;

¹⁶ US EPA, (1994). *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. (US EPA SW-846)

¹⁷ Keith, H, (1991). *Environmental Sampling and Analysis, A Practical Guide*.

- All blank data reported;
- All laboratory duplicate and RPDs calculated;
- All surrogate spike data reported;
- All matrix spike and lab control spike (LCS) data reported and RPDs calculated;
- Spike recovery acceptable limits reported; and
- NATA stamp on reports.

F. Comparability

Comparability is the evaluation of the similarity of conditions (e.g. sample depth, sample homogeneity) under which separate sets of data are produced. Data comparability checks include a bias assessment that may arise from the following sources:

- Collection and analysis of samples by different personnel; Use of different techniques;
- Collection and analysis by the same personnel using the same methods but at different times; and
- Spatial and temporal changes (due to environmental dynamics).

G. Blanks

The purpose of laboratory and field blanks is to check for artefacts and interferences that may arise during sampling, transport and analysis.

H. Matrix Spikes

Samples are spiked with laboratory grade standards to detect interactive effects between the sample matrix and the analytes being measured. Matrix Spikes are reported as a percent recovery and are prepared for 1 in every 20 samples. Sample batches that contain less than 20 samples may be reported with a Matrix Spike from another batch. The percent recovery is calculated using the formula below. Acceptable recovery limits are 70% to 130%.

$$\frac{(\text{Spike Sample Result} - \text{Sample Result}) \times 100}{\text{Concentration of Spike Added}}$$

I. Surrogate Spikes

Samples are spiked with a known concentration of compounds that are chemically related to the analyte being investigated but unlikely to be detected in the environment. The purpose of the Surrogate Spikes is to check the accuracy of the analytical technique. Surrogate Spikes are reported as percent recovery.

J. Duplicates

Laboratory duplicates measure precision, expressed as Relative Percent Difference. Duplicates are prepared from a single field sample and analysed as two separate extraction procedures in the laboratory. The RPD is calculated using the formula where D1 is the sample concentration and D2 is the duplicate sample concentration:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$



Appendix G: Data (QA/QC) Evaluation

Data (QA/QC) Evaluation

A. INTRODUCTION

This Data (QA/QC) Evaluation forms part of the validation process for the DQOs documented in Section 6.1 of this report. Checks were made to assess the data in terms of precision, accuracy, representativeness, comparability and completeness. These 'PARCC' parameters are referred to collectively as DQIs and are defined in the Report Explanatory Notes attached in the report appendices.

1. Field and Laboratory Considerations

The quality of the analytical data produced for this project has been considered in relation to the following:

- Sample collection, storage, transport and analysis;
- Laboratory PQLs;
- Field QA/QC results; and
- Laboratory QA/QC results.

2. Field QA/QC Samples and Analysis

A summary of the field QA/QC samples collected and analysed for this assessment is provided in the following table:

Sample Type	Sample Identification	Frequency (of Sample Type)	Analysis Performed
Intra-laboratory duplicate (soil)	Dup 1 (primary sample BH2 0-0.1m)	Approximately 7% of primary samples	Heavy metals, TRH/BTEX, PAHs, OCPs, OPPs and PCBs
Intra-laboratory duplicate (soil)	Dup 2 (primary sample BH5 0.4-0.6m)	As above	Heavy metals, TRH/BTEX, PAHs
Inter-laboratory duplicate (soil)	Dup 3 (primary sample BH8 0-0.1m)	Approximately 7% of primary samples	Heavy metals, TRH/BTEX, PAHs
Trip spike (soil)	TS1 (26 March 2019)	One for the assessment to demonstrate adequacy of preservation, storage and transport methods	BTEX
Trip blank (soil)	TB1 (26 March 2019)	One for the assessment to demonstrate adequacy of storage and transport methods	BTEX

The results for the field QA/QC samples are detailed in the laboratory summary tables (Table G to Table J inclusive) attached to the assessment report and are discussed in the subsequent sections of this Data (QA/QC) Evaluation report.

3. Data Assessment Criteria

EIS adopted the following criteria for assessing the field and laboratory QA/QC analytical results:

Field Duplicates

Acceptable targets for precision of field duplicates in this report will be less than 50% RPD for concentrations greater than 10 times the PQL, less than 75% RPD for concentrations between five and 10 times the PQL and less than 100% RPD for concentrations that are less than five times the PQL. RPD failures will be considered qualitatively on a case-by-case basis taking into account factors such as the sample type, collection methods and the specific analyte where the RPD exceedance was reported.

Field Blanks and Rinsates

Acceptable targets for field blank and rinsate samples in this report will be less than the PQL for organic analytes. Metals will be considered on a case-by-case basis with regards to typical background concentrations in soils and published drinking water guidelines for waters.

Trip Spikes

Acceptable targets for trip spike samples in this report will be 70% to 130%. This is in line with spike recovery limits adopted by the laboratory for organic analysis.

Laboratory QA/QC

The suitability of the laboratory data is assessed against the laboratory QA/QC criteria which is outlined in the laboratory reports. These criteria were developed and implemented in accordance with the laboratory's NATA accreditation and align with the acceptable limits for QA/QC samples as outlined in NEPM (2013) and other relevant guidelines.

A summary of the acceptable limits adopted by the primary laboratory (EnviroLab) is provided below:

RPDs

- Results that are <5 times the PQL, any RPD is acceptable; and
- Results >5 times the PQL, RPDs between 0-50% are acceptable.

Laboratory Control Samples (LCS) and Matrix Spikes

- 70-130% recovery acceptable for metals and inorganics;
- 60-140% recovery acceptable for organics; and
- 10-140% recovery acceptable for VOCs.

Surrogate Spikes

- 60-140% recovery acceptable for general organics; and
- 10-140% recovery acceptable for VOCs.

Method Blanks

- All results less than PQL.

B. DATA EVALUATION

1. Sample Collection, Storage, Transport and Analysis

Samples were collected by trained field staff in accordance with the EIS SSP. The SSP was developed to be consistent with relevant guidelines, including NEPM (2013) and other guidelines made under the CLM Act 1997.

Appropriate sample preservation, handling and storage procedures were adopted. Laboratory analysis was undertaken within specified holding times generally in accordance with Schedule B(3) of NEPM (2013) and the laboratory NATA accredited methodologies. It is noted that the sample temperature on receipt at the laboratory was recorded at approximately 17°C. The lab records this temperature using an infrared scanner on the outside of the jar, therefore the temperature is not considered to be an accurate reflection of the soil inside the jar. All samples were stored in the fridge prior to being delivered to the lab and therefore were adequately cooled for preservation purposes.

Envirolab noted that the asbestos results were reported to be consistent with the recommendations in NEPM (2013), however this level of reporting is outside the scope of their NATA accreditation. In the absence of other available analytical methods for asbestos, this was found to be acceptable for the purpose of this assessment.

Review of the project data also indicated that:

- COC documentation was adequately maintained;
- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and
- Consistent units were used to report the analysis results.

2. Laboratory PQLs

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC. Some PQLs were raised in some samples and for some analytes, however all PQLs were low enough to adequately assess risks against the nominated SAC.

3. Field QA/QC Sample Results

Field Duplicates

The results indicated that field precision was acceptable. RPD non-conformances were reported for fluoranthene (a PAH compound) in the intra-laboratory duplicated DUP1. This value has been attributed to minor sample heterogeneity and the difficulties associated with obtaining homogenous duplicate samples of heterogeneous fill matrices. The higher duplicate concentrations for PAHs have been appropriately considered in the risk assessment for this project.

Field Blanks

During the investigation, one soil trip blank was placed in the esky during sampling and transported back to the laboratory. The results were all less than the PQLs, therefore cross contamination between samples that may have significance for data validity did not occur.

Trip Spikes

The results ranged from 91% to 99% and indicated that field preservation methods were appropriate.

4. Laboratory QA/QC

The analytical methods implemented by the laboratory were performed in accordance with their NATA accreditation and were consistent with Schedule B(3) of NEPM (2013). The frequency of data reported for the laboratory QA/QC (i.e. duplicates, spikes, blanks, LCS) was considered to be acceptable for the purpose of this assessment. Some surrogate recovery values for TRHs were not reported due to interference from these analytes in some samples. This is not considered to have impacted the overall assessment of the data.

C. DATA QUALITY SUMMARY

EIS are of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the assessment objectives.



Appendix H: Guidelines and Reference Documents



-
- CRC Care, (2011). Technical Report No. 10 – Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document
- CRC Care, (2017). Technical Report No. 39 – Risk-based management and guidance for benzo(a)pyrene
- Contaminated Land Management Act 1997 (NSW)
- Managing Land Contamination, Planning Guidelines SEPP55 – Remediation of Land (1998)
- NSW EPA, (1995). Contaminated Sites Sampling Design Guidelines
- NSW EPA, (2015). Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997
- NSW EPA, (2017). Guidelines for the NSW Site Auditor Scheme, 3rd Edition
- National Environmental Protection (Assessment of Site Contamination) Measure 1999 as amended (2013)
- Olszowy, H., Torr, P., and Imray, P., (1995). Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission
- Protection of the Environment Operations Act 1997 (NSW)
- State Environmental Planning Policy No.55 – Remediation of Land 1998 (NSW)
- Western Australia Department of Health, (2009). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia