ENVIRONMENTAL INVESTIGATION SERVICES

REPORT

TO

BISHI CONSTRUCTIONS

ON

PRELIMINARY ENVIRONMENTAL SCREENING

FOR

PROPOSED RESIDENTIAL DEVELOPMENT

AT

15-17 DENT STREET, JAMISONTOWN, NSW

28 NOVEMBER 2016 **REF: E29853Krpt**

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ABBREVIATIONS

Ambient Background Concentrations	**ABC**
Added Contaminant Limits	**ACL**
Asbestos Containing Material	**ACM**
Australian Drinking Water Guidelines	**ADWG**
Area of Environmental Concern	**AEC**
Australian Height Datum	**AHD**
Asbestos Health Screening Levels	**ASL**
Acid Sulfate Soil	**ASS**
Above-Ground Storage Tank	**AST**
Below Ground Level	**BGL**
Bureau of Meteorology	**BOM**
Benzene, Toluene, Ethylbenzene, Xylene	**BTEX**
Benzene, Toluene, Ethylbenzene, Xylene, Naphthalene	**BTEXN**
Cation Exchange Capacity	**CEC**
Contaminated Land Management	**CLM**
Construction Management Plan	**CMP**
Contaminant(s) of Potential Concern	**CoPC**
Chain of Custody	**COC**
Conceptual Site Model	**CSM**
Data Quality Indicator	**DQI**
Data Quality Objective	**DQO**
Detailed Site Investigation	**DSI**
Ecological Assessment Criteria	**EAC**
Ecological Investigation Levels	**EILs**
Ecological Screening Level	**ESL**
Environmental Management Plan	**EMP**
Excavated Natural Material	**ENM**
Environmental Protection Agency	**EPA**
Environmental Site Assessment	**ESA**
Ecological Screening Level	**ESL**
Fibre Cement Fragments	**FCF**
General Approvals of Immobilisation	**GAI**
General Solid Waste	**GSW**
Health Investigation Level	**HILs**
Hardness Modified Trigger Values	**HMTV**
Health Screening Level	**HSLs**
International Organisation of Standardisation	**ISO**
Lab Control Spike	**LCS**
Light Non-Aqueous Phase Liquid	**LNAPL**
Local Government Authority	**LGA**
Map Grid of Australia	**MGA**
National Association of Testing Authorities	**NATA**
National Environmental Protection Measure	**NEPM**
Organochlorine Pesticides	**OCP**
Organophosphate Pesticides	**OPP**
Polycyclic Aromatic Hydrocarbons	**PAH**

ABBREVIATIONS

Photo-ionisation Detector	**PID**
Practical Quantitation Limit	**PQL**
Preliminary Site Investigation	**PSI**
Quality Assurance	**QA**
Quality Control	**QC**
Remediation Action Plan	**RAP**
Relative Percentage Difference	**RPD**
Restricted Solid Waste	**RSW**
Site Assessment Criteria	**SAC**
Sampling, Analysis and Quality Plan	**SAQP**
Site Audit Statement	**SAS**
Site Audit Report	**SAR**
Specific Contamination Concentration	**SCC**
Standard Penetration Test	**SPT**
Semi-Volatile Organic Compounds	**sVOC**
Standard Sampling Procedure	**SSP**
Standard Water Level	**SWL**
Standard Sampling Procedure	**SSP**
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**
Work Health and Safety	**WHS**

1 INTRODUCTION

Bishi Constructions ('the client') commissioned Environmental Investigation Services (EIS)[1] to undertake a Preliminary Environmental Screening (PES) for the proposed residential development at 15-17 Dent Street, Jamisontown, NSW. The site location is shown on Figure 1 and the assessment was confined to the site boundaries as shown on Figure 2.

A geotechnical investigation was undertaken in conjunction with this assessment by JK Geotechnics[2]. The results of the investigation are presented in a separate report (Ref. 29853Zrpt, dated 2 November 2016[3]). This report should be read in conjunction with the JK report.

1.1 Proposed Development Details

EIS understand that the development includes the demolition of the previous structures on the site and the construction of a multi storey residential building over two levels of basement.

1.2 Aim 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, make a preliminary assessment of the soil and groundwater contamination conditions and make a preliminary assessment of site salinity 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 via a site walkover inspection;
- Identify potential contamination sources/areas of environmental concern (AEC) and contaminants of potential concern (CoPC);
- Assess the soil and groundwater 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 the potential for saline conditions at the site via soil sampling and analysis;
- Provide a preliminary waste classification for off-site disposal of soil;
- Assess whether further intrusive investigation and/or remediation is required; and
- Assess whether the site is suitable or can be made suitable for the proposed development (from a contamination viewpoint).

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

[2] Geotechnical consulting division of J&K

[3] Referred to as JK 2016 Report

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1.3 Scope of Work

The assessment was undertaken generally in accordance with an EIS proposal (Ref: EP43495K) of 5/10/2016 and written acceptance from the client of 12/10/2016. The scope of work included the following:

- Review of site information, including background and site history information from a Lotsearch Pty Ltd *Environmental Risk and Planning Report* and other sources;
- A walkover site inspection;
- Design and implementation of a sampling, analysis and quality plan (SAQP);
- Interpretation of the analytical results against the adopted site assessment criteria (SAC);
- Assessment of data quality; and
- Preparation of an PES report presenting the results of the assessment, including a CSM.

The report was prepared with reference to regulations/guidelines outlined in the table below. Individual guidelines are also referenced within the text of the report.

Table 1-1: Guidelines

Guidelines/Regulations/Documents
Contaminated Land Management Act (1997)[4]
Guidelines for Consultants Reporting on Contaminated Sites (2011)[5]
National Environmental Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013)[6]
Site Investigations for Urban Salinity (2002[7])
Managing Urban Stormwater – Soil and Construction (2004, 4th Ed[8])
Salinity Potential in Western Sydney Map (2002[9])
Western Sydney Salinity Code of Practice (March 2003 [amended January 2004])
AS2159-2009[10]
T56: Guide to Residential Slabs and Footings in Saline Environments (2005[11])

[4] NSW Government Legislation, (1997). *Contaminated Land Management Act 1997.* (referred to as CLM Act 1997)

[5] NSW Office of Environment and Heritage (OEH), (2011). *Guidelines for Consultants Reporting on Contaminated Sites.* (referred to as Reporting Guidelines 2011)

[6] National Environment Protection Council, (2013). *National Environmental Protection (Assessment of Site Contamination) Amendment Measure 1999* (as amended 2013). (referred to as NEPM 2013)

[7] *Site Investigations for Urban Salinity,* Department of Land and Water Conservation (DLWC), 2002 (DLWC 2002)

[8] *Managing Urban Stormwater – Soil and Construction*, NSW Government/Landcom, 2004 (4th Ed) (Blue Book 2004)

[9] *1:100,000 Map – Salinity Potential in Western Sydney*, Department of Infrastructure, Planning and Natural Resources (DIPNR), 2002 (Salinity Potential Map 2002)

[10] *Piling – Design and Installation,* Standards Australia, 2009 (AS2159-2009)

[11] *T56: Guide to Residential Slabs and Footings in Saline Environments,* CCAA, 2005 (CCAA 2005)

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3 BACKGROUND ON SALINITY

3.1 General Information on Salinity

Salinity is the accumulation and concentration of salt at or near the ground surface or within surface water bodies. Salt is naturally present in the landscape through deposition of salt from the ocean in coastal areas and through weathering of bedrock that contains salt, accumulated during deposition of original sediments in a prehistoric marine environment. The salts are commonly soluble chlorides, sulphates or carbonates of sodium and magnesium.

In Sydney, salinity issues are typically associated with the Wianamatta Group shales and their derived soil landscapes. The natural vegetation of western Sydney is dominated by large isolated trees with deep root systems that remove subsurface moisture. Slow rates of percolation through the relatively impermeable clay soil and uptake of a large proportion of rainfall by the trees results in limited recharge of the groundwater system by rainfall. The depth to groundwater has developed a natural equilibrium and there is little tendency for salt contained in the groundwater or subsoils to rise to the surface.

3.2 Salinity and Urban Development

Salinity becomes a problem in urban areas when changes in the land use result in changes to the way water moves through the environment. This can result in vegetation die-back, decrease in water quality and damage to urban infrastructure.

Removal of deep rooted tree species during development and replacement with urban infrastructure, houses and industrial developments reduces the mechanism for the removal of subsurface moisture.

The development of urban salinity is commonly associated with changes in the hydrological cycle through the environment (rainfall, surface run-off, water infiltration and groundwater system). An increase in the quantity of water reaching the groundwater table as a result of vegetation clearance, irrigation of parklands, leaking water infrastructure and changes in drainage patterns, can cause a relatively rapid rise in the groundwater table. Earthworks that include excavation of natural soil profiles and exposure of more saline subsurface soils or shale bedrock may also result in an increase in salt concentrations at the ground surface.

Construction of roads, pipelines and buildings commonly results in removal of topsoil leading to exposure of the subsoils and interception of surficial and shallow subsurface drainage. In addition, over-irrigation of urban gardens, leaking water infrastructure and concentrated drainage patterns can result in increased water movement through the subsoil to the groundwater system leading to a relatively rapid rise in the groundwater table.

A rise in groundwater levels and impediments to subsurface drainage patterns can transport salt formerly stored in the bedrock to the surficial soil profile. This may result in salt encrustation of exposed soils, building foundations, roads, drainage infrastructure and corrosion of metal, concrete

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and other building materials. Increasing salt concentrations in surficial soils (and consequently in surface waters) may also result in die-off of the existing vegetation, further reducing the hydrological load on the groundwater system and resulting in further groundwater table rises.

3.3 Potential Salinity Impacts on Urban Development

Some of the adverse impacts that can arise from saline conditions include:

- Salt scalds caused by a rise in the subsoil moisture content that mobilises salt to the ground surface;
- Salt scalds caused by modification of former drainage patterns which leads to the day lighting of subsurface seepage (either perched water or groundwater) in areas lower in the catchment, either at breaks in the slope or within drainage lines;
- A rise in groundwater table or accumulation of salt rich seepage leading to corrosion of subsurface facilities including concrete structures, metal pipework, cables, foundations, underground services, etc;
- Rising damp, where salt rich moisture is drawn into building and pavement materials by capillary action leading to deterioration of brick, mortar and concrete;
- Structural cracking, damage or building collapse which may occur as a result of shifting and or sinking foundations;
- Plant die-back associated with a rise in groundwater table level that mobilises excess salt to the plant root zone; and
- Subsurface water discharge and subsequent pollution of streams and drainage channels.

3.4 Soils and Groundwater Planning Strategy in Western Sydney

The aim of the DLWC 2002 document is to provide a framework for the sustainable development and management of new developments in the western region of Sydney. In relation to salinity management, the development should be designed and constructed such that there is no significant increase in the water table level and no adverse salinity impacts.

The proposed development controls that relate to soils and groundwater issues are summarised below:

1. A water management strategy should be prepared to address the following:
   - Reduction of potable water usage onsite;
   - Development of best practice measures for stormwater reuse for open space irrigation;
   - Reduction of potable water demand;
   - Reduction of adverse impacts on local groundwater regimes;
   - Reduction of change in local flow regimes; and
   - Preparation of water maintenance and a monitoring management system.
2. A salinity management plan should be prepared that includes a groundwater management strategy related to:
   - Adoption of small landscaped areas to reduce irrigation requirements;
   - Use of native and other low water requirement plants;

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- Use of mulch cover (not in drainage lines);
- Use of low flow watering facilities for landscaped areas;
- Implementation of a tree planting program, especially in high recharge areas, of native, deep rooted, large growing species to assist retention of the groundwater at existing levels;
- Retention of existing native tree cover where possible; and
- Not permitting infiltration pits or tanks to disperse surface water.

3. An assessment of soil and rock conditions at the site, including erosion, expansive and dispersive soil conditions, and plant growth potential should be undertaken.
4. Use of the Blue Book 2004 as a guide to prepare soil and water management plans. The approved plan and subsequent works are to be supervised by appropriately qualified experienced personnel.

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4 SITE INFORMATION

4.1 Site Identification

Table 4-1: Site Identification

Site Address:	15-17 Dent Street, Jamisontown, NSW
Lot & Deposited Plan:	SP 79056 DP 1283
Current Land Use:	Low Density Residential
Proposed Land Use:	High Density Residential
Local Government Authority (LGA):	Penrith City Council
Current Zoning:	R4 – High Density Residential
Site Area (m^2):	1,021
RL (AHD in m) (approx.):	29-31
Geographical Location (decimal degrees) (approx.):	Latitude: -33.762565 Longitude: 150.686104

4.2 Site Location and Regional Setting

The site is located in a predominantly residential area of Jamisontown. The site is bounded by Dent Street to the east. The site is located approximately 1,600m to the east of the Nepean River.

4.3 Topography

The site and regional topography is relatively flat. The site itself appeared to slope no more than 1^0.

4.4 Site Inspection

A walkover inspection of the site was undertaken by EIS on 20/10/2016. The inspection was limited to accessible areas of the site and immediate surrounds. A summary of the findings are outlined in the following subsections:

4.4.1 Buildings, Structures and Roads

At the time of the inspection the site was occupied by two single storey brick residential houses (number 15 and 17). An internal inspection of buildings was not undertaken.

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4.4.2 Boundary Conditions, Soil Stability and Erosion

The site appeared to be generally grassed with some minor bare patches observed. The neighbouring property to the immediate north included exposed soil at the surface with no grass observed.

4.4.3 Visible or Olfactory Indicators of Contamination

EIS observed several fibre cement fragments on the ground surface of northern property (number 15) as shown on the attached figure 2. Two representative samples were collected (F1 and F2).

4.4.4 Presence of Drums/Chemicals, Waste and Fill Material

There were no significant chemical or drums observed on site besides some domestic products that appeared to be used for gardening. There was no obvious signs that significant filling had occurred on the site such as retaining walls or stockpiles.

4.4.5 Sensitive Environments

Sensitive environments such as wetlands, ponds, creeks or extensive areas of natural vegetation were not identified on site or in the immediate surrounds.

4.4.6 Landscaped Areas and Visible Signs of Plant Stress

The landscaped areas on the site appeared to show no signs of stress.

4.5 Surrounding Land Use

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

- North – Residential properties, several fibre cement fragments were observed on the ground surface of the property to the north of the site.
- South – Residential properties extended to Preston Street. Beyond was a mechanical workshop and a sand and soil supplier.
- East – Residential properties.
- West – Residential properties.

4.6 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. No major services were identified that would be expected to act as preferential pathway for contamination migration.

4.7 Section 149 Planning Certificate

The s149 (2 and 5) planning certificate was reviewed for the assessment (number 15 only). Copies of the certificates are attached in the appendices. A summary of the relevant information is outlined below:

- The site is not located in an area of ecological significance;

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- 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 subject to a Site Audit Statement (SAS);
- The site is not located within an ASS risk area; and
- The site is not located in a heritage conservation area.

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5 GEOLOGY AND HYDROGEOLOGY

5.1 Regional Geology

A review of the regional geological map of Penrith (1991[12]) indicates that the site is underlain fluvial deposits comprising gravel, sand, silt and clay.

5.2 Acid Sulfate Soil Risk and Planning

The site is not located in an acid sulfate soil (ASS) risk area according to the risk maps prepared by the Department of Land and Water Conservation.

5.3 Hydrogeology

Hydrogeological information presented in the Lotsearch report (attached in the appendices) There were a total of 34 registered bores within the report buffer of 2,000m. In summary:

- The nearest registered bore was located approximately 378m from the site. This was utilised for irrigation purposes. Given the distance this is unlikely to be a potential receptor;
- The majority of the bores were registered for monitoring purposes; and
- The drillers log information from the closest registered bores typically identified standing water levels (SWLs) in the bores ranged from 4.5mBGL to 12.0mBGL.

5.4 Receiving Water Bodies

Surface water bodies were not identified in the immediate vicinity of the site. The closest environmentally sensitive surface water body is Nepean River located approximately 1.6km to the west of the site. This is up-gradient from site and is not considered to be a potential receptor.

[12] Department of Mineral Resources, (1991). *1:100,000 Geological Map of Penrith (Series 9030).*

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6 SITE HISTORY INFORMATION

6.1 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 6-1: Summary of Historical Aerial Photographs

Year	Details
1943	The site appeared to be vacant and grassed (possibly used for grazing purposes). The surrounds appeared similar to the site and were most likely used for grazing. Some residential properties appeared in the nearby area.
1956	A fence appeared to have been constructed in the central section of the site which ran in an east to west direction. The density of residential properties appeared to have increased in the surrounding areas
1961	EIS note the image was of poor quality. The site and immediate surrounds appeared to be generally similar to the 1956 image. The density of residential properties appeared to have increased in the surrounding areas.
1965	EIS note the image was of poor quality. The site and immediate surrounds appeared to be generally similar to the 1961 image. The density of residential properties appeared to have increased in the surrounding areas.
1970	EIS note the image was of poor quality. The site and immediate surrounds appeared to be generally similar to the 1965 image. A small shed appeared to have been constructed in the north western section of the site. The density of residential properties appeared to have increased in the surrounding areas.
1982	The shed in the north western section of the site appeared to have been demolished. Two buildings appeared to have been constructed on the site. The north building appeared similar to the existing (2016) residential building. The site and immediate surrounds appeared to be generally similar to the 1970 image.
1991	The southern residential property on the site appeared to have been redeveloped and appeared similar to the existing (2016) residential building. To the south of Preston Street large commercial properties appeared to have been constructed.
2002	The site and immediate surrounds appeared to be generally similar to the 1991 image.
2009	The site and immediate surrounds appeared to be generally similar to the 2002 image
2014	The site and immediate surrounds appeared to be generally similar to the 2009 image

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6.2 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 records indicate that the site was owned by an orchardist from 1915-1921 and a poultry farmer from 1921-1922. The use of the site as an orchard may have included the use of pesticides. The professions of the individuals listed on the title records from 1922 are not considered to be associated with site contaminating activities.

6.3 Review of Council Records

Council records available under the access to public information were requested for the assessment. A copy of council's response is attached in the appendices. The council did not identify any information including the DA/BA records located in their system relating to land contamination.

6.4 SafeWork NSW Records

SafeWork NSW records were reviewed for the assessment. Copies of relevant documents are attached in the appendices. The search did not identify any licences to store dangerous goods including underground fuel storage tanks (USTs) or above ground storage tanks (ASTs) at the site.

6.5 NSW EPA Records

The Lotsearch report (attached in the appendices) included information from the NSW EPA databases for 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 under Section 60 of the CLM Act 1997; and
- There were no records for licenced activities at the site under the POEO Act 1997.

Current and historical licenses were identified for several properties within the report buffer, however these activities are considered unlikely to pose a contamination risk to the site.

6.6 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). EIS are of the opinion that the historical businesses in the report buffer are unlikely to represent potential off-site sources of site contamination.

6.7 Summary of Site History Information

A review of the site history information has indicated the following:

- The site was likely used as an orchard and/or farmland in the early 1900's;
- The aerial photographs and land title records indicate that the site has been used for residential purposes since at least 1982 to now;

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- WorkCover records did not indicate any licences to store dangerous goods at the site; and
- NSW EPA records did not indicate any current or former notices for the site.

6.8 Integrity of Site History Information

The majority of the site history information has been obtained from government organisations as outlined and 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 has relied upon the Lotsearch report and has 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.

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7 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.

7.1 Potential Contamination Sources/AEC and CoPC

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

Table 7-1: Potential Contamination Sources/AEC and Contaminants of Potential Concern

Source / AEC	CoPC
Fill material - The site is likely to have been historically filled to achieve the existing levels. The fill may have been imported from various sources and could be contaminated.	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.
Historical agricultural use – The site appears to have been used for agricultural purposes. This could have resulted in contamination across the site via use of machinery, application of pesticides and building/demolition of various structures. Asbestos pipes may also be present for irrigation purposes.	Heavy metals, TRH, PAHs, OCPs, PCBs and asbestos
Hazardous Building Material – 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. In particular number 15.	Asbestos, lead and PCBs

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8 SAMPLING, ANALYSIS AND QUALITY PLAN

8.1 Data Quality Objectives (DQO)

The NEPM 2013 defines the DQO process as a seven step iterative planning tool used to define the type, quantity and quality of data needed to inform decisions relating to the environmental condition of the site. The DQO process is detailed in the Site Auditor Guidelines 2006 and the USEPA documents Data Quality Objectives Processes for Hazardous Waste Site Investigations (2000) and Guidance on Systematic Planning Using the Data Quality Objectives Process (2006). These seven steps are applicable to this assessment as summarised in the table below:

Table 8-1: DQOs – Seven Steps

Step	Input
State the Problem	The CSM has identified AEC at the site which may pose a risk to the site receptors. An intrusive investigation is required to assess the risk and comment on the suitability of the site for the proposed development or intended landuse.
Identify the Decisions/ Goal of the Study	The data collection is project specific and has been designed based on the following information: • Review of site information including site history; • AEC, CoPC, receptors, pathways and medium identified in the CSM; • Development of SAC for each media; and • The use of decision statements outlined below: 1. Are any of the soil or groundwater results above the SAC? 2. Is there asbestos containing material present on the site? 3. Can the site be made suitable for the proposed development?
Identify Information Inputs	The following information will be collected: • Soil samples based on subsurface conditions; • Groundwater samples from monitoring well; • Fibre Cement Fragments (FCF) in the vicinity of the sampling points; • The SAC will be designed based on the criteria outlined in NEPM 2013. Other criteria will be used as required and detailed in this report; • The samples will be analysed in accordance with the analytical methods outlined in NEPM 2013; • Field screening information (i.e. PID data, presence of hydrocarbons etc.) will be taken into consideration in selecting the analytical schedule; and • Any additional information that may arise during the field work will also be used as data inputs.
Define the Study Boundary	The sampling will be confined to the site boundaries as shown in Figure 2. Fill has been identified as an AEC. The source of fill has not been established. Fill is considered to be heterogeneous material with PCC occurring in random pockets or layers. The presence of PCC in between sampling points cannot be measured.

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Step	Input
	The areas excluded from the investigation are outlined in the data gaps.
Develop the analytical approach (or decision rule)	The following acceptable limits will be adopted for the data quality assessment: • The following acceptance criteria will be used to assess the RPD results: ➢ results > 10 times the practical quantitation limit (PQL), RPDs < 50% are acceptable; ➢ results between 5 and 10 times PQL, RPDs < 75% are acceptable; ➢ results < 5 times PQL, RPDs < 100% are acceptable; and ➢ An explanation is provided if RPD results are outside the acceptance criteria. • Acceptable concentrations in Trip Blanks (TB). Non-compliance to be documented in the report; • The following acceptance criteria will be used to assess the primary laboratory QA/QC results. Non-compliance to be documented: ➢ <u>RPDs</u>: - Results that are < 5 times the PQL, any RPD is acceptable; and - Results > 5 times the PQL, RPDs between 0-50% are acceptable; ➢ <u>LCS recovery and matrix spikes</u>: - 70-130% recovery acceptable for metals and inorganics; - 60-140% recovery acceptable for organics; and - 10-140% recovery acceptable for VOCs; ➢ <u>Surrogate spike recovery</u>: - 60-140% recovery acceptable for general organics; and - 10-140% recovery acceptable for VOCs; ➢ <u>Blanks</u>: All less than PQL.
Specify the performance or acceptance criteria	NEPM 2013 defines decision errors as '*incorrect decisions caused by using data which is not representative of site conditions'*. This can arise from errors during sampling or analytical testing. A combination of these errors is referred to as '*total study error*'. The study error can be managed through the correct choice of sample design and measurement. 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. In this case, for example, the PCC identified in the PCSM is considered to pose a risk to receptors unless proven not to. The null hypothesis has been adopted for this assessment.
Optimise the design for obtaining data	The most resource-effective design will be used in an optimum manner to achieve the assessment objectives.

8.2 Soil Sampling Plan and Methodology

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

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Table 8-2: Soil Sampling Plan and Methodology

Aspect	Input
Sampling Density	The NSW EPA Contaminated Sites Sampling Design Guidelines (1995[13]) recommend a sampling density for an environmental assessment based on the size of the investigation area. The guideline provides a minimum number of sampling points required for the investigation on a systematic sampling pattern. The guidelines recommend sampling from a minimum of 6 evenly spaced sampling points for this site with an area of approximately 1,021m^2. Samples for this investigation were obtained from two sampling points as shown on the attached Figure 2. This density is approximately 33% of the minimum sampling density recommended by the EPA.
Exclusion Areas (Data Gaps)	Sampling was not undertaken in inaccessible areas of the site such as beneath existing buildings. These areas have been excluded from the investigation.
Sampling Equipment	Soil samples were obtained on 20/10/2016 in accordance with the standard sampling procedure (SSP) attached in the appendices. Sampling locations were set out using a tape measure. In-situ sampling locations were cleared for underground services by an external contractor prior to sampling as outlined in the SSP. The sample locations were drilled using a hydraulically operated drill rig equipped with spiral flight augers. Soil samples were obtained from a Standard Penetration Test (SPT) sampler or directly from the auger when conditions did not allow use of the SPT sampler.
Sampling Collection and Field QA/QC	Soil samples were collected from the fill and natural profiles based on field observations. The sampling depths are shown on the logs attached in the appendices. Additional samples were obtained when relatively deep fill (>0.5m) was encountered. Samples were also obtained when there was a distinct change in lithology or based on the observations made during the investigation. During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis. Samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. Sampling personnel used disposable nitrile gloves during sampling activities. The samples were labelled with the job number, sampling location, sampling depth and date in accordance with the SSP.

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

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Aspect	Input
Field PID Screening for VOCs	A portable Photoionisation Detector (PID) was used to screen the samples for the presence of VOCs and to assist with selection of samples for hydrocarbon analysis. The sensitivity of the PID is dependent on the organic compound and varies for different mixtures of hydrocarbons. Some compounds give relatively high readings and some can be undetectable even though present in identical concentrations. The portable PID is best used semi-quantitatively to compare samples contaminated by the same hydrocarbon source. The PID is calibrated before use by measurement of an isobutylene standard gas. All the PID measurements are quoted as parts per million (ppm) isobutylene equivalents. 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.
Sample Preservation	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 delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

8.3 Groundwater Sampling Plan and Methodology

The groundwater sampling plan and methodology is outlined in the table below:

Table 8-3: Groundwater Sampling Plan and Methodology

Aspect	Input
Sampling Plan	A groundwater monitoring well was installed in BH1 as shown on Figure 2.
Exclusion Areas (Data Gaps)	Sampling was not undertaken in inaccessible areas of the site such as beneath existing buildings. These areas have been excluded from the investigation.
Monitoring Well Installation Procedure	The monitoring well construction is documented on the appropriate borehole log attached in the appendices. The monitoring well was installed to depth of approximately 9.2m below ground level. The wells were constructed as follows: • A 50mm diameter Class 18 PVC casing and machine slotted screen; • A 2mm sand filter pack was used around the screen section for groundwater infiltration; • A bentonite seal/plug was used on top of the slotted section to seal the well;

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Aspect	Input
	• A gatic cover was installed at the surface with a concrete plug to limit the inflow of surface water.
Groundwater Sampling	The monitoring well was allowed to recharge for approximately 4 hours after development. Groundwater grab sample was obtained on 20/11/2016 using a disposable bailer.
Sample Preservation	The decontamination procedure adopted during sampling is outlined in the SSP attached in the appendices. The samples were preserved in accordance with water sampling requirements detailed in NEPM 2013 and placed in an insulated container with ice in accordance with the SSP. On completion of the fieldwork, the samples were delivered in the insulated sample container to a NATA registered laboratory for analysis under standard COC procedures.

8.4 Analytical Schedule

The analytical schedule is outlined in the following table:

Table 8-4: Analytical Schedule

PCC/CoPC	Fill Samples	Natural Soil Samples	Groundwater Samples
Heavy Metals	2	2	1
TRH/BTEXN	2	2	1
PAHs	2	2	Na
OCPs/OPPs	2	2	Na
PCBs	2	2	Na
Asbestos	2	Na	Na
Asbestos in Fibre Cement Fragments (FCF)	1	Na	Na
pH	Na	8	Na
Electrical Conductivity (EC)	Na	8	Na

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PCC/CoPC	Fill Samples	Natural Soil Samples	Groundwater Samples
Texture modification of EC values (Ece)	1	1	Na
Sulphate	Na	8	Na
Chloride	Na	8	Na
Asbestos in Fibre Cement Fragments (FCF)	1	Na	Na

8.4.1 Laboratory Analysis

The samples were analysed by the NATA Accredited laboratory/s 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 8-5: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicates and trip blanks)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	155826
All salinity samples	SGS Alexandria Environmental NSW NATA Accreditation Number – 2562(4354) (ISO/IEC 17025 compliance)	SE158347

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9 SITE ASSESSMENT CRITERIA (SAC)

The SAC adopted for the assessment is outlined in the table below. The SAC has been derived from the NEPM 2013 and other guidelines as applicable. The guideline values for individual contaminants are presented in the attached report tables.

Table 9-1: SAC Adopted for this Investigation

Guideline	Applicability
Health Investigation Levels (HILs) (NEPM 2013)	The HIL-A criteria for 'residential with accessible soil' have been adopted for this assessment. These are the most conservative criteria adopted due to the preliminary nature of the investigation.
Health Screening Levels (HSLs) (NEPM 2013)	The HSL-A criteria for 'residential with accessible soil' have been adopted for this assessment.
Ecological Assessment Criteria (EAC) (NEPM 2013)	A preliminary screening of ecological risk has been undertaken based on the limited information available at this stage. The EAC criteria for 'urban residential and public open space (URPOS)' exposure setting have been adopted. Soil parameters: pH; cation exchange capacity (CEC); and clay content have not been analysed for the assessment. On this basis, the EIL and ESL calculations have taken the 'worst case' scenario in order to generate the EAC.
Asbestos in Soil	The 'presence/absence' of asbestos in soil has been adopted as the assessment criterion for the Preliminary Site Investigation (PSI).
Waste Classification (WC) Criteria	The criteria outlined in the NSW EPA Waste Classification Guidelines - Part 1: Classifying Waste (2014[14]) has been adopted to classify the material for off-site disposal.

[14] NSW EPA, (2014), *Waste Classification Guidelines, Part 1: Classifying Waste.* (referred to as Waste Classification Guidelines 2014)

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Guideline	Applicability
Groundwater Investigation Levels (GILs)	The NSW Department of Environment and Conservation (now EPA) Guidelines for the Assessment and Management of Groundwater Contamination (2007[15]) require an assessment of environmental values including: **1. <u>Aquatic Ecosystems:</u>** The closest receiving water body in the vicinity of the site is the Nepean River. This water body predominantly sustains a freshwater ecosystem. Hence the freshwater water trigger values presented in Australian and New Zealand Guidelines for Fresh Water Quality (2000[16]) have been adopted for the assessment (referred to as GIL-ANZECC-Fresh. The NSW EPA promotes the use of trigger values for the protection of 95% of aquatic ecosystems, except where the contaminants have the potential to bio-accumulate, in which case the 99% trigger values are recommended. The 95% trigger values have been adopted for this assessment. Where necessary, the low reliability trigger values are quoted. **2. <u>Human Uses</u>:** The ANZECC 2000 Recreational Water Quality guidelines are designed to protect the health of both primary contact (e.g. swimming) and secondary contact (e.g. boating) water users. As Nepean River is utilised as a recreational water body, these guidelines have been adopted for this assessment where applicable (referred to as GIL-ANZECC-Recreation). The groundwater bore search did not indicate the presence of bores registered for domestic use in the immediate vicinity of the site. The extraction and use of groundwater for drinking purposes is unlikely to occur at the site. The site is also connected to the mains water supply. Based on this, the Australian Drinking Water Guidelines (2011[17]) have not been adopted for this assessment (referred to as GIL-ADWG). **3. <u>Health Risk in Non-use Scenarios</u>:** Health risks in non-use scenarios are usually associated with the presence of vapours associated with volatile contaminants. The HSL A for 'residential with accessible soil' have been adopted for this investigation.

[15] NSW DEC (2007), *Guidelines for the Assessment and Management of Groundwater Contamination* (referred to as Groundwater Guidelines 2011)

[16] ANZECC, (2000), *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* (referred to as ANZECC 2000)

[17] National Health and Medical Research Council, (2011), *Australian Drinking Water Guidelines.* (referred to as ADWG 2011)

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10 SITE ASSESSMENT CRITERIA (SAC) – SALINITY

10.1 Overview

The Salinity Potential Map 2002 provides local government and state agencies with information to develop a salinity management response. The map indicates the distribution and potential severity of salinity at a 1:100,000 scale based on the current understanding of the factors that may lead to the development of saline conditions.

Western Sydney Salinity Code of Practice 2004 document was developed by the Regional Organisation of Councils Ltd (WSROC) in conjunction with DIPNR (now EPA) as a management tool to assist individual councils to develop policy to address salinity at the local government level.

Government departments (now under EPA) have also released a series of documents under the Local Government Salinity Initiative providing information on salinity in urban areas. This series includes the DLWC 2002 document which provides a frame work for undertaking salinity investigations for urban development.

Salinity management recommendations outlined in this report have been designed generally in accordance with the amended Salinity Code of Practice 2004. The recommendations have been designed with reference to various levels of salinity management response outlined in the publication.

10.2 Soil Salinity and Plant Growth

The electrical conductivity (EC) of a 1:5 soil:water extract is commonly used as an indicator of soil salinity conditions as the reading is directly related to the electrolyte (salt) concentration of the extract. In order to compare the laboratory data with published salinity classes, the results are converted to equivalent saturated paste (ECe) using texture adjustment values presented in DLWC 2002.

The following table provides a summary of plant response with reference to salinity:

Table 10-1: Plant Response to Soil Salinity

ECe (dS/m)	Salinity Class	Plant Response[1]
<2	Non-saline	Salinity effects mostly negligible
2-4	Slightly saline	Yields of very sensitive crops may be affected
4-8	Moderately saline	Yield of many crops affected
8-16	Very saline	Only tolerant crops yield satisfactorily
>16	Highly saline	Only a few very tolerant crops yield satisfactorily

Note:

1 - Plant Response to Salinity Class has been adopted from DLWC 2002

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10.3 Soil pH and Plant Growth

Soil pH is a measure of the acidity or alkalinity of the soils and values have been assessed as an indicator of soil fertility with respect to plant growth.

The optimal pH for plant growth is between 5.5 and 7. Beyond this range, effective revegetation of exposed soil following disturbance is increasingly difficult and the potential for erosion is considered to increase. Highly alkaline soils are commonly associated with saline and sodic soil conditions and can limit the ability of plants to take up water and nutrients. Highly acidic soils exhibit aluminium toxicity toward plants and can limit the ability of plants to take up other essential nutrients including molybdenum.

Interpretation of soil pH with respect to plant growth is undertaken using the ratings published in Bruce and Rayment (1982[18]) presented below:

Table 10-2: Plant Response to Soil pH

pH	Rating
<4.5	Extremely acidic
4.5-5.0	Very strongly acidic
5.1-5.5	Strongly acidic
5.6 – 7.3	Optimal plant growth
7.4-7.8	Mildly alkaline
7.9-8.4	Moderately alkaline
8.5-9.0	Strongly alkaline
>9.1	Very strongly alkaline

10.4 Cation Exchange Capacity (CEC) in Soil

The ability of soils to attract, retain and exchange cations (positively charged ions) is estimated by the calculated CEC value. CEC represents the major controlling factor in stability of clay soil structure, nutrient availability for plant growth, soil pH and the reaction of the soil to chemical applications (fertilisers, conditioners etc.).

High CEC soils have a greater capacity to retain nutrients, however, deficient soils require greater applications of nutrients to correct imbalances. Low CEC soils have a reduced capacity to retain nutrients and may result in leaching of nutrients from the soil in the event of excess nutrient applications.

Metson (1961[19]) developed a set of ratings for effective CEC and the most abundant cations. These are summarised below (values are in meq/100g):

[18] *Analytical Methods and Interpretations used by the Agricultural Chemistry Branch for Soil and Land Use Surveys,* Bruce, R.C. and Rayment, G.E., 1982 (Bruce and Rayment 1982)

[19] *Methods of Chemical Analysis for Soil Survey Samples,* Metson, A.J, 1961 (Metson 1961)

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Table 10-3: CEC Rating

Rating	eCEC	Exch Na	Exch K	Exch Ca	Exch Mg
Very low	<6	0-0.1	0-0.2	0-2	0-0.3
Low	6-12	0.1-0.3	0.2-0.3	2-5	0.3-1
Moderate	12-25	0.3-0.7	0.3-0.7	5-10	1-3
High	25-40	0.7-2	0.7-2	10-20	3-8
Very high	>40	>2	>2	>20	>8

Note:

CEC – Cation Exchange Capacity
Na – Sodium
K – Potassium
Ca – Calcium
Mg – Magnesium

10.5 Exchangeable Sodium Percentage or Sodicity (ESP%)

Exchangeable sodium is an important soil stability and salinity parameter. Excessive exchangeable sodium leads to unstable soils, increased runoff, potential salinity, dispersivity and water logging problems.

Normally the sodium content is expressed as a percentage of the CEC as other cations counteract the negative effects of sodium (known as ESP% and termed sodicity). The effect of the exchangeable sodium (exchangeable sodium percentage, ESP) varies with other soil factors such as the type of clay, the relative quantity of magnesium and the quantity of organic matter. However, Charman & Murphy (2000[20]) indicate that a soil is generally considered sodic if the ESP exceeds 6% and extremely sodic if the ESP exceeds 15%.

10.6 Recommendations for Concrete Slabs and Footings in Saline Soils

In the absence of endorsed recommendations for buildings in saline environments, reference is made to the CCAA 2005. The guide provides recommendations on the minimum concrete grade/strength required for slabs and footings in saline soils. Reference should be made to the CCAA 2005 publication for future information:

Table 10-4: Minimum Concrete Grade for Slabs and Footings in Saline Soils

ECe (dS/m)	Salinity Class	Concrete Grade[1]
<2	Non-saline	N20
2-4	Slightly saline	N20
4-8	Moderately saline	N25
8-16	Very saline	N32
>16	Highly saline	≥N40

[20] *Soils: Their Management and Properties,* Charman, P.E.V and Murphy, B.W (eds), 2000 (Charman and Murphy 2000)

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Note:

1 - Concrete Grade for Salinity Class has been adopted from CCAA 2005

10.7 Recommendations for Durability with Reference to AS2159-2009

In designing for durability, reference should be made to the requirements listed in the AS2159-2009. The exposure classification for concrete and steel piles and foundations is outlined in the following tables.

Table 10-5: Exposure Classification for Concrete Piles

Exposure Conditions				Exposure Classification	
Sulphate (expressed as SO_4)		pH	Chlorides in Groundwater (ppm)	Soil Conditions A[1]	Soil Conditions B[2]
In Soil (ppm)	In Groundwater (ppm)				
<5,000	<1,000	>5.5	<6,000	Mild	Non-aggressive
5,000-10,000	1,000-3,000	4.5-5.5	6,000-12,000	Moderate	Mild
10,000-20,000	3,000-10,000	4-4.5	12,000-30,000	Severe	Moderate
>20,000	>10,000	<4	>30,000	Very severe	Severe

Notes:

1 - High permeability soils (eg sands and gravels) which are in groundwater

2 – Low permeability soils (eg silts and clays) or all soils above groundwater

Table 10-6: Exposure Classification for Steel Piles

Exposure Conditions				Exposure Classifications	
pH	Chlorides		Resistivity (ohm.cm)	Soil Conditions A[1]	Soil Conditions B[2]
	In Soil (ppm)	In Groundwater (ppm)			
>5	<5,000	<1,000	>5,000	Non-aggressive	Non-aggressive
4-5	5,000-20,000	1,000-10,000	2,000-5,000	Mild	Non-aggressive
3-4	20,000-50,000	10,000-20,000	1,000-2,000	Moderate	Mild
<3	>50,000	>20,000	<1,000	Severe	Moderate

Notes:

1 - High permeability soils (eg sands and gravels) which are in groundwater

2 – Low permeability soils (eg silts and clays) or all soils above groundwater

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11 INVESTIGATION RESULTS

11.1 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 11-1: Summary of Subsurface Conditions

Profile	Description (m in bgl)
Fill	Topsoil/fill material was encountered at the surface in all boreholes and extended to depths of approximately 0.4 to 0.5m. The fill typically comprised of silty clay with a trace of ironstone gravel.
Natural Soil	Silty clay was encountered beneath the fill/topsoil and was in turn underlain by alluvial layers of silty sand, silty clay gravel and clayey sand. The natural soil extended to the termination of the boreholes at a maximum depth of 11m.
Groundwater	Groundwater seepage was encountered in BH1 at approximately 8.0m. A monitoring well was installed to a depth of 9.2m in BH1.

11.2 Field Screening

A summary of the field screening results are presented in the table below.

Table 11-2: Summary of Field Screening

Aspect	Details (m in bgl)
PID Screening of Soil Samples for VOCs	PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. All results were 0 ppm equivalent isobutylene which indicates a lack of PID detectable VOCs.
Groundwater Depth	An accurate SWL measured could not be recorded due to a low volume of extremely silty water in the well.

11.3 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.

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Table 11-3: Summary of Soil Laboratory Results

Analyte	Results Compared to SAC
Heavy Metals	**HILs:** All heavy metal results were below the HIL-A criteria. **EILs:** All heavy metal results were below the EIL-UR&POS criteria. **WC:** All heavy metal results were less than the CT1 and SCC1 criteria.
TRH	**HSLs:** All TRH results were below the HSL-A criteria. **ESLs:** All TRH results were below the ESL-URPOS criteria. **WC:** All TRH results were less than the relevant CT1 and SCC1 criteria.
BTEXN	**HSLs:** All BTEXN results were below the HSL-A criteria. **ESLs:** All BTEXN results were below the ESL-URPOS criteria. **WC:** All BTEX results were less than the relevant CT1 and SCC1 criteria.
PAHs	**HILs:** All PAH results were below the HIL-A criteria. **HSLs:** All naphthalene results were below the HSL-A criteria. **ESLs:** All benzo(a)pyrene results were below the ESL-URPOS criteria. **EILs:** All naphthalene results were below the EIL-URPOS criteria. **WC:** All PAH results were less than the relevant CT1 and SCC1 criteria.
OCPs & OPPs	**HILs:**

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Analyte	Results Compared to SAC
	All OCP and OPP results were below the HIL-A criteria. **EILs:** All DDT results were below the EIL-URPOS criteria. **WC:** All OCP and OPP results were less than the relevant CT1 and SCC1 criteria.
PCBs	**HILs:** All PCB results were below the HIL-A criterion. **WC:** All PCB results were less than the SCC1 criterion.
Asbestos	Asbestos was not detected in the soil samples analysed for the investigation. Chrysotile and Amosite Asbestos was detected in surface fibre cement fragment (F1).

11.4 Groundwater Laboratory Results

The groundwater laboratory results are presented in the attached report tables. A summary of the results assessed against the SAC is presented below.

Table 11-4: Summary of Groundwater Laboratory Results

Analyte	Results Compared to SAC
Heavy Metals	**GIL-ANZECC-Fresh:** The total chromium result encountered in MW1 was 95ug and copper result was 17ug which were above the adopted GIL-ANZECC fresh criteria. The remaining heavy metal results were below the GIL-ANZECC-fresh criteria. **GIL-ANZECC-Recreational:** The total Chromium result was above the GIL-ANZECC fresh water criteria. The remaining heavy metal results were below the GIL-ANZECC-recreational criteria.
BTEXN	**GIL-ANZECC-Fresh:** All BTEXN results were below the GIL-ANZECC criteria. **GIL-ANZECC-Recreational:** All BTEXN results were below the GIL-recreational criteria **HSLs:**

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Analyte	Results Compared to SAC
	All BTEXN results were below the GIL-HSL criteria.

11.5 Soil Laboratory Results - Salinity

The laboratory results are presented in attached to the report tables. A summary of the results are presented below.

Table 11-5: Summary of Laboratory Results

Analyte	Number of Samples Analysed	Results
EC & EC_e	9 selected samples	The EC results ranged from 77µS/cm to 420µS/cm. The ECe results ranged from 0.6dS/m to 3.8dS/m.
Resistivity	9 selected samples	Resistivity values were calculated based on the raw EC values. The resistivity values for the soil samples ranged from 2,400ohm.cm to 13,000ohm.cm.
pH	9 selected samples	The results of the analysis ranged from 6.5 to 7.8.
CEC	2 selected samples	The results of the analysis ranged from: • CEC – 15meq/100g to 32meq/100g; • Exchangeable Na – 0.19meq/100g to 0.21meq/100g; • Exchangeable K – 0.28meq/100g to 0.19meq/100g; • Exchangeable Ca – 13meq/100g to 30meq/100g; • Exchangeable Mg – 1.3meq/100g to 1.8meq/100g;
Sulphate	9 selected samples	The results ranged from 35mg/kg to 140mg/kg.
Chloride	9 selected samples	The results ranged from 2mg/kg to 130mg/kg.
Groundwater		Salinity groundwater samples were not obtained due to the low volume of ground water collected in the monitoring well.

Note:
Na – Sodium
K – Potassium
Ca – Calcium
Mg – Magnesium

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11.6 Interpretation of Laboratory Results – Salinity

The laboratory results have been assessed against the criteria outlined in **Section 10**.

Table 11-6: Interpretation of Laboratory Results

Parameter	Notes
Soil Salinity and Plant Growth	The ECe results ranged from 0.6dS/m to 3.8dS/m. The samples were classed as non-saline to slightly.
Soil pH and Plant Growth	The soil pH results ranged from 6.5 to 7.8 and are classed as optimal to mildly alkaline. The majority of the surficial soils were generally alkaline.
CEC in Soil	The CEC value of 12 and 32meq/100g. The result was within the low to high range. Low range is generally indicative of the low levels of organic matter within the soils. High range is generally indicative of high levels of organic matter within the soils and a greater capacity to retain nutrients.
ESP%	The ESP% values ranged from 0.7-1.3%. The ESP result were below the 5% threshold and is classed as non-sodic.
Concrete Slabs and Footings in Saline Soils (CCAA 2005)	CCAA 2005 recommended concrete grade for slabs and footings in moderately saline soils is N20. Reference should also be made to AS2159-2009 for minimum concrete strengths and reinforcement cover for concrete piles/foundations.
Soil Conditions for Exposure Classification (AS2159-2009)	The boreholes drilled for the investigation have indicated that the subsurface conditions at the site generally comprise of low permeability soils (i.e. silts and clays). However some groundwater was encountered at the site therefore we have assessed the data against both the Class A and B conditions. This data should be provided to the structural engineer.
Exposure Classification for Concrete Piles/Foundations (AS2159-2009)	The soil pH, sulfate and chloride results indicate that subsurface conditions could potentially be mildly aggressive to buried concrete.
Exposure Classification for Steel Piles/Foundations (AS2159-2009)	The soil resistivity, pH and chloride results indicate that the soils are mildly aggressive towards buried steel.

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12 DATA QUALITY ASSESSMENT

As part of the data quality assessment the following data quality indicators (DQIs) were assessed: precision, accuracy, representativeness, completeness and comparability as outlined in the table below. Reference should be made to the appendices for an explanation of the individual DQI.

Table 12-1: Assessment of DQIs

Completeness

Field Considerations:

- The investigation was designed as a preliminary screening and sampling was confined to accessible areas of the site (see Figure 2);
- Samples were obtained from various depths based on the subsurface conditions encountered at the sampling locations. All samples were recorded on the borehole logs. All sampling points are shown on the attached Figure 2;
- The investigation was undertaken by trained staff in accordance with the SSP; and
- Documentation maintained during the field work is attached in the appendices where applicable.

Laboratory Considerations:

- All samples were analysed by NATA registered laboratories in accordance with the analytical methods outlined in NEPM 2013;
- Appropriate analytical methods and PQLs were used by the laboratories. The BTEXN PQLs in water was raised due to a sample matrix requiring dilution; and
- Appropriate sample preservation, handling, holding time and COC procedures were adopted for the investigation.

Comparability

Field Considerations:

- The investigation was undertaken by trained staff in accordance with the SSP;
- The climate conditions encountered during the field work were noted on the site description record maintained in the job file; and
- Consistency was maintained during sampling in accordance with the SSP.

Laboratory Considerations:

- All samples were analysed in accordance with the analytical methods outlined in NEPM 2013;
- Appropriate PQLs were used by the laboratories for all analysis (other than those outlined above);
- All primary, intra-laboratory duplicate/s and other QA/QC samples were analysed by the same laboratory; and
- The same units were used by the laboratories for all of the analysis.

Representativeness

Field Considerations:

- The investigation was designed to obtain appropriate media encountered during the field work as outlined in the SAQP.

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Precision

Field Considerations:

- The investigation was undertaken in accordance with the SSP.

Laboratory Considerations:

- Analysis of field QA/QC samples including intra-laboratory duplicates and trip blanks (TB), as outlined below;
- The field QA/QC frequency adopted for the investigation is outlined below;
- Calculation of the Relative Percentage Difference (RPD) from the primary and duplicate results (the RPD calculation equation is outlined in the attached appendices);
- Assessment of RPD results against the acceptance criteria outlined in **Section 8.1.**

Intra-laboratory RPD Results:

Soil Samples at a frequency of 25% of the primary samples:

- Dup A1 is a soil duplicate of primary sample BH2(0-0.1m).

The RPD value for a zinc was outside the acceptance criteria. This values outside the acceptable limits has been attributed to sample heterogeneity and the difficulties associated with obtaining homogenous duplicate samples of heterogenous matrices.

Trip Blank (TB):

One soil TB were analysed for BTEX at a frequency of one blank per batch of volatiles. The results are presented in the attached report tables. The results were all less than the PQLs.

Accuracy

Field Considerations:

- The investigation was undertaken in accordance with the SSP.

Laboratory Considerations:

- The analytical quality assessment adopted by the laboratories was in accordance with the NATA and NEPM 2013 requirements as outlined in the analytical report/s;
- A review of the report/s indicates that the analytical results were generally within the acceptance criteria adopted by the laboratories;
- A review of the report/s indicates the following comments noted by Envirolab:

Envirolab Report 155826 – The BTEX in water PQL has been raised due to the sample matrix requiring dilution.

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13 WASTE CLASSIFICATION OF SOIL FOR OFF-SITE DISPOSAL

The waste classification of soil for off-site disposal is summarised in the following table:

Table 13-1: Waste Classification

Site Extent / Material Type	Preliminary Classification	Disposal Option
Fill or topsoil material in the investigation area	General Solid Waste (non-putrescible) (GSW) containing asbestos Further investigation may be required to assess the potential for the fill to be classified as GSW.	A NSW EPA landfill licensed to receive the waste stream. The landfill should be contacted to obtain the required approvals prior to commencement of excavation.
Natural silty clay soil in the investigation area	Due to the asbestos encountered on the surface an asbestos clearance of the excavated surface will be required once the fill material has been removed in order to demonstrate that the underlying natural soil is VENM.	

Following removal of the fill material the excavation surface should be inspected and cleared by a licenced asbestos assessor in order to classify the underlying natural soil as VENM.

There in the potential for the asbestos to be confined to only lot. However, this cannot be confirm without undertaking an additional investigation.

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14 TIER 1 RISK ASSESSMENT AND REVIEW OF PCSM

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.

No elevations were encountered in the soil samples obtained for this investigation. The assessment has identified the following contamination issues at the site:

Table 14-1: Tier 1 Risk Assessment and Review of PCSM

Contaminant of Primary Concern (CoPC)	Receptor and Exposure Pathway	Discussion and Risk Rating
Copper and Chromium (groundwater)	Human Receptors: Dermal Contact, ingestion Environmental Receptors: Direct exposure to plants and animals	The CoPC were above the SAC adopted for this investigation and pose a risk to site receptors. EIS are of the opinion that the elevated copper and chromium results in the groundwater can be attributed to an artefact associated with the sampling methodology (grab sample) affecting the accuracy of the result. The sample provided to the laboratory was extremely silty. This was due to the low volume of groundwater collected in the monitoring well.
Asbestos in FCF	Human Receptors: Inhalation of airborne asbestos fibres	The investigation encountered FCF containing asbestos on the ground surface. During sampling the FCF were assessed to be in good condition and could not be broken by hand pressure. Hence the material was assessed to be 'non-friable' based on field information. EIS are of the opinion that the risk posed to human receptors is low to moderate and will require remediation and/or management.

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14.1 Data Gaps

The assessment has identified the following data gaps:

- The EPA sampling density has not met;
- The salinity conditions in the groundwater conditions at the site have not been assessed;
- Areas beneath the existing buildings have not been included in the assessment; and
- The presence of hazardous building materials in the existing buildings has not been assessed.

Due to the low volume of groundwater various other contaminants were not analysed during this preliminary screening. Additional analysis of the groundwater should be undertaken to further investigate the chromium and copper results.

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15 CONCLUSION

EIS consider that the report objectives outlined in **Section 1.2** have been addressed.
The use of decision statements outlined below:

1) Are any of the soil or groundwater results above the SAC? Yes
2) Is there asbestos containing material present on the site? Yes
3) Can the site be made suitable for the proposed development? Yes

EIS consider that the site can be made suitable for the proposed development provided that the following recommendations are implemented to address the data gaps and to minimise the risks:

1. Undertake a Stage 2 ESA to address some of the data gaps identified in **Section 13** once the building have been demolished and the finalised design of the building has been prepared; and

2. Undertake a Hazardous Materials Assessment (Hazmat) for the existing buildings prior to the commencement of demolition work.

15.1 Salinity

Slightly saline conditions were encountered in the soil samples analysed for the investigation. Based on these results EIS consider that a salinity management plan should be prepared for the site.

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15.2 Regulatory Requirement

The regulatory requirements applicable for the site are outlined in the following table:

Table 15-1: Regulatory Requirement

Guideline	Applicability
Duty to Report Contamination 2015[21]	The requirement to notify the NSW EPA regarding site contamination should be assessed once the results of the additional investigation work have been reviewed and a remedial strategy (if necessary) has been selected. Please note that in the event the recommendations for additional work and remediation/management are not undertaken, there may be justification to notify the EPA. EIS can be contacted for further advice regarding notification.
POEO Act 1997	Section 143 of the POEO Act 1997 states that if waste is transported to a place that cannot lawfully be used as a waste facility for that waste, then the transporter and owner of the waste are each guilty of an offence. The transporter and owner of the waste have a duty to ensure that the waste is disposed of in an appropriate manner.
Work Health and Safety Code of Practice 2011[22]	Sites contaminated with asbestos become a 'workplace' when work is carried out there and require a register and asbestos management plan.
Dewatering Consent	In the event groundwater is intercepted during excavation works, dewatering may be required. Council, NSW Office of Water (NOW) and other relevant approvals (from discharge authorities like Sydney Water etc.) should be obtained prior to the commencement of dewatering.

[21] NSW Department of Environment and Climate Change, (2009), *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997.* (referred to as Duty to Report Contamination 2009)

[22] WorkCover NSW, (2011), *WHS Regulation: Code of Practice – How to Manage and Control Asbestos in the Workplace.*

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16 LIMITATIONS

The report limitations are outlined below:

- Salinity is a natural phenomenon and can change over time based on site conditions and climatic variations. Changes to existing drainage patters can also impact the salinity at the site. The results outlined in this report are a snap shot of conditions present at the time of the investigation and is bound to change over time;
- EIS accepts no responsibility for any unidentified salinity 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;
- EIS accepts no responsibility for non-compliance of salinity management recommends outlined in this report;
- 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;

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- 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.

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LIST OF IN-TEXT TABLES

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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.

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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.

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REPORT FIGURES

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AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.5.1557
AERIAL IMAGE ©: 2015 GOOGLE INC.

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

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Title: **SITE LOCATION PLAN**

Location: 15-17 DENT STREET
JAMISONTOWN, NSW

Report No: E29853K

Figure No: 1

ENVIRONMENTAL INVESTIGATION SERVICES

PLOT DATE: 24/11/2016 9:39:02 AM DWG FILE: S:\5 EIS\5C- EIS JOBS\29000'S\E29853K JAMISONTOWN\CAD\E29853K.DWG

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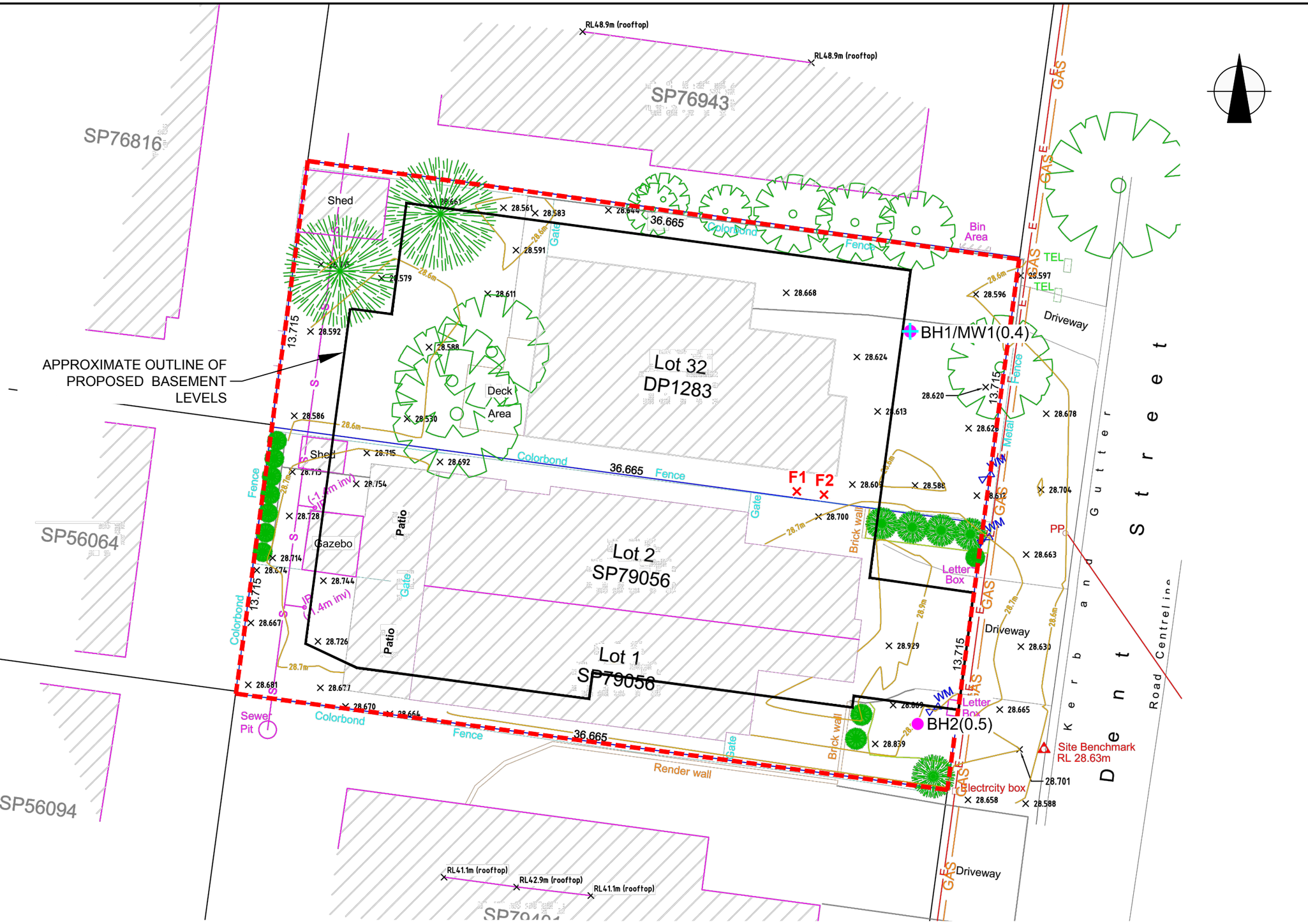

LEGEND

APPROXIMATE SITE BOUNDARY	
BH (Fill Depth)	BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m)
BH/MW(Fill Depth)	BOREHOLE AND GROUND WATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m)
× F	SURFACE SAMPLE FIBRE CEMENT FRAGMENT (FCF)

SCALE 1:200 @A3 METRES (0 2 4 6 8 10)

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

Title: **INVESTIGATION LOCATION PLAN**

Location: 15-17 DENT STREET JAMISONTOWN, NSW

Report No: E29853K

Figure No: 2

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

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LABORATORY SUMMARY TABLES

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TABLE A
SOIL LABORATORY RESULTS COMPARED TO HILs
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 [2]	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P TEQ [3]	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) [1]			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	0-0.1	Fill: silty clay	LPQL	LPQL	12	19	48	LPQL	9	110	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No Asbestos Dectected
BH1	0.5-0.6	Silty clay	LPQL	LPQL	11	11	6	LPQL	3	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH2	0-0.1	Fill: silty clay	7	LPQL	13	20	20	LPQL	3	38	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No Asbestos Dectected
BH2	0.5-0.6	Silty clay	LPQL	LPQL	11	16	6	LPQL	3	11	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
F1	Surface	Fargment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Chrysotile and Amosite Asbestos Detected
Total Number of Samples			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
Maximum Value			7	LPQL	13	20	48	LPQL	9	110	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NC

Explanation:

1 - Site Assessment Criteria (SAC): NEPM 2013, HIL-A: 'Residential with garden/accessible soils; children's day care centers; preschools; and primary schools'

2 - The 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.

3 - B(a)P TEQ - Benzo(a)pyrene Toxicity Equivalence Quotient has been calculated based on 8 carcinogenic PAHs and their Toxic Equivalence Factors (TEFs) outlined in NEPM 2013

Concentration above the SAC **VALUE**

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons	UCL: Upper Level Confidence Limit on Mean Value
B(a)P: Benzo(a)pyrene	HILs: Health Investigation Levels
PQL: Practical Quantitation Limit	NA: Not Analysed
LPQL: Less than PQL	NC: Not Calculated
OPP: Organophosphorus Pesticides	NSL: No Set Limit
OCP: Organochlorine Pesticides	SAC: Site Assessment Criteria
PCBs: Polychlorinated Biphenyls	NEPM: National Environmental Protection Measure

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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	PID [2]
PQL - Envirolab Services					25	50	0.2	0.5	1	3	1	
HSL Land Use Category [1]					**HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
BH1	0-0.1	Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH1	0.5-0.6	Silty Clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0-0.1	Fill: silty clay	0m to < 1m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
BH2	0.5-0.6	Silty Clay	1m to <2m	Clay	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	0
Total Number of Samples					4	4	4	4	4	4	4	4
Maximum Value					LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL

Explanation:
1 - Site Assessment Criteria (SAC): NEPM 2013
2 - Field PID values obtained during the investigation

Concentration above the SAC **VALUE**
The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

Abbreviations:

UCL: Upper Level Confidence Limit on Mean Value	NC: Not Calculated	PQL: Practical Quantitation Limit
HSLs: Health Screening Levels	NL: Not Limiting	LPQL: Less than PQL
NA: Not Analysed	SAC: Site Assessment Criteria	NEPM: National Environmental Protection Measure

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	3	1
HSL Land Use Category [1]					**HIGH DENSITY RESIDENTIAL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
BH1	0-0.1	Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH1	0.5-0.6	Silty Clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH2	0-0.1	Fill: silty clay	0m to < 1m	Clay	50	280	0.7	480	NL	110	5
BH2	0.5-0.6	Silty Clay	1m to <2m	Clay	90	NL	1	NL	NL	310	NL

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Preliminary Environmental Screening
15-17 Dent Street, Jamisontown, NSW
E29853K

EIS

TABLE C
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES (2014)
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful [2]	Total Scheduled[3]	PCBs	C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.2	0.5	1	3	100
General Solid Waste CT1 [1]			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	<50	<50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1 [1]			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	<50	<50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2 [1]			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	<50	<50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2 [1]			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	<50	<50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
BH1	0-0.1	Silty Clay	LPQL	LPQL	12	19	48	LPQL	9	110	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No Asbestos Dectected
BH1	0.5-0.6	Silty Clay	LPQL	LPQL	11	11	6	LPQL	3	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
BH2	0-0.1	Fill: silty clay	7	LPQL	13	20	20	LPQL	3	38	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	No Asbestos Dectected
BH2	0.5-0.6	Silty Clay	LPQL	LPQL	11	16	6	LPQL	3	11	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NA
F1	Surface	Fargment	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	Chrysotile and Amosite Asbestos Detected
Total Number of samples			4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2
Maximum Value			7	LPQL	13	20	48	LPQL	9	110	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	NC

Explanation:

[1] - NSW EPA Waste Classification Guidelines (2014)

[2] - Assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion

[3] - Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde

Concentration above the CT1 — VALUE
Concentration above SCC1 — VALUE
Concentration above the SCC2 — VALUE

Abbreviations:

PAHs: Polycyclic Aromatic Hydrocarbons	UCL: Upper Level Confidence Limit on Mean Value	CT: Contaminant Threshold
B(a)P: Benzo(a)pyrene	NA: Not Analysed	SCC: Specific Contaminant Concentration
PQL: Practical Quantitation Limit	NC: Not Calculated	HILs: Health Investigation Levels
LPQL: Less than PQL	NSL: No Set Limit	NEPM: National Environmental Protection Measure
PID: Photoionisation Detector	SAC: Site Assessment Criteria	BTEX: Monocyclic Aromatic Hydrocarbons
PCBs: Polychlorinated Biphenyls	TRH: Total Recoverable Hydrocarbons	

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TABLE D
SOIL LABORATORY RESULTS COMPARED TO EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category [1]				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																	
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-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) [2]				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0-0.1	Silty Clay	Fine	NA	NA	NA	LPQL	12	19	48	9	110	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH1	0.5-0.6	Silty Clay	Fine	NA	NA	NA	LPQL	11	11	6	3	10	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH2	0-0.1	Fill: silty clay	Fine	NA	NA	NA	7	13	20	20	3	38	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
BH2	0.5-0.6	Silty Clay	Fine	NA	NA	NA	LPQL	11	16	6	3	11	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL
Total Number of Samples				NC	NC	NC	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Maximum Value				NC	NC	NC	7	13	20	48	9	110	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL

Explanation:

1 - Site Assessment Criteria (SAC): NEPM 2013

2 - ABC Values for selected metals has 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)

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

Abbreviations:

EILs: Ecological Investigation Levels
UCL: Upper Level Confidence Limit on Mean Value
LPQL: Less than PQL
NC: Not Calculated
B(a)P: Benzo(a)pyrene
ESLs: Ecological Screening Levels
SAC: Site Assessment Criteria
NSL: No Set Limit
PQL: Practical Quantitation Limit
NA: Not Analysed
NEPM: National Environmental Protection Measure
ABC: Ambient Background Concentration

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category [1]				URBAN RESIDENTIAL AND PUBLIC OPEN SPACE																	
							AGED HEAVY METALS-EILs						EILs		ESLs							
				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	>C_{16}-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) [2]				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
BH1	0-0.1	Silty Clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	0.7
BH1	0.5-0.6	Silty Clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	0.7
BH2	0-0.1	Fill: silty clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	0.7
BH2	0.5-0.6	Silty Clay	Fine	NA	NA	NA	100	203	88	1263	35	192	170	180	180	120	1300	5600	60	105	125	45	0.7

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TABLE E

SUMMARY OF GROUNDAWATER LABORATORY RESULTS COMPARED TO GILs

All results in µg/L unless stated otherwise.

	PQL Envirolab Services	GIL - ANZECC 2000 [1] Fresh Waters	GIL - ANZECC 2000 4 Recreational	SAMPLES MW1
Metals				
Arsenic (As lll)	1	24	50	2
Cadmium	0.1	0.2	5	LPQL
Chromium (total)	2	1[a^]	50	**95**
Copper	1	1.4	1000	**17**
Lead	1	3.4	50	**LPQL**
Total Mercury (inorganic)	0.05	0.06	1	LPQL
Nickel	1	11	100	5
Zinc	1	8	5000	11
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)				
Benzene	1	950	10	LPQL
Toluene	1	180[a]	NSL	LPQL
Ethylbenzene	1	80[a]	NSL	LPQL
m+p-xylene	2	75[m]	NSL	LPQL
o-xylene	1	350[a]	NSL	LPQL
Total xylenes	2	NSL	NSL	LPQL

Explanation:

1 - ANZECC Australian Water Quality Guidelines for Fresh Waters (ANZECC 2000) - Trigger Values for protection of 95% of species

2 - NHMRC Australian Drinking Water Guidelines (ADWG 2011)

4 - ANZECC Australian Water Quality Guidelines for Recreational Waters (ANZECC 2000)

a - In the absence of a high reliability guideline concentration, the moderate or low reliability guideline concentration has been quoted

b - In the absence of Australian guidelines, the USEPA Region 9 Screening Levels for tapwater have been adopted as a preliminary screening tool

c - 99% trigger values adopted due to the potential for bioaccumulation effects

d - In the absence of a health guideline the aesthetic guideline concentration has been quoted

g - Guideline value only. The guideline criteria for this analyte should be checked with the local authority.

m - Guideline value adopted for m-Xylene. We note that the m-Xylene guideline value is 75ug/L and the p-Xylene guideline value is 200ug/L. However these two isomers cannot be distinguished analytically. Therefore EIS have adopted the more conservative guideline value

r - The more conservative value for Benzo(b)fluoranthene has been adopted

a# - The GIL for Cr III has been adopted as Cr VI is relatively unstable and breaksdown rapidly

a^ - The GIL for Cr VI has been adopted as a conservative measure

Concentration above the GIL VALUE

Abbreviations:

NA: Not Analysed

NSL: No Set Limit

GIL - Groundwater Investigation Levels

PQL: Practical Quantitation Limit

LPQL: Less than Practical Quantitation Limit

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TABLE F
GROUNDWATER LABORATORY RESULTS COMPARED TO HSLs
All data in µg/L unless stated otherwise

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID [2]
PQL - Envirolab Services				10	50	1	1	1	3	1	
Land Use Category [1]				**HIGH DENSITY RESIDENTIAL**							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW1	2.46	2m to <4m	Clay	NA	NA	LPQL	LPQL	LPQL	LPQL	LPQL	0
Depth1											
Total Number of Samples				NC	NC	1	1	1	1	1	1
Maximum Value				LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL	LPQL

Explanation:
1 - Groundwater Investigation Levels (GILs): NEPM 2013
2 - Field PID values obtained during the investigation

Concentration above the SAC	VALUE
Site specific assesment required	VALUE

The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

Abbreviations:

UCL: Upper Level Confidence Limit on Mean Value	PQL: Practical Quantitation Limit
HSLs: Health Screening Levels	LPQL: Less than PQL
NA: Not Analysed	SAC: Site Assessment Criteria
NC: Not Calculated	NEPM: National Environmental Protection Measure
NL: Not Limiting	SSA: Site Specific Assessment

COLUMN 'E' IS HIDDEN

HSL GROUNDWATER ASSESSMENT CRITERIA

				C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services				10	50	1	1	1	3	1
Land Use Category [1]				**HIGH DENSITY RESIDENTIAL**						
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**							
MW1	2.46	2m to <4m	Clay	NA	NA	5000	NL	NL	NL	NL

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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 (0-0.1m)	Arsenic	4	8	7	7.5	13
Dup Ref = A1	Cadmium	0.4	LPQL	LPQL	NC	NC
	Chromium	1	14	13	13.5	7
Envirolab Report: 155826	Copper	1	24	20	22.0	18
	Lead	1	32	20	26.0	46
	Mercury	0.1	LPQL	LPQL	NC	NC
	Nickel	1	6	3	4.5	67
	Zinc	1	79	38	58.5	70

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

Abbreviations:

PQL: Practical Quantitation Limit

LPQL: Less than PQL

NA: Not Analysed

NC: Not Calculated

OCP: Organochlorine Pesticides

OPP: Organophosphorus Pesticides

PCBs: Polychlorinated Biphenyls

TRH: Total Recoverable Hydrocarbons

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TABLE H

SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	Envirolab PQL		TB1[S] 20/11/2016 155826 mg/kg
	mg/kg	µg/L	
Benzene	1	1	LPQL
Toluene	1	1	LPQL
Ethylbenzene	1	1	LPQL
m+p-xylene	2	2	LPQL
o-xylene	1	1	LPQL

Explanation:

[W] Sample type (water)

[S] Sample type (sand)

BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria **VALUE**

Abbreviations:

PQL: Practical Quantitation Limit
LPQL: Less than PQL
NA: Not Analysed
NC: Not Calculated
TB: Trip Blank
TS: Trip Spike
RS: Rinsate Sample
TRH: Total Recoverable Hydrocarbons

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TABLE I
SUMMARY OF SALINITY, EROSION & SEDIMENT CONTROL MANAGEMENT STRATEGY

Salinity Control	Benefit	Control	Details	Monitoring Method	Trigger for Action	Management Method
Minimise Groundwater Recharge	Prevent Rising Groundwater Table Level & Development of Saline Conditions	Minimise Importation & Use of Potable Water on Site	Reuse Stormwater for Irrigation	Evidence of Stormwater Catchment/Retention	No Evidence of Stormwater Retention or Re-use	1). Ensure Stormwater is being used Appropriately
			Minimise Potable Water Use	Evidence of Stormwater Re-use		2). Design and Construct Appropriately Sized Lawns
		Reduce Irrigation Requirement	Adopt Small Gardens and Lawns	Check Size and Design of Gardens/Lawns	Absence of Small Gardens/Lawns	3). Replace Non-native Plants with Native Species
			Establish Plants which require Less Water	Check Plant Selection against Accepted List	Absence of Appropriate Plants & Mulch Cover	4). Encourage use of Mulch in Landscaped Areas
			Use Mulch Cover	Evidence of Mulch Cover	Absence of Low Flow Water Equipment	5). Design & Install Low Flow Water Equipment
			Use Low Flow Watering Facilities	Presence of Low Flow Water Equipment		6). Ensure Liners are Installed in all Water Retention Structures & Wetlands
		Avoid use of Infiltration Pits to Disperse Surface Water	Design Stormwater System to Negate the Need for Site Stormwater Storage Disposal	Check Design & Actual Construction of Stormwater Storage & Disposal System	Absence of Stormwater Storage & Disposal System	7). Monitor Groundwater Levels Periodically
			Connect all Downpipes Directly to Stormwater	Check if all Downpipes are Connected to the Stormwater	Absence of Downpipe Connections to the Stormwater	8). Regular Inspections of Vegetation & Infrastructure including Buildings
		Prevent Leakage from Wetlands & Drainage Facilities	Line all Permanent Water Retention Structures & Wetlands	Check Design Drawings for Liner Installation Details	Absence of Liner in Design Drawings	
				Monitor Liner Installation During Earthworks	Elevated Groundwater Levels Due to Seepage	
Encourage use of Groundwater as a Resource	Maintain or Lower Groundwater Table Level	Encourage Tree Planting & Retention, Especially in Areas of Higher Recharge	Use/Retain Native, Deep-Rooted, Large Growing Species	Check Landscape Design Drawings to Ensure Selection of Native Plants & Deep-Rooted Trees	Absence of Native Plants & Deep-Rooted Trees in Landscaped Areas	Design and Construction of Appropriately sized Nature Strips to Ensure Growth of Native Plants & Deep-Rooted Trees
				Check The Planting & Progress of Deep-Rooted Trees & Native Plants	Plant Die Back in Landscaped Areas	
Erosion Control	Prevents Siltation Problems in Drainage Facilities & Damage that Could Result from Erosion	Design all Works to Limit Generation of Potential Erosion Surfaces & Stabilise Disturbed Areas as soon as possible	Stabilise Disturbed Surfaces	Undertake Regular Inspections of all Construction Activities	Absence of Silt Control Fence	1). Regular Inspection Reports to be Submitted to Consent Authority
			Conserve Topsoil by Stockpiling for later use	Perform Regular Inspection of Vegetation Conditions in Development Area	Absence of Mulch and Grass Cover	2). Appropriate Grass & Mulch Cover to be Maintained at all times
			Use Fast Growing Grass Species	Maintain Silt Control Fence in Drainage Channels	Exposed Stockpiles	3). Re-Installation of Silt Control Fence
			Use Temporary Ground Cover for Areas to be re-disturbed	Maintain Mulch and Grass Cover	Presence of Erosion Gullies on Exposed Batters & Surfaces	
			Minimise area of Disturbance		Presence of Silt in Wetlands & Water Retention Structures	
			Cover Stockpiles			
			Use Lime Stabilisation During Earthworks to Improve Subgrade & Reduce Dispersibility			
Sediment Control	Control Sediment Generated by Construction & Other Activities	Include Sediment Control Considerations In all Designs	Project Stockpiles from Erosion by Run-off from upslope	Undertake Regular Inspections of all Construction Activities	Exposed Stockpiles	1). Regular Inspection Reports to be Submitted to Controlling Authority
			Use Temporary Sediment Basins to Maximise Effectiveness & Minimise Sediment Transport	Perform Regular Inspection of Vegetation Condition in Development Area	Absence of Temporary Sediment Basins	2). Stockpiles to be Covered at all Times
			Use Specific Soil Stabilisation Measures in Areas of High Soil Erosion Potential		Presence of Erosion Gullies on Exposed Batters & Surfaces	3). Re-Installation of Temporary Sediment Basins

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TABLE J
SUMMARY OF SOIL LABORATORY RESULTS - EC and ECe

Borehole Number	Sample Depth (m)	Sample Description	EC (µS/cm)	ECe (dS/m)	Salinity Class[1]
BH1	1.4-1.5	Silty Clay	77	0.62	**Non-saline**
BH1	2.5-3.0	Silty Clay	170	1.36	**Non-saline**
BH1	4.0-4.5	Silty Sand	150	2.55	**Slightly Saline**
BH1	8.5-9.0	Silty sandy gravel	320	2.88	**Slightly Saline**
BH1	10.5-11.0	Clayey sand	310	3.10	**Slightly Saline**
BH2	1.3-1.5	Silty Clay	310	2.48	**Slightly Saline**
BH2	2.7-3.0	Silty Clay	230	1.84	**Non-saline**
BH2	4.1-4.5	Silty Clay	180	1.44	**Non-saline**
BH2	5.0-6.0	Silty Clayey gravel	420	3.78	**Slightly Saline**
Total Number of Samples			9	9	-
Minimum Value			77	0.616	-
Maximum Value			420	3.78	-

Explanation

1 - Salinity Class has been adopted from '*Site Investigations for Urban Salinity*' DLWC 2002.

(dS/m)	Salinity Class
<2	**Non-Saline**
2 to 4	**Slightly Saline**
4 to 8	**Moderately Saline**
8 to 16	**Very Saline**
>16	**Highly Saline**

Abbreviations

EC - Electrical Conductivity
ECe - Extract Electrical Conductivity

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TABLE K
SUMMARY OF RESISTIVITY CALCULATION ON SOIL EC RESULTS

Borehole Number	Sample Depth (m)	Sample Description	EC (µS/cm)	Resistivity[1] (ohm.cm)	Classification[2] Condition A	Classification[2] Condition B
BH1	1.4-1.5	Silty clay	77	13,000	Non-Aggressive	Non-Aggressive
BH1	2.5-3.0	Silty clay	170	5,800	Non-Aggressive	Non-Aggressive
BH1	4.0-4.5	Silty sand	150	6,600	Non-Aggressive	Non-Aggressive
BH1	8.5-9.0	Silty sand	320	3,100	**Mildly Aggressive**	Non-Aggressive
BH1	10.5-11.0	Clayey sand	310	3,300	**Mildly Aggressive**	Non-Aggressive
BH2	1.3-1.5	Silty clay	310	3,200	**Mildly Aggressive**	Non-Aggressive
BH2	2.7-3.0	Silty clay	230	4,300	**Mildly Aggressive**	Non-Aggressive
BH2	4.1-4.5	Silty clay	180	5,500	Non-Aggressive	Non-Aggressive
BH2	5.0-6.0	Silty clayey gravel	420	2,400	**Mildly Aggressive**	Non-Aggressive
Total Number of Samples			9	9	-	-
Minimum Value			77	2,400	-	-
Maximum Value			420	13,000	-	-

Explanation

1 - Resistivity values have been calculated on the laboratory EC values presented in Table B
2 - Classification derived from the Australian Standard 2159-2009 Piling Design and Installation (Table 6.5.2 [A] & [C])

Classification is based on Soil condition 'A' - high permeability soils (e.g. sands & gravel) that are in groundwater.

Resistivity Values (ohm.cm)	Classification for Steel Piles
>5,000	**Non-Aggressive**
2,000 - 5,000	**Mildly Aggressive**
1,000 - 2,000	**Moderately Aggressive**
<1,000	**Severely Aggressive**

Classification is based on Soil condition 'B' - low permeability soils (e.g. silts & clays) or all soils above groundwater.

Resistivity Values (ohm.cm)	Classification for Steel Piles
>5,000	**Non-Aggressive**
2,000 - 5,000	**Non-Aggressive**
1,000 - 2,000	**Mildly Aggressive**
<1,000	**Moderately Aggressive**

Abbreviations

EC - Electrical Conductivity

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TABLE L
SUMMARY OF SOIL LABORATORY RESULTS - pH

Borehole Number	Sample Depth (m)	Sample Description	pH	Classification for Concrete Piles[1] Soil Condition A[2]	Classification for Steel Piles[1] Soil Condition A[2]	Classification for Concrete Piles[1] Soil Condition B[2]	Classification for Steel Piles[1] Soil Condition B[2]
BH1	1.4-1.5	Silty clay	6.8	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH1	2.5-3.0	Silty clay	6.5	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH1	4.0-4.5	Silty sand	6.9	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH1	8.5-9.0	Silty sand	7.3	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH1	10.5-11.0	Clayey sand	7.4	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH2	1.3-1.5	Silty clay	7.4	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH2	2.7-3.0	Silty clay	7.2	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH2	4.1-4.5	Silty clay	7.8	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH2	5.0-6.0	Silty clayey gravel	7.6	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
Total Number of Samples			9	-	-	-	-
Minimum Value			6.5	-	-	-	-
Maximum Value			7.8	-	-	-	-

Explanation

1 - pH Classification derived from the Australian Standard 2159-2009 Piling Design and Installation (Tables 6.4.2 [C] & 6.5.2 [C])

2 - Classification is based on Soil condition 'A' - high permeability soils (e.g. sands & gravel) that are in groundwater.

pH Value	Classification for Concrete Piles
>5.5	Mildly Aggressive
4.5 - 5.5	Moderately Aggressive
4 - 4.5	Severely Aggressive
<4	Very Severely Aggressive

pH Value	Classification for Steel Piles
>5	Non-Aggressive
4.0 - 5.0	Mildly Aggressive
3.0 - 4.0	Moderately Aggressive
<3	Severely Aggressive

2 - Classification is based on Soil condition 'B' - low permeability soils (e.g. silts & clays) or all soils above groundwater.

pH Value	Classification for Concrete Piles
>5.5	Non-Aggressive
4.5 - 5.5	Mildly Aggressive
4 - 4.5	Moderately Aggressive
<4	Severely Aggressive

pH Value	Classification for Steel Piles
>5	Non-Aggressive
4.0 - 5.0	Non-Aggressive
3.0 - 4.0	Mildly Aggressive
<3	Moderately Aggressive

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TABLE M
SUMMARY OF SOIL LABORATORY RESULTS - SULPHATE & CHLORIDES

Borehole Number	Sample Depth (m)	Sample Description	Sulphate (mg/kg)	Chloride (mg/kg)	Classification for Concrete Piles[1] SO4 - Soil Condition A[2]	Classification for Steel Piles[1] Cl - Soil Condition A[2]	Classification for Concrete Piles[1] SO4 - Soil Condition B[2]	Classification for Steel Piles[1] Cl - Soil Condition B[2]
BH1	1.4-1.5	Silty clay	35	2	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH1	2.5-3.0	Silty clay	130	2	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH1	4.0-4.5	Silty sand	100	5	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH1	8.5-9.0	Silty sand	92	130	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH1	10.5-11.0	Clayey sand	81	93	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH2	1.3-1.5	Silty clay	100	12	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH2	2.7-3.0	Silty clay	140	16	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH2	4.1-4.5	Silty clay	63	13	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
BH2	5.0-6.0	Silty clayey gravel	110	15	Mildly Aggressive	Non-Aggressive	Non-Aggressive	Non-Aggressive
Total Number of Samples			9	9	-	-	-	-
Minimum Value			35	2	-	-	-	-
Maximum Value			140	130	-	-	-	-

Explanation

1 - Classification derived from the Australian Standard 2159-2009 Piling Design and Installation (Tables 6.4.2 [C] & 6.5.2 [C])

2 - Classification is based on Soil condition 'A' - high permeability soils (e.g. sands & gravel) that are in groundwater.

Sulphate (SO4) Values	Classification for Concrete Piles	Chloride (Cl) Values	Classification for Steel Piles
<5,000	Mildly Aggressive	<5,000	Non-Aggressive
5,000 - 10,000	Moderately Aggressive	5,000 - 20,000	Mildly Aggressive
10,000 - 20,000	Severely Aggressive	20,000 - 50,000	Moderately Aggressive
>20,000	Very Severely Aggressive	>50,000	Severely Aggressive

2 - Classification is based on Soil condition 'B' - low permeability soils (e.g. silts & clays) or all soils above groundwater.

Sulphate (SO4) Values	Classification for Concrete Piles	Chloride (Cl) Values	Classification for Steel Piles
<5,000	Non-Aggressive	<5,000	Non-Aggressive
5,000 - 10,000	Mildly Aggressive	5,000 - 20,000	Non-Aggressive
10,000 - 20,000	Moderately Aggressive	20,000 - 50,000	Mildly Aggressive
>20,000	Severely Aggressive	>50,000	Moderately Aggressive

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TABLE N
SUMMARY OF SOIL LABORATORY RESULTS - CEC & ESP

Borehole Number	Sample Depth (m)	Sample Description	Total CEC	Ca	K	Mg	Na	ESP[1]
			(meq/100g)					%
BH1	0.4-0.5	Silty clay	15	13	0.28	1.8	0.19	1.3
BH2	0.2-0.5	Fill: silty clay	32	30	0.19	1.3	0.21	0.7
Total Number of Samples			2	2	2	2	2	2
Minimum Value			15.00	13.00	0.19	1.30	0.19	0.66
Maximum Value			32.00	30.00	0.28	1.80	0.21	1.27

Explanation

1 - Sodicity rating has been adopted from the publication *'Site Investigations for Urban Salinity' DLWC* 2002.

ESP Value	Sodicity Rating
< 5%	Non-Sodic
5% to 15%	Sodic
> 15%	Highly Sodic

Abbreviation

CEC: Cation Exchange Capacity
ESP: Exchangeable Sodium Percentage (Each Na/CEC)
Mg: Exchangeable Magnesium
Na: Exchangeable Sodium
K: Exchangeable Potassium
Ca: Exchangeable Calcium

E29853K

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Version: 1, Version Date: 19/05/2017

REPORT APPENDICES

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Appendix A: Site Information including Site History

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Proposed Development Plans

Document Set ID: 7663113
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DRAWING LIST

NO.	NAME
DA000	COVER SHEET
DA001	LOCATION/SITE PLAN
DA002	SITE PLAN/SITE ANALYSIS
DA005	SHADOWS DIAGRAM 9.00AM
DA006	SHADOWS DIAGRAM 12.00PM
DA007	SHADOWS DIAGRAM 3.00PM
DA101	PARKING 2
DA102	PARKING 1
DA201	LEVEL 1(GD)
DA202	LEVEL 2
DA203	LEVEL 3
DA204	LEVEL 4
DA205	LEVEL 5
DA206	LEVEL 6
DA207	LEVEL 7(PLANT)
DA208	ROOF
DA301	EAST ELEVATION
DA302	SOUTH ELEVATION
DA303	WEST ELEVATION
DA304	NORTH ELEVATION
DA401	SECTION 1
DA402	SECTION 2

Number	Type
Level 1	
101	STUDIO
102	STUDIO
103	2B
104	2B
4	
Level 2	
201	2B
202	2B
203	2B
204	2B
205	2B
5	
Level 3	
301	2B
302	2B
303	2B
304	2B
305	2B
5	
Level 4	
401	2B
402	2B
403	2B
404	2B
405	2B
5	
Level 5	
501	2B
502	2B+S
503	2B
504	2B
4	
Level 6	
601	2B
602	2B
603	2B
604	2B
4	
Grand total: 27	

PARKING QUANTITIES
(Total-Site)

Type	Spaces
Residential	27
Residential_Disable	1
Visitor	5
Grand total: 33	33

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	17.08.16	MEETING WITH CLIENT	TWJ
B	10.07.16	SHADOW DRAWINGS ISSUED FOR DESIGN REVIEW PANEL	
A	06.07.16	ISSUED FOR DESIGN REVIEW PANEL	TWJ
1	11.06.16	DRAFT ISSUE	TWJ

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ALAN JOHNSON ARCHITECT
ABN 70 626 763 554

1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

COVER SHEET

DATE	SCALE	DRAWING NO	REV
MAY 2011		DA000	C
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LOCATION/SITE PLAN

DATE	SCALE	DRAWING NO	REV
MAY 2011		DA001	A
DRAWN BY: TWJ	PROJ. NO: 15015		

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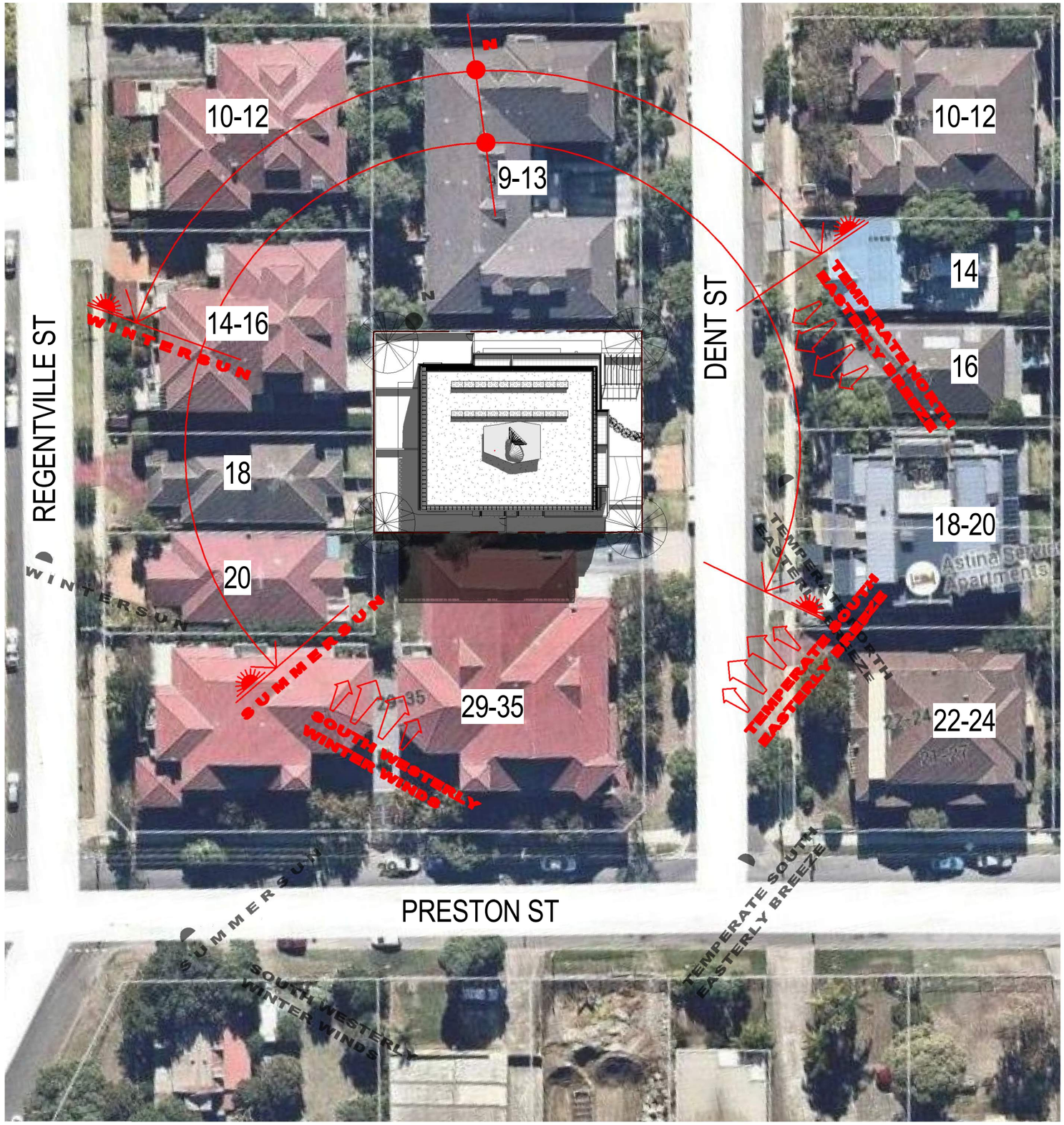

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SITE PLAN/SITE ANALYSIS

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 600	DA002	PA
DRAWN BY: Author	PROJ. NO: 15015		

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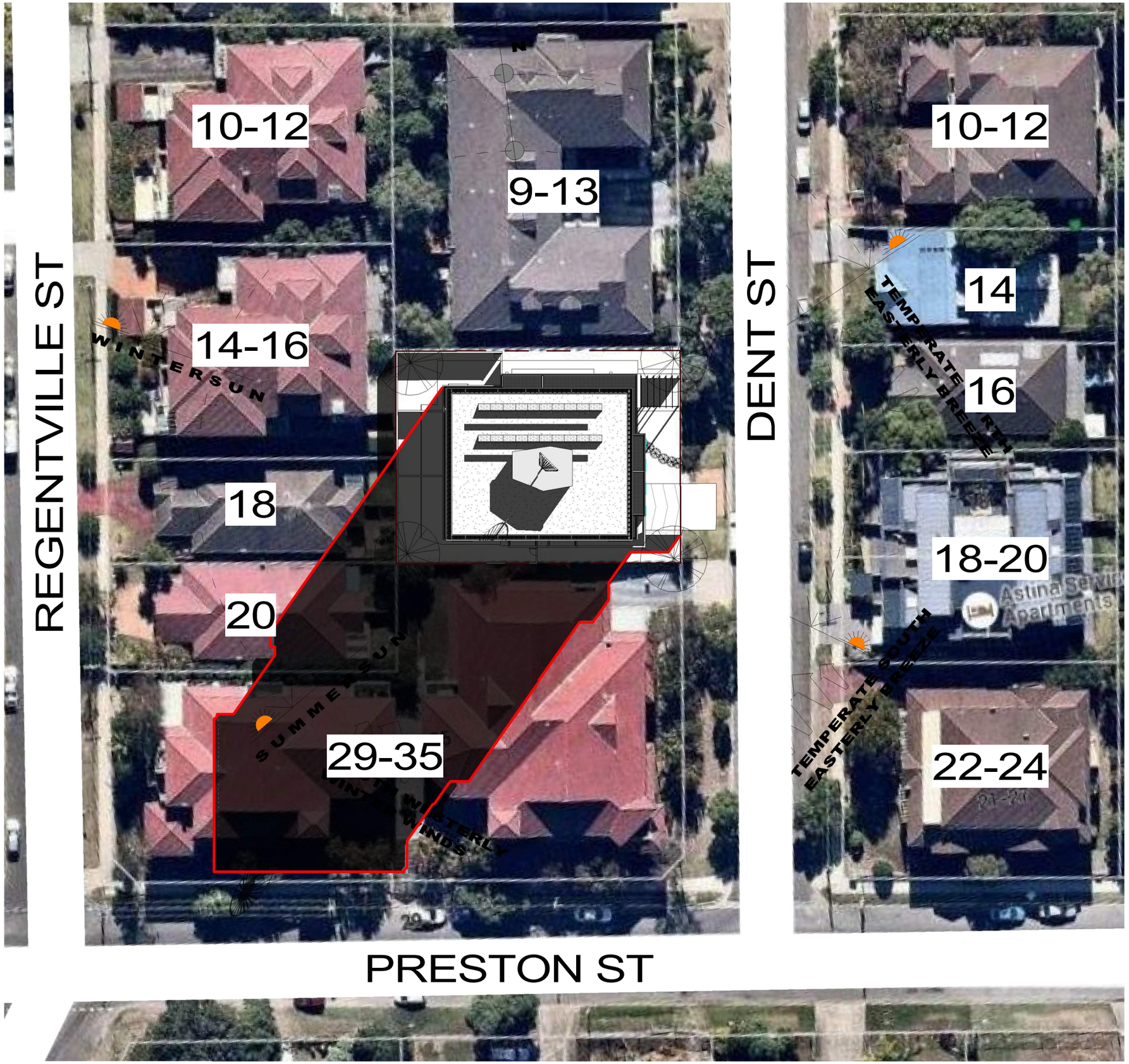

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DRAWING TITLE

SHADOWS DIAGRAM 9.00AM

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 500	DA005	B
DRAWN BY: Author	PROJ. NO: 15015		

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DRAWING TITLE

SHADOWS DIAGRAM 12.00PM

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 500	DA006	B
DRAWN BY: Author	PROJ. NO: 15015		

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DRAWING TITLE

SHADOWS DIAGRAM 3.00PM

DATE	SCALE	DRAWING NO	REV
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DRAWN BY	PROJ. NO		
Author	15015		

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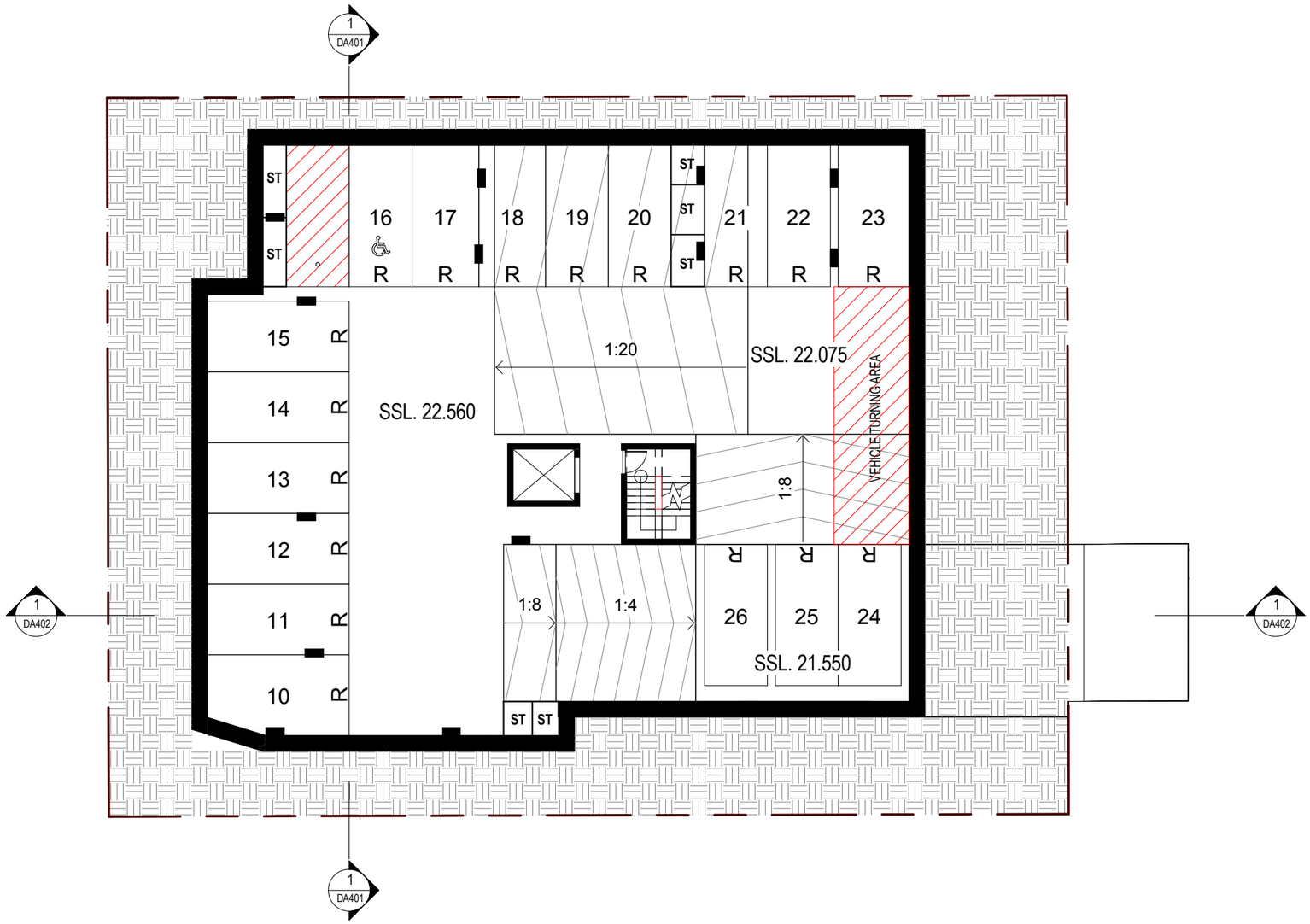

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PARKING 2

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA101	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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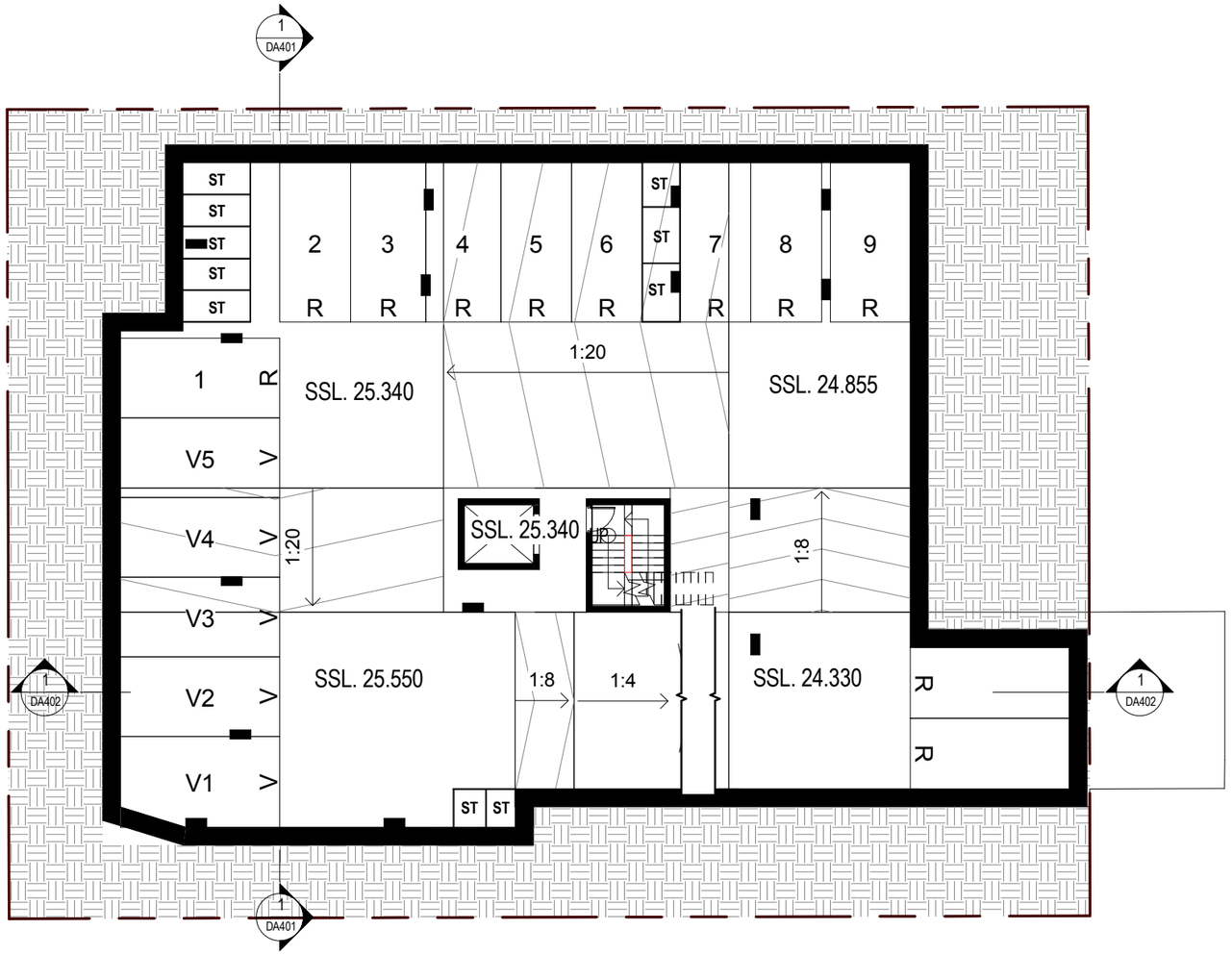

1 DA301

REV	DATE	REVISION	BY
B	30.08.16	ISSUED FOR PRE-DA MEETING	TWJ
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A	06.07.16	ISSUED FOR DESIGN REVIEW PANEL	TWJ
1	11.06.16	DRAFT ISSUE	TWJ

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ABN 70 626 763 554

1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

PARKING 1

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA102	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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H:\Amd\Projects\15015_Bishi_Dent_St\Arch\DA_Set\Revit\15015_Bishi_Dent_St_V15.rvt A3

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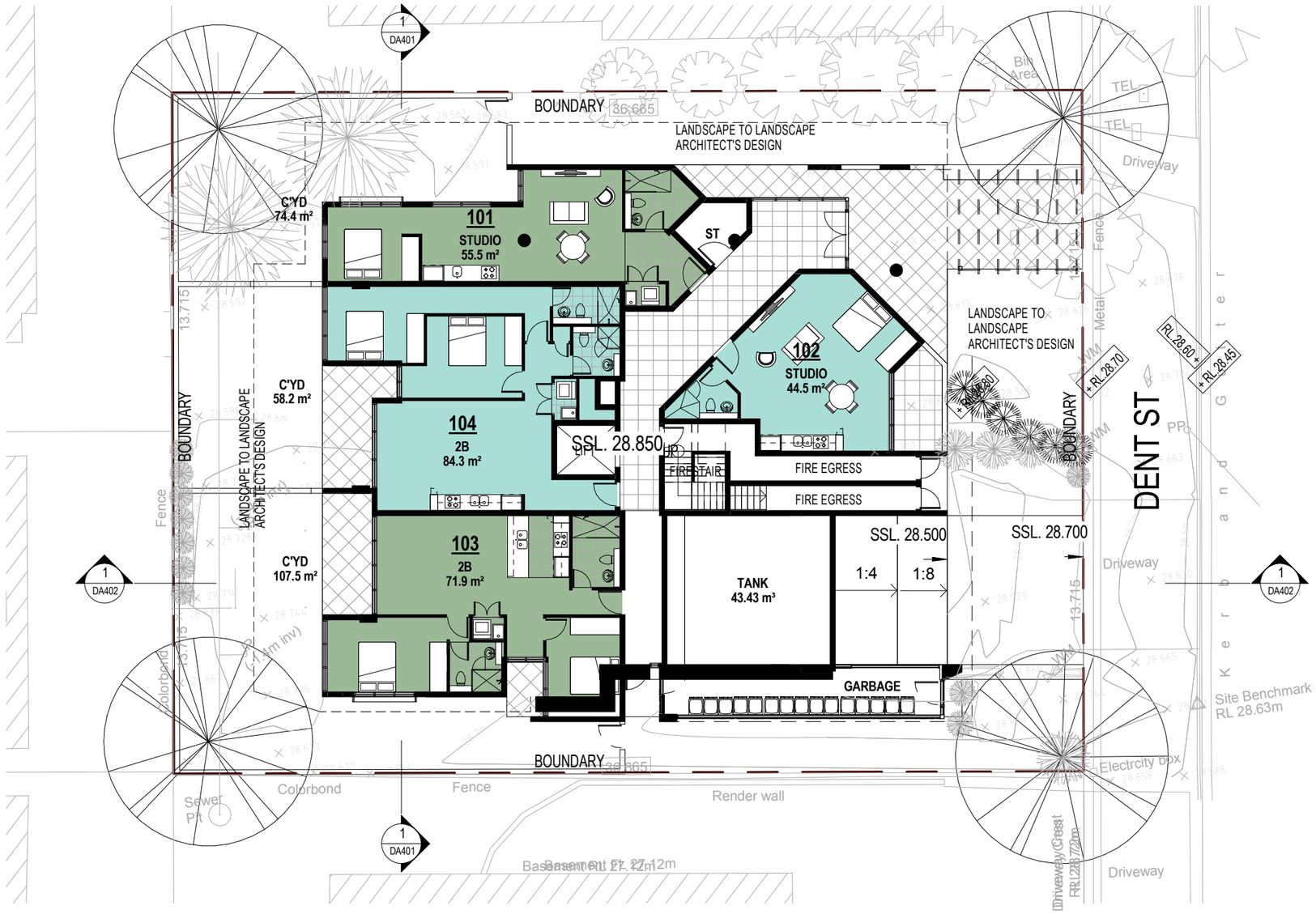

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2	21.06.16	HIGHLIGHT WINDOWS SHOWN	TWJ
1	11.06.16	DRAFT ISSUE	TWJ

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DRAWING TITLE

LEVEL 1(GD)

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA201	B
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2	21.06.16	HIGHLIGHT WINDOWS SHOWN	TWJ
1	11.06.16	DRAFT ISSUE	TWJ

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DRAWING TITLE

LEVEL 2

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA202	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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DRAWING TITLE

LEVEL 3

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA203	B
DRAWN BY: TWJ	PROJ. NO: 15015		

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PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

LEVEL 4

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA204	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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NORTH

DA ISSUE

30/08/2016 1:35:53 AM

Document Set ID: 7663113
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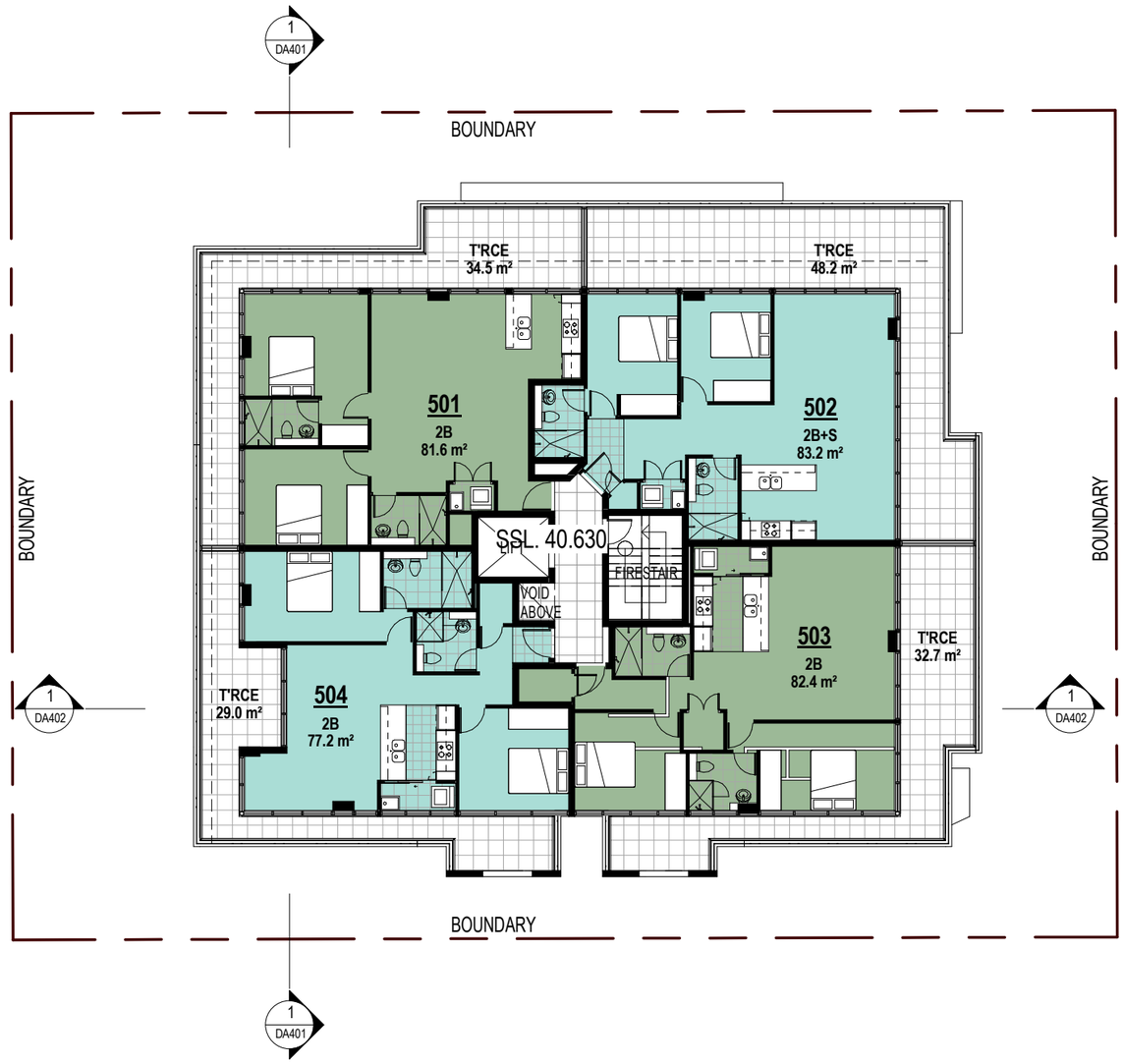

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B	30.08.16	ISSUED FOR PRE-DA MEETING	TWJ
	17.08.16	MEETING WITH CLIENT	TWJ
A	06.07.16	ISSUED FOR DESIGN REVIEW PANEL	TWJ
1	11.06.16	DRAFT ISSUE	TWJ

AIDED MODELING WITH DESIGN

ALAN JOHNSON ARCHITECT
ABN 70 626 763 554

1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

LEVEL 5

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA205	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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1	11.06.16	DRAFT ISSUE	TWJ

AIDED MODELING WITH DESIGN

ALAN JOHNSON ARCHITECT
ABN 70 626 763 554
1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

LEVEL 6

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA206	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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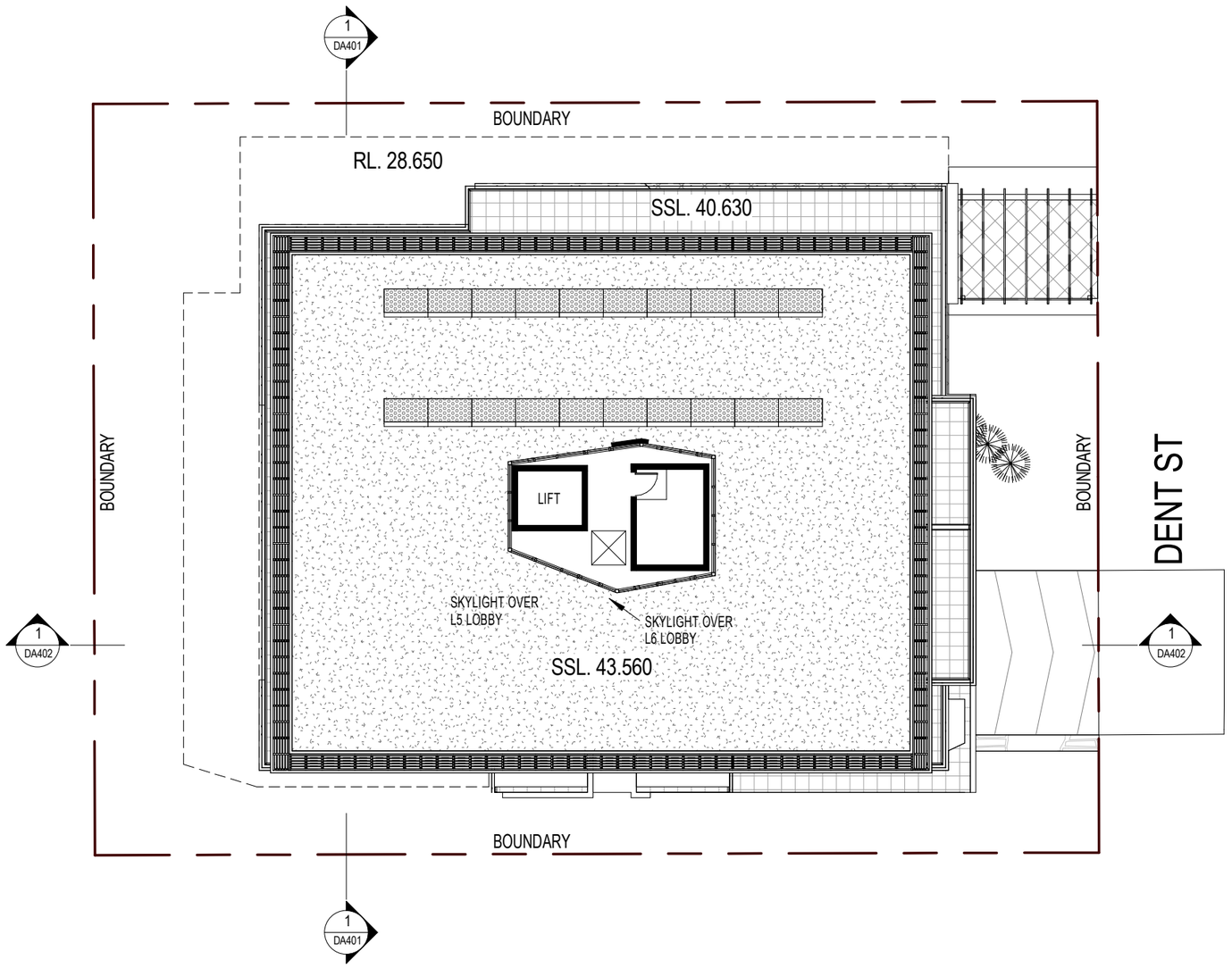
DA ISSUE

30/08/2016 1:35:58 AM

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

H:\Amd\Projects\15015_Bishi_Dent_St\Arch\DA_Set\Revit\15015_Bishi_Dent_St_V15.rvt A3



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1	11.06.16	DRAFT ISSUE	TWJ

AIDED MODELING WITH DESIGN

ALAN JOHNSON ARCHITECT
ABN 70 626 763 554

1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

LEVEL 7(PLANT)

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA207	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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30/08/2016 1:36:53 AM

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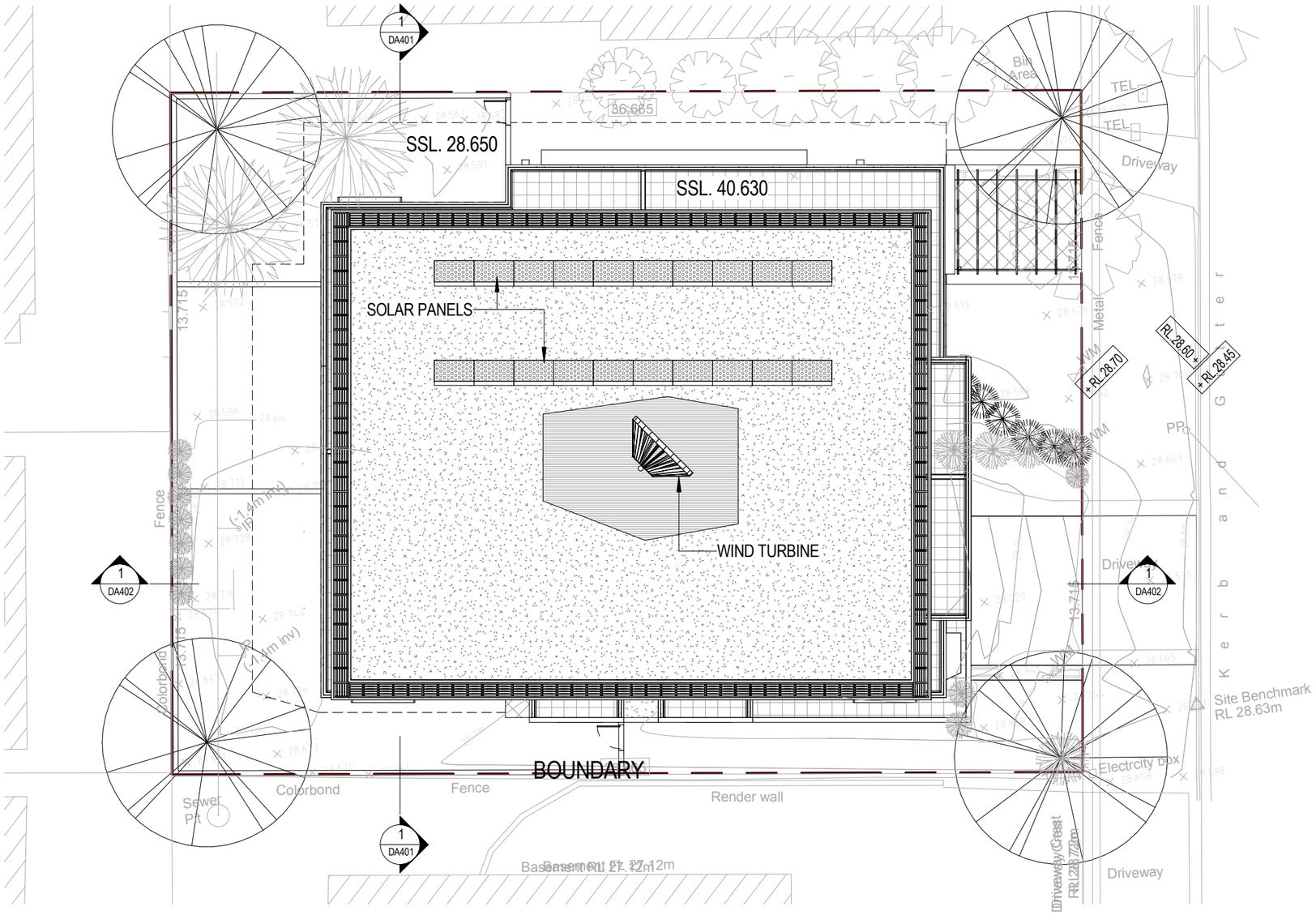

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1	11.06.16	DRAFT ISSUE	TWJ

AIDED MODELING WITH DESIGN

ALAN JOHNSON ARCHITECT
ABN 70 626 763 554

1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

ROOF

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA208	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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1	11.06.16	DRAFT ISSUE	TWJ

AIDED MODELING WITH DESIGN

ALAN JOHNSON ARCHITECT
ABN 70 626 763 554
1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

EAST ELEVATION

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA301	B
DRAWN BY: TWJ	PROJ. NO: 15015		

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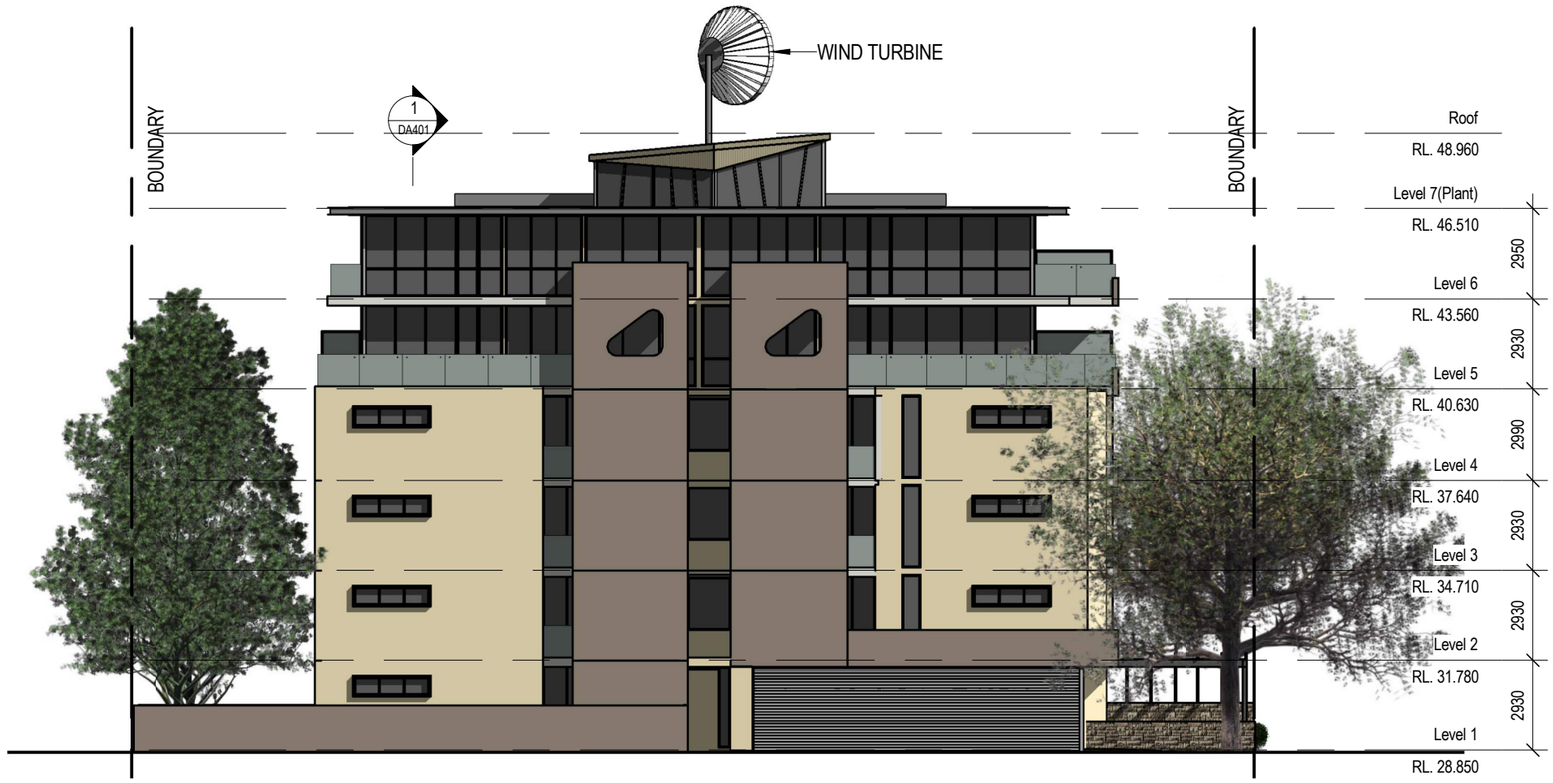

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1	11.06.16	DRAFT ISSUE	TWJ

AIDED MODELING WITH DESIGN

ALAN JOHNSON ARCHITECT
ABN 70 626 763 554

1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

SOUTH ELEVATION

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA302	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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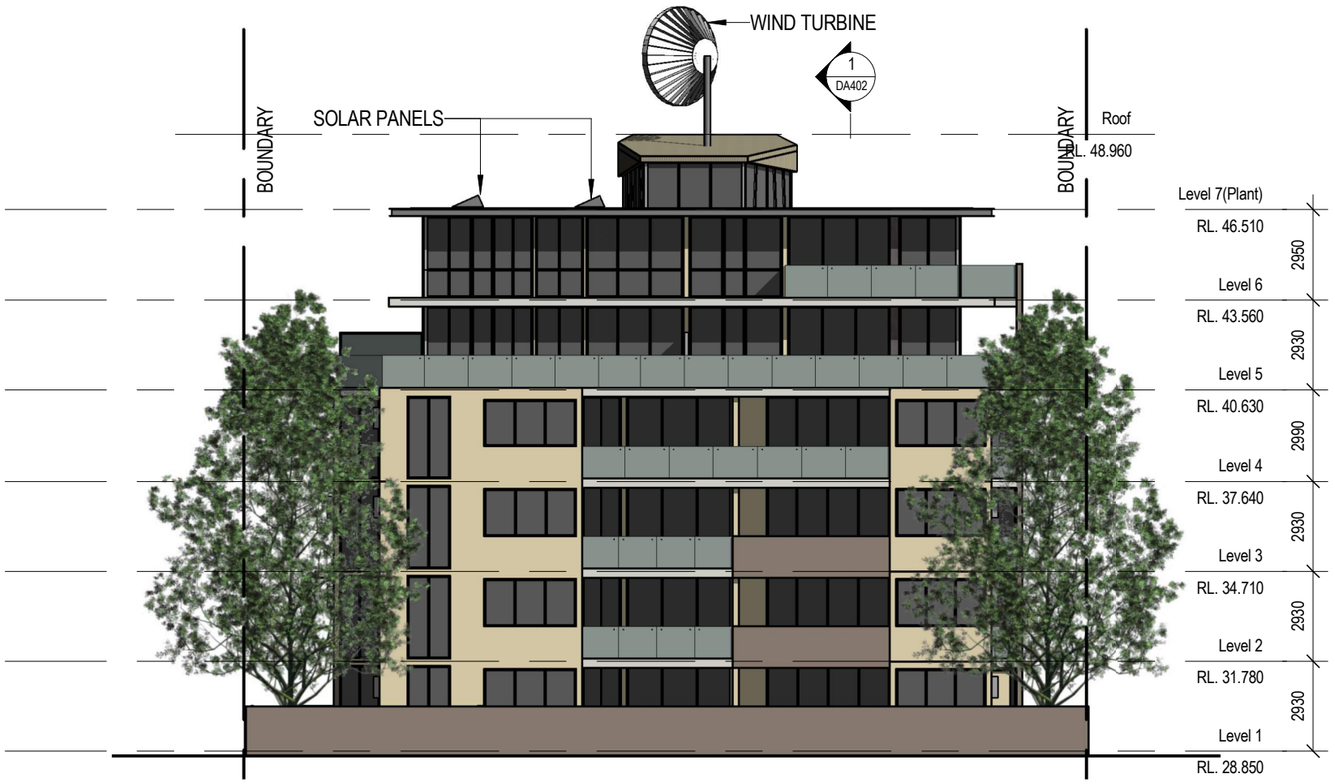

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ALAN JOHNSON ARCHITECT
ABN 70 626 763 554

1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

WEST ELEVATION

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA303	B
DRAWN BY: TWJ	PROJ. NO: 15015		

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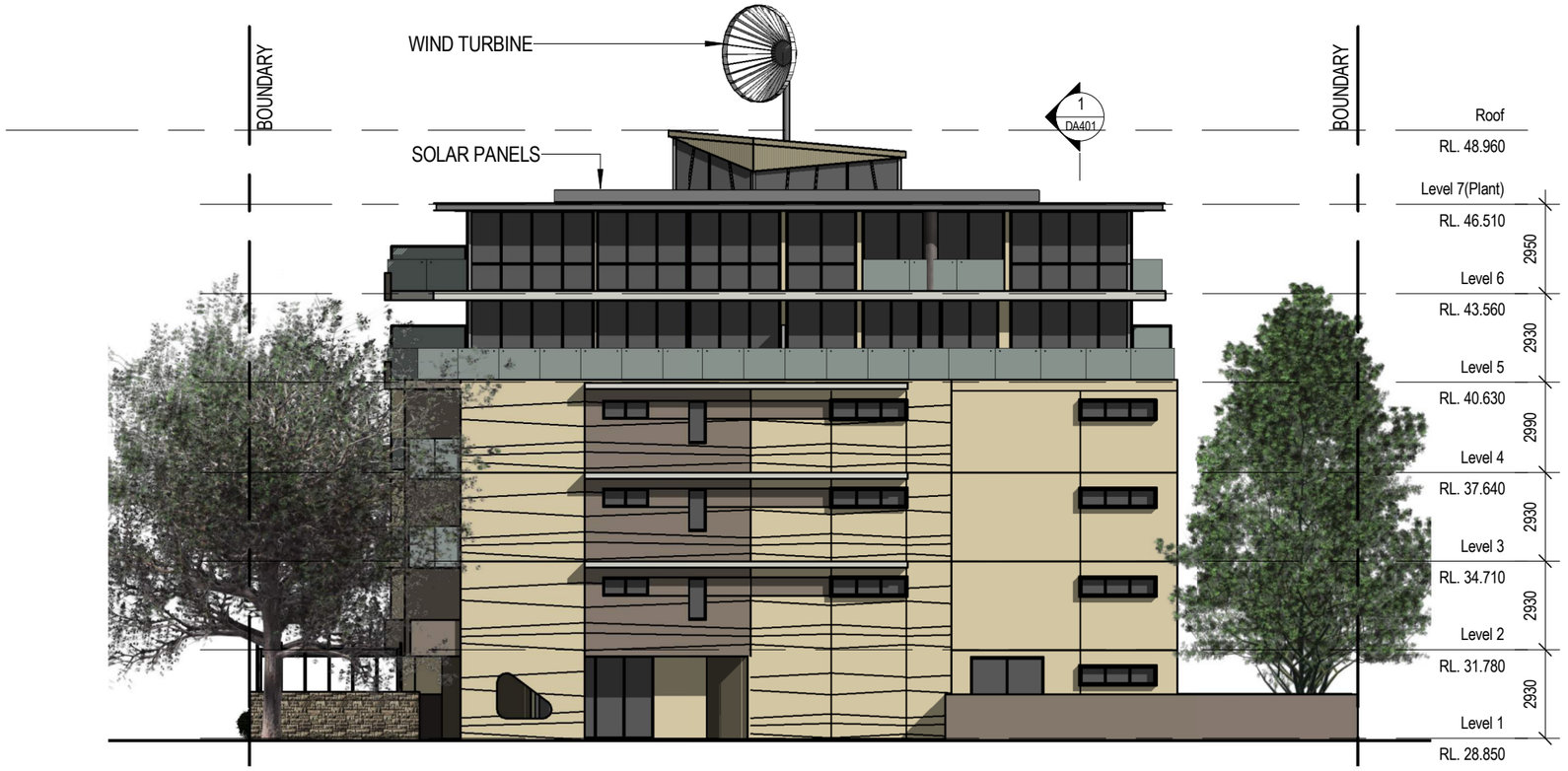

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ALAN JOHNSON ARCHITECT
ABN 70 626 763 554

1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

NORTH ELEVATION

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA304	B
DRAWN BY: TWJ	PROJ. NO: 15015		

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30/08/2016 1:36:40 AM

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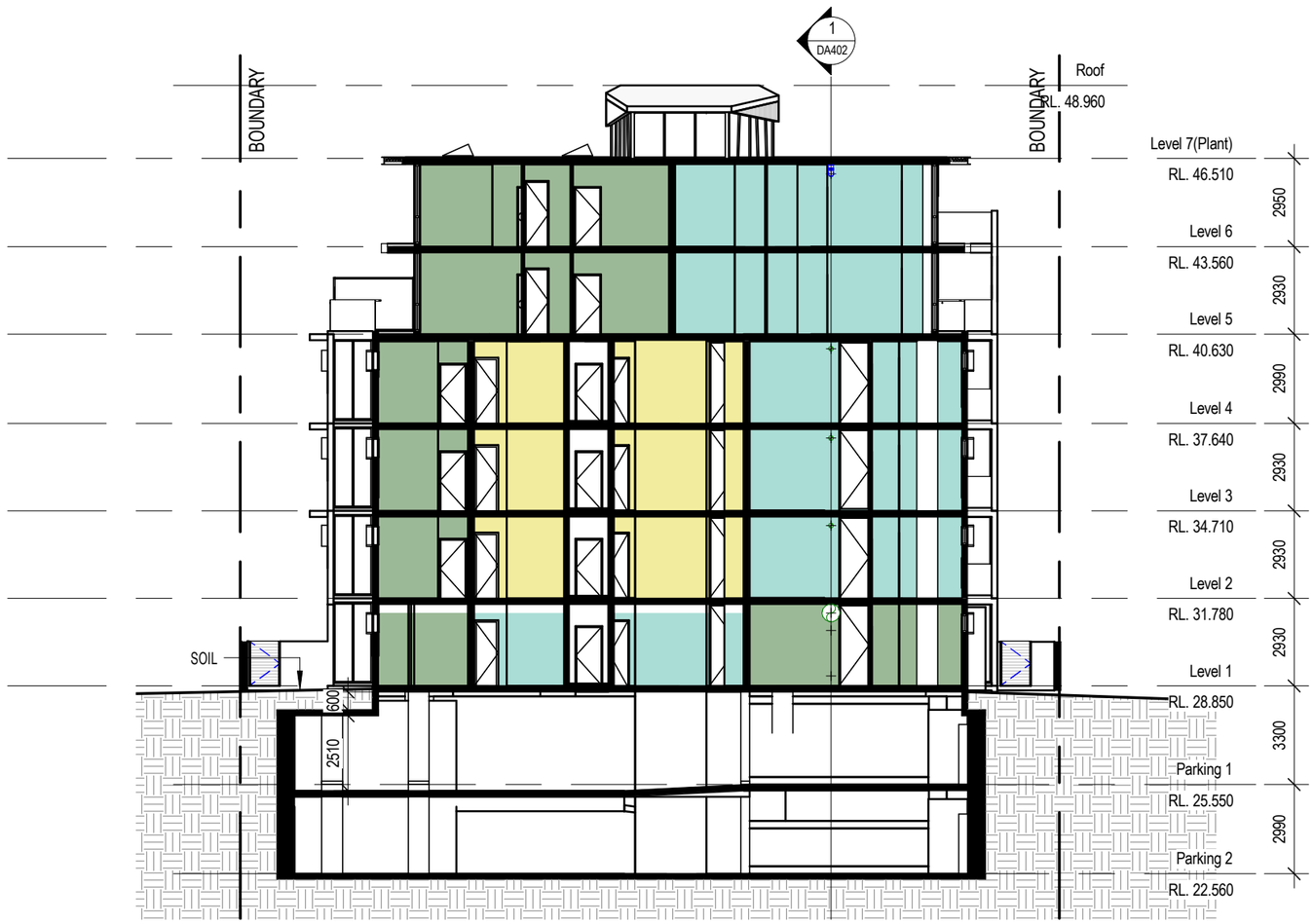

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ALAN JOHNSON ARCHITECT
ABN 70 626 763 554

1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

SECTION 1

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA401	B
DRAWN BY: TWJ	PROJ. NO: 15015		

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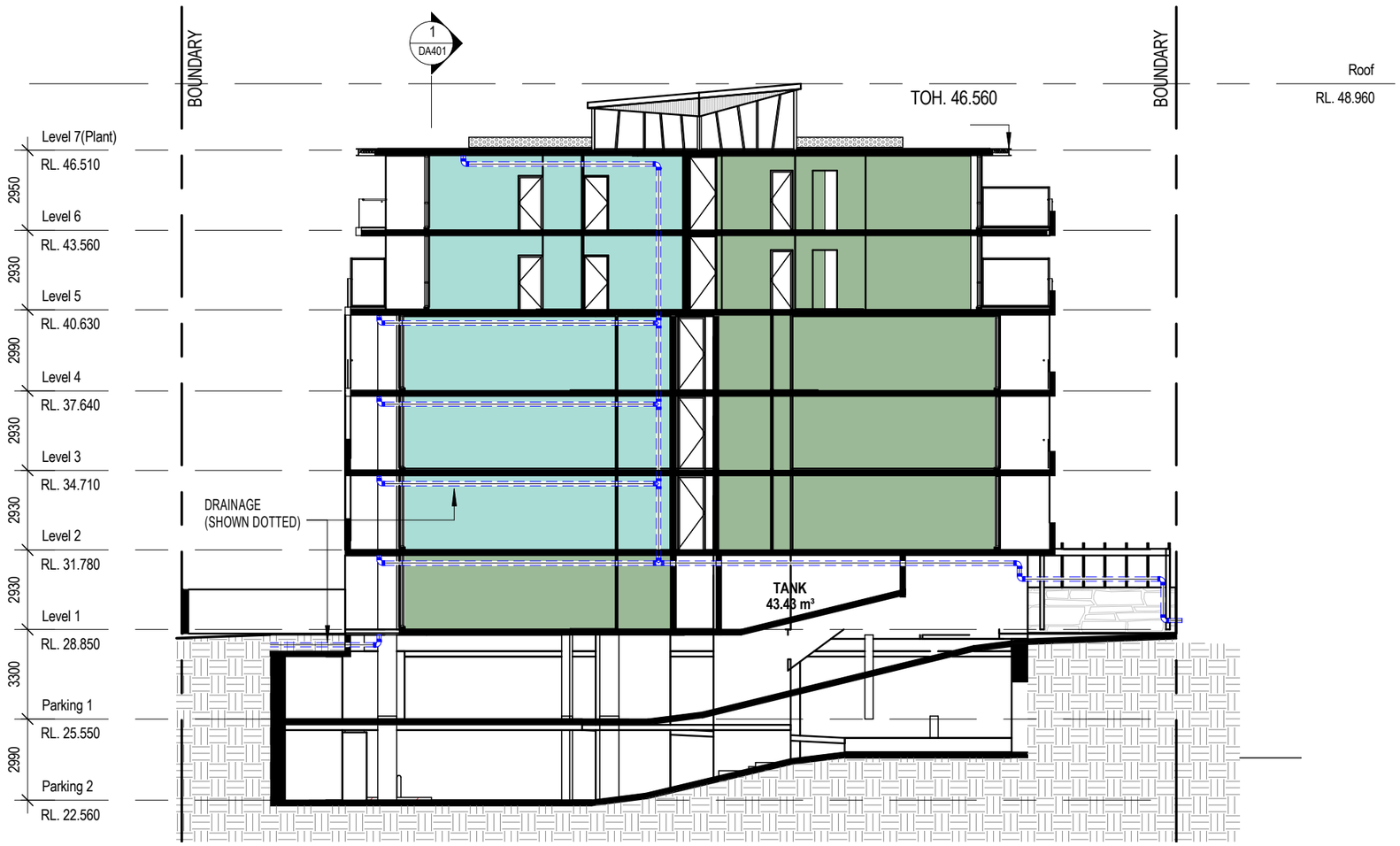

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ABN 70 626 763 554
1 STRICKLAND AVE
LINDFIELD NSW 2070

PROJECT

MR B TANCEV
15-17 DENT STREET,
JAMISONTOWN NSW 2750

DRAWING TITLE

SECTION 2

DATE	SCALE	DRAWING NO	REV
MAY 2011	1 : 200	DA402	B
DRAWN BY	PROJ. NO		
TWJ	15015		

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A3

30/08/2016 1:36:49 AM

Lotsearch Environmental Risk and Planning Report

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Lotsearch

Environmental Risk and Planning Report

15-17 Dent Street, Jamisontown, NSW 2750

Report Buffer: **1000m**

Report Date: **13 Oct 2016 16:53:49**

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.

Table of Contents

Location Confidences

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

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

Dataset Listing

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

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	Land and Property Information	13/10/2016	13/10/2016	Daily	-	-	-
Topographic Data	Land and Property Information	10/04/2015	01/04/2015	As required	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	10/10/2016	30/08/2016	Monthly	0	0	2
Contaminated Land: Records of Notice	Environment Protection Authority	10/10/2016	10/10/2016	Monthly	0	0	1
Former Gasworks	Environment Protection Authority	10/10/2016	10/05/2013	Monthly	0	0	0
National Waste Management Site Database	Geoscience Australia	06/07/2016	15/11/2012	Quarterly	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	20/09/2016	20/09/2016	Monthly	0	0	0
Delicensed POEO Activities still Regulated by the EPA	Environment Protection Authority	20/09/2016	20/09/2016	Monthly	0	0	0
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	20/09/2016	20/09/2016	Monthly	0	0	6
UPSS Environmentally Sensitive Zones	Department of Environment, Climate Change and Water (NSW)	14/04/2015	12/01/2010	As required	1	1	1
UBD Business to Business Directory 1991	Hardie Grant			Not required	0	9	15
UBD Business Directory 1991 Motor Garages/Service Stations	Hardie Grant			Not required	0	0	0
UBD Business Directory 1970	Hardie Grant			Not required	0	0	0
UBD Business Directory 1970 Drycleaners & Motor Garages/Service Stations	Hardie Grant			Not required	0	0	0
UBD Business Directory 1950	Hardie Grant			Not required	0	0	0
UBD Business Directory 1950 Drycleaners & Motor Garages/Service Stations	Hardie Grant			Not required	0	0	0
Points of Interest	Land and Property Information	10/04/2015	01/04/2015	Annually	0	0	25
Tanks (Areas)	Land and Property Information	10/04/2015	01/04/2015	Annually	0	0	0
Tanks (Points)	Land and Property Information	10/04/2015	01/04/2015	Annually	0	0	0
Major Easements	Land and Property Information	11/06/2014	11/06/2014	As required	0	0	3
State Forest	Land and Property Information	11/04/2016	23/01/2015	As required	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment and Heritage	11/04/2016	31/12/2015	Annually	0	0	0
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1	1	1
Groundwater Boreholes	NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation; Commonwealth of Australia (Bureau of Meteorology) 2015	21/03/2016	01/12/2015	Annually	0	0	34
Geological Units 1:100,000	NSW Department of Industry, Resources & Energy	20/08/2014		None planned	1	-	3
Geological Structures 1:100,000	NSW Department of Industry, Resources & Energy	20/08/2014		None planned	0	-	0
Naturally Occurring Asbestos Potential	NSW Department of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	0	0	0
Soil Landscapes	NSW Office of Environment and Heritage	12/08/2014		None planned	1	-	5
Standard Local Environmental Plan Acid Sulfate Soils	NSW Planning and Environment	07/10/2016	07/10/2016	As required	0	-	-
Dryland Salinity Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	0	0	1
Mining Subsidence Districts	Land and Property Information	13/10/2016	13/10/2016	As required	0	0	0
SEPP 14 - Coastal Wetlands	NSW Planning and Environment	17/12/2015	24/10/2008	Annually	0	0	0

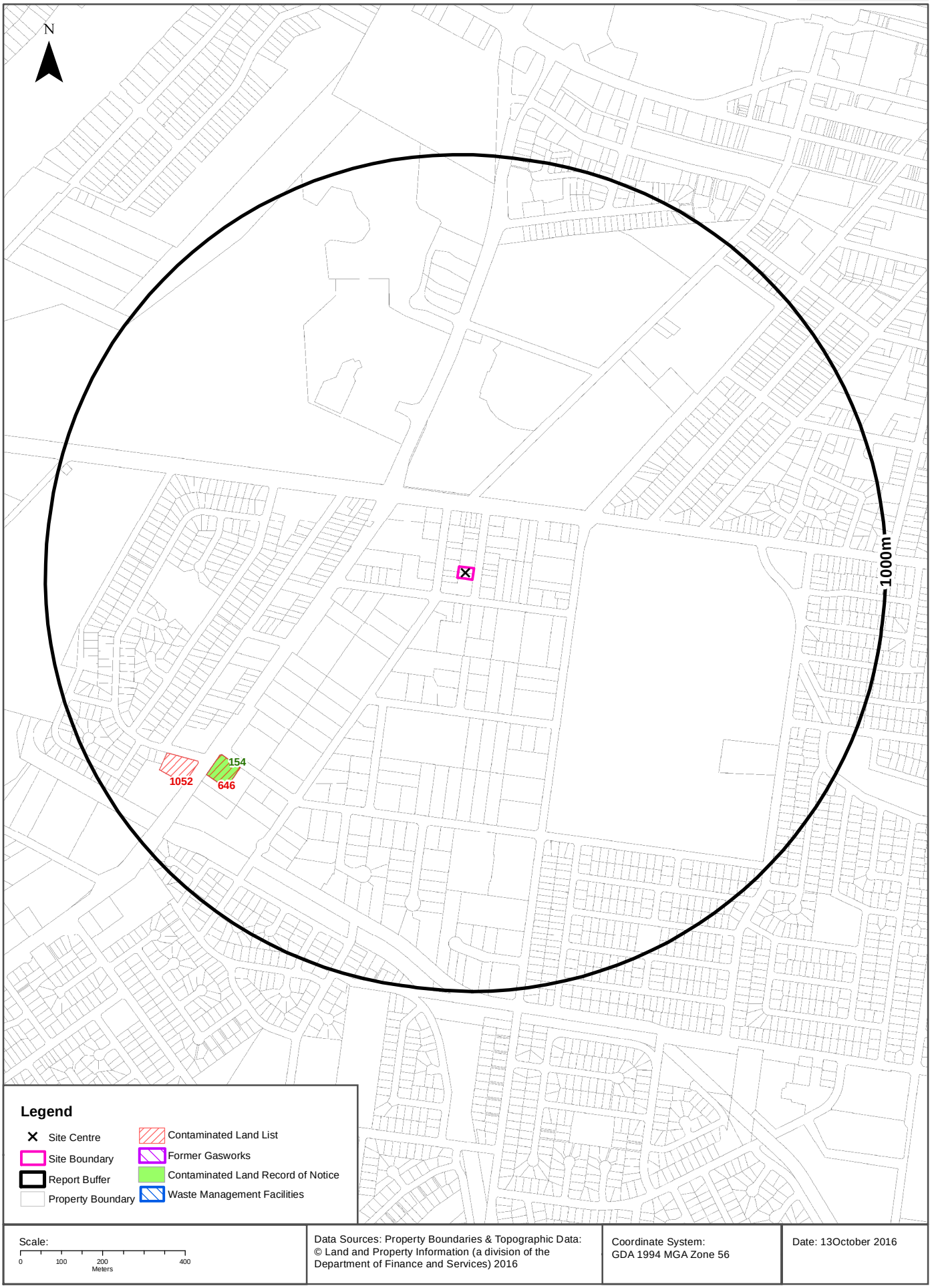
Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	No. Features Onsite	No. Features within 100m	No. Features within Buffer
SEPP 26 - Littoral Rainforest	NSW Planning and Environment	17/12/2015	05/02/1988	Annually	0	0	0
SEPP 71 - Coastal Protection	NSW Planning and Environment	17/12/2015	01/08/2003	Annually	0	0	0
SEPP Major Developments 2005	NSW Planning and Environment	09/03/2013	25/05/2005	Under Review	0	0	0
SEPP Strategic Land Use Areas	NSW Planning and Environment	06/07/2016	28/01/2014	Annually	0	0	2
Local Environmental Plan - Land Zoning	NSW Planning and Environment	03/10/2016	04/08/2016	Quarterly	1	3	54
Local Environmental Plan - Minimum Subdivision Lot Size	NSW Planning and Environment	03/10/2016	04/08/2016	Quarterly	1	-	-
Local Environmental Plan - Height of Building	NSW Planning and Environment	03/10/2016	04/08/2016	Quarterly	1	-	-
Local Environmental Plan - Floor Space Ratio	NSW Planning and Environment	03/10/2016	04/08/2016	Quarterly	0	-	-
Local Environmental Plan - Land Application	NSW Planning and Environment	03/10/2016	04/08/2016	Quarterly	1	-	-
Local Environmental Plan - Land Reservation Acquisition	NSW Planning and Environment	03/10/2016	04/08/2016	Quarterly	0	-	-
State Heritage Items	NSW Planning and Environment	03/10/2016	12/03/2015	Quarterly	0	0	0
Local Heritage Items	NSW Planning and Environment	03/10/2016	04/08/2016	Quarterly	0	0	8
Bushfire Prone Land	NSW Rural Fire Service	18/08/2016	12/08/2016	Quarterly	0	0	3
Remnant Vegetation of the Cumberland Plain	NSW Office of Environment and Heritage	07/10/2014	04/08/2011	Unknown	0	0	3
RAMSAR Wetlands	Commonwealth of Australia Department of the Environment	08/10/2014	24/06/2011	As required	0	0	0
ATLAS of NSW Wildlife	NSW Office of Environment and Heritage	13/10/2016	13/10/2016	Daily	-	-	-

Aerial Imagery 2015

15-17 Dent Street, Jamisontown, NSW 2750

Contaminated Land & Waste Management Facilities

15-17 Dent Street, Jamisontown, NSW 2750



Data Sources: Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2016

Coordinate System: GDA 1994 MGA Zone 56

Date: 13October 2016

Contaminated Land & Waste Management Facilities

15-17 Dent Street, Jamisontown, NSW 2750

List of NSW contaminated sites notified to EPA

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

Map Id	Site	Address	Suburb	Activity	EPA site management class	Status	Dist	Direction	LC
646	7-Eleven Service Station	92 Mulgoa Road	Jamisontown	Service Station	Contamination currently regulated under CLM Act	Current EPA List	701m	South West	1
1052	Former Caltex Jamisontown	229-231 Mulgoa Road	Jamisontown	Service Station	Under assessment	Current EPA List	772m	South West	1

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

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

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Contaminated Land & Waste Management Facilities

15-17 Dent Street, Jamisontown, NSW 2750

Contaminated Land: Records of Notice

Record of Notices within the report buffer:

Map Id	Area No	Name	Address	Suburb	Notices	Distance	Direction	LC
154	3284	7-Eleven Service Station	92 Mulgoa Road	Jamisontown	2 current	701m	South West	1

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 report buffer:

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

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 report buffer:

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

Wate Management Facilities Data Source: Australian Governement Geoscience Australia
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EPA Activities

15-17 Dent Street, Jamisontown, NSW 2750

Licensed Activities under the POEO Act 1997

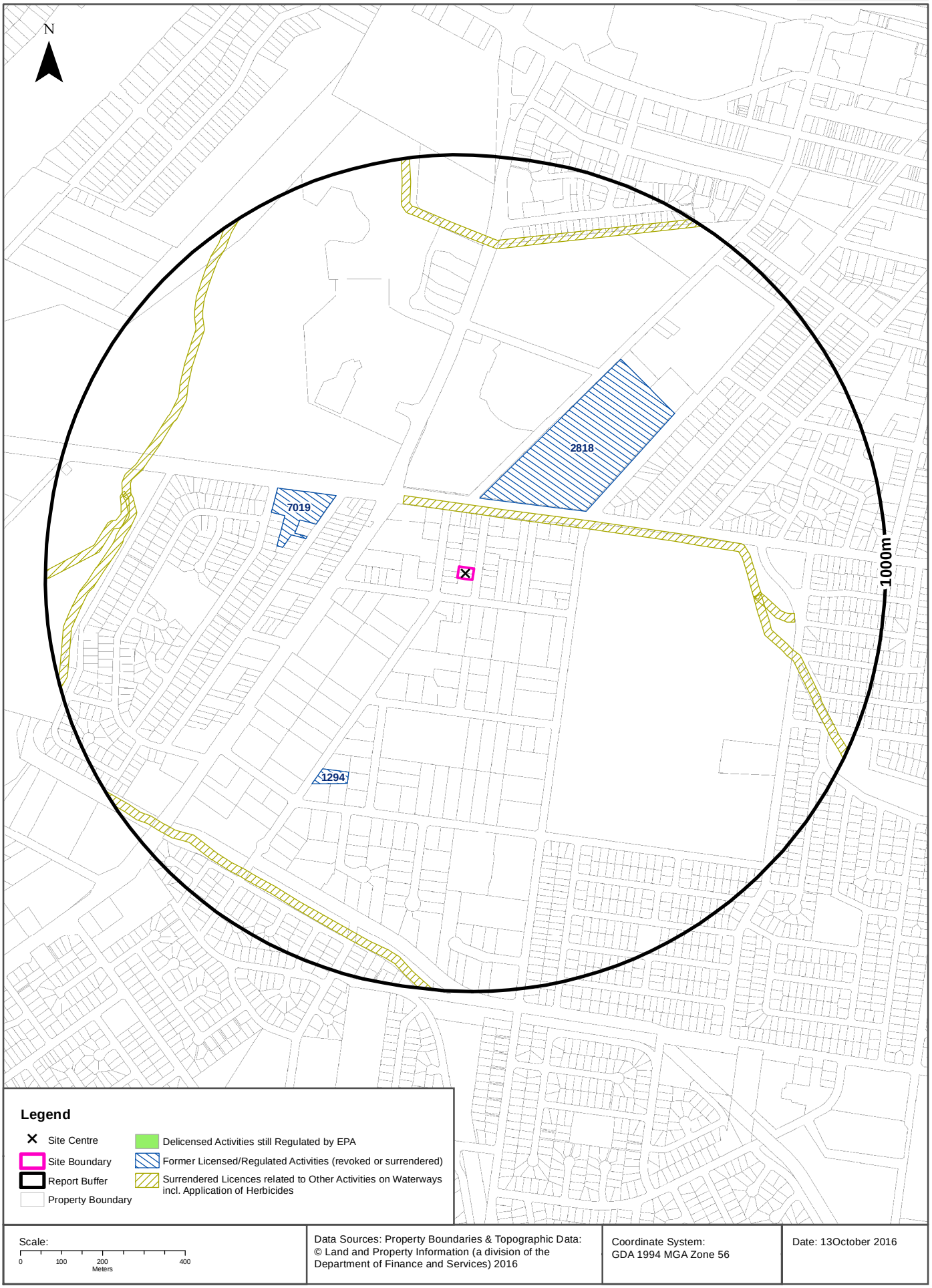
Licensed activities under the Protection of the Environment Operations Act 1997, within the report buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
N/A	No records in buffer							

POEO Licence Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Delicensed & Former Licensed EPA Activities

15-17 Dent Street, Jamisontown, NSW 2750



EPA Activities

15-17 Dent Street, Jamisontown, NSW 2750

Delicensed Activities still regulated by the EPA

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

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
N/A	No records in buffer							

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

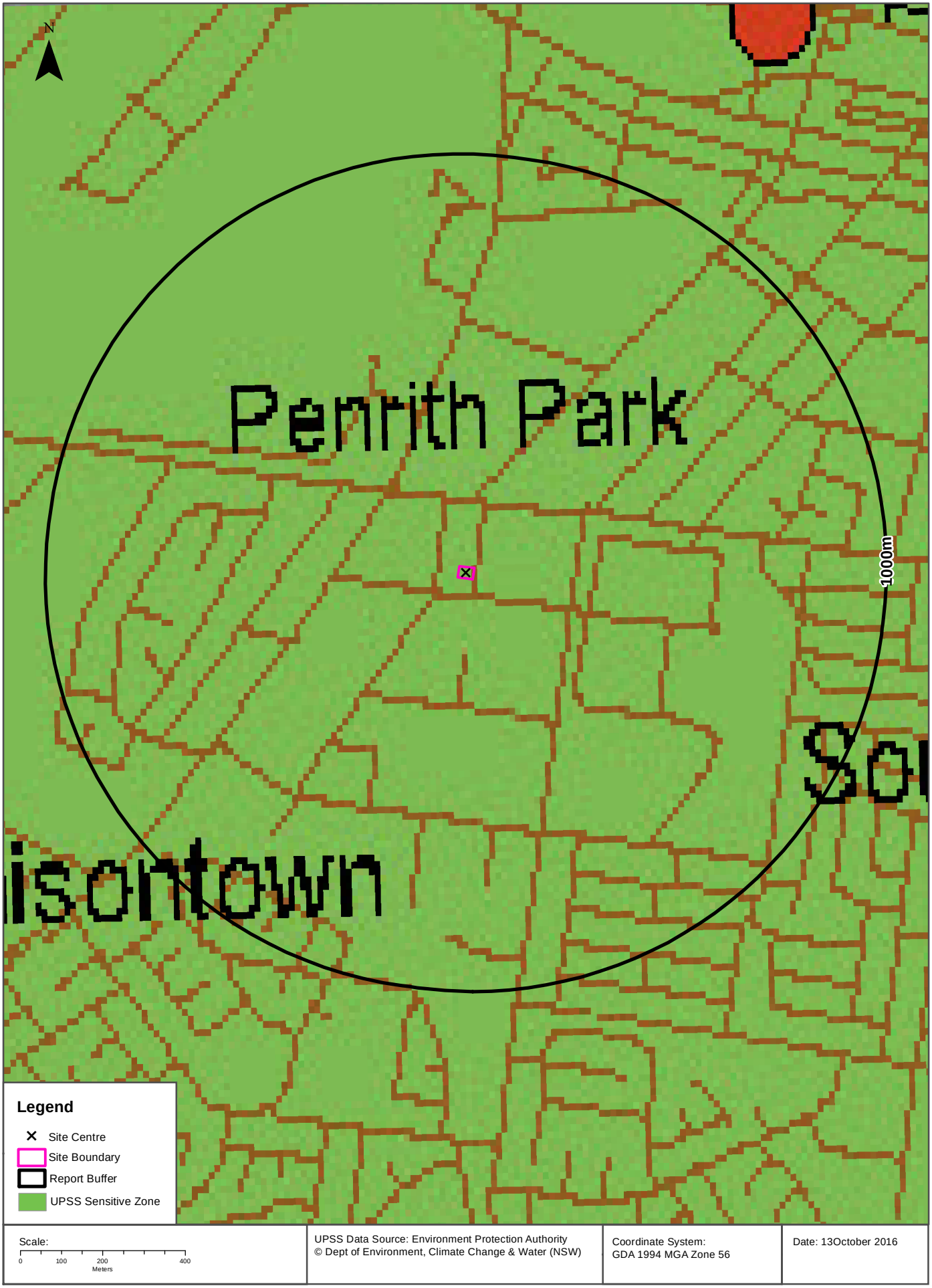
Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the report buffer:

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	7	131m	-
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	7	131m	-
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	7	131m	-
2818	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	Surrendered	24/03/2000	Hazardous, Industrial or Group A Waste Generation or Storage	1	171m	North East
7019	JAMISON PRIVATE HOSPITAL PROPERTY PTY LTD	366 JAMISON ROAD, PENRITH, NSW 2750	Surrendered	20/03/2001	Hazardous, Industrial or Group A Waste Generation or Storage	1	344m	West
1294	VICARY CORPORATION PTY LIMITED	60-62 REGENTVILLE ROAD, PENRITH, NSW 2750	Surrendered	22/08/2000	Concrete works	1	540m	South West

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

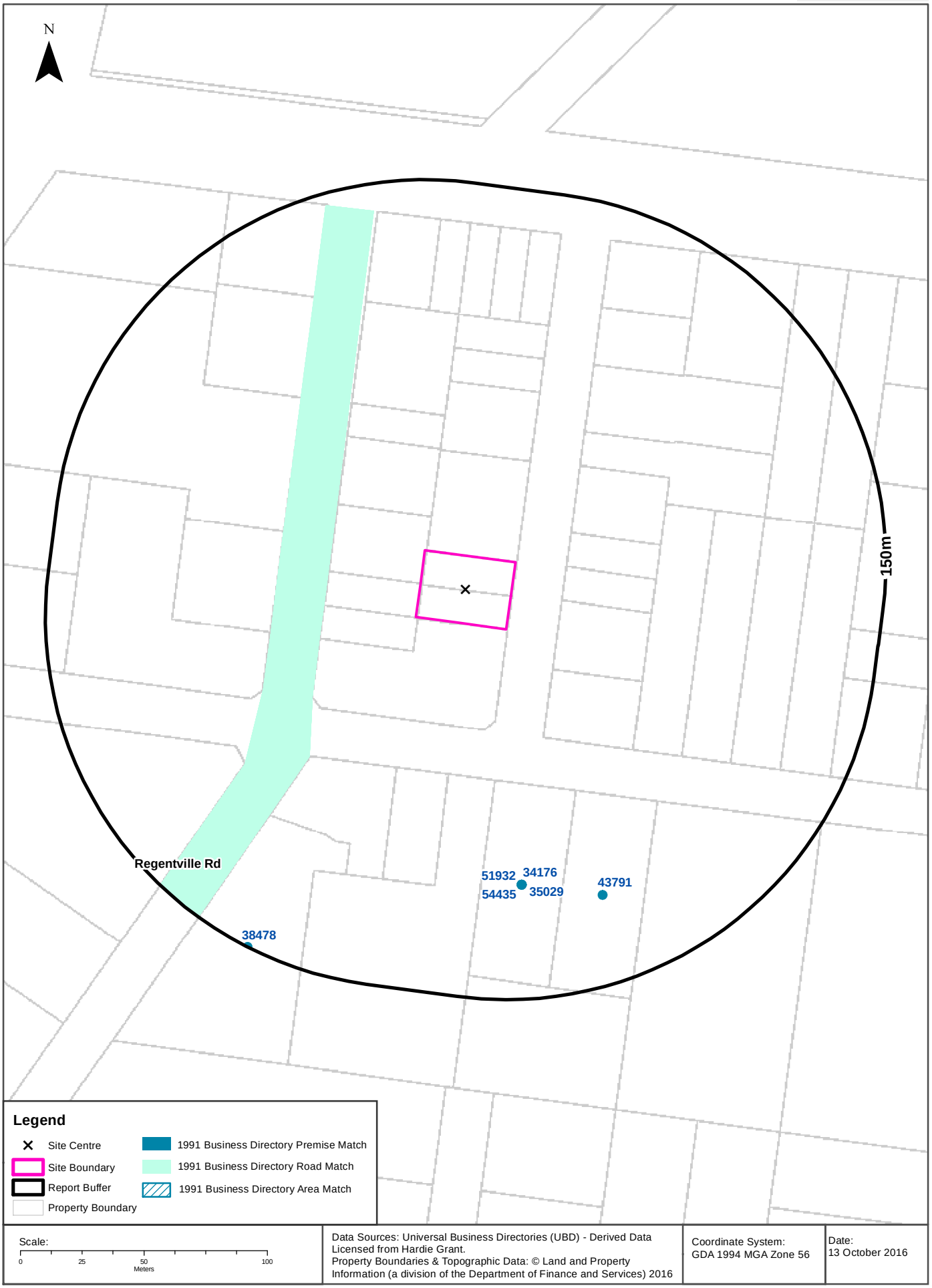
UPSS Sensitive Zones

15-17 Dent Street, Jamisontown, NSW 2750



1991 Historical Business Directory Records

15-17 Dent Street, Jamisontown, NSW 2750



Historical Business Directories

15-17 Dent Street, Jamisontown, NSW 2750

1991 Business to Business Directory Records

Records from the 1991 UBD Business to Business Directory within 150m of the site:

Business Activity	Organisation	Address	Ref No.	Location Confidence	Distance	Direction
Tyre Dealers &/or Retreaders &/or Vulcanisers	Archers Tyre Service	Unit 3 Lot 802 Regentville Rd Penrith 2750	65196	Road Match	38m	South West
Engineers General	B.T.N. Engineering	Unit 5 Lot 40 Regentville Rd Penrith 2750	43911	Road Match	38m	South West
Roof Trusses Mfrs &/or Dists	Graterest Frames & Roof Trusses Pty Ltd	Lot 1 Regentville Rd Penrith 2750	61181	Road Match	38m	South West
Motor Trimmers	Greenies Auto Upholstery	Regentville Rd Penrith 2750	55441	Road Match	38m	South West
Motor Wheel Aligning & Balancing Services	Penrith Truck & Bus Align	Lot 41 Regentville Rd Penrith 2750	55593	Road Match	38m	South West
Printing Machinery Mfrs &/or Imps &/or Dists	Scan Hydraulics Pty Ltd	Unit 6, Lot 40 Regentville Rd Penrith 2750	59502	Road Match	38m	South West
Auto Electricians	Springs Auto Electrician	Lot 80, Regentville Rd, Penrith 2750	35026	Road Match	38m	South West
Box & Case Mfrs &/or Merchants	Trask Cases & Components,	Lot 79, Regentville Rd., Penrith. 2750	36540	Road Match	38m	South West
Concrete Ready Mixed	Western Suburbs Concrete	Lot 2, Regentville Rd, Penrith 2750	40617	Road Match	38m	South West
Motor Panel Beaters &/or Spray Painters	Hayden & Davison	Unit 3/26 Preston St Penrith	54435	Premise Match	102m	South
Mobile Phones	Stage Co	26 Preston St Penrith 2750	51932	Premise Match	102m	South
Auto Electricians	Stage Co	26 Preston St, Penrith 2750	35029	Premise Match	102m	South
Airconditioning Automotive	Stage Co.	26 Preston St., Penrith 2750	34176	Premise Match	102m	South
Engineers Fabricating	Penrith Engineering	20 Preston St Penrith 2750	43791	Premise Match	112m	South East
Carriers &/or Cartage Contractors	Roberts Haulage Contractors Pty. Ltd.	26 Regentville Rd., Penrith. 2750	38478	Premise Match	148m	South West

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1991 Business Directory Motor Garages & Service Stations

Motor Garages & Service Stations from the 1991 UBD Business Directory within 1km of the site:

Business Activity	Organisation	Address	Ref No.	Location Confidence	Distance	Direction
N/A	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

15-17 Dent Street, Jamisontown, NSW 2750

1970 Business Directory Records

Records from the 1970 UBD Business Directory within 150m of the site:

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1970 Business Directory Drycleaners & Service Stations

Drycleaners, Motor Garages & Service Stations from the 1970 UBD Business Directory within 1km of the site:

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1950 Business Directory Records

Records from the 1950 UBD Business Directory within 150m of the site:

Business Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1950 Business Directory Drycleaners & Service Stations

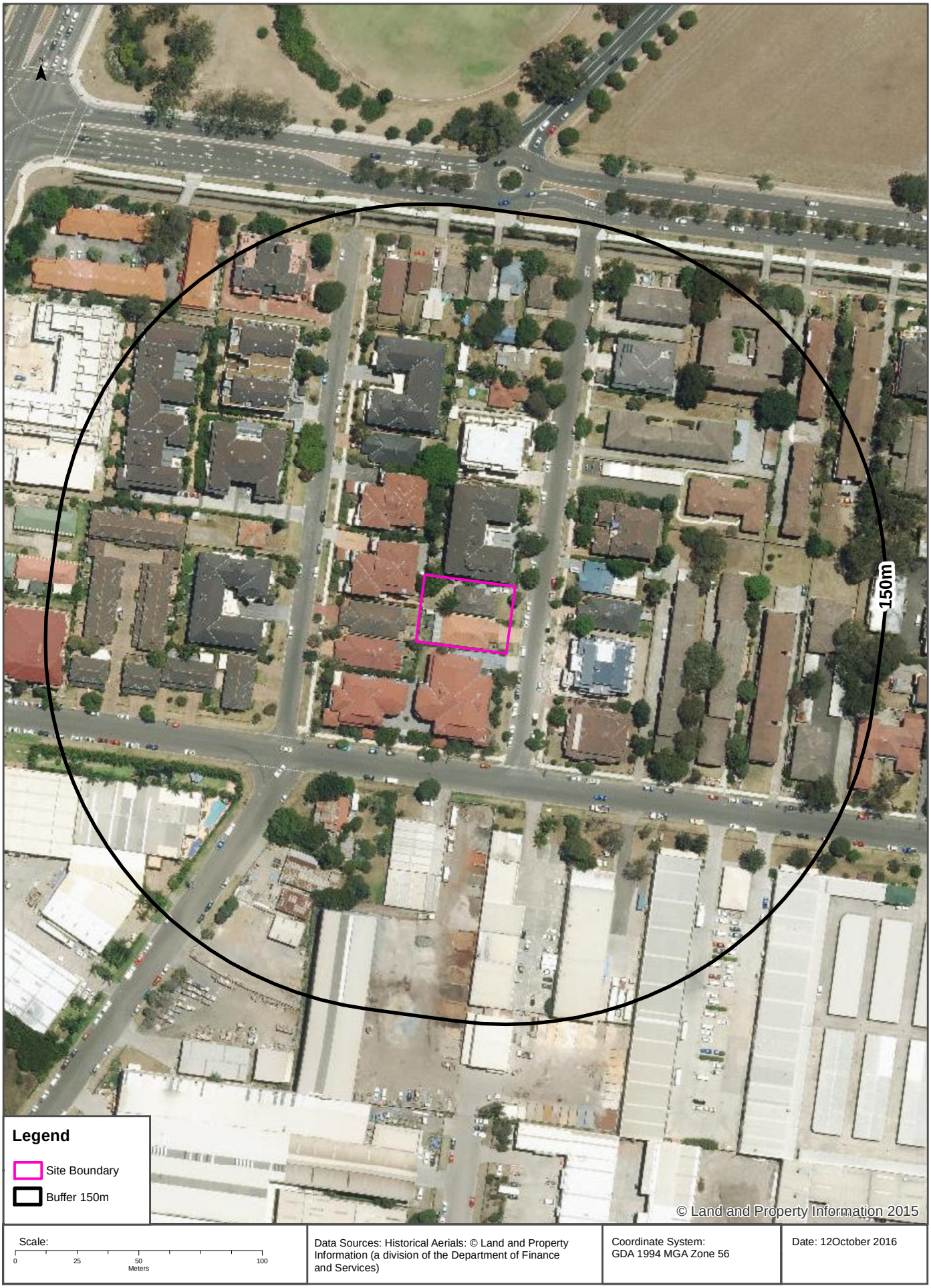
Drycleaners, Motor Garages & Service Stations from the 1950 UBD Business Directory within 1km of the site:

Activity	Organisation & Premise	Ref No.	Location Confidence	Distance	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Aerial Imagery 2014

15-17 Dent Street, Jamisontown, NSW 2750

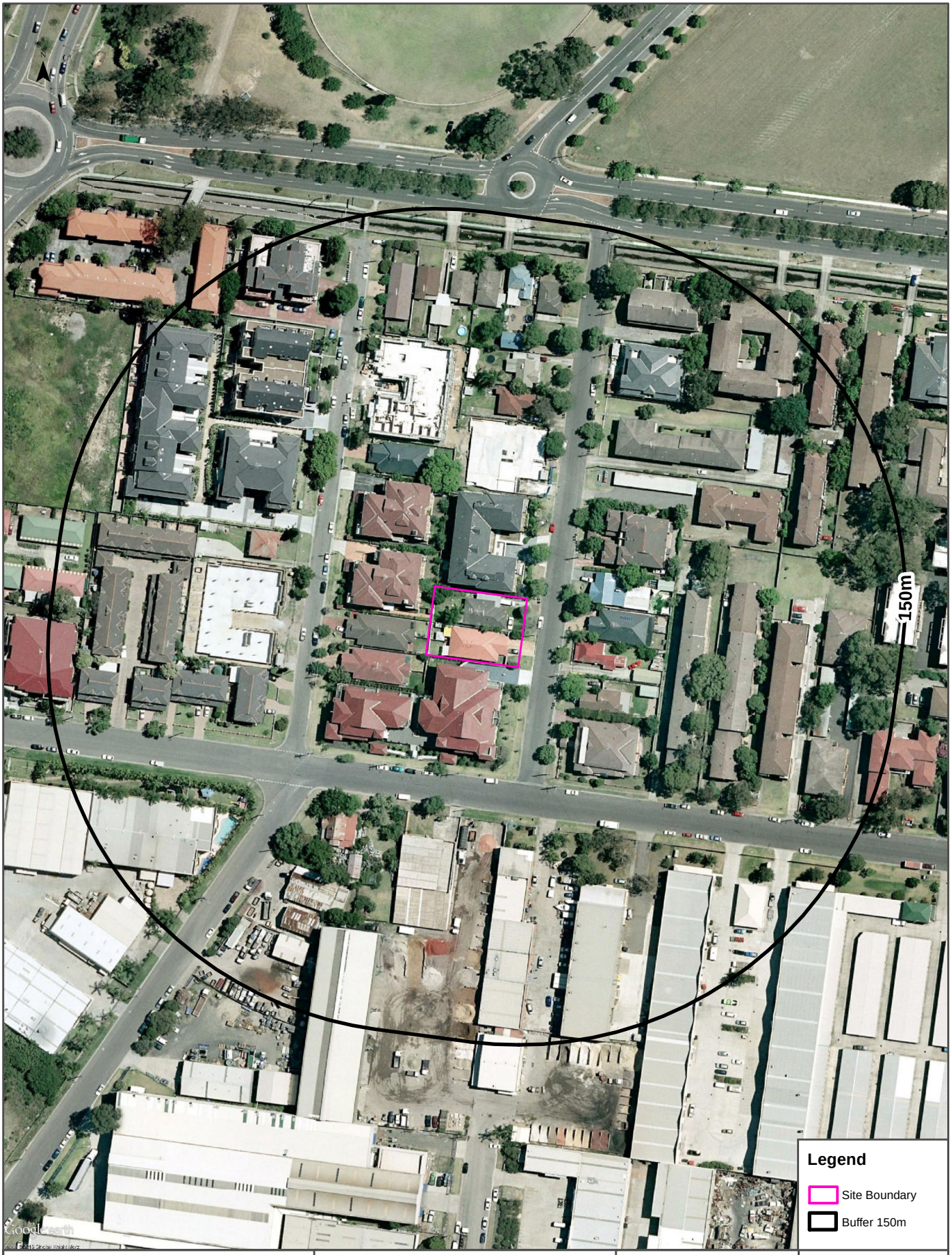


Scale:	Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)	Coordinate System: GDA 1994 MGA Zone 56	Date: 12October 2016

0 25 50 100 Meters

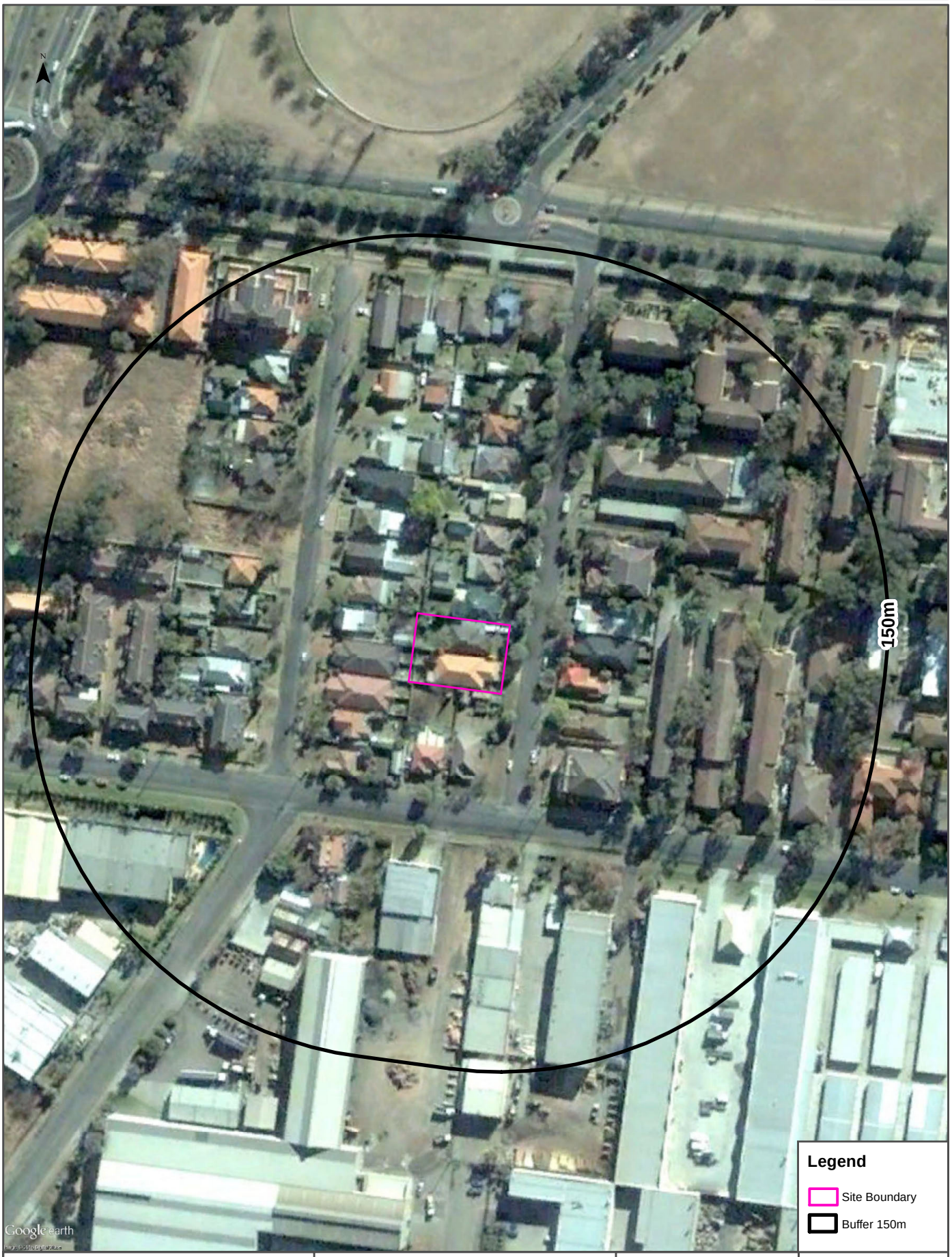
Aerial Imagery 2009

15-17 Dent Street, Jamisontown, NSW 2750



Aerial Imagery 2002

15-17 Dent Street, Jamisontown, NSW 2750



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Coordinate System: GDA 1994 MGA Zone 56

Date: 12October, 2016

Aerial Imagery 1991

15-17 Dent Street, Jamisontown, NSW 2750

Aerial Imagery 1982

15-17 Dent Street, Jamisontown, NSW 2750

Aerial Imagery 1970

15-17 Dent Street, Jamisontown, NSW 2750

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

Coordinate System: GDA 1994 MGA Zone 56

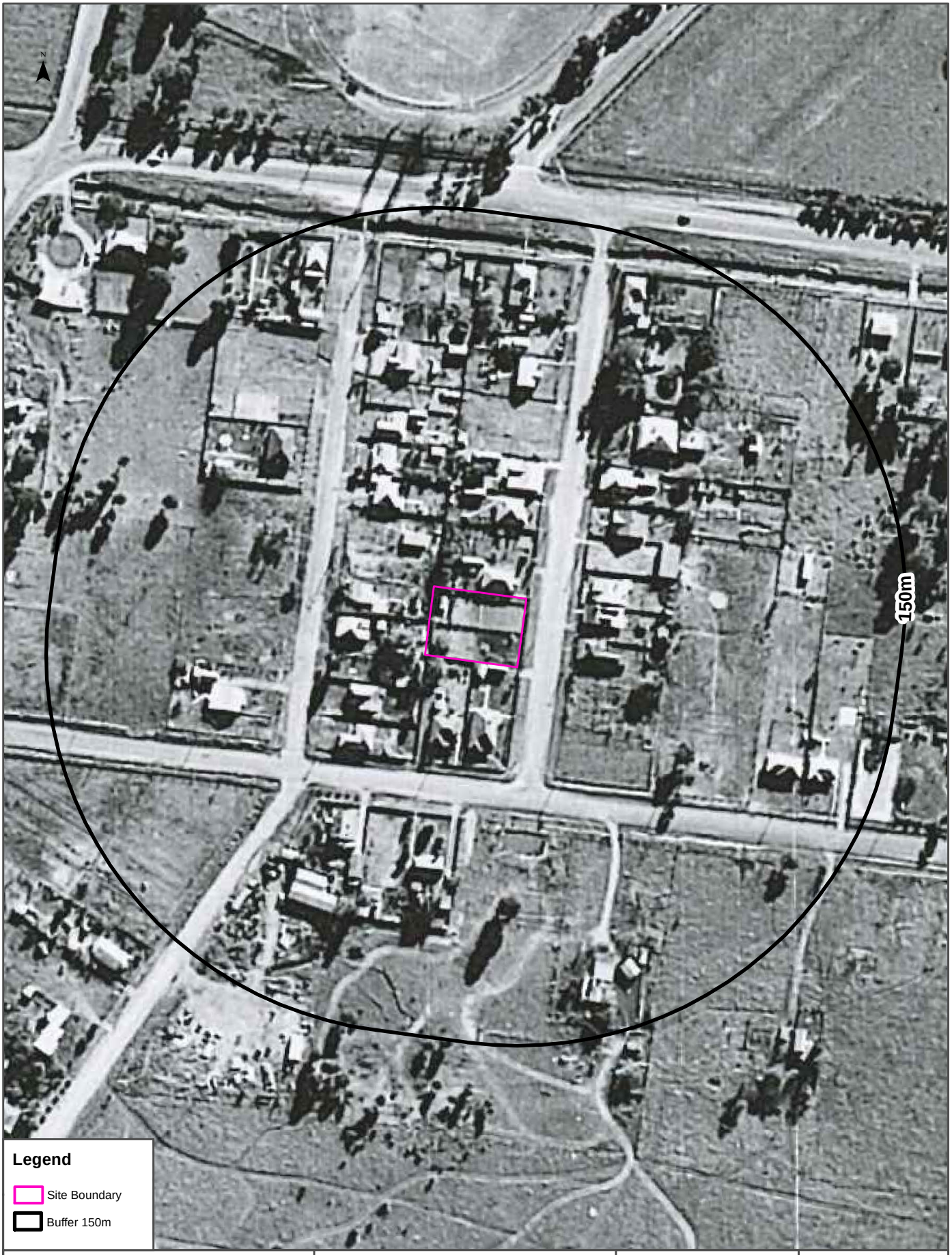
Date: 12October 2016

Aerial Imagery 1965

15-17 Dent Street, Jamisontown, NSW 2750

Aerial Imagery 1961

15-17 Dent Street, Jamisontown, NSW 2750



Aerial Imagery 1956

15-17 Dent Street, Jamisontown, NSW 2750

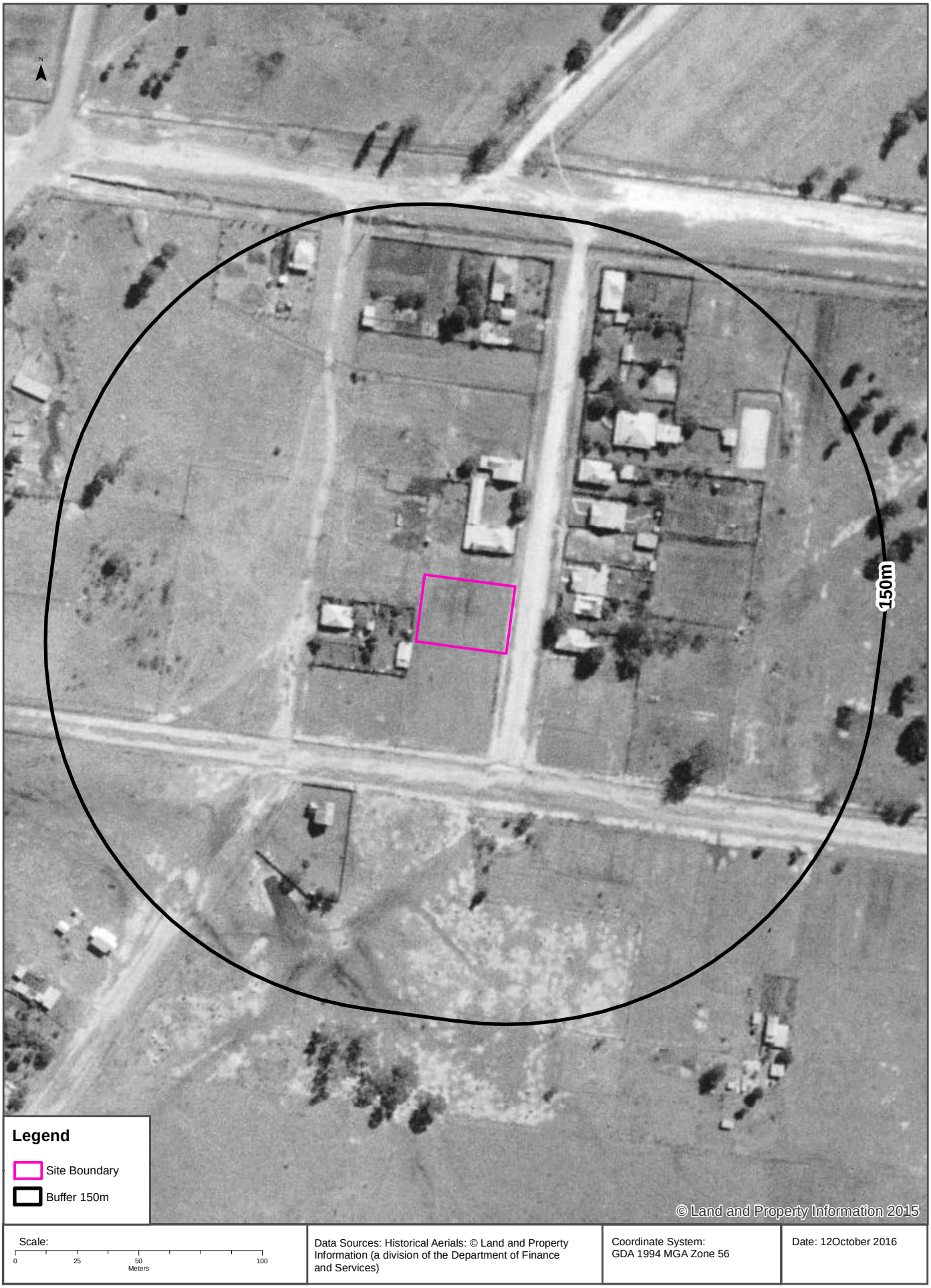
Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)

Coordinate System: GDA 1994 MGA Zone 56

Date: 12October 2016

Aerial Imagery 1943

15-17 Dent Street, Jamisontown, NSW 2750

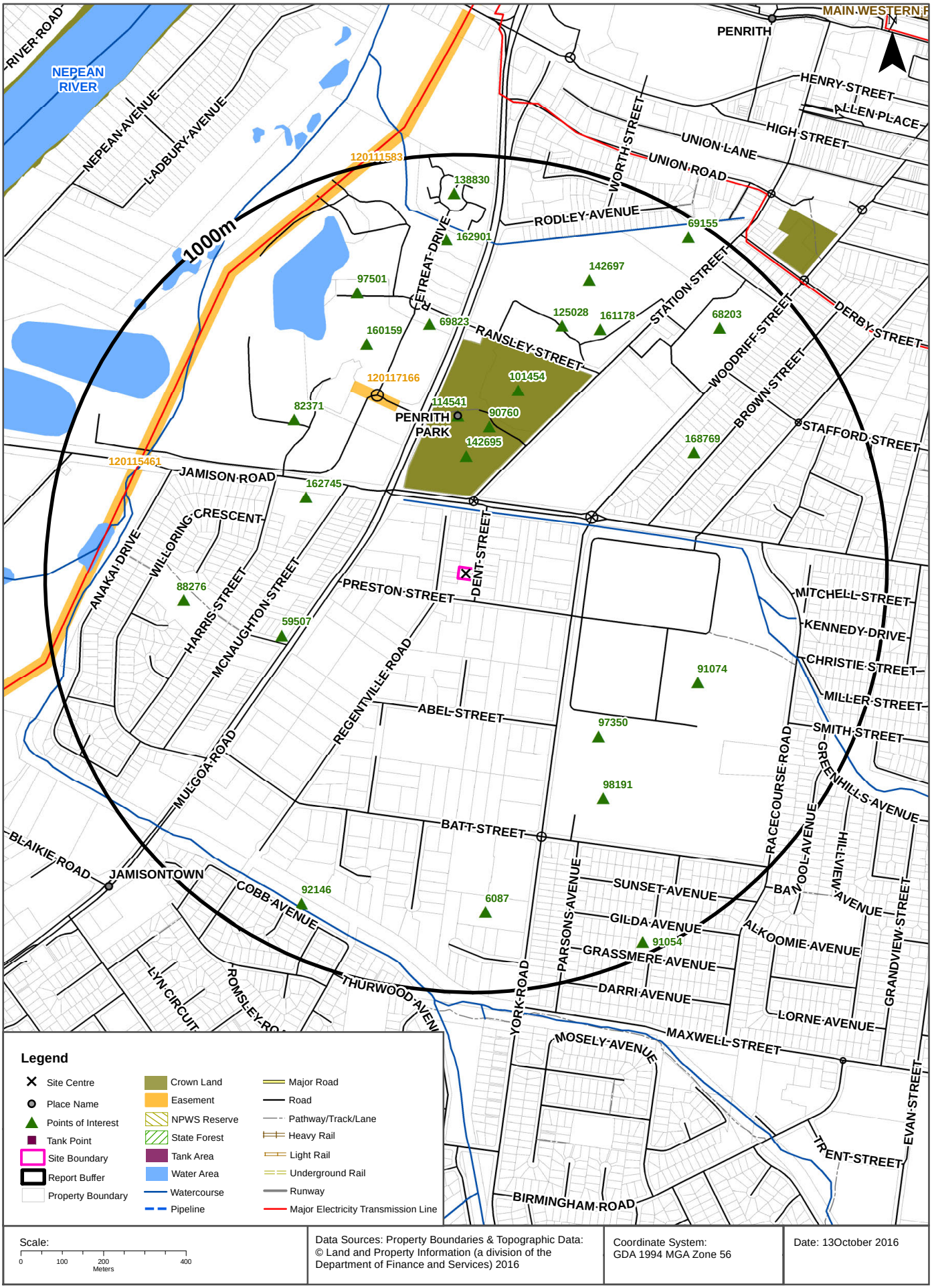


Scale:	Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)	Coordinate System: GDA 1994 MGA Zone 56	Date: 12October 2016

0 25 50 100 Meters

Topographic Features

15-17 Dent Street, Jamisontown, NSW 2750



Topographic Features

15-17 Dent Street, Jamisontown, NSW 2750

Points of Interest

What Points of Interest exist within the report buffer?

Map Id	Feature Type	Label	Distance	Direction
142695	Sports Field	HOWELL OVAL	270m	North
90760	Park	PENRITH PARK	348m	North
114541	Locality	PENRITH PARK	367m	North
162745	Community Home	SUMMITCARE PENRITH	408m	North West
101454	Sports Field	PENRITH STADIUM	447m	North
59507	Place Of Worship	UNITING CHURCH	448m	West
97350	Sports Court	BASKETBALL COURTS	485m	South East
82371	Golf Course	PANTHERS GOLF DRIVING RANGE	537m	North West
160159	Club	PENRITH RUGBY LEAGUE CLUB	586m	North West
69823	Tourist Information Centre	PENRITH VALLEY VISITOR INFORMATION CENTRE	594m	North
91074	Park	JAMISON PARK	598m	South East
168769	Park	BROWN STREET RESERVE	602m	North East
98191	Sports Court	NETBALL COURTS	615m	South East
125028	Showground	PENRITH SHOWGROUND	627m	North
161178	Club	CLUB PACEWAY	657m	North East
88276	Park	Park	666m	West
97501	Sports Court	TENNIS COURTS	710m	North
142697	Trotting Track	PENRITH PACEWAY	755m	North East
162901	Community Home	MOUNTAINVIEW NURSING HOME	795m	North
6087	Community Facility	MOTOR REGISTRY	804m	South
68203	Shopping Centre	NEPEAN SQUARE	834m	North East
92146	Park	Park	875m	South West
138830	Retirement Village	MOUNTAINVIEW RETREAT RETIREMENT VILLAGE	907m	North
69155	Swimming Pool	PENRITH WAR MEMORIAL SWIMMING POOL	958m	North East
91054	Park	Park	968m	South East

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

15-17 Dent Street, Jamisontown, NSW 2750

Tanks (Areas)

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

Map Id	Tank Type	Status	Name	Capture Method	Feature Currency	Distance	Direction
N/A	No records in buffer						

Tanks (Points)

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

Map Id	Tank Type	Status	Name	Capture Method	Feature Currency	Distance	Direction
N/A	No records in buffer						

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

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

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
120117166	Primary	Undefined		410m	North West
120111583	Primary	Undefined		794m	West
120115461	Primary	Undefined		804m	West

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

15-17 Dent Street, Jamisontown, NSW 2750

State Forest

What State Forest exist within the report buffer?

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

State Forest Data Source: © Land and Property Information (2015)
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National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the report buffer?

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

NPWS Data Source: © Land and Property Information (2015)
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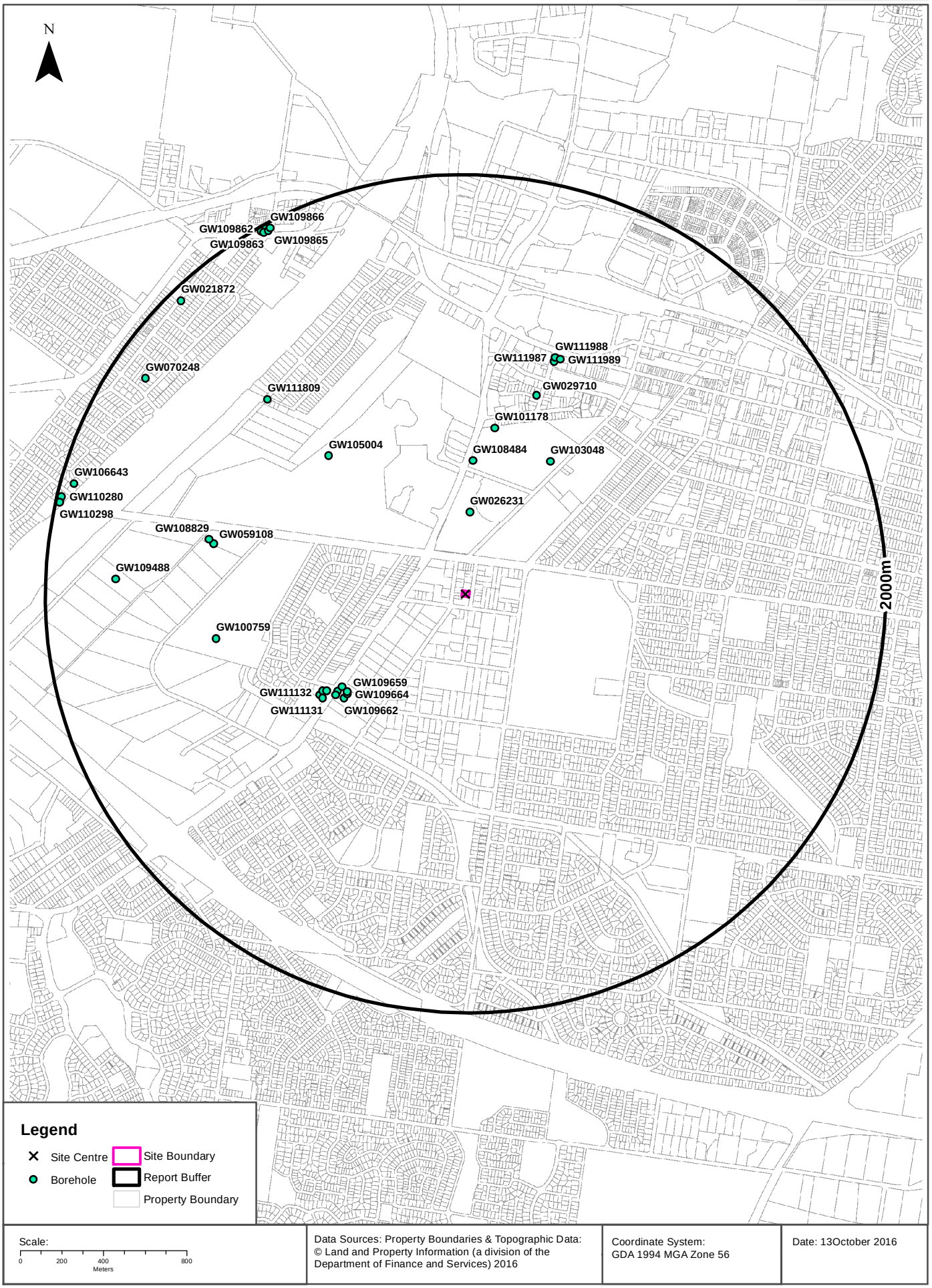
Elevation Contours (m AHD)

15-17 Dent Street, Jamisontown, NSW 2750

Groundwater Boreholes

15-17 Dent Street, Jamisontown, NSW 2750



Hydrogeology & Groundwater

15-17 Dent Street, Jamisontown, NSW 2750

Hydrogeology

Description of aquifers on-site:

Description
Porous, extensive highly productive aquifers

Description of aquifers within the report buffer:

Description
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

Groundwater Boreholes

Boreholes within 2km of the site:

GW No.	Licence No	Work Type	Owner Type	Purpose	Contractor	Complete Date	Final Depth	Drilled Depth	Salinity	SWL	Yield	Elev	Dist	Dir
GW026231	10BL019074	Well	Local Govt	Irrigation		01/01/1966	8.50	8.50	1001-3000 ppm				378m	North
GW108484	10BL163999, 10WA112767	Well	Private	Recreation	Ultra Drilling	06/09/2006	11.00	11.00	550				625m	North
GW109659	10BL602658	Bore	Private	Monitoring	Macquarie Drilling	30/07/2008	9.50	9.50		8.60			716m	South West
GW109660	10BL602658	Bore	Private	Monitoring	Macquarie Drilling	01/08/2008	9.60	9.60		6.00			722m	South West
GW109664	10BL602658	Bore	Private	Monitoring	Macquarie Drilling	01/08/2008	5.10	5.10		4.50			725m	South West
GW103048	10BL141316, 10WA112767	Bore		Recreation		01/01/1990	8.00	8.00		6.00	1.000		735m	North East
GW109662	10BL602658	Bore	Private	Monitoring	Macquarie Drilling	04/08/2008	12.00	12.00		9.00			747m	South West
GW109661	10BL602658	Bore	Private	Monitoring	Macquarie Drilling	01/08/2008	5.20	5.20		4.50			750m	South West
GW109663	10BL602658	Bore	Private	Monitoring	Macquarie Drilling	01/08/2008	9.50	9.50		9.00			769m	South West
GW111130	10BL602387	Bore	Private	Monitoring	Macquarie Drilling	28/08/2007	11.80	11.80		8.50			792m	South West
GW101178	10BL158273, 10BL158422, 10WA112767	Bore	Private	Industrial, Recreation	Intertec Drilling Services	15/01/1998	11.20	11.20	180	8.00	0.600		794m	North
GW111129	10BL602387	Well	Private	Monitoring	Macquarie Drilling	28/08/2007	10.00	10.00		8.00			807m	South West
GW111131	10BL602387	Bore	Private	Monitoring	Macquarie Drilling	29/08/2007	11.50	11.50		8.50			828m	South West
GW111132	10BL602387	Bore	Private	Monitoring	Macquarie Drilling	30/08/2007	12.50	12.50		9.00			830m	South West
GW105004	10BL162036, 10BL162489, 10WA112773	Bore		Recreation	Ultra Drilling	24/09/2003	183.00	183.00	450	12.00	2.200		910m	North West
GW029710	10BL018657, 10WA112614	Well	Private	General Use		01/04/1969	7.90	7.90					997m	North
GW111987	10BL603225	Well	Private	Monitoring		24/03/2010	9.00	9.00					1178m	North
GW100759	10BL157492, 10BL157730, 10CA112749	Bore	Private	Irrigation, Recreation	Ultra Drilling	29/02/1996	10.00	10.00	Good	6.00	3.500		1195m	West

GW No.	Licence No	Work Type	Owner Type	Purpose	Contractor	Complete Date	Final Depth	Drilled Depth	Salinity	SWL	Yield	Elev	Dist	Dir
GW111988	10BL603225	Well	Private	Monitoring		24/03/2010	9.00	9.00					1196m	North
GW111989	10BL603225	Well	Private	Monitoring		24/03/2010	9.00	9.00					1197m	North
GW059108	10BL118685	Excavation	Private	General Use		01/06/1981	6.00						1216m	West
GW108829	10BL164175, 10WA112699	Bore	Private	Domestic, Stock	Ultra Drilling	31/01/2007	66.00	66.00	1500	25.00	1.200		1241m	West
GW111809	10BL600900, 10WA112710	Bore	Private	Domestic	ULTRADRILLING	30/05/2007	15.00	15.00		13.00	1.000		1309m	North West
GW109488	10BL164612, 10WA112702	Bore	Private	Domestic	Ultra Drilling	15/02/2008	15.00		1200	9.00	0.900		1663m	West
GW070248		Bore	Private	Domestic		29/05/1992	48.00						1831m	North West
GW106643	10BL164010, 10WA112697	Bore	Private	Domestic	Ultra Drilling	23/11/2004	16.30	16.30	300	3.00	2.500		1933m	West
GW021872	10BL014388	Well	Private	General Use		01/05/1964	7.90	7.90	Hard				1939m	North West
GW109865	10BL601223	Bore	Private	Monitoring	Terratest Pty Ltd	11/10/2006	12.00	12.00		9.59			1965m	North West
GW109863	10BL601223	Bore	Private	Monitoring	Terratest Pty Ltd	11/10/2006	11.60	11.60		9.29			1968m	North West
GW109866	10BL601223	Bore	Private	Monitoring	Terratest Pty Ltd	11/10/2006	12.50	12.50		9.72			1970m	North West
GW110280	10BL602707, 10WA112720	Battery Spears, Filter Pac	Private	Domestic	Ultra Drilling	21/11/2008	17.00	17.00	300	10.00	0.500		1977m	West
GW110298	10BL602709, 10WA112721	Bore	Private	Domestic	Ultra Drilling	19/11/2008	17.00	17.00	300	11.00	0.400		1980m	West
GW109862	10BL601223	Bore	Private	Monitoring	Terratest Pty Ltd	10/10/2006	11.00	11.00		9.29			1980m	North West
GW109864	10BL601223	Bore	Private	Monitoring	Terratest Pty Ltd	12/10/2006	11.85	11.85		9.63			1984m	North 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

15-17 Dent Street, Jamisontown, NSW 2750

Driller's Logs

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

Groundwater No	Drillers Log	Distance	Direction
GW026231	0.00m-4.26m Silt 0.00m-4.26m Loam Clay 4.26m-8.53m Gravel Alluvial Water Supply	378m	North
GW108484	0.00m-6.00m CLAY 6.00m-8.50m SAND 8.50m-11.00m GRAVEL	625m	North
GW109659	0.00m-0.30m FILL, CLAYEY SAND 0.30m-4.10m CLAYEY SILT 4.10m-4.50m CLAYEY SAND 4.50m-9.50m GRAVELS	716m	South West
GW109660	0.00m-1.10m FILL,CLAYEY SAND 1.10m-4.50m CLAYEY SILT 4.50m-5.40m SAND 5.40m-9.60m GRAVELS	722m	South West
GW109664	0.00m-0.60m TOPSOIL 0.60m-2.50m CLAYEY SILT 2.50m-5.10m SAND	725m	South West
GW109662	0.00m-1.00m FILL,CLAYEY SAND 1.00m-4.30m CLAYEY SILT 4.30m-4.80m SAND 4.80m-12.00m GRAVELS	747m	South West
GW109661	0.00m-0.40m FILL, CLAYEY SAND 0.40m-1.80m CLAYEY SAND 1.80m-4.40m CLAY 4.40m-5.20m SAND	750m	South West
GW109663	0.00m-0.40m FILL,CLAYEY SAND 0.40m-2.40m CLAYEY SAND 2.40m-4.60m CLAY 4.60m-9.50m GRAVELS	769m	South West
GW111130	0.00m-0.15m CONCRETE 0.15m-0.50m FILL,CLAY,ORANGE BROWN,MOIST 0.50m-4.00m SAND CLAYEY,ORANGE BROWN,DAMP,LOOSE 4.00m-11.80m GRAVEL,MIXED WITH SAND,RED YELLOW	792m	South West
GW101178	0.00m-2.00m Sandy clay 2.00m-6.00m Grey sand 6.00m-10.50m Coarse gravel and cobbles (water bearing) 10.50m-11.20m Dark grey shale and clay	794m	North
GW111129	0.00m-0.15m CONCRETE 0.15m-1.00m SAND,RED BROWN 1.00m-4.00m SAND CLAYEY,DAMP,LOOSE,ANGULAR 4.00m-5.00m SAND,MIXED,RED BROWN,MOIST,GRAVEL 5.00m-10.00m GRAVEL	807m	South West
GW111131	0.00m-0.15m CONCRETE 0.15m-4.00m SAND,CLAYEY,RED BROWN,DAMP,LOOSE 4.00m-11.50m GRAVEL,SOME SAND	828m	South West
GW111132	0.00m-0.17m CONCRETE 0.17m-0.50m FILL,CLAYEY,BROWN,MOIST,SOFT 0.50m-3.00m SAND,CLAYEY,RED BROWN,DAMP,LOOSE 3.00m-12.50m GRAVEL,LITTLE SAND,HOMOGENOUS,DAMP	830m	South West
GW105004	0.00m-0.50m FILL 0.50m-9.50m CLAY/GRAVEL 9.50m-11.50m GRAVEL 11.50m-50.30m SHALE/SANDSTONE 50.30m-164.60m SANDSTONE/SHALE SEAMS 164.60m-169.50m SANDSTONE/QUARTZITE 169.50m-174.50m SANDSTONE/SHALE 174.50m-183.00m SANDSTONE/QUARTZITE	910m	North West
GW029710	0.00m-2.74m Loam Red 2.74m-7.92m Sand Gravel Water Supply	997m	North
GW111987	0.00m-3.00m CLAY MINOR SAND RED BROWN 3.00m-9.00m GRAVEL WITH MINOR SAND	1178m	North

Groundwater No	Drillers Log	Distance	Direction
GW100759	0.00m-3.00m clay 3.00m-7.00m sand 7.00m-10.00m river gravel	1195m	West
GW111988	0.00m-3.00m CLAY MINOR SAND RED BROWN 3.00m-9.00m GRAVEL WITH MINOR SAND	1196m	North
GW111989	0.00m-3.00m CLAY MINOR SAND RED BROWN 3.00m-9.00m GRAVEL WITH MINOR SAND	1197m	North
GW108829	0.00m-48.00m clay, shale 48.00m-66.00m gravel, slate	1241m	West
GW106643	0.00m-0.50m soil 0.50m-7.00m sand 7.00m-16.00m gravel, coarse 16.00m-16.30m shale	1933m	West
GW021872	0.00m-0.60m Soil 0.60m-7.92m Sand Water Supply	1939m	North West
GW109865	0.00m-0.20m CONCRETE 0.20m-0.50m FILL 0.50m-4.20m CLAY 4.20m-12.00m SAND	1965m	North West
GW109863	0.00m-0.20m CONCRETE 0.20m-0.40m FILL 0.40m-5.20m CLAY 5.20m-11.60m SAND	1968m	North West
GW109866	0.00m-0.40m FILL 0.40m-12.50m SAND	1970m	North West
GW110280	0.00m-2.00m TOPSOIL 2.00m-8.00m SAND 8.00m-16.50m SAND AND GRAVEL 16.50m-17.00m SHALE	1977m	West
GW109862	0.00m-0.20m CONCRETE 0.20m-0.40m FILL 0.40m-8.20m SAND/CLAY 8.20m-11.00m SAND	1980m	North West
GW110298	0.00m-2.00m TOPSOIL 2.00m-8.00m SAND MEDIUM 8.00m-16.50m GRAVEL AND SAND 16.50m-17.00m SHALE	1980m	West
GW109864	0.00m-0.15m CONCRETE 0.15m-0.80m FILL 0.80m-5.20m SAND/CLAY 5.20m-11.85m SAND	1984m	North West

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp
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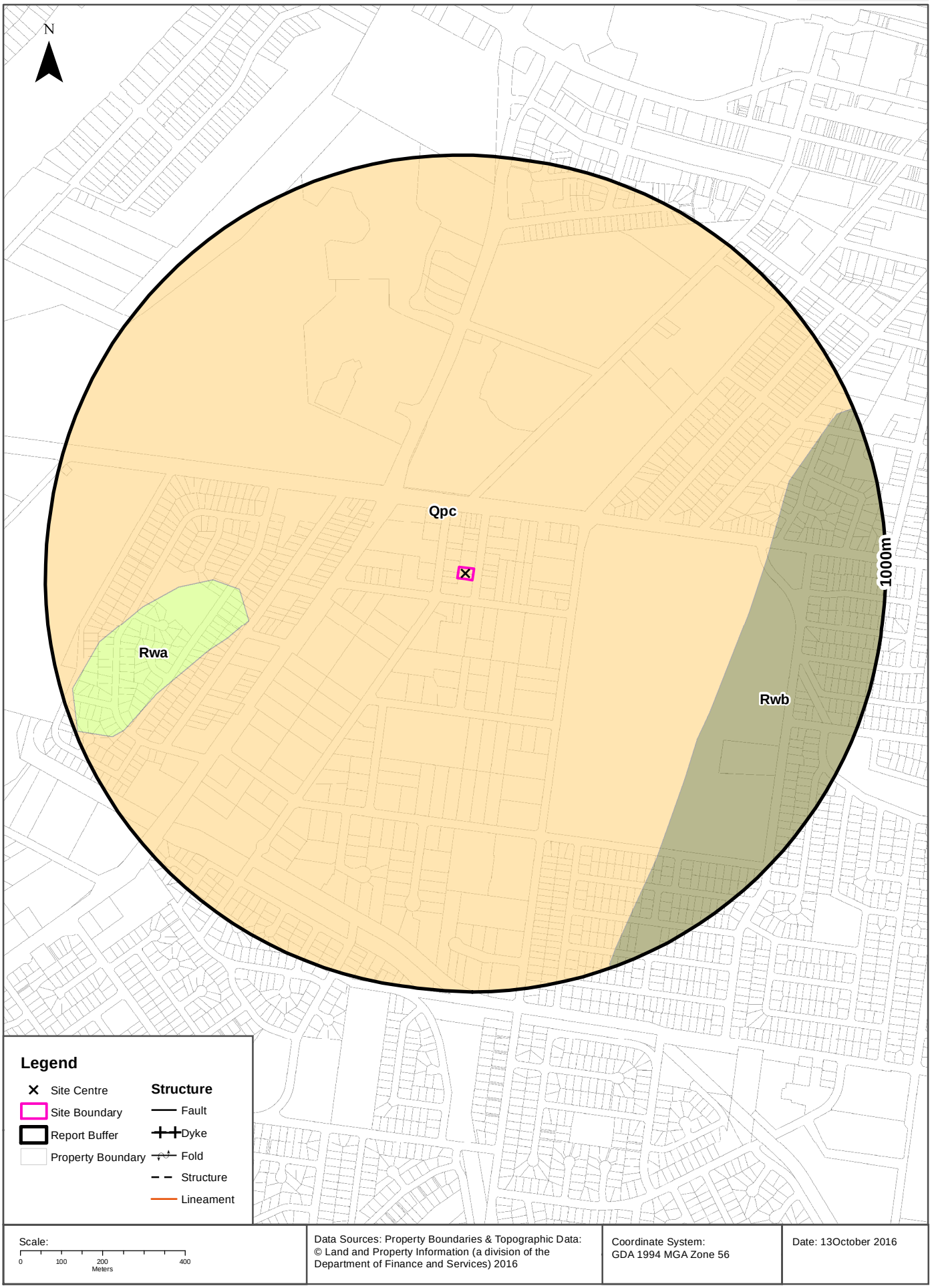
Geology 1:100,000

15-17 Dent Street, Jamisontown, NSW 2750



Geology

15-17 Dent Street, Jamisontown, NSW 2750

Geological Units

What are the Geological Units onsite?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Qpc	Gravel, sand, silt, clay	Cranebrook Formation			Quaternary		Penrith	1:100,000

What are the Geological Units within the report buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Qpc	Gravel, sand, silt, clay	Cranebrook Formation			Quaternary		Penrith	1:100,000
Rwa	Dark-grey to black claystone-siltstone and fine sandstone -siltstone laminate	Ashfield Shale	Wianamatta Group (undifferentiated)		Middle Triassic		Penrith	1:100,000
Rwb	Shale, carbonaceous claystone,claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff	Bringelly Shale	Wianamatta Group (undifferentiated)		Middle Triassic		Penrith	1:100,000

Geological Structures

What are the Geological Structures onsite?

Feature	Name	Description	Map Sheet	Dataset
No features				1:100,000

What are the Geological Structures within the report buffer?

Feature	Name	Description	Map Sheet	Dataset
No features				1:100,000

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

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Naturally Occurring Asbestos Potential

15-17 Dent Street, Jamisontown, NSW 2750

Naturally Occurring Asbestos Potential

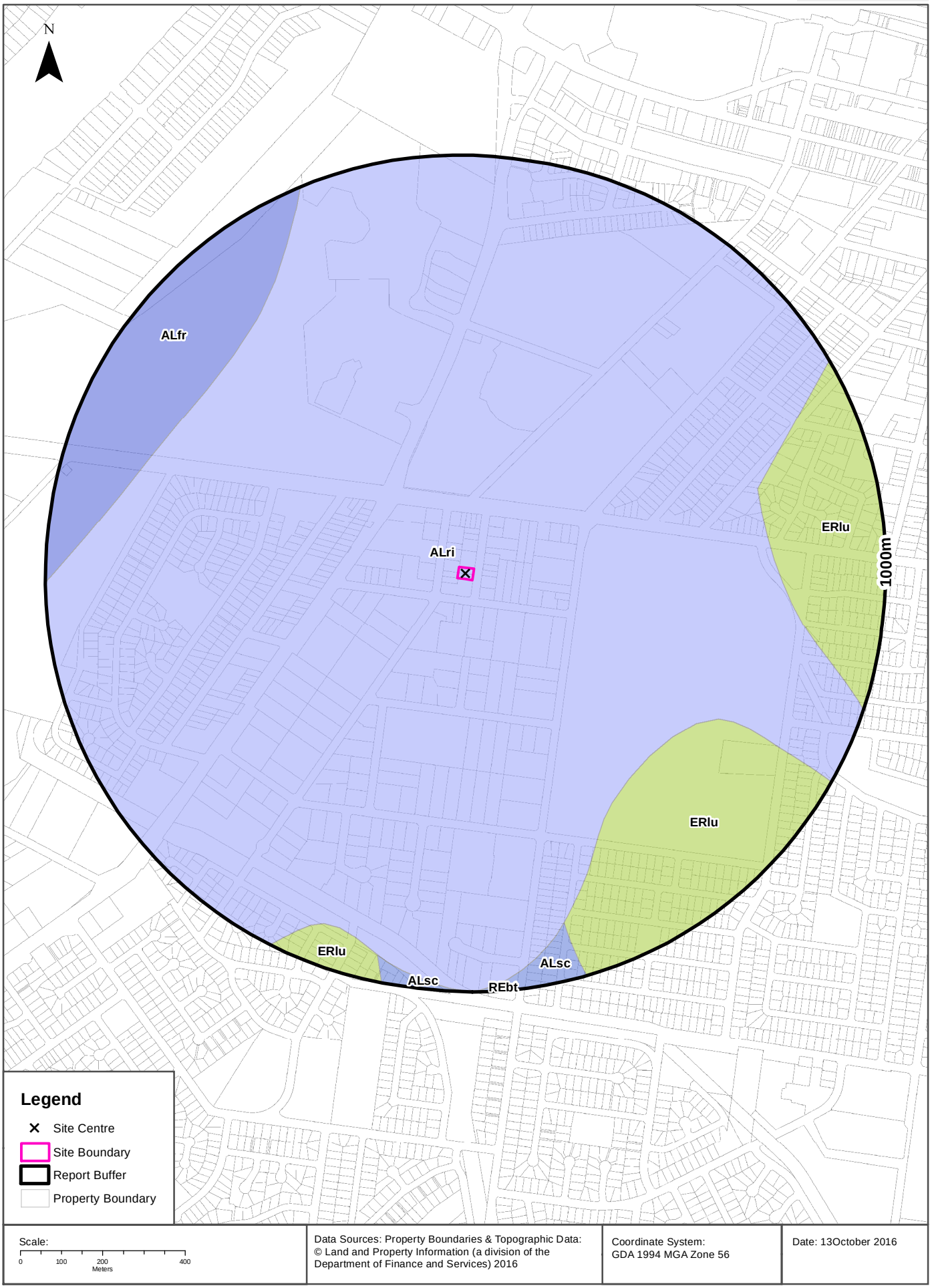
Naturally Occurring Asbestos Potential within the report buffer?

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

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

Soil Landscapes

15-17 Dent Street, Jamisontown, NSW 2750



Soils

15-17 Dent Street, Jamisontown, NSW 2750

Soil Landscapes

What are the onsite Soil Landscapes?

Soil Code	Name	Group	Process	Map Sheet	Scale
ALri	RICHMOND		ALLUVIAL	Penrith	1:100,000

What are the Soil Landscapes within the report buffer?

Soil Code	Name	Group	Process	Map Sheet	Scale
ALfr	FREEMANS REACH		ALLUVIAL	Penrith	1:100,000
ALri	RICHMOND		ALLUVIAL	Penrith	1:100,000
ALsc	SOUTH CREEK		ALLUVIAL	Penrith	1:100,000
ERlu	LUDDENHAM		EROSIONAL	Penrith	1:100,000
REbt	BLACKTOWN		RESIDUAL	Penrith	1:100,000

Soils Landscapes Data Source : NSW Office of Environment and Heritage
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Standard Local Environmental Plan Acid Sulfate Soils

15-17 Dent Street, Jamisontown, NSW 2750

Standard Local Environmental Plan Acid Sulfate Soils

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

Soil Class	Description	LEP
N/A		

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

Soil Class	Description	LEP	Distance	Direction
N/A				

Acid Sulfate Data Source Accessed 07/10/2016: NSW Crown Copyright - Planning and Environment
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Dryland Salinity

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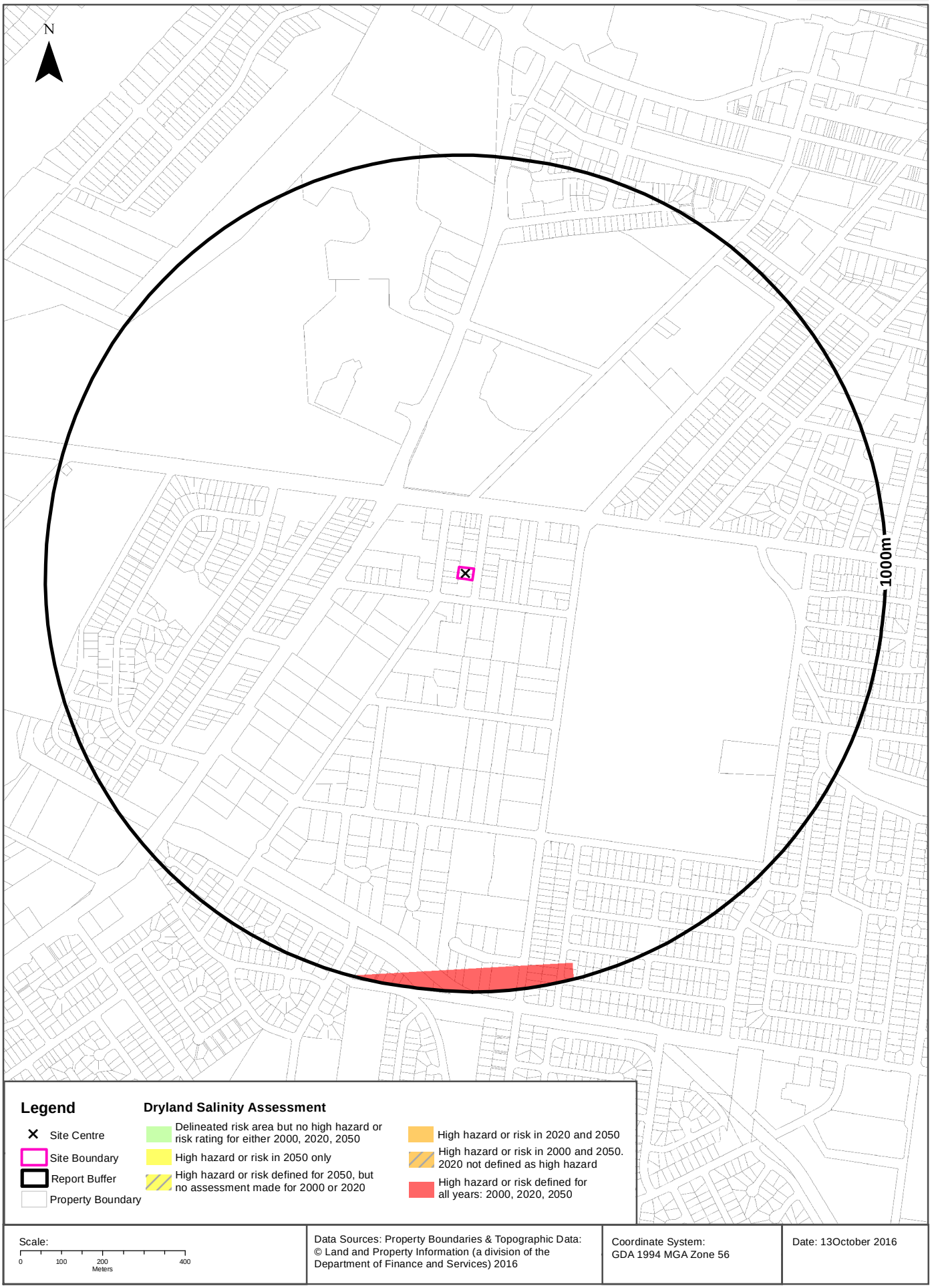

Dryland Salinity

15-17 Dent Street, Jamisontown, NSW 2750

Dryland Salinity

Is there Dryland Salinity data onsite?

No

Is there Dryland Salinity data within the report 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	940m	South East

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

Mining Subsidence Districts

15-17 Dent Street, Jamisontown, NSW 2750

Mining Subsidence Districts

Mining Subsidence Districts within the report buffer?

District	Distance	Direction
There are no Mining Subsidence Districts within the report buffer		

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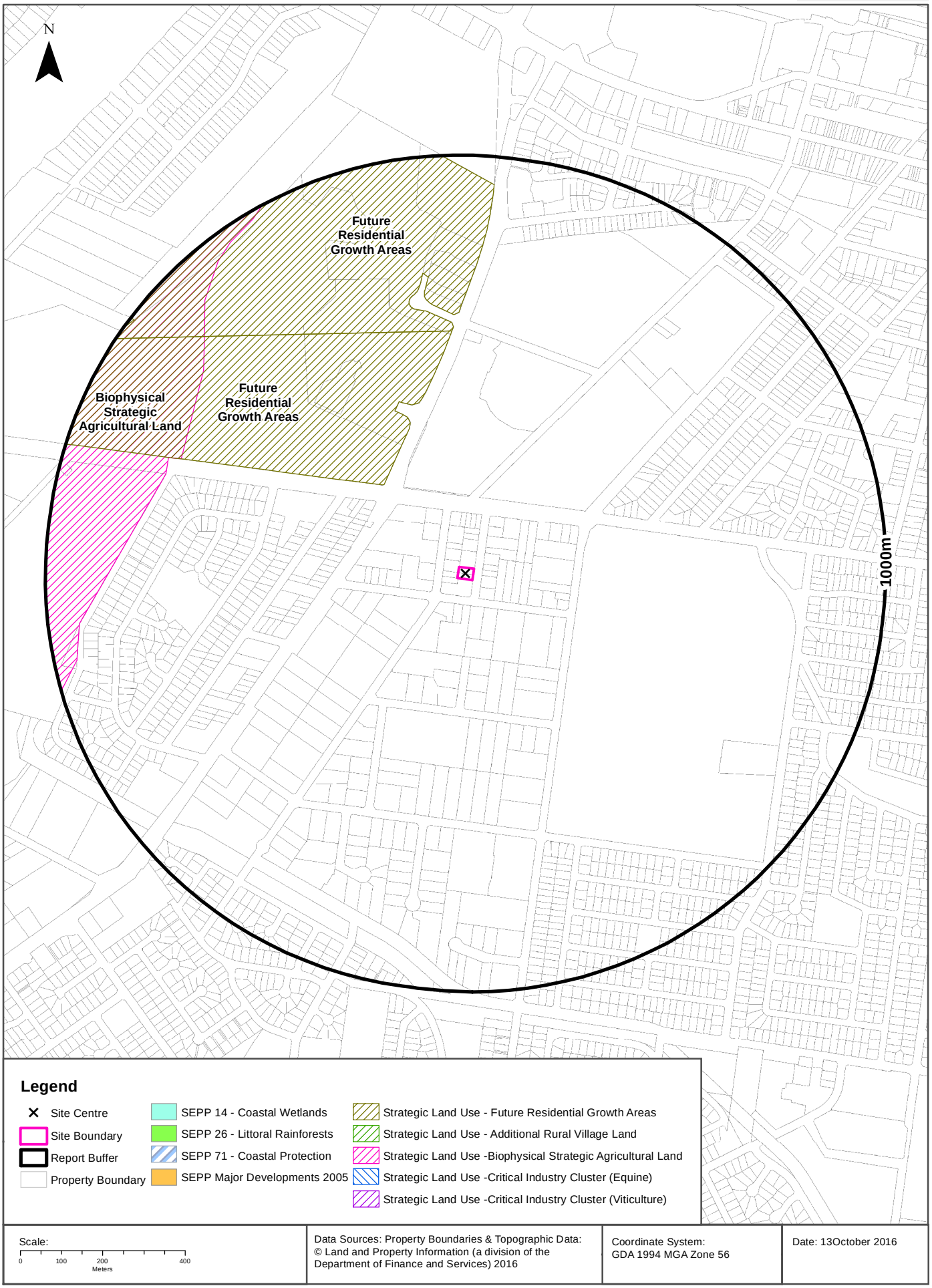
State Environmental Planning Policy

15-17 Dent Street, Jamisontown, NSW 2750



Environmental Zoning

15-17 Dent Street, Jamisontown, NSW 2750

State Environmental Planning Policy Protected Areas

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

Dataset	Onsite	Within Site Buffer	Distance
SEPP14 - Coastal Wetlands	No	No	N/A
SEPP26 - Littoral Rainforests	No	No	N/A
SEPP71 - Coastal Protection Zone	No	No	N/A

SEPP Protected Areas Data Source: NSW Department of Planning & Environment
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State Environmental Planning Policy Major Developments (2005)

State Environmental Planning Policy Major Developments within the report buffer?

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

SEPP Major Development Data Source: NSW Department of Planning & Environment
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State Environmental Planning Policy Strategic Land Use Areas

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

Strategic Land Use	SEPPNo	Effective Date	Amendment	Amendment Year	Distance	Direction
Future Residential Growth Areas	2007	28/01/2014	Coal Seam Gas	2014	271m	North West
Biophysical Strategic Agricultural Land	2007	28/01/2014	Coal Seam Gas	2014	723m	West

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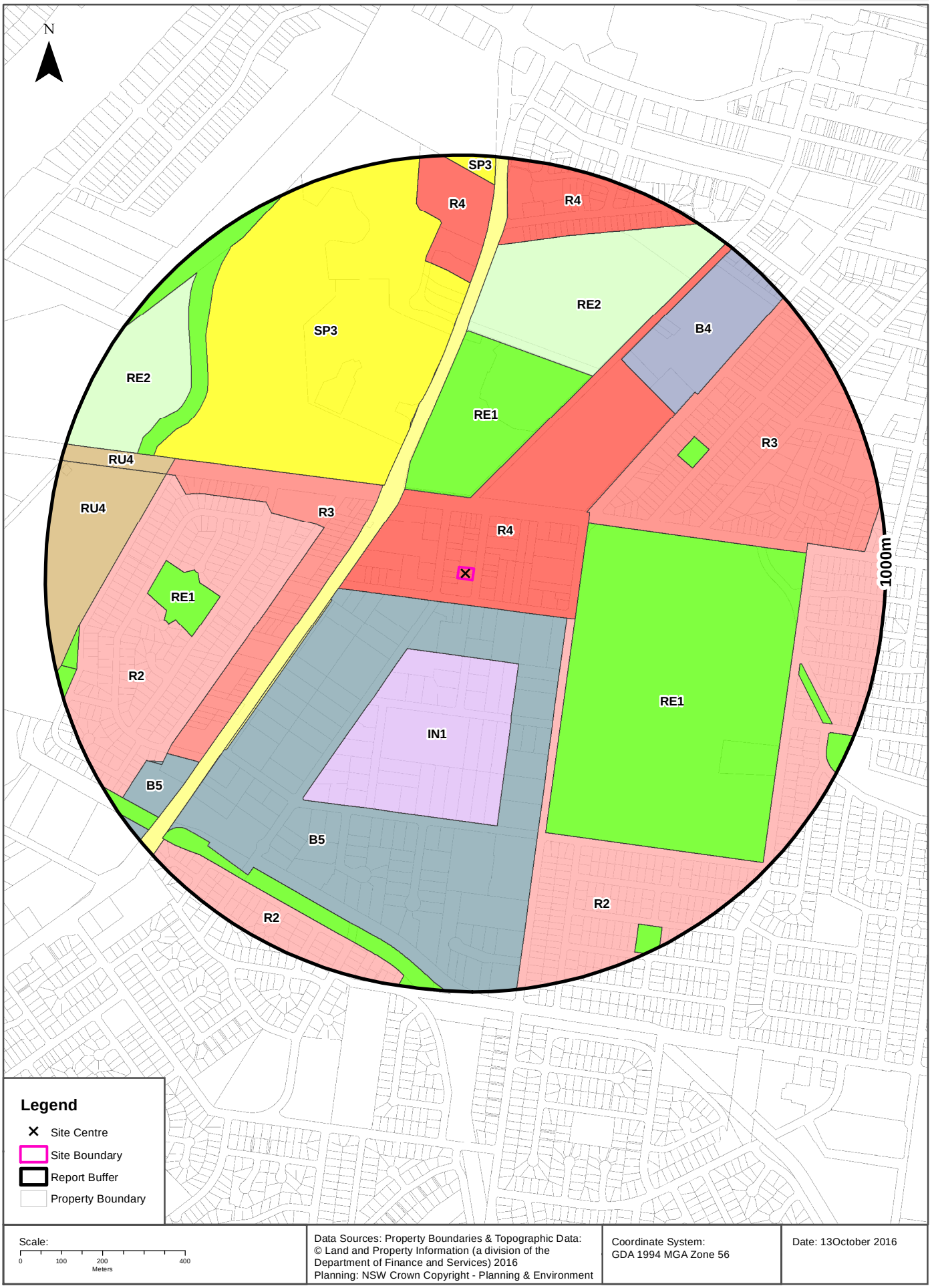
LEP Planning Zones

15-17 Dent Street, Jamisontown, NSW 2750



Local Environmental Plan

15-17 Dent Street, Jamisontown, NSW 2750

Land Zoning

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

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
R4	High Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	0m	Onsite
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	61m	South
R2	Low Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	61m	South West
R2	Low Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	151m	South East
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	171m	North
IN1	General Industrial		Penrith Local Environmental Plan 2010	22/09/2010	22/09/2010	25/02/2015		187m	South
R2	Low Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	189m	West
SP2	Infrastructure	Classified Road	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	210m	East
R2	Low Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	221m	West
R2	Low Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	245m	South East
R3	Medium Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	251m	West
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	258m	South East
SP3	Tourist		Penrith Local Environmental Plan 2010	21/06/2013	21/06/2013	25/02/2015	Amendment No 2	271m	North West
SP3	Tourist		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	272m	North West
SP3	Tourist		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	285m	North West
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	291m	West
R3	Medium Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	297m	East
SP2	Infrastructure	Local Road	Penrith Local Environmental Plan 2010	10/08/2012	10/08/2012	25/02/2015	Amendment No 1	309m	South West
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	312m	West
R2	Low Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	341m	West
SP3	Tourist		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	357m	North
SP3	Tourist		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	418m	North
SP2	Infrastructure	Classified Road	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	453m	North
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	475m	South West
RE2	Private Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	539m	North East
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	565m	North East
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	578m	West
SP3	Tourist		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	583m	North
SP2	Infrastructure	Classified Road	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	591m	North
B4	Mixed Use		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	611m	North East

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
SP2	Infrastructure	Classified Road	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	626m	North
R4	High Density Residential		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	691m	North
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	717m	South West
RE1	Public Recreation		Penrith Local Environmental Plan 2010	21/06/2013	21/06/2013	25/02/2015	Amendment No 2	738m	North West
RU4	Primary Production Small Lots		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	738m	West
RU4	Primary Production Small Lots		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	746m	West
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	772m	South West
RE2	Private Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	778m	North West
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	816m	West
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	819m	East
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	830m	South West
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	856m	South West
SP3	Tourist		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	874m	North
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	875m	South West
SP3	Tourist		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	890m	North
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	924m	West
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	926m	South East
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	930m	South West
SP3	Tourist		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	932m	North
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	940m	South West
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	940m	South East
RE1	Public Recreation		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	951m	West
B5	Business Development		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	968m	South West
RU4	Primary Production Small Lots		Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	968m	South West

Local Environment Plan Data Source: NSW Crown Copyright - Planning & Environment
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Local Environmental Plan

15-17 Dent Street, Jamisontown, NSW 2750

Minimum Subdivision Lot Size

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

Symbol	Minimum Lot Size	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
S	800 m2	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	19/02/2016	Amendment No 4	100

Maximum Height of Building

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

Symbol	Maximum Height of Building	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
P	18.00 m	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	100

Floor Space Ratio

What are the onsite Local Environmental Plan Floor Space Ratios?

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

Land Application

What are the onsite Local Environmental Plan Land Applications?

Application Type	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
Included	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	Amendment No 4	100

Land Reservation Acquisition

What are the onsite Local Environmental Plan Land Reservation Acquisitions?

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

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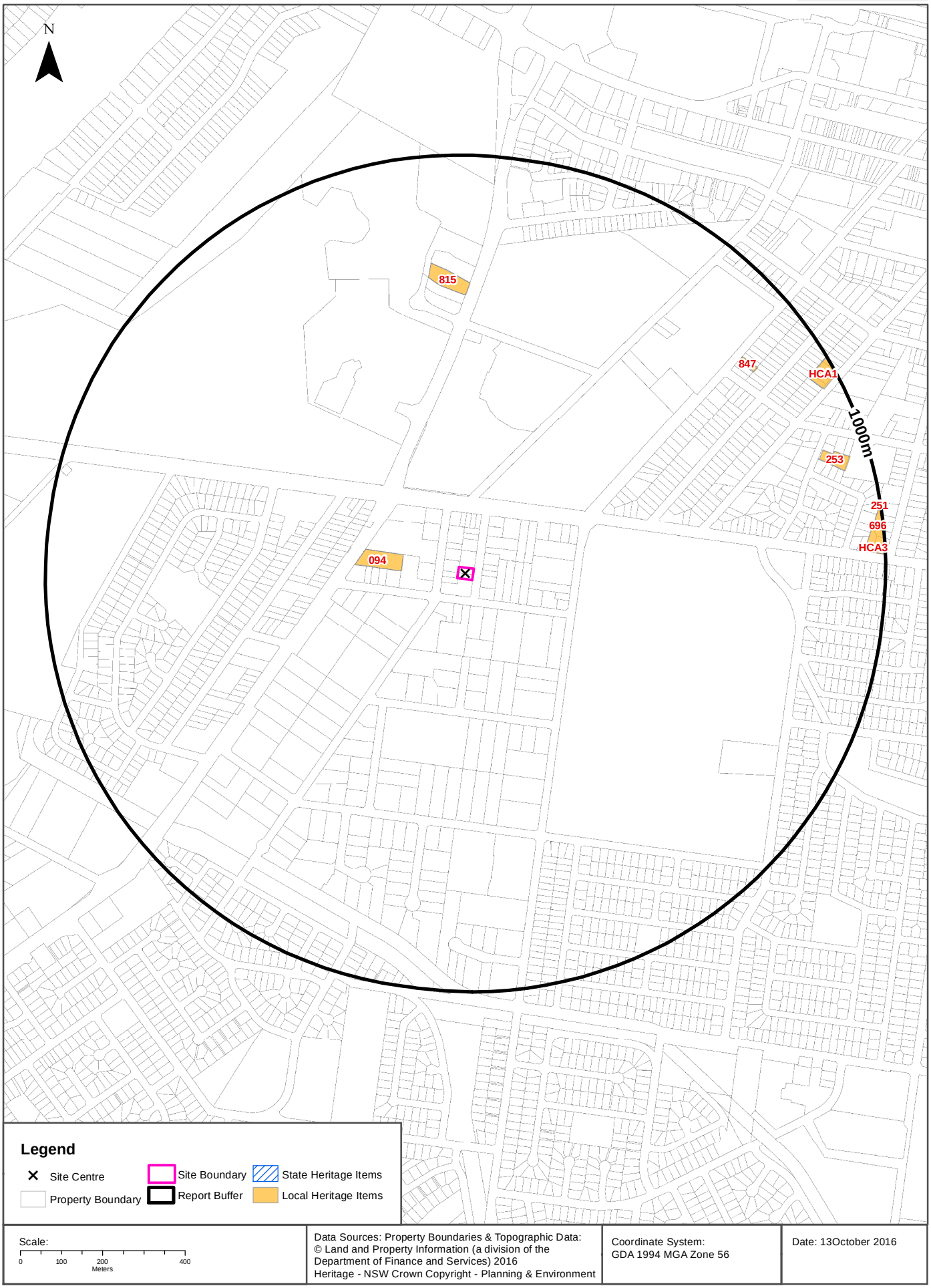
Heritage Items

15-17 Dent Street, Jamisontown, NSW 2750



Heritage

15-17 Dent Street, Jamisontown, NSW 2750

State Heritage Items

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

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

Heritage Data Source: NSW Crown Copyright - Planning & Environment
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Local Heritage Items

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

Map Id	Name	Classification	Significance	LEP or Act	Published Date	Commenced Date	Currency Date	Distance	Direction
094	Workmenâ??s cottages	Item - General	Local	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	138m	West
815	The Willows - House	Item - General	Local	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	662m	North
847	Cottage	Item - General	Local	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	818m	North East
253	Victorian house	Item - General	Local	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	879m	East
HCA1	Hornseywood	Conservation Area - General	Local	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	935m	North East
HCA3	Warwick Street	Conservation Area - General	Local	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	948m	East
696	Minnamurra - house	Item - General	Local	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	970m	East
251	The Cottage - dwelling and pine tree	Item - General	Local	Penrith Local Environmental Plan 2010	25/02/2015	25/02/2015	25/02/2015	987m	East

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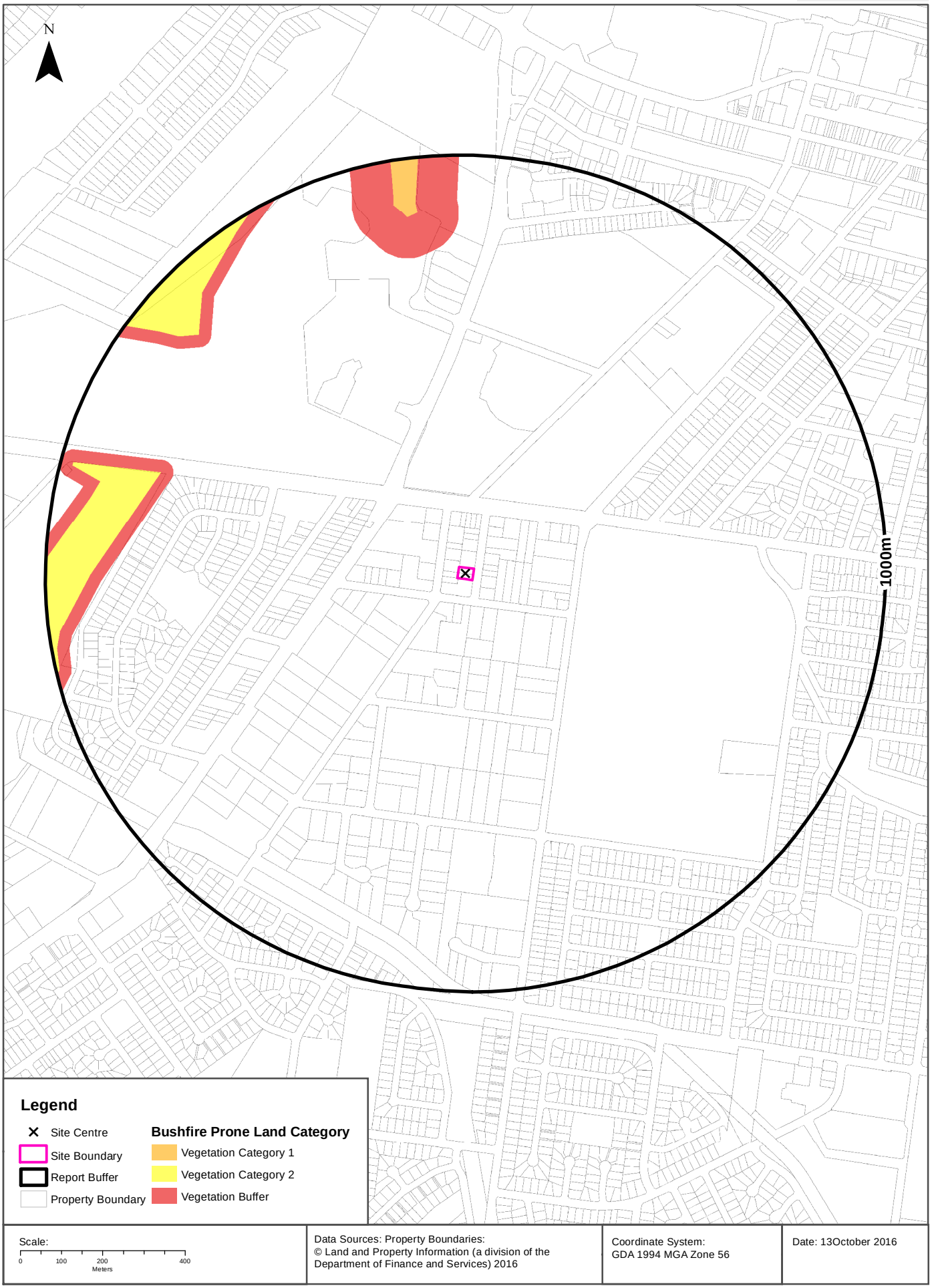
Natural Hazards - Bushfire Prone Land

15-17 Dent Street, Jamisontown, NSW 2750



Natural Hazards

15-17 Dent Street, Jamisontown, NSW 2750

Bushfire Prone Land

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

Bushfire Prone Land Category	Distance	Direction
Vegetation Buffer	728m	West
Vegetation Category 2	758m	West
Vegetation Category 1	858m	North

Bushfire Prone Land Data Reference - NSW RFS GIS Data Set

Ecological Constraints - Remnant Vegetation of the Cumberland Plain

15-17 Dent Street, Jamisontown, NSW 2750

Ecological Constraints

15-17 Dent Street, Jamisontown, NSW 2750

Remnant Vegetation of the Cumberland Plain

What remnant vegetation of the Cumberland Plain exists within the report buffer?

Description	Crown Cover	Distance	Direction
11 - Alluvial Woodland	Crown cover less than 10%	178m	North West
11 - Alluvial Woodland	Crown cover less than 10% (urban areas)	622m	South
10 - Shale Plains Woodland	Crown cover less than 10%	717m	South East

Remnant Vegetation of the Cumberland Plain : NSW Office of Environment and Heritage
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RAMSAR Wetlands

What RAMSAR Wetland areas exist within the report buffer?

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

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

Ecological Constraints

15-17 Dent Street, Jamisontown, NSW 2750

ATLAS of NSW Wildlife

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

Class	Family	Scientific	Common	Exotic	NSW Status	Commonwealth Status
Amphibia	Hylidae	Litoria aurea	Green and Golden Bell Frog	No	Endangered, Protected	Vulnerable
Amphibia	Myobatrachidae	Heleioporus australiacus	Giant Burrowing Frog	No	Vulnerable, Protected	Vulnerable
Amphibia	Myobatrachidae	Pseudophryne australis	Red-crowned Toadlet	No	Vulnerable, Protected	
Aves	Acanthizidae	Chthonicola sagittata	Speckled Warbler	No	Vulnerable, Protected	
Aves	Accipitridae	Circus assimilis	Spotted Harrier	No	Vulnerable, Protected	
Aves	Accipitridae	Hieraaetus morphnoides	Little Eagle	No	Vulnerable, Protected	
Aves	Accipitridae	Lophoictinia isura	Square-tailed Kite	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Anatidae	Stictonetta naevosa	Freckled Duck	No	Vulnerable, Protected	
Aves	Ardeidae	Botaurus poiciloptilus	Australasian Bittern	No	Endangered, Protected	Endangered
Aves	Ardeidae	Ixobrychus flavicollis	Black Bittern	No	Vulnerable, Protected	
Aves	Artamidae	Artamus cyanopterus cyanopterus	Dusky Woodswallow	No	Vulnerable, Protected	
Aves	Burhinidae	Burhinus grallarius	Bush Stone-curlew	No	Endangered, Protected	
Aves	Cacatuidae	Callocephalon fimbriatum	Gang-gang Cockatoo	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Cacatuidae	Calyptorhynchus lathami	Glossy Black-Cockatoo	No	Vulnerable, Protected, Category 2 Sensitive Species	
Aves	Ciconiidae	Ephippiorhynchus asiaticus	Black-necked Stork	No	Endangered, Protected	
Aves	Estrildidae	Stagonopleura guttata	Diamond Firetail	No	Vulnerable, Protected	
Aves	Meliphagidae	Anthochaera phrygia	Regent Honeyeater	No	Critically Endangered Species, Protected	Critically Endangered
Aves	Meliphagidae	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	No	Vulnerable, Protected	
Aves	Neosittidae	Daphoenositta chrysoptera	Varied Sittella	No	Vulnerable, Protected	
Aves	Petroicidae	Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	No	Vulnerable, Protected	
Aves	Petroicidae	Petroica boodang	Scarlet Robin	No	Vulnerable, Protected	
Aves	Petroicidae	Petroica phoenicea	Flame Robin	No	Vulnerable, Protected	
Aves	Psittacidae	Glossopsitta pusilla	Little Lorikeet	No	Vulnerable, Protected	
Aves	Psittacidae	Lathamus discolor	Swift Parrot	No	Endangered, Protected, Category 3 Sensitive Species	Critically Endangered
Aves	Psittacidae	Neophema pulchella	Turquoise Parrot	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Rostratulidae	Rostratula australis	Australian Painted Snipe	No	Endangered, Protected	Endangered
Aves	Scolopacidae	Limosa limosa	Black-tailed Godwit	No	Vulnerable, Protected	CAMBA, JAMBA, ROKAMBA
Aves	Strigidae	Ninox connivens	Barking Owl	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Strigidae	Ninox strenua	Powerful Owl	No	Vulnerable, Protected, Category 3 Sensitive Species	

Class	Family	Scientific	Common	Exotic	NSW Status	Commonwealth Status
Aves	Tytonidae	Tyto novaehollandiae	Masked Owl	No	Vulnerable, Protected, Category 3 Sensitive Species	
Aves	Tytonidae	Tyto tenebricosa	Sooty Owl	No	Vulnerable, Protected, Category 3 Sensitive Species	
Gastropoda	Camaenidae	Meridolum corneovirens	Cumberland Plain Land Snail	No	Endangered	
Insecta	Petaluridae	Petalura gigantea	Giant Dragonfly	No	Endangered	
Mammalia	Burramyidae	Cercartetus nanus	Eastern Pygmy-possum	No	Vulnerable, Protected	
Mammalia	Dasyuridae	Dasyurus maculatus	Spotted-tailed Quoll	No	Vulnerable, Protected	Endangered
Mammalia	Emballonuridae	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	No	Vulnerable, Protected	
Mammalia	Molossidae	Mormopterus norfolkensis	Eastern Freetail-bat	No	Vulnerable, Protected	
Mammalia	Petauridae	Petaurus australis	Yellow-bellied Glider	No	Vulnerable, Protected	
Mammalia	Petauridae	Petaurus norfolcensis	Squirrel Glider	No	Vulnerable, Protected	
Mammalia	Phascolarctidae	Phascolarctos cinereus	Koala	No	Vulnerable, Protected	Vulnerable
Mammalia	Pteropodidae	Pteropus poliocephalus	Grey-headed Flying-fox	No	Vulnerable, Protected	Vulnerable
Mammalia	Vespertilionidae	Chalinolobus dwyeri	Large-eared Pied Bat	No	Vulnerable, Protected	Vulnerable
Mammalia	Vespertilionidae	Falsistrellus tasmaniensis	Eastern False Pipistrelle	No	Vulnerable, Protected	
Mammalia	Vespertilionidae	Miniopterus australis	Little Bentwing-bat	No	Vulnerable, Protected	
Mammalia	Vespertilionidae	Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	No	Vulnerable, Protected	
Mammalia	Vespertilionidae	Myotis macropus	Southern Myotis	No	Vulnerable, Protected	
Mammalia	Vespertilionidae	Scoteanax rueppellii	Greater Broad-nosed Bat	No	Vulnerable, Protected	
Reptilia	Elapidae	Hoplocephalus bungaroides	Broad-headed Snake	No	Endangered, Protected, Category 2 Sensitive Species	Vulnerable
Flora	Apocynaceae	Marsdenia viridiflora subsp. viridiflora	Marsdenia viridiflora R. Br. subsp. viridiflora population in the Bankstown, Blacktown, Camden, Campbelltown, Fairfield, Holroyd, Liverpool and Penrith local government areas	No	Endangered Population	
Flora	Casuarinaceae	Allocasuarina glareicola		No	Endangered, Protected	Endangered
Flora	Dilleniaceae	Hibbertia puberula		No	Endangered, Protected	
Flora	Ericaceae	Leucopogon fletcheri subsp. fletcheri		No	Endangered, Protected	
Flora	Fabaceae (Faboideae)	Dillwynia tenuifolia		No	Vulnerable, Protected	
Flora	Fabaceae (Faboideae)	Pultenaea parviflora		No	Endangered, Protected	Vulnerable
Flora	Fabaceae (Faboideae)	Pultenaea villifera	Pultenaea villifera Sieber ex DC. population in the Blue Mountains local government area	No	Endangered Population	
Flora	Fabaceae (Mimosoideae)	Acacia bynoeana	Bynoe's Wattle	No	Endangered, Protected	Vulnerable
Flora	Myrtaceae	Eucalyptus benthamii	Camden White Gum	No	Vulnerable, Protected	Vulnerable
Flora	Myrtaceae	Melaleuca deanei	Deane's Paperbark	No	Vulnerable, Protected	Vulnerable
Flora	Myrtaceae	Micromyrtus minutiflora		No	Endangered, Protected	Vulnerable
Flora	Myrtaceae	Syzygium paniculatum	Magenta Lilly Pilly	No	Endangered, Protected	Vulnerable
Flora	Orchidaceae	Pterostylis chaetophora		No	Vulnerable, Protected, Category 2 Sensitive Species	
Flora	Orchidaceae	Pterostylis saxicola	Sydney Plains Greenhood	No	Endangered, Protected, Category 2 Sensitive Species	Endangered
Flora	Proteaceae	Grevillea juniperina subsp. juniperina	Juniper-leaved Grevillea	No	Vulnerable, Protected	

Class	Family	Scientific	Common	Exotic	NSW Status	Commonwealth Status
Flora	Proteaceae	Persoonia hirsuta	Hairy Geebung	No	Endangered, Protected, Category 3 Sensitive Species	Endangered
Flora	Proteaceae	Persoonia nutans	Nodding Geebung	No	Endangered, Protected	Endangered
Flora	Thymelaeaceae	Pimelea spicata	Spiked Rice-flower	No	Endangered, Protected	Endangered

Data does not include records not defined as either endangered or vulnerable, and category 1 sensitive species are also excluded. NSW Office of Environment and Heritage's Atlas of NSW Wildlife, which holds data from a number of custodians. Data obtained 13/10/2016

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Land Title Records

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JDC

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14th October, 2016

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

Attention: Jake Cashman,

RE: **15 – 17 Dent Street,**
Jamisontown
Job No. E29853K

Note 1:	**Common Property**	**SP 79056**	(page 1)
Note 2:	**Lot 32**	**DP 1283**	(page 4)

Note 1:

Current Search

Folio Identifier CP/SP79056 (attached)
Strata Plan 79056 (attached)
Dated 12th October, 2016
Registered Proprietor:
THE OWNERS – STRATA PLAN 79056
(2 Units in SP79056)

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Title Tree
Common Property SP79056

Folio Identifier CP/SP79056

Folio Identifier 33/1090055

Folio Identifier 33/1283

Certificate of Title Volume 5716 Folio 207

Certificate of Title Volume 5427 Folio 114

Certificate of Title Volume 5368 Folio 131

Certificate of Title Volume 3253 Folio 160

Certificate of Title Volume 718 Folio 214

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Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Summary of Proprietor(s)
Common Property SP79056

Year	Proprietor(s)
	(Common Property SP 79056)
2007 – todate	The Owners – Strata Plan No. 79056
	(Lot 33 DP 1090055)
2006 – 2007	Ida Santarossa
	(Lot 33 DP 1283)
1989 – 2006	Ida Santarossa
	(Lot 33 DP 1283 – Area 19 ¾ Perches – CTVol 5716 Fol 207)
1987 – 1989	Ida Santarossa
1981 – 1987	Agostino Santarossa, concretor Ida Santarossa, his wife
1980 – 1981	A & P Manzi Pty Limited
1947 – 1980	Jean Luxford, wife of Albert Edwin Luxford, millwright
	(Lots 29, 30, 31 & 33 DP 1283 – Area 1 Rood 39 Perches – CTVol 5427 Fol 114)
1944 – 1947	Ernest Victor Galvin, painter William Baron Lethbridge, agent
	(Lots 29 to 33 DP 1283 – Area 2 Roods 18 ¾ Perches – CTVol 5368 Fol 131)
1944 – 1944	Ernest Victor Galvin, painter William Baron Lethbridge, agent
1943 – 1944	Thomas Galvin, freeholder Ernest Victor Galvin, painter William Baron Lethbridge, agent
	(Lots 29 to 33 and Lots 41 and 42 DP 1283 – CTVol 3253 Fol 160)
1943 – 1943	Thomas Galvin, freeholder Ernest Victor Galvin, painter William Baron Lethbridge, agent
1926 – 1943	Mercy Galvin, wife of Thomas Galvin, gentleman
1922 – 1926	Beatrice Selby, spinster
1921 – 1922	Hugh Thompson, poultry farmer
	(Lots 31 to 33 DP 1283 – Area 1 Rood 19 ¼ Perches – CTVol 718 Fol 214)
1921 – 1921	William Arthur Collum, railway employee
1915 – 1921	Robert Collum, orchardist
1912 – 1915	Robert Robertson, gentleman
1911 – 1912	Emanuel Griffiths, freeholder
1889 – 1911	Hugh Millen, railway engine driver
1884 – 1889	John Millen, freeholder

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Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Note 2:

Current Search

Folio Identifier 32/1283 (attached)
DP 1283 (attached)
Dated12th October, 2016
Registered Proprietor:
BHABISHAN NATH TANCEV
STEPHANIE DE VERA

Title Tree
Lot 32 DP 1283

Folio Identifier 32/1283

Certificate of Title Volume 5427 Folio 113

Certificate of Title Volume 5368 Folio 131

Certificate of Title Volume 3253 Folio 160

Certificate of Title Volume 718 Folio 214

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Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Summary of Proprietor(s)
Lot 32 DP 1283

Year	Proprietor(s)
	(Lot 32 DP 1283)
2016 – todate	Bhabishan Nath Tancev Stephanie De Vera
1991 – 2016	Halim Boulos Fam Nahed Naguib Fam
1989 – 1991	Peter John Kable Lyn Denise Kable
	(Lot 32 DP 1283 – Area 19 ¾ Perches – CTVol 5427 Fol 113)
1985 – 1989	Peter John Kable Lyn Denise Kable
1981 – 1985	Samuel Dickey Isobel Mavis Dickey
1973 – 1981	Dennis Carpenter, despatcher Jean Ann Carpenter, wife
1971 – 1973	Mario Coratza, bricklayer
1971 – 1971	Mary Hannah Smith, widow Shirley Joan Turner, married woman Arthur James Smith, grazier
1957 – 1971	Colin Arthur Smith, grazier
1957 – 1957	Brian Stuart Lanvock, solicitor
1954 – 1957	Sydney Mulvey, printer
1944 – 1954	Gordon Scott Murray, painter
	(Lots 29 to 33 DP 1283 – Area 2 Roods 18 ¾ Perches – CTVol 5368 Fol 131)
1944 – 1944	Ernest Victor Galvin, painter William Baron Lethbridge, agent
1943 – 1944	Thomas Galvin, freeholder Ernest Victor Galvin, painter William Baron Lethbridge, agent
	(Lots 29 to 33 and Lots 41 and 42 DP 1283 – CTVol 3253 Fol 160)
1943 – 1943	Thomas Galvin, freeholder Ernest Victor Galvin, painter William Baron Lethbridge, agent
1926 – 1943	Mercy Galvin, wife of Thomas Galvin, gentleman
1922 – 1926	Beatrice Selby, spinster
1921 – 1922	Hugh Thompson, poultry farmer

Cont

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Version: 1, Version Date: 19/05/2017

Cont

	(Lots 31 to 33 DP 1283 – Area 1 Rood 19 ¼ Perches – CTVol 718 Fol 214)
1921 – 1921	William Arthur Collum, railway employee
1915 – 1921	Robert Collum, orchardist
1912 – 1915	Robert Robertson, gentleman
1911 – 1912	Emanuel Griffiths, freeholder
1889 – 1911	Hugh Millen, railway engine driver
1884 – 1889	John Millen, freeholder

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Land & Property Information

Cadastral Records Enquiry Report

Ref : eis - jamisontown

Requested Parcel : Lot 32 DP 1283 **Identified Parcel :** Lot 32 DP 1283

Locality : JAMISONTOWN **LGA :** PENRITH **Parish :** MULGOA **County :** CUMBERLAND

Report Generated 9:39:10 AM, 12 October, 2016

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This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

Advance Legal Searchers
Pty Ltd Phone: 02 9644 1679

Advance Legal Searchers Pty Ltd hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act.

Information provided through Tri-Search an approved LPI*NSW* Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 32/1283

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2016	9:41 AM	3	9/6/2016

LAND

LOT 32 IN DEPOSITED PLAN 1283
LOCAL GOVERNMENT AREA PENRITH
PARISH OF MULGOA COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1283

FIRST SCHEDULE

BHABISHAN NATH TANCEV
STEPHANIE DE VERA
AS JOINT TENANTS (T AK498048)

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AK498051 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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.

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Req:R561942 /Doc:DL Z762477 /Rev:24-Jun-2010 /Sts:OK.SC /Pgs:ALL /Prt:12-Oct-2016 09:47 /Seq:1 of 1
Ref:eis - jamisontown /Src:T

RP 13 STAMP DUTY

[redacted]

B

OFFICE USE ONLY

Z 762477 Q

$2 10

TRANSFER

REAL PROPERTY ACT, 1900

T 1 2 of 3 X $68.50 R 3/3

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
DESCRIPTION OF LAND Note (a) Volume 5427 Folio 113 Folio Identifier 32/1283	WHOLE	at Penrith Parish Mulgoa County Cumberland

TRANSFEROR Note (b): PETER JOHN KABLE and LYN DENISE KABLE

ESTATE Note (c): (the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of $ 136,500.00 and transfers an estate in fee simple in the land above described to the TRANSFEREE

TRANSFEREE Note (d): HALIM BOULOS FAM and NAHED NAGUIB FAM both of 39 John Oxley Avenue Werrington

OFFICE USE ONLY: J T 2

TENANCY Note (e): as joint tenants ~~and as tenants in common~~

PRIOR ENCUMBRANCES Note (f): subject to the following PRIOR ENCUMBRANCES 1. ..... 2. ..... 3. .....

DATE

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

EXECUTION Note (g)

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

..... Signature of Witness

ELIZABETH CANAK
Name of Witness (BLOCK LETTERS)

6 Macquarie Ave Penrith
Address and occupation of Witness

Clerk

L.D. Kable J.P.
Signature of Transferor

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

Note (g)

..... Signature of Witness

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

..... Address and occupation of Witness

.....

..... Signature of Transferee

SOLICITOR
N. WILLIAMSON

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

LODGED BY

REIMER WINTER
THE LAWYERS
DX 8006 PENRITH
88 F

Ref:
Delivery Box Number

LOCATION OF DOCUMENTS	CT	OTHER
Herewith.		
In L.T.O. with		
Produced by		

OFFICE USE ONLY

Checked	Passed	REGISTERED - -19
Signed	Extra Fee	19 JUL 1991

Secondary Directions			
Delivery Directions			

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

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Pty Ltd Phone: 02 9644 1879

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 9:44AM

FOLIO: 32/1283

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 5427 FOL 113

Recorded	Number	Type of Instrument	C.T. Issue
18/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
11/7/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
19/7/1991	Z762476	DISCHARGE OF MORTGAGE	
19/7/1991	Z762477	TRANSFER	
19/7/1991	Z762478	MORTGAGE	EDITION 1
27/6/1997	3181590	CAVEAT	
24/8/2004	AA900790	WITHDRAWAL OF CAVEAT	
8/9/2004	AA941222	DISCHARGE OF MORTGAGE	
8/9/2004	AA941223	MORTGAGE	EDITION 2
9/6/2016	AK498046	DISCHARGE OF MORTGAGE	
9/6/2016	AK498048	TRANSFER	
9/6/2016	AK498051	MORTGAGE	EDITION 3

*** END OF SEARCH ***

*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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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: CP/SP79056

SEARCH DATE	TIME	EDITION NO	DATE
12/10/2016	9:40 AM	1	12/6/2007

LAND

THE COMMON PROPERTY IN THE STRATA SCHEME BASED ON STRATA PLAN 79056
WITHIN THE PARCEL SHOWN IN THE TITLE DIAGRAM

AT PENRITH
LOCAL GOVERNMENT AREA PENRITH
PARISH OF MULGOA COUNTY OF CUMBERLAND
TITLE DIAGRAM SP79056

FIRST SCHEDULE

THE OWNERS - STRATA PLAN NO. 79056
ADDRESS FOR SERVICE OF NOTICES:
17 DENT STREET
PENRITH
NSW 2750

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 ATTENTION IS DIRECTED TO THE RESIDENTIAL SCHEMES MODEL BY-LAWS CONTAINED IN THE STRATA SCHEMES MANAGEMENT REGULATION APPLICABLE AT THE DATE OF REGISTRATION OF THE SCHEME
KEEPING OF ANIMALS - OPTION A HAS BEEN ADOPTED

SCHEDULE OF UNIT ENTITLEMENT (AGGREGATE: 20)

STRATA PLAN 79056

LOT	ENT	LOT	ENT
1	10	2	10

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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.

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

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Pty Ltd Phone: 02 9644 1879

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 9:43AM

FOLIO: CP/SP79056

First Title(s): OLD SYSTEM
Prior Title(s): 33/1090055

Recorded	Number	Type of Instrument	C.T. Issue
12/6/2007	SP79056	STRATA PLAN	FOLIO CREATED EDITION 1

*** END OF SEARCH ***

**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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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 9:45AM

FOLIO: 33/1090055

First Title(s): OLD SYSTEM
Prior Title(s): 33/1283

Recorded	Number	Type of Instrument	C.T. Issue
20/2/2006	DP1090055	DEPOSITED PLAN	FOLIO CREATED EDITION 1
12/6/2007	SP79056	STRATA PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

**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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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
12/10/2016 9:46AM

FOLIO: 33/1283

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 5716 FOL 207

Recorded	Number	Type of Instrument	C.T. Issue
17/12/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
28/7/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
27/5/1997	3095302	MORTGAGE	EDITION 1
4/5/1998	3959730	DISCHARGE OF MORTGAGE	EDITION 2
20/2/2006	DP1090055	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

*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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Version: 1, Version Date: 19/05/2017

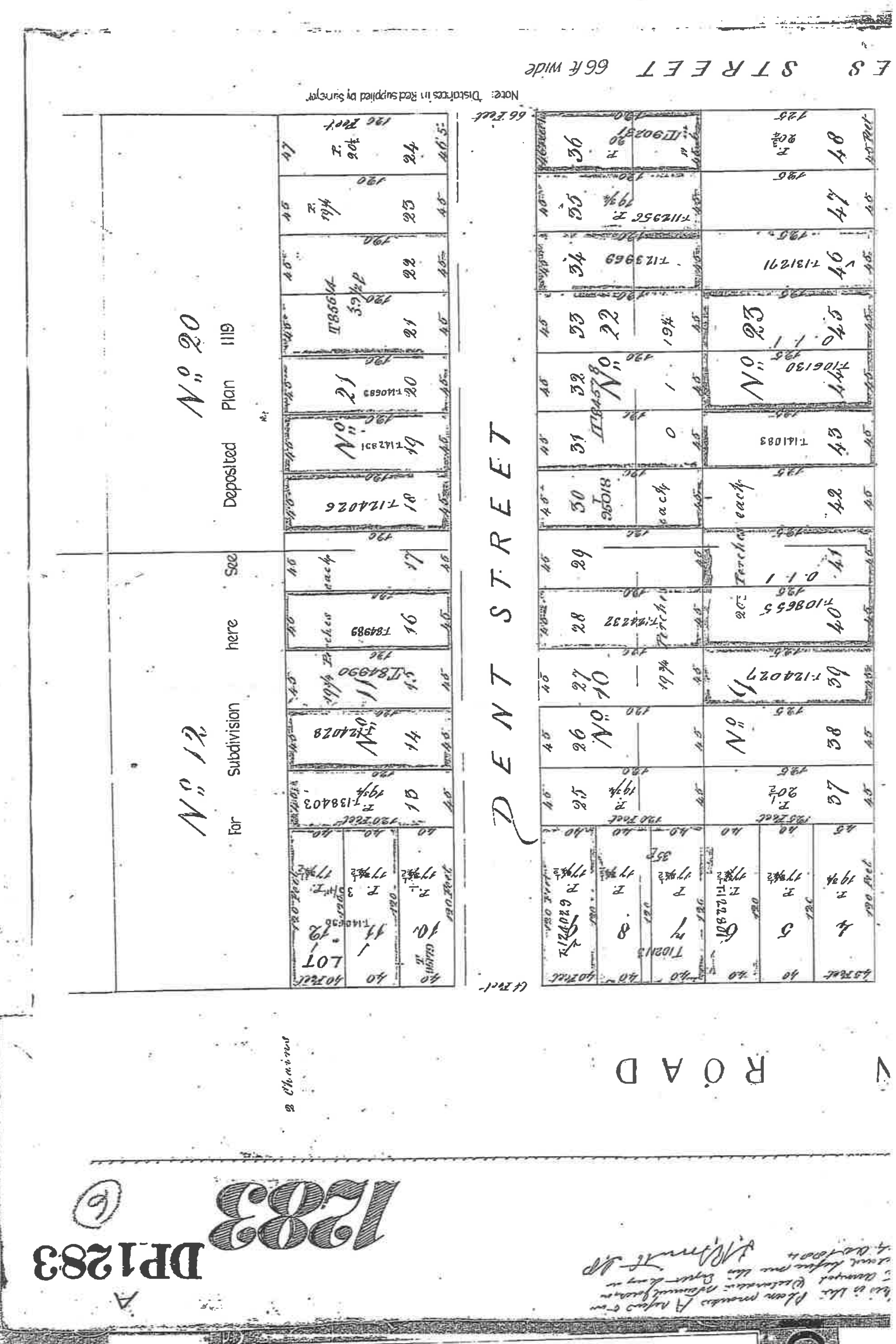
CONVERSION TABLE ADDED IN REGISTRAR GENERAL'S DEPARTMENT

DP 1283

FEET	INCHES	METRES
15	-	4.57
40	-	12.19
44	-	13.41
45	-	13.715
45	6	13.87
46	-	14.02
46	1	14.045
46	6	14.175
47	-	14.325
66	-	20.115
120	-	36.575
125	-	38.1
132	-	40.235

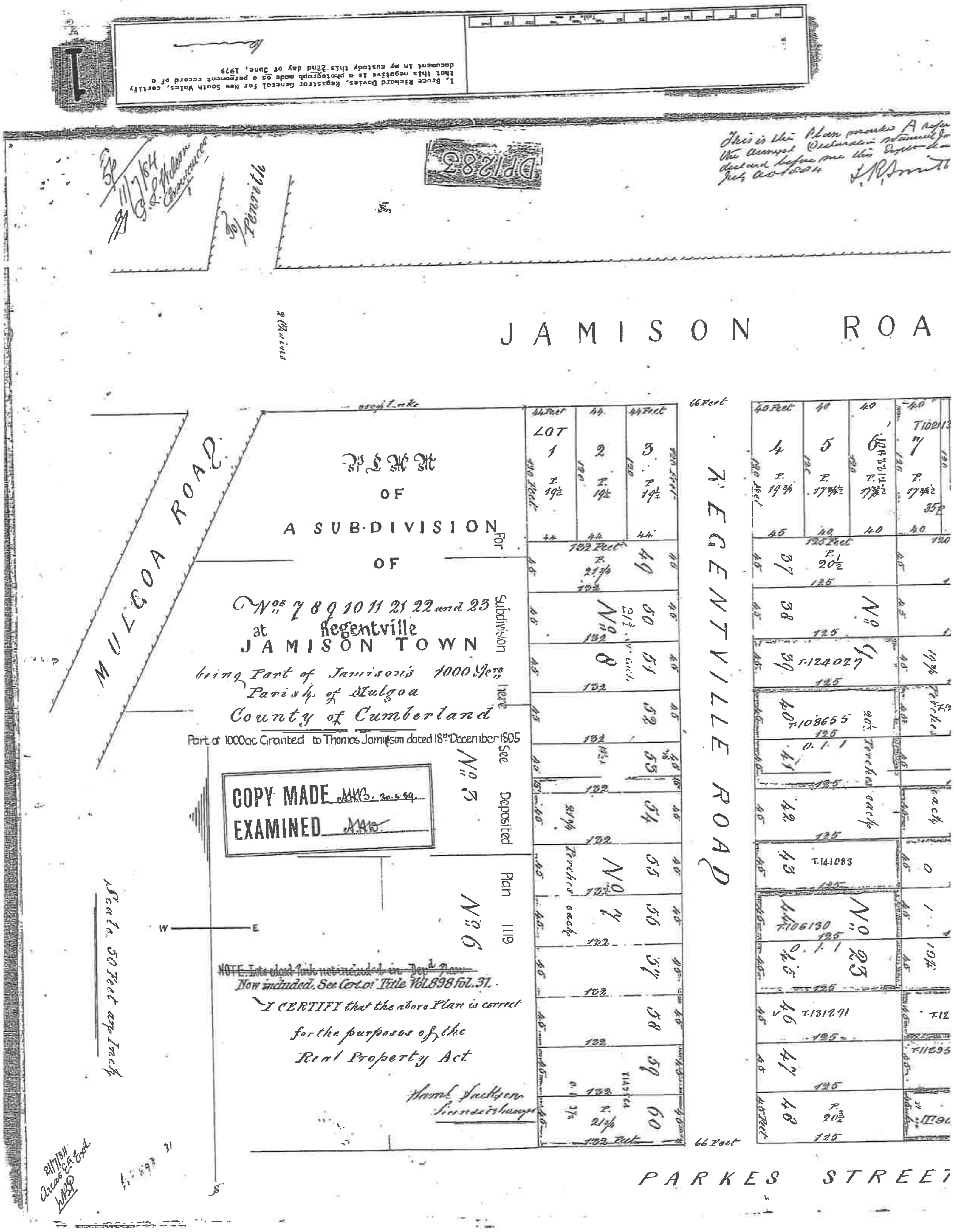
LINKS	METRES
200	40.233
350.75	70.56

AC	RD	P	SQ M
-	-	2	50.6
-	-	17 1/2	442.6
-	-	19 1/4	486.9
-	-	19 3/4	499.5
-	-	20	505.9
-	-	20 1/2	518.5
-	-	20 3/4	524.8
-	-	21 3/4	550.1
-	-	35 1/4	891.6
-	-	39 1/2	999.1
-	1	1	1037
-	1	3 1/2	1100



I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 22nd day of June, 1979

Req:R561845 /Doc:DP 0001283 P /Rev:21-Jul-1992 /Sts:OK.OK /Pgs:ALL /Prt:12-Oct-2016 09:39 /Seq:2 of 2
Ref:als /Src:T


I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 22nd day of June, 1979
DP1283
JAMISON ROAD
MULGOA ROAD
REGENTVILLE ROAD
PARKES STREET
PLAN OF A SUB-DIVISION OF Nos 7 8 9 10 11 21 22 and 23 at Regentville JAMISON TOWN
being Part of Jamison's 1000 Acres Parish of Mulgoa County of Cumberland
Part of 1000ac Granted to Thomas Jamison dated 18th December 1805
For Subdivision here See Deposited Plan 1119
No 3
No 6
No 8
No 7
No 4
No 23
COPY MADE
EXAMINED
Now included. See Cert of Title Vol.898 fol.31.
I CERTIFY that the above Plan is correct for the purposes of the Real Property Act
Scale 50 Feet an Inch
66 Feet
2 Chains

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

STRATA PLAN FORM 1

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

OFFICE USE ONLY

STRATA CERTIFICATE SC 06/00068

*Name of Council/~~*Accredited Certifier~~ PENRITH CITY

being satisfied that the requirements of the
*Strata Schemes (Freehold Development) Act 1973
*Strata Schemes (Leasehold Development) Act 1986
have been complied with, approves of the proposed:
*strata plan
~~*strata plan of subdivision~~
illustrated in the annexure to this certificate.

~~*The accredited certifier is satisfied that the plan is consistent with~~ a relevant development consent in force, and that all conditions of the development consent that by its terms are required to be complied with before a strata certificate may be issued,have been complied with

*The Strata plan/strata plan of subdivision is part of a development scheme. The *council/*accredited certifier is satisfied that the plan is consistent with any applicable conditions of any development consent and that the plan gives effect to the stage of the strata development contract to which it relates.

*The council does not object to the encroachment of the building beyond the alignment of _____

*The accredited Certifier is satisfied that the building complies with a relevant development consent in force that allows the encroachment.

*This approval is given on the condition that the use of lot(s) (being utility lot/s designed to be used primarily for the storage or accommodation of boats,motor vehicles or goods and not for human occupation as a residence, office, shop or the like) is restricted to the proprietor or occupier of a lot or proposed lot (not being such a utility lot) the subject of the strata scheme concerned, as referred to in *section 39 of the Strata Schemes (Freehold Development) Act 1973 or *section 68 of the Strata Schemes (Leasehold ~~Development~~) Act 1986.

Date 8/12/06
Subdivision No 0971/06

Application No _____
Relevant Development Consent No DA05/1431
Issued by PCC

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

*complete , or delete if applicable

SURVEYORS CERTIFICATE

I MATTHEW CHARLES FREEBURN
of 2 CASTLEREAGH STREET PENRITH 2750

a surveyor registered under the Surveying Act 2002,hereby certified that:

(1) each applicable requirement of *Schedule 1A to the Strata Schemes (Freehold Development) Act 1973 or ~~*Schedule 1A to the Strata Schemes (Leasehold Development) Act 1986 has been met~~;

~~(2) *(a) the building encroaches on a public place;~~
*(b) the building encroaches on land (other than a public place), in respect of which encroachment an appropriate easement :
* has been created by +
* is to be created under section 88B of the Conveyancing Act 1919.

(3) the survey information recorded in the accompanying location plan is accurate.

Signature M. Freeburn
Date 14/02/2006

*Delete if applicable
+State whether dealing or plan, and quote registered number.

THIS IS SHEET 1 OF MY PLAN IN 3 SHEETS

Residential Model By-laws adopted for this scheme
Keeping of Animals: Option A / ~~B / C~~
*Schedule of By-laws in sheets filed with plan
*No By-laws apply
*Strike out whichever is inapplicable

SCHEDULE OF UNIT ENTITLEMENT

LOT No	UNIT ENTITLEMENT
1	10
2	10
TOTAL	20

PLAN OF SUBDIVISION OF LOT 33 IN DP 1090055

LGA: PENRITH Suburb/Locality: PENRITH

Parish: MULGOA County: CUMBERLAND

SP79056

Registered: 12 · 6 · 2007

Purpose: STRATA PLAN

Ref.Map : U 6460 - 63

Last Plan: DP1090055

Name of, and *address for services of notices on, the owners corporation
*Address required on original strata plan only

THE OWNERS
STRATA PLAN No. 79056
17 DENT STREET
PENRITH NSW 2750

FOR LOCATION PLAN SEE SHEET 2

Signatures, seals and statements of intention to create easements,restrictions on the use of land or positive covenants

Ida Santarossa

SURVEYOR'S REFERENCE: 29 806 STRATA

Req:R561856 /Doc:SP 0079056 P /Rev:13-Jun-2007 /Sts:SC.OK /Pgs:ALL /Prt:12-Oct-2016 09:39 /Seq:1 of 3
Ref:als /Src:T

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Local Council Information

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Jake Cashman

From: Karin Fuller <Karin.Fuller@penrith.city>
Sent: Wednesday, 2 November 2016 2:48 PM
To: Jake Cashman
Subject: RE: Informal Request for Access to Information Section 8 Government Information Public Access Act 2009 for 15-17 Dent Street Jamisontown

Good Afternoon

As discussed I have been unable to locate any Contamination Reports in the Development Application files for 15-17 Dent Street Jamisontown

Kind Regards
Karin Fuller
Administration Officer - DSD

T +612 4732 7991 | F +612 4732 7958 |
PO Box 60, PENRITH NSW 2751
www.visitpenrith.com.au
www.penrithcity.nsw.gov.au

PENRITH
CITY COUNCIL

Follow us

#RESPOND 7375156
#ECMBODY

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Section 149 Certificates

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

DC

24 OCT 2016

PENRITH CITY COUNCIL

Civic Centre
601 High Street, Penrith

PO Box 60 Penrith NSW 2751

Telephone: 02 4732 7777
Facsimile: 02 4732 7958

Email: pencit@penrithcity.nsw.gov.au

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Property No:	231680	Issue Date:	18/10/2016
Your Reference:	E29853K / Post	Certificate No:	16/05261
Contact No:	02 9888 5000	Receipt Date:	17/10/2016
		Receipt No:	2614888

Issued to: Jake Cashman
115 Wicks Road
MACQUARIE PARK NSW 2113

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: MULGOA**

Location: 15 Dent Street JAMISONTOWN NSW 2750
Land Description: Lot 32 DP 1283

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 149(2) of the Act the following information is furnished in respect of the abovementioned land:

1 *NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs*

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

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):

State Environmental Planning Policy No.1 - Development Standards. (Note: This policy does not apply to the land to which Penrith Local Environmental Plan 2010 or State Environmental Planning Policy (Western Sydney Employment Area) 2009 apply.)

State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)

State Environmental Planning Policy No.21 - Caravan Parks.

State Environmental Planning Policy No.30 - Intensive Agriculture.

State Environmental Planning Policy No.32 - Urban Consolidation (Redevelopment of Urban Land). (Note: This policy does not apply to land identified as coastal protection, environmental protection, escarpment, floodway, natural hazard, non-urban, rural, rural residential, water catchment or wetland.)

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

PENRITH CITY COUNCIL

Civic Centre
601 High Street, Penrith

PO Box 60 Penrith NSW 2751

Telephone: 02 4732 7777
Facsimile: 02 4732 7958

Email: pencit@penrithcity.nsw.gov.au

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.62 - Sustainable Aquaculture.
State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (Major Development) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:
(Information is provided in this section only if a proposed environmental planning instrument that is or has been the subject of community consultation or on public exhibition under the Act will apply to the carrying out of development on the land.)

Draft State Environmental Planning Policy (Infrastructure) Amendment (Shooting Ranges) 2013 applies to the land.

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

PENRITH CITY COUNCIL

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PO Box 60 Penrith NSW 2751

Telephone: 02 4732 7777
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Email: pencit@penrithcity.nsw.gov.au

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Zone R4 High Density Residential
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To provide for the housing needs of the community within a high density residential environment.
- To provide a variety of housing types within a high density residential environment.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.
- To ensure that a high level of residential amenity is achieved and maintained.
- To encourage the provision of affordable housing.
- To ensure that development reflects the desired future character and dwelling densities of the area.

2 Permitted without consent

Home occupations

3 Permitted with consent

Boarding houses; Building identification signs; Business identification signs; Car parks; Child care centres; Community facilities; Emergency services facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Home-based child care; Home businesses; Information and education facilities; Neighbourhood shops; Places of public worship; Recreation areas; Recreation facilities (indoor); Residential accommodation; Respite day care centres; Roads; Shop top housing

4 Prohibited

Rural workers' dwellings; Any other development not specified in item 2 or 3

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

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Facsimile: 02 4732 7958

Email: pencit@penrithcity.nsw.gov.au

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Under the terms of Clause 5.9 of Penrith Local Environmental Plan 2010 trees or other vegetation subject to relevant sections of Penrith Development Control Plan 2014 must not be ringbarked, cut down, topped, lopped, removed, injured or wilfully destroyed without the authority conferred by a development consent or a Council permit.

Note 9: Under the terms of Clause 5.9AA of Penrith Local Environmental Plan 2010 (PLEP 2010) any tree or other vegetation that is not of a species or kind prescribed for the purposes of Clause 5.9 of PLEP 2010 by Penrith Development Control Plan 2014 may be ringbarked, cut down, topped, lopped, removed, injured or destroyed without development consent.

Note 10: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 11: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 12: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 13: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

3 COMPLYING DEVELOPMENT

GENERAL HOUSING CODE

(The General Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the General Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

RURAL HOUSING CODE

(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Rural Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

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Complying development under the Commercial and Industrial (New Buildings and Alterations) Code **may** be carried out on the land if the land is within one of the abovementioned zones.

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

5 MINE SUBSIDENCE

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

6 ROAD WIDENING AND ROAD REALIGNMENT

The 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) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies
The land is affected by the Asbestos Policy adopted by Council.
The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies
The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.
The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) This land has not been identified as being below the adopted flood planning level (ie. the 1% Annual Exceedance Probability flood level plus 0.5 metre) and as such flood related development controls generally do not apply for dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) if such uses are permissible on the land. Council reserves the right, however, to apply flood related development controls depending on the merits of any particular application. Should future studies change this situation this position may be reviewed.

(2) This land has not been identified as being below the adopted flood planning level (ie. the 1% Annual Exceedance Probability flood level plus 0.5 metre) and as such flood related development controls generally do not apply for any other purpose not referred to in (1) above. Council reserves the right, however, to apply flood related development controls depending on the merits of any particular application. Should future studies change this situation this position may be reviewed.

8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan 2007 applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park). See <http://www.penrithcity.nsw.gov.au/uploadedFiles/Content/Website/Our_Services/Planning_and_Development/Planning__Zoning_Information/Local_Planning_Documents/LocalOpenSpaceDCP(1).pdf>

The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*).)

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10 BIOBANKING AGREEMENTS

(Information is provided in this section only if Council has been notified by the Director-General of the Department of Environment, Climate Change and Water that the land is land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates.)

11 BUSH FIRE PRONE LAND

The land is not identified as bush fire prone land according to Council records.

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

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

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

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

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

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(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

18 PAPER SUBDIVISION INFORMATION

(Information is provided in this section only if a development plan adopted by a relevant authority applies to the land or is proposed to be subject to a consent ballot, or a subdivision order applies to the land.)

19 SITE VERIFICATION CERTIFICATES

(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

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

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 – a copy of which has been provided to Council.)

Note: Section 149(5) information for this property may contain additional information regarding contamination issues.

Note: The Environmental Planning and Assessment Amendment Act 1997 commenced operation on the 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 and Environmental Planning and Assessment Regulation 2000.

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Information is provided only to the extent that Council has been notified by relevant government departments.

149(5) Certificate
This Certificate is directed to the following relevant matters affecting the land

When information pursuant to section 149(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6) which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Note:

- Council's 149(5) information does not include development consent or easement information. Details of development consents may be obtained by making enquiries with Council's Development Services Department pursuant to section 12 of the Local Government Act 1993 or (for development applications lodged after January 2007) by viewing the Online Services area at www.penrithcity.nsw.gov.au . Details of any easements may be obtained from a Title Search at Land and Property Information New South Wales.
- This certificate does not contain information relating to Complying Development Certificates.
- This certificate may not provide full details of development rights over the land.
-

* Threatened Species Conservation Act 1995

When considering any development application Council must have regard to the Threatened Species Conservation Act 1995. Please note that this legislation may have application to any land throughout the city. Interested persons should make their own enquiries in regard to the impact that this legislation could have on this land.

* Preservation of Trees and Vegetation

See Clauses 5.9 and 5.9AA of Penrith Local Environmental Plan 2010 and Chapter C2 of Penrith Development Control Plan 2014 for specific controls relating to the preservation of trees and vegetation.

* Development Control Plan General Information

Penrith Development Control Plan 2014 which applies to the land, sets out requirements for a range of issues that apply across the Penrith Local Government Area, including:

- Site Planning and Design Principles
- Vegetation Management
- Water Management
- Land Management
- Waste Management
- Landscape Design
- Culture and Heritage
- Public Domain
- Advertising and Signage
- Transport, Access and Parking
- Subdivision
- Noise and Vibration, and
- Infrastructure and Services.

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The Development Control Plan also specifies requirements relating to various types of land uses including:

- Rural Land Uses
- Residential Development
- Commercial and Retail Development, and
- Industrial Development

as well as for a number of specific activities, including child care centres; health consulting rooms; educational establishments; parent friendly amenities; places of public worship; vehicle repair stations; cemeteries, crematoria and funeral homes; extractive industries; and telecommunication facilities.
The Development Control Plan also details requirements relating to key precincts within the Penrith Local Government Area, including:

- Caddens
- Claremont Meadows Stage 2
- Cranebrook
- Emu Heights
- Emu Plains
- Erskine Business Park
- Glenmore Park
- Kingswood
- Mulgoa Valley
- Orchard Hills
- Penrith
- Penrith Health and Education Precinct
- Riverlink Precinct
- St Clair, and
- St Marys / St Marys North.

Penrith Development Control Plan 2014 may be accessed at https://www.penrithcity.nsw.gov.au/Building-and-Development/Planning-and-Zoning/Planning-Controls/Development-Control-Plans/

Alan Stoneham
General Manager

PER

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SafeWork NSW Records

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JDC

27 OCT 2016

NSW GOVERNMENT | SafeWork NSW

SafeWork NSW
92-100 Donnison Street, Gosford, NSW, 2250
Locked Bag 2906, Lisarow, NSW, 2252 |
Customer Service Centre **13 10 50**
licensing@safework.nsw.gov.au | www.safework.nsw.gov.au

Our Ref: D16/690997
Your ref: Jake Cashman

24 October 2016

Attention: Jake Cashman
Environmental Investigation Services
PO BOX 976
North Ryde BC NSW 1670

Dear Mr Cashman,

RE SITE: 15-17 Dent St Jamisontown NSW

I refer to your site search request received by SafeWork NSW on 17 October 2016 requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above mentioned premises.

For further information or if you have any questions, please call our Customer Service Centre on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely,

Brent Jones
Customer Service Officer
Customer Service Centre - Operations
SafeWork NSW

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Appendix B: Borehole Logs

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 1
1/2

Client: BISHI CONSTRUCTIONS PTY LTD
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 15-17 DENT STREET, JAMISONTOWN, NSW

Job No. 29853Z
Date: 20-10-16
Method: SPIRAL AUGER JK300
Logged/Checked by: A.C.K./A.Z.
R.L. Surface: ≈ 28.6m
Datum: AHD

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0			TOPSOIL: Silty clay, low plasticity, dark brown.	MC<PL	(St)		GRASS COVER TO 50mm DEPTH
					N = 20 5,7,13	0.5		CL	SILTY CLAY: low to medium plasticity, light grey and light brown, trace of root fibres.	MC<PL	H	>600 >600 >600	FLUVIAL
					N = 16 4,6,10	1.5			SILTY CLAY: medium plasticity, light grey brown and orange brown.	MC≈PL		475 300 >600	
					N = 32 14,16,16	2.5			SILTY CLAY: low plasticity, brown, with fine grained sand.	MC<PL		>600 >600 >600	
						4		SM	SILTY SAND: fine to medium grained, brown, trace of clay nodules.	M	(L-MD)		
					N > 15 9,15/ 150mm REFUSAL	4.5		GC	SILTY CLAYEY GRAVEL: fine to coarse grained, sub angular and sub rounded igneous, light grey and grey, low plasticity clay, trace of fine grained sand.		(D)		VERY HIGH 'TC' BIT RESISTANCE

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. 1
2/2

Client: BISHI CONSTRUCTIONS PTY LTD
Project: PROPOSED RESIDENTIAL DEVELOPMENT
Location: 15-17 DENT STREET, JAMISONTOWN, NSW

Job No. 29853Z
Date: 20-10-16
Method: SPIRAL AUGER JK300
Logged/Checked by: A.C.K./A.Z.
R.L. Surface: ≈ 28.6m
Datum: AHD

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
ON COMPLET-ION									SILTY CLAYEY GRAVEL: medium to coarse grained, sub angular and sub rounded igneous, light grey and grey, trace of fine grained sand.	M	(D)		VERY HIGH RESISTANCE
						8		SM	SILTY SAND: fine to medium grained, light grey and brown.	W	(MD)		
AFTER 0.5 HRS					Nc= 20 REF.	9		SC	CLAYEY SAND: fine grained, light grey brown, medium to coarse grained gravel.				
						10							
						11			END OF BOREHOLE AT 11.0m				TERMINAL DUR TO COLLAPSE MONITORING WELL INSTALLED TO 9.2m, CLASS 18 MACHINE SLOTTED 50mm PVC 3.2m TO 9.2m, CASING 0m TO 3.2m, 2mm SAND FILTER 2.7m TO 9.2m, BENTONITE SEAL 0.15m TO 2.7m, COMPLETED WITH GATIC COVER AT SURFACE
						12							
						13							
						14							

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GEOTECHNICAL AND ENVIRONMENTAL ENGINEERS

BOREHOLE LOG

Borehole No. **2** 1/1

Client: BISHI CONSTRUCTIONS PTY LTD

Project: PROPOSED RESIDENTIAL DEVELOPMENT

Location: 15-17 DENT STREET, JAMISONTOWN, NSW

Job No. 29853Z **Method:** SPIRAL AUGER JK300 **R.L. Surface:** ≈ 28.9m

Date: 20-10-16 **Datum:** AHD

Logged/Checked by: A.C.K./A.Z.

Groundwater Record	SAMPLES ES	SAMPLES U50	SAMPLES DB	SAMPLES DS	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
						0			FILL: Silty clay, low plasticity, trace of fine grained ironstone gravel.	MC<PL			GRASS COVER TO 50mm DEPTH
					N = 10 2,4,6			CL	SILTY CLAY: medium plasticity, light grey and light brown, trace of fine grained sand.	MC>PL	VSt	320 230 240	FUUVIAL
						1							
					N = 12 3,5,7							215 180 190	
						2							
									SILTY CLAY: low plasticity, grey and orange brown, trace of fine grained sand.				
					N = 15 5,6,9	3					St-VSt	250 140 130	
						4							
					N = 25 7,12,13			SM	SILTY SAND: fine grained, brown, trace of clayey nodules.	M	MD		
						5		GC	SILTY CLAYEY GRAVEL: coarse grained, light grey igneous, medium to high plasticity clay, trace of fine grained sand.		(D)		VERY HIGH 'TC' BIT RESISTANCE
						6			END OF BOREHOLE AT 6.0m				'TC' BIT REFUSAL
						7							

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EXPLANATORY NOTES – ENVIRONMENTAL LOGS

INTRODUCTION

These notes have been provided to supplement the environmental report with regards to drilling and field logging. 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 manmade processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies involve gathering and assimilating limited facts about these characteristics and properties in order to understand the ground on a particular site under certain conditions. These conditions 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, the SAA Site Investigation Code. 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 geotechnical practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached Unified Soil Classification Table qualified by the grading of other particles present (e.g. sandy clay) as set out below (note that unless stated in the report, the soil classification is based on a qualitative field assessment, not laboratory testing):

Soil Classification	Particle Size
Clay	less than 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2mm
Gravel	2 to 60mm

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	less than 4
Loose	4 – 10
Medium dense	10 – 30
Dense	30 – 50
Very Dense	greater than 50

Cohesive soils are classified on the basis of strength (consistency) either by use of hand penetrometer, laboratory testing or engineering examination. The strength terms are defined as shown in the following table:

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Classification	Unconfined Compressive Strength kPa
Very Soft	less than 25
Soft	25 – 50
Firm	50 – 100
Stiff	100 – 200
Very Stiff	200 – 400
Hard	Greater than 400
Friable	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 thinly bedded to laminated siltstone.

DRILLING OR EXCAVATION METHODS

The following is a brief summary of drilling and excavation methods currently adopted by the Company, and some comments on their use and application. All except test pits and hand auger drilling require the use of a mechanical drilling rig.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the in-situ soils if it is safe to descend into the pit. The depth of penetration is limited to approximately 3m for a backhoe and up to 6m for an excavator. Limitations of test pits include problems associated with disturbance and difficulty of reinstatement; and the consequent effects on nearby structures. Care must be taken if construction is to be carried out near test pit locations to either properly re-compact 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. Premature refusal of the hand augers can occur on a variety of materials such as fill, hard clay, gravel or ironstone, 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 in-situ 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 relatively lower 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 fragments. 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 determined from the cuttings, together with some information from "feel" and rate of penetration.

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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 such as Revert or Biogel. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (e.g. 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, an NMLC triple tube core barrel, which gives a core of about 50mm diameter, 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 CORE LOSS. The locations of losses are determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the top end 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, "Methods of Testing Soils for Engineering Purposes" – Test F3.1.

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 63kg 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. Occasionally, the drop hammer is used to drive 50mm diameter thin walled sample tubes (U50) in clays. In such circumstances, the test results are shown on the borehole logs in brackets.

A modification to the SPT test 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 "Nc" 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 attached explanatory notes define the terms and symbols used in preparation of the logs.

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"

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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; and
- 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 water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after stabilising 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 (e.g. bricks, concrete, plastic, slag/ash, 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 determine the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density, strength and material type is much greater than with natural soil deposits. If the volume and quality 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 classifications and rocks strengths indicated on the environmental logs unless noted in the report.

SITE ANOMALIES

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, EIS should be notified immediately.

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GRAPHIC LOG SYMBOLS FOR SOIL AND ROCKS

SOIL


FILL


TOPSOIL


CLAY (CL, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CH)


SILTY CLAY (CL, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML)


PEAT AND ORGANIC SOILS

ROCK


CONGLOMERATE


SANDSTONE


SHALE


SILTSTONE, MUDSTONE, CLAYSTONE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

DEFECTS AND INCLUSIONS


CLAY SEAM


SHEARED OR CRUSHED SEAM


BRECCIATED OR SHATTERED SEAM/ZONE


IRONSTONE GRAVEL


ORGANIC MATERIAL

OTHER MATERIALS


CONCRETE


BITUMINOUS CONCRETE, COAL


COLLUVIUM

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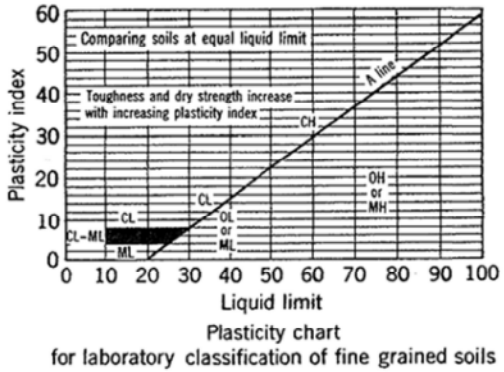
Field Identification Procedures (Excluding particles larger than 75 μm and basing fractions on estimated weights)						Group Symbols [a]	Typical Names	Information Required for Describing Soils	Laboratory Classification Criteria
Coarse-grained soils More than half of material is *larger* than 75 μm sieve size[b] (The 75 μm sieve size is about the smallest particle visible to naked eye)	Gravels More than half of coarse fraction is larger than 4 mm sieve size	Clean gravels (little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes			*GW*	Well graded gravels, gravel-sand mixtures, little or no fines	Give typical name; indicate approximate percentages of sand and gravel; maximum size; angularity, surface condition, and hardness of the coarse grains; local or geologic name and other pertinent descriptive information; and symbols in parentheses For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics Example: *Silty sand*, gravelly; about 20% hard, angular gravel particles 12 mm maximum size; rounded and subangular sand grains coarse to fine, about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (*SM*)	Use grain size curve in identifying the fractions as given under field identification Determine percentages of gravel and sand from grain size curve Depending on percentage of fines (fraction smaller than 75 μm sieve size) coarse grained soils are classified as follows: Less than 5% *GW*, *GP*, *SW*, *SP* More than 12% *GM*, *GC*, *SM*, *SC* 5% to 12% *Borderline* cases requiring use of dual symbols $C_U = \frac{D_{60}}{D_{10}}$ Greater than 4 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *GW* Atterberg limits below "A" line, or *PI* less than 4 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits above "A" line, with *PI* greater than 7
			Predominantly one size or a range of sizes with some intermediate sizes missing			*GP*	Poorly graded gravels, gravel-sand mixtures, little or no fines		
		Gravels with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures see *ML* below)			*GM*	Silty gravels, poorly graded gravel-sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*GC*	Clayey gravels, poorly graded gravel-sand-clay mixtures		
	Sands More than half of coarse fraction is smaller than 4 mm sieve size	Clean sands (little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes			*SW*	Well graded sands, gravelly sands, little or no fines		$C_U = \frac{D_{60}}{D_{10}}$ Greater than 6 $C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3 Not meeting all gradation requirements for *SW* Atterberg limits below "A" line or *PI* less than 5 — Above "A" line with *PI* between 4 and 7 are *borderline* cases requiring use of dual symbols Atterberg limits below "A" line with *PI* greater than 7
			Predominantly one size or a range of sizes with some intermediate sizes missing			*SP*	Poorly graded sands, gravelly sands, little or no fines		
		Sands with fines (appreciable amount of fines)	Nonplastic fines (for identification procedures, see *ML* below)			*SM*	Silty sands, poorly graded sand-silt mixtures		
			Plastic fines (for identification procedures, see *CL* below)			*SC*	Clayey sands, poorly graded sand-clay mixtures		
Fine-grained soils More than half of material is *smaller* than 75 μm sieve size	Identification Procedures on Fraction Smaller than 380 μm Sieve Size		Dry Strength (crushing characteristics)	Dilatancy (reaction to shaking)	Toughness (consistency near plastic limit)				
	Silts and clays liquid limit less than 50		None to slight	Quick to slow	None	*ML*	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree and character of plasticity, amount and maximum size of coarse grains; colour in wet condition, odour if any, local or geologic name, and other pertinent descriptive information, and symbol in parentheses For undisturbed soils add information on structure, stratification, consistency in undisturbed and remoulded states, moisture and drainage conditions Example: *Clayey silt*, brown; slightly plastic; small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (*ML*)	
			Medium to high	None to very slow	Medium	*CL*	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays		
			Slight to medium	Slow	Slight	*OL*	Organic silts and organic silt-clays of low plasticity		
	Silts and clays liquid limit greater than 50		Slight to medium	Slow to none	Slight to medium	*MH*	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts		
			High to very high	None	High	*CH*	Inorganic clays of high plasticity, fat clays		
			Medium to high	None to very slow	Slight to medium	*OH*	Organic clays of medium to high plasticity		
Highly Organic Soils			Readily identified by colour, odour, spongy feel and frequently by fibrous texture			*Pt*	Peat and other highly organic soils		



Plasticity chart
for laboratory classification of fine grained soils

Note: 1 Soils possessing characteristics of two groups are designated by combinations of group symbols (eg. GW-GC, well graded gravel-sand mixture with clay fines).
2 Soils with liquid limits of the order of 35 to 50 may be visually classified as being of medium plasticity.

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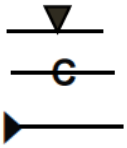
LOG SYMBOLS

LOG COLUMN	SYMBOL	DEFINITION
Groundwater Record		Standing water level. Time delay following completion of drilling may be shown. Extent of borehole collapse shortly after drilling. Groundwater seepage into borehole or excavation noted during drilling or excavation.
Samples	ES U50 DB DS ASB ASS SAL	Soil sample taken over depth indicated, for environmental analysis. Undisturbed 50mm diameter tube sample taken over depth indicated. Bulk disturbed sample taken over depth indicated. Small disturbed bag sample taken over depth indicated. Soil sample taken over depth indicated, for asbestos screening. Soil sample taken over depth indicated, for acid sulfate soil analysis. 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 show blows per 150mm penetration. 'R' as noted below.
	N_c = 5 7 3 R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60 degree solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of Undrained Shear Strength. Photoionisation detector reading in ppm (Soil sample heads pace test).
Moisture (Cohesive Soils) (Cohesionless)	MC > PL MC ≈ PL MC < PL D M W	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. DRY – Runs freely through fingers. MOIST – Does not run freely but no free water visible on soil surface. WET – Free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt H ( )	VERY SOFT – Unconfined compressive strength less than 25kPa SOFT – Unconfined compressive strength 25-5 0kPa FIRM – Unconfined compressive strength 50-1 00kPa STIFF – Unconfined compressive strength 100- 200kPa VERY STIFF – Unconfined compressive strength 200- 400kPa HARD – Unconfined compressive strength greater than 400kPa Bracketed symbol indicates estimated consistency based o n tactile examination or other tests.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**Density Index (ID) Range (%)** / **SPT ' N' Value Range (Blows/300mm)** Very Loose <15 / 0-4 Loose 15-35 / 4-10 Medium Dense 35-65 / 10-30 Dense 65-85 / 30-50 Very Dense >85 / >50 Bracketed symbol indicates estimated density based on ease of drilling or other tests.
Hand Penetrometer Readings	300 250	Numbers indicate individual test results in kPa on representative undisturbed material unless noted otherwise
Remarks	'V' bit 'TC' bit T_{60}	Hardened steel 'V' shaped bit. Tungsten carbide wing bit. Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.

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LOG SYMBOLS CONTINUED

ROCK STRENGTH

Rock strength is defined by the Point Load Strength Index (Is 50) and refers to the strength of the rock substance in the bedding. The test procedure is described by the International Journal of Rock Mechanics, Mining and Geomechanics Abstract Volume 22, No 2, 1985.

TERM	SYMBOL	Is (50) MPa	FIELD GUIDE
Extremely Low:	EL	0.03	Easily remoulded by hand to a material with soil properties.
Very Low:	VL	0.1	May be crumbled in the hand. Sandstone is "sugary" and friable.
Low:	L	0.3	A piece of core 150 mm long x 50mm dia. may be broken by hand and easily scored with a knife. Sharp edges of core may be friable and break during handling.
Medium Strength:	M	1	A piece of core 150 mm long x 50mm dia. can be broken by hand with difficulty. Readily scored with knife.
High:	H	3	A piece of core 150 mm long x 50mm dia. core cannot be broken by hand, can be slightly scratched or scored with knife; rock rings under hammer.
Very High:	VH	10	A piece of core 150 mm long x 50mm dia. may be broken with hand-held pick after more than one blow. Cannot be scratched with pen knife; rock rings under hammer.
Extremely High:	EH		A piece of core 150 mm long x 50mm dia. is very difficult to break with h and-held hammer . Rings when struck with a hammer.

ROCK STRENGTH

ABBREVIATION	DESCRIPTION	NOTES
Be	Bedding Plane Parting	Defect orientations measured relative to the normal to (i.e. relative to horizontal for vertical holes)
CS	Clay Seam	
J	Joint	
P	Planar	
Un	Undulating	
S	Smooth	
R	Rough	
IS	Iron stained	
XWS	Extremely Weathered Seam	
Cr	Crushed Seam	
60t	Thickness of defect in millimetres	

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Appendix C: Laboratory Report/s & COC Documents

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
enquiries@envirolabservices.com.au
www.envirolabservices.com.au

SAMPLE RECEIPT ADVICE

Client Details	
Client	Environmental Investigation Services
Attention	Jake Cashman

Sample Login Details	
Your Reference	E29853K, Jamisontown
Envirolab Reference	**155826**
Date Sample Received	21/10/2016
Date Instructions Received	21/10/2016
Date Results Expected to be Reported	**28/10/2016**

Sample Condition	
Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 water 11 soils
Turnaround Time Requested	Standard
Temperature on receipt (°C)	14.1
Cooling Method	Ice
Sampling Date Provided	YES

Comments
Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples

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@envirolabservices.com.au	Email: jhurst@envirolabservices.com.au

Sample and Testing Details on 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
enquiries@envirolabservices.com.au
www.envirolabservices.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*	*Asbestos ID - materials*	*BTEX in Water*	*HM in water - dissolved*	*On Hold*
BH1-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓				
BH1-0.5-0.6	✓	✓	✓	✓	✓	✓	✓					
BH1-1-1.1												✓
BH1-1.5-1.6												✓
BH2-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓				
BH2-0.5-0.6	✓	✓	✓	✓	✓	✓	✓					
BH2-1-1.1												✓
DUPA1							✓					
TB	✓											
F1									✓			
F2												✓
MW1										✓	✓	

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E29853K	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 99106200	Date Results Required: STANDARD	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201		Attention: Jake Cashman
Attention: Aileen	Page: 1 of 1	

Location: Jamisontown

Sampler: JDC

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 6a	Combo 6	Asbestos	8 Metals	BTEX
20/10/2016	1	BH1	0-0.1	G, A	0	Fill	X				
	2		0.5-0.6			Sandy clay		X			
	3		1-1.1								
	4		1.5-1.6								
	5	BH2	0-0.1			Fill	X				
	6		0.5-0.6			Silty clay		X			
	7		1-1.1								
	8	DUP1	-	-	-	-				X	
	9	TB	-	-	-	-					X
	10	F1	Surface	A	-	Fragments			X		
	11	F2		A	-						
	12	MW1	-	3 bottles	-	Groundwater				X	X

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 155826

Date Received: 21.10.16

Time Received: 17.10

Received by: JC

Temp: Cool/Ambient: 14.1°C

Cooling: Ice/Icepack

Security: Intact/Broken/None

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Jake Cashman	21/10/2016	17:10	CLS JC	21.10

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12 Ashley Street, Chatswood, NSW 2067
tel: +61 2 9910 6200

email: sydney@envirolab.com.au
envirolab.com.au

Envirolab Services Pty Ltd - Sydney | ABN 37 112 535 645

CERTIFICATE OF ANALYSIS 155826

Client:

Environmental Investigation Services
PO Box 976
North Ryde BC
NSW 1670

Attention: Jake Cashman

Sample log in details:

Your Reference:	**E29853K, Jamisontown**
No. of samples:	1 water 11 soils
Date samples received / completed instructions received	21/10/16 / 21/10/16

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: / Issue Date:	28/10/16 / 27/10/16
Date of Preliminary Report:	Not Issued

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:

David Springer
General Manager

ACCREDITED FOR TECHNICAL COMPETENCE

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vTRH(C6-C10)/BTEXN in Soil						
Our Reference:	UNITS	155826-1	155826-2	155826-5	155826-6	155826-9
Your Reference	---------- -	BH1	BH1	BH2	BH2	TB
Depth	----------	0-0.1	0.5-0.6	0-0.1	0.5-0.6	-
Date Sampled		20/10/2016	20/10/2016	20/10/2016	20/10/2016	20/10/2016
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/10/2016	24/10/2016	24/10/2016	24/10/2016	24/10/2016
Date analysed	-	25/10/2016	25/10/2016	25/10/2016	24/10/2016	25/10/2016
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
Surrogate aaa-Trifluorotoluene	%	74	88	84	86	74

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svTRH (C10-C40) in Soil					
Our Reference:	UNITS	155826-1	155826-2	155826-5	155826-6
Your Reference	----------	BH1	BH1	BH2	BH2
Depth	- ----------	0-0.1	0.5-0.6	0-0.1	0.5-0.6
Date Sampled		20/10/2016	20/10/2016	20/10/2016	20/10/2016
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/10/2016	24/10/2016	24/10/2016	24/10/2016
Date analysed	-	25/10/2016	25/10/2016	25/10/2016	25/10/2016
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	<100	<100	<100	<100
TRH>C$_{10}$-C$_{16}$	mg/kg	<50	<50	<50	<50
TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH>C$_{16}$-C$_{34}$	mg/kg	<100	<100	<100	<100
TRH>C$_{34}$-C$_{40}$	mg/kg	<100	<100	<100	<100
Surrogate o-Terphenyl	%	88	83	85	84

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PAHs in Soil					
Our Reference:	UNITS	155826-1	155826-2	155826-5	155826-6
Your Reference	----------	BH1	BH1	BH2	BH2
Depth	- ----------	0-0.1	0.5-0.6	0-0.1	0.5-0.6
Date Sampled		20/10/2016	20/10/2016	20/10/2016	20/10/2016
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/10/2016	24/10/2016	24/10/2016	24/10/2016
Date analysed	-	25/10/2016	25/10/2016	25/10/2016	25/10/2016
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<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
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Total Positive PAHs	mg/kg	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	118	130	117	127

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Organochlorine Pesticides in soil					
Our Reference:	UNITS	155826-1	155826-2	155826-5	155826-6
Your Reference	----------	BH1	BH1	BH2	BH2
Depth	- ----------	0-0.1	0.5-0.6	0-0.1	0.5-0.6
Date Sampled		20/10/2016	20/10/2016	20/10/2016	20/10/2016
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/10/2016	24/10/2016	24/10/2016	24/10/2016
Date analysed	-	25/10/2016	25/10/2016	25/10/2016	25/10/2016
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	101	104	103

Organophosphorus Pesticides					
Our Reference:	UNITS	155826-1	155826-2	155826-5	155826-6
Your Reference	----------	BH1	BH1	BH2	BH2
Depth	- ----------	0-0.1	0.5-0.6	0-0.1	0.5-0.6
Date Sampled		20/10/2016	20/10/2016	20/10/2016	20/10/2016
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/10/2016	24/10/2016	24/10/2016	24/10/2016
Date analysed	-	25/10/2016	25/10/2016	25/10/2016	25/10/2016
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	105	101	104	103

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PCBs in Soil					
Our Reference:	UNITS	155826-1	155826-2	155826-5	155826-6
Your Reference	----------	BH1	BH1	BH2	BH2
Depth	- ----------	0-0.1	0.5-0.6	0-0.1	0.5-0.6
Date Sampled		20/10/2016	20/10/2016	20/10/2016	20/10/2016
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/10/2016	24/10/2016	24/10/2016	24/10/2016
Date analysed	-	25/10/2016	25/10/2016	25/10/2016	25/10/2016
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	105	101	104	103

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Acid Extractable metals in soil						
Our Reference:	UNITS	155826-1	155826-2	155826-5	155826-6	155826-8
Your Reference	----------	BH1	BH1	BH2	BH2	DUPA1
Depth	- ----------	0-0.1	0.5-0.6	0-0.1	0.5-0.6	-
Date Sampled		20/10/2016	20/10/2016	20/10/2016	20/10/2016	20/10/2016
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/10/2016	24/10/2016	24/10/2016	24/10/2016	24/10/2016
Date analysed	-	24/10/2016	24/10/2016	24/10/2016	24/10/2016	24/10/2016
Arsenic	mg/kg	<4	<4	7	<4	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	11	13	11	14
Copper	mg/kg	19	11	20	16	24
Lead	mg/kg	48	6	20	6	32
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	3	3	3	6
Zinc	mg/kg	110	10	38	11	79

Moisture Our Reference: Your Reference	UNITS ----------	155826-1 BH1	155826-2 BH1	155826-5 BH2	155826-6 BH2	155826-8 DUPA1
Depth	- ----------	0-0.1	0.5-0.6	0-0.1	0.5-0.6	-
Date Sampled		20/10/2016	20/10/2016	20/10/2016	20/10/2016	20/10/2016
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/10/2016	24/10/2016	24/10/2016	24/10/2016	24/10/2016
Date analysed	-	25/10/2016	25/10/2016	25/10/2016	25/10/2016	25/10/2016
Moisture	%	8.5	9.4	15	16	16

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Asbestos ID - soils			
Our Reference:	UNITS	155826-1	155826-5
Your Reference	----------	BH1	BH2
	-		
Depth	----------	0-0.1	0-0.1
Date Sampled		20/10/2016	20/10/2016
Type of sample		SOIL	SOIL
Date analysed	-	27/10/2016	27/10/2016
Sample mass tested	g	Approx. 20g	Approx. 25g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	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

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Asbestos ID - materials		
Our Reference:	UNITS	155826-10
Your Reference	----------	F1
	-	
Depth	----------	-
Date Sampled		20/10/2016
Type of sample		material
Date analysed	-	27/10/2016
Mass / Dimension of Sample	-	95x55x5mm
Sample Description	-	Beige compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected Amosite asbestos detected

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BTEX in Water		
Our Reference:	UNITS	155826-12
Your Reference	----------	MW1
	-	
Depth	----------	-
Date Sampled		20/10/2016
Type of sample		water
Date extracted	-	24/10/2016
Date analysed	-	24/10/2016
Benzene	µg/L	<10
Toluene	µg/L	<10
Ethylbenzene	µg/L	<10
m+p-xylene	µg/L	<20
o-xylene	µg/L	<10
Surrogate Dibromofluoromethane	%	97
Surrogate toluene-d8	%	99
Surrogate 4-BFB	%	99

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HM in water - dissolved		
Our Reference:	UNITS	155826-12
Your Reference	----------	MW1
	-	
Depth	----------	-
Date Sampled		20/10/2016
Type of sample		water
Date prepared	-	25/10/2016
Date analysed	-	25/10/2016
Arsenic-Dissolved	µg/L	2
Cadmium-Dissolved	µg/L	<0.1
Chromium-Dissolved	µg/L	95
Copper-Dissolved	µg/L	17
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	5
Zinc-Dissolved	µg/L	11

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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.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
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-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. 'TEQ 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. 'TEQ 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. 'TEQ 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-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105+/-5 deg C for a minimum of 12 hours.
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.
Metals-022 ICP-MS	Determination of various metals by ICP-MS.

QUALITY CONTROL vTRH(C6-C10)/BTEXN in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/10/2016	[NT]	[NT]	LCS-6	24/10/2016
Date analysed	-			25/10/2016	[NT]	[NT]	LCS-6	25/10/2016
TRHC$_{6}$ - C$_{9}$	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-6	101%
TRHC$_{6}$ - C$_{10}$	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-6	101%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-6	102%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-6	98%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-6	102%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-6	102%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-6	103%
naphthalene	mg/kg	1	Org-014	[NT]	[NT]	[NT]	[NR]	[NR]
Surrogate aaa-Trifluorotoluene	%		Org-016	88	[NT]	[NT]	LCS-6	88%

QUALITY CONTROL svTRH (C10-C40) in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/10/2016	[NT]	[NT]	LCS-6	24/10/2016
Date analysed	-			24/10/2016	[NT]	[NT]	LCS-6	24/10/2016
TRHC$_{10}$ - C$_{14}$	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-6	116%
TRHC$_{15}$ - C$_{28}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-6	115%
TRHC$_{29}$ - C$_{36}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-6	96%
TRH>C$_{10}$-C$_{16}$	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-6	116%
TRH>C$_{16}$-C$_{34}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-6	115%
TRH>C$_{34}$-C$_{40}$	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-6	96%
Surrogate o-Terphenyl	%		Org-003	85	[NT]	[NT]	LCS-6	94%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/10/2016	[NT]	[NT]	LCS-6	24/10/2016
Date analysed	-			25/10/2016	[NT]	[NT]	LCS-6	25/10/2016
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-6	122%
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-6	128%
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-6	130%
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-6	120%
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	LCS-6	119%
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(b,j +k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	LCS-6	130%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d14	%		Org-012	130	[NT]	[NT]	LCS-6	115%

QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/10/2016	[NT]	[NT]	LCS-6	24/10/2016
Date analysed	-			25/10/2016	[NT]	[NT]	LCS-6	25/10/2016
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	95%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	87%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	84%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	96%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	90%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	82%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	109%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	102%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	104%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-6	82%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	108	[NT]	[NT]	LCS-6	118%

QUALITY CONTROL Organophosphorus Pesticides	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/10/2016	[NT]	[NT]	LCS-6	24/10/2016
Date analysed	-			25/10/2016	[NT]	[NT]	LCS-6	25/10/2016
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-6	104%
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-6	114%
Dimethoate	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-6	124%
Fenitrothion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-6	107%
Malathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-6	86%
Parathion	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-6	113%
Ronnel	mg/kg	0.1	Org-008	<0.1	[NT]	[NT]	LCS-6	111%
Surrogate TCMX	%		Org-008	108	[NT]	[NT]	LCS-6	105%

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			24/10/2016	[NT]	[NT]	LCS-6	24/10/2016
Date analysed	-			25/10/2016	[NT]	[NT]	LCS-6	25/10/2016
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-6	106%
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	108	[NT]	[NT]	LCS-6	105%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date prepared	-			24/10/2016	[NT]	[NT]	LCS-6	24/10/2016
Date analysed	-			24/10/2016	[NT]	[NT]	LCS-6	24/10/2016
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	LCS-6	119%
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	LCS-6	110%
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-6	113%
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-6	112%
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-6	111%
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	LCS-6	85%
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-6	105%
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	LCS-6	107%

QUALITY CONTROL BTEX in Water	UNITS	PQL	METHOD	Blank
Date extracted	-			24/10/2016
Date analysed	-			24/10/2016
Benzene	µg/L	1	Org-016	<1
Toluene	µg/L	1	Org-016	<1
Ethylbenzene	µg/L	1	Org-016	<1
m+p-xylene	µg/L	2	Org-016	<2
o-xylene	µg/L	1	Org-016	<1
Surrogate Dibromofluoromethane	%		Org-016	99
Surrogate toluene-d8	%		Org-016	100
Surrogate 4-BFB	%		Org-016	100

QUALITY CONTROL HM in water - dissolved	UNITS	PQL	METHOD	Blank
Date prepared	-			25/10/2016
Date analysed	-			25/10/2016
Arsenic-Dissolved	µg/L	1	Metals-022 ICP-MS	<1
Cadmium-Dissolved	µg/L	0.1	Metals-022 ICP-MS	<0.1
Chromium-Dissolved	µg/L	1	Metals-022 ICP-MS	<1
Copper-Dissolved	µg/L	1	Metals-022 ICP-MS	<1
Lead-Dissolved	µg/L	1	Metals-022 ICP-MS	<1
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05
Nickel-Dissolved	µg/L	1	Metals-022 ICP-MS	<1
Zinc-Dissolved	µg/L	1	Metals-022 ICP-MS	<1

QUALITY CONTROL BTEX in Water	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date extracted	-	[NT]	[NT]	LCS-W1	24/10/2016
Date analysed	-	[NT]	[NT]	LCS-W1	24/10/2016
Benzene	µg/L	[NT]	[NT]	LCS-W1	109%
Toluene	µg/L	[NT]	[NT]	LCS-W1	109%
Ethylbenzene	µg/L	[NT]	[NT]	LCS-W1	105%
m+p-xylene	µg/L	[NT]	[NT]	LCS-W1	106%
o-xylene	µg/L	[NT]	[NT]	LCS-W1	106%
Surrogate Dibromofluoromethane	%	[NT]	[NT]	LCS-W1	96%
Surrogate toluene-d8	%	[NT]	[NT]	LCS-W1	103%
Surrogate 4-BFB	%	[NT]	[NT]	LCS-W1	102%
QUALITY CONTROL HM in water - dissolved	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Spike % Recovery
Date prepared	-	[NT]	[NT]	LCS-W2	25/10/2016
Date analysed	-	[NT]	[NT]	LCS-W2	25/10/2016
Arsenic-Dissolved	µg/L	[NT]	[NT]	LCS-W2	104%
Cadmium-Dissolved	µg/L	[NT]	[NT]	LCS-W2	104%
Chromium-Dissolved	µg/L	[NT]	[NT]	LCS-W2	94%
Copper-Dissolved	µg/L	[NT]	[NT]	LCS-W2	106%
Lead-Dissolved	µg/L	[NT]	[NT]	LCS-W2	102%
Mercury-Dissolved	µg/L	[NT]	[NT]	LCS-W2	99%
Nickel-Dissolved	µg/L	[NT]	[NT]	LCS-W2	95%
Zinc-Dissolved	µg/L	[NT]	[NT]	LCS-W2	103%

Report Comments:

BTEX in water:
PQL has been raised due to the sample matrix requiring dilution.

Asbestos: Excessive sample volumes were provided for asbestos analysis.
A portion of the supplied samples were sub-sampled according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Samples 155826-1 & 5 were sub-sampled from bags provided by the client.

Asbestos ID was analysed by Approved Identifier:	Paul Ching
Asbestos ID was authorised by Approved Signatory:	Paul Ching

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

SAMPLE RECEIPT ADVICE

SE158347

CLIENT DETAILS

Contact	Jake Cashman
Client	Jeffery & Katauskas Pty Ltd
Address	Rear 115 Wicks Road MACQUARIE PARK MACQUARIE PARK NSW 2113
Telephone	(02) 9888 5000
Facsimile	(02) 9888 5004
Email	jcashman@jkgroup.net.au
Project	**E29853K**
Order Number	(Not specified)
Samples	11

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Fri 21/10/2016
Report Due	Mon 31/10/2016
SGS Reference	**SE158347**

SUBMISSION DETAILS

This is to confirm that 11 samples were received on Friday 21/10/2016. Results are expected to be ready by Monday 31/10/2016. Please quote SGS reference SE158347 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	11 Soil	Type of documentation received	COC
Date documentation received	21/10/2016	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	16.3°C
Sample container provider	Client	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	None	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

Samples received at 21/10/16 @ 5:00pm. Request was not registered until the next business day.
2 soil samples have been placed on hold.

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/en/terms-and-conditions as at the date of this document. Attention is drawn to the limitations of liability and to the clauses of indemnification.

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SAMPLE RECEIPT ADVICE

SE158347

CLIENT DETAILS

Client Jeffery & Katauskas Pty Ltd

Project E29853K

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity (1:2) in soil	Exchangeable Cations and Cation Exchange Capacity	Moisture Content	pH in soil (1:2)	Soil Texture (AS4419)	Soluble Anions in Soil from 1:2 DI Extract by Ion
001	BH1 0.4-0.5	-	13	1	-	-	-
002	BH1 1.4-1.5	2	-	1	1	1	2
003	BH1 2.5-3.0	2	-	1	1	1	2
004	BH1 4.0-4.5	2	-	1	1	1	2
005	BH1 8.5-9.0	2	-	1	1	1	2
006	BH1 10.5-11.0	2	-	1	1	1	2
007	BH2 0.2-0.5	-	13	1	-	-	-
008	BH2 1.3-1.5	2	-	1	1	1	2
009	BH2 2.7-3.0	2	-	1	1	1	2
010	BH2 4.1-4.5	2	-	1	1	1	2
011	BH2 5.0-6.0	2	-	1	1	1	2

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

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ANALYTICAL REPORT

Accreditation No. 2562

CLIENT DETAILS		LABORATORY DETAILS	
Contact	Jake Cashman	Manager	Huong Crawford
Client	Jeffery & Katauskas Pty Ltd	Laboratory	SGS Alexandria Environmental
Address	Rear 115 Wicks Road MACQUARIE PARK MACQUARIE PARK NSW 2113	Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	(02) 9888 5000	Telephone	+61 2 8594 0400
Facsimile	(02) 9888 5004	Facsimile	+61 2 8594 0499
Email	jcashman@jkgroup.net.au	Email	au.environmental.sydney@sgs.com
Project	**E29853K**	SGS Reference	**SE158347 R0**
Order Number	(Not specified)	Date Received	21 Oct 2016
Samples	11	Date Reported	31 Oct 2016

COMMENTS

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

SIGNATORIES

Bennet Lo
Senior Organic Chemist/Metals Chemis

Dong Liang
Metals/Inorganics Team Leader

Huong Crawford
Production Manager

Ly Kim Ha
Organic Section Head

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Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE158347.001 Soil 20 Oct 2016 BH1 0.4-0.5	SE158347.002 Soil 20 Oct 2016 BH1 1.4-1.5	SE158347.003 Soil 20 Oct 2016 BH1 2.5-3.0	SE158347.004 Soil 20 Oct 2016 BH1 4.0-4.5
pH in soil (1:2) Method: AN101 Tested: 26/10/2016							
pH (1:2)	pH Units	-		-	**6.8**	**6.5**	**6.9**
Conductivity (1:2) in soil Method: AN106 Tested: 26/10/2016							
Conductivity (1:2) @25 C*	µS/cm	1		-	**77**	**170**	**150**
Resistivity (1:2)*	ohm cm	-		-	**13000**	**5800**	**6600**
Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography Method: AN245 Tested: 31/10/2016							
Chloride	mg/kg	0.25		-	**1.5**	**1.7**	**4.8**
Sulphate	mg/kg	0.5		-	**35**	**130**	**100**
Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) Method: AN122 Tested: 31/10/2016							
Exchangeable Sodium, Na	mg/kg	2		**44**	-	-	-
Exchangeable Sodium, Na	meq/100g	0.01		**0.19**	-	-	-
Exchangeable Sodium Percentage*	%	0.1		**1.3**	-	-	-
Exchangeable Potassium, K	mg/kg	2		**110**	-	-	-
Exchangeable Potassium, K	meq/100g	0.01		**0.28**	-	-	-
Exchangeable Potassium Percentage*	%	0.1		**1.9**	-	-	-
Exchangeable Calcium, Ca	mg/kg	2		**2500**	-	-	-
Exchangeable Calcium, Ca	meq/100g	0.01		**13**	-	-	-
Exchangeable Calcium Percentage*	%	0.1		**84.7**	-	-	-
Exchangeable Magnesium, Mg	mg/kg	2		**220**	-	-	-
Exchangeable Magnesium, Mg	meq/100g	0.02		**1.8**	-	-	-
Exchangeable Magnesium Percentage*	%	0.1		**12.1**	-	-	-
Cation Exchange Capacity	meq/100g	0.02		**15**	-	-	-
Soil Texture (AS4419) Method: AN051 Tested: 31/10/2016							
Texture Classification*	No unit	1		-	Silty loam	Sandy loam	Sandy loam
Moisture Content Method: AN002 Tested: 27/10/2016							
% Moisture	%w/w	0.5		**11.7**	**11.4**	**8.7**	**6.7**

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Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	SE158347.005 Soil 20 Oct 2016 BH1 8.5-9.0	SE158347.006 Soil 20 Oct 2016 BH1 10.5-11.0	SE158347.007 Soil 20 Oct 2016 BH2 0.2-0.5	SE158347.008 Soil 20 Oct 2016 BH2 1.3-1.5
pH in soil (1:2) Method: AN101 Tested: 26/10/2016							
pH (1:2)	pH Units	-		7.3	7.4	-	7.4
Conductivity (1:2) in soil Method: AN106 Tested: 26/10/2016							
Conductivity (1:2) @25 C*	µS/cm	1		320	310	-	310
Resistivity (1:2)*	ohm cm	-		3100	3300	-	3200
Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography Method: AN245 Tested: 31/10/2016							
Chloride	mg/kg	0.25		130	93	-	12
Sulphate	mg/kg	0.5		92	81	-	100
Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) Method: AN122 Tested: 31/10/2016							
Exchangeable Sodium, Na	mg/kg	2		-	-	48	-
Exchangeable Sodium, Na	meq/100g	0.01		-	-	0.21	-
Exchangeable Sodium Percentage*	%	0.1		-	-	0.7	-
Exchangeable Potassium, K	mg/kg	2		-	-	73	-
Exchangeable Potassium, K	meq/100g	0.01		-	-	0.19	-
Exchangeable Potassium Percentage*	%	0.1		-	-	0.6	-
Exchangeable Calcium, Ca	mg/kg	2		-	-	6100	-
Exchangeable Calcium, Ca	meq/100g	0.01		-	-	30	-
Exchangeable Calcium Percentage*	%	0.1		-	-	94.7	-
Exchangeable Magnesium, Mg	mg/kg	2		-	-	160	-
Exchangeable Magnesium, Mg	meq/100g	0.02		-	-	1.3	-
Exchangeable Magnesium Percentage*	%	0.1		-	-	4.1	-
Cation Exchange Capacity	meq/100g	0.02		-	-	32	-
Soil Texture (AS4419) Method: AN051 Tested: 31/10/2016							
Texture Classification*	No unit	1		Loamy sand	Fine sand clay loam	-	Medium clay
Moisture Content Method: AN002 Tested: 27/10/2016							
% Moisture	%w/w	0.5		16.0	13.5	12.5	13.0

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Parameter	Units	LOR	Sample Number: SE158347.009 Sample Matrix: Soil Sample Date: 20 Oct 2016 Sample Name: BH2 2.7-3.0	SE158347.010 Soil 20 Oct 2016 BH2 4.1-4.5	SE158347.011 Soil 20 Oct 2016 BH2 5.0-6.0
pH in soil (1:2) Method: AN101 Tested: 26/10/2016					
pH (1:2)	pH Units	-	**7.2**	**7.8**	**7.6**
Conductivity (1:2) in soil Method: AN106 Tested: 26/10/2016					
Conductivity (1:2) @25 C*	µS/cm	1	**230**	**180**	**420**
Resistivity (1:2)*	ohm cm	-	**4300**	**5500**	**2400**
Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography Method: AN245 Tested: 25/10/2016					
Chloride	mg/kg	0.25	**16**	**13**	**15**
Sulphate	mg/kg	0.5	**140**	**63**	**110**
Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) Method: AN122 Tested: 31/10/2016					
Exchangeable Sodium, Na	mg/kg	2	-	-	-
Exchangeable Sodium, Na	meq/100g	0.01	-	-	-
Exchangeable Sodium Percentage*	%	0.1	-	-	-
Exchangeable Potassium, K	mg/kg	2	-	-	-
Exchangeable Potassium, K	meq/100g	0.01	-	-	-
Exchangeable Potassium Percentage*	%	0.1	-	-	-
Exchangeable Calcium, Ca	mg/kg	2	-	-	-
Exchangeable Calcium, Ca	meq/100g	0.01	-	-	-
Exchangeable Calcium Percentage*	%	0.1	-	-	-
Exchangeable Magnesium, Mg	mg/kg	2	-	-	-
Exchangeable Magnesium, Mg	meq/100g	0.02	-	-	-
Exchangeable Magnesium Percentage*	%	0.1	-	-	-
Cation Exchange Capacity	meq/100g	0.02	-	-	-
Soil Texture (AS4419) Method: AN051 Tested: 31/10/2016					
Texture Classification*	No unit	1	Medium clay	Fine sandy loam	Medium clay
Moisture Content Method: AN002 Tested: 27/10/2016					
% Moisture	%w/w	0.5	**13.9**	**13.2**	**12.9**

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QC SUMMARY

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

Conductivity (1:2) in soil **Method: ME-(AU)-[ENV]AN106**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Conductivity (1:2) @25 C*	LB112456	µS/cm	1	<1	1%	100%
Resistivity (1:2)*	LB112456	ohm cm	-		1%	NA

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR) **Method: ME-(AU)-[ENV]AN122**

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Exchangeable Sodium, Na	LB112668	mg/kg	2		98%
Exchangeable Sodium, Na	LB112668	meq/100g	0.01	<0.01	NA
Exchangeable Sodium Percentage*	LB112668	%	0.1		NA
Exchangeable Potassium, K	LB112668	mg/kg	2		98%
Exchangeable Potassium, K	LB112668	meq/100g	0.01	<0.01	NA
Exchangeable Potassium Percentage*	LB112668	%	0.1		NA
Exchangeable Calcium, Ca	LB112668	mg/kg	2		90%
Exchangeable Calcium, Ca	LB112668	meq/100g	0.01	<0.01	NA
Exchangeable Calcium Percentage*	LB112668	%	0.1		NA
Exchangeable Magnesium, Mg	LB112668	mg/kg	2		92%
Exchangeable Magnesium, Mg	LB112668	meq/100g	0.02	<0.02	NA
Exchangeable Magnesium Percentage*	LB112668	%	0.1		NA
Cation Exchange Capacity	LB112668	meq/100g	0.02	<0.02	NA

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

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture	LB112573	%w/w	0.5	0 - 7%

pH in soil (1:2) **Method: ME-(AU)-[ENV]AN101**

Parameter	QC Reference	Units	LOR	DUP %RPD	LCS %Recovery
pH (1:2)	LB112456	pH Units	-	0%	99%

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography **Method: ME-(AU)-[ENV]AN245**

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery
Chloride	LB112339	mg/kg	0.25	<0.25	3%	98%
Sulphate	LB112339	mg/kg	0.5	<0.5	4%	98%

METHOD SUMMARY

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
AN051	A small sample of soil is kneaded with water and then pressed out into a ribbon . The behaviour of this ribbon is used to classify the soil into one of the texture classes in AS 4419.
AN101	pH in Soil Sludge Sediment and Water: pH is measured electrometrically using a combination electrode and is calibrated against 3 buffers purchased commercially. For soils, an extract with water is made at a ratio of 1:2 and the pH determined and reported on the extract after 1 hour extraction (pH 1:2) or after 1 hour extraction and overnight aging (pH (1:2) aged). Reference APHA 4500-H+.
AN106	Conductivity : Conductivity is measured by meter with temperature compensation and is calibrated against a standard solution of potassium chloride. Conductivity is generally reported as µmhos/cm or µS/cm @ 25°C. For soils, an extract with water is made at a ratio of 1:2 and the EC determined and reported on the extract basis after the 1 hour extraction (EC(1:2)) or after the 1 hour extraction and overnight aging (EC(1:2) aged). Reference APHA 2510 B.
AN106	Resistivity of the extract is reported on the extract basis and is the reciprocal of conductivity. Salinity and TDS can be calculated from the extract conductivity and is reported back to the soil basis.
AN122	Exchangeable Cations, CEC and ESP: Soil sample is extracted in 1 M Ammonium Acetate at pH=7 (or 1M Ammonium Chloride at pH=7) with cations (Na, K, Ca & Mg) then determined by ICP OES/ICP MS and reported as Exchangeable Cations. For saline soils, these results can be corrected for water soluble cations and reported as Exchangeable cations in meq/100g or soil can be pre-treated (aqueous ethanol/aqueous glycerol) prior to extraction. Cation Exchange Capacity (CEC) is the sum of the exchangeable cations in meq/100g.
AN122	The Exchangeable Sodium Percentage (ESP) is calculated as the exchangeable sodium divided by the CEC (all in meq/100g) times 100. ESP can be used to categorise the sodicity of the soil as below: ESP < 6% non-sodic ESP 6-15% sodic ESP >15% strongly sodic Method is refernced to Rayment and Higginson, 1992, sections 15D3 and 15N1.-
AN245	Anions by Ion Chromatography: A water sample or extract is injected into an eluent stream that passes through the ion chromatographic system where the anions of interest ie Br, Cl, NO2, NO3 and SO4 are separated on their relative affinities for the active sites on the column packing material . Changes to the conductivity and the UV-visible absorbance of the eluent enable identification and quantitation of the anions based on their retention time and peak height or area. APHA 4110 B

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FOOTNOTES

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

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

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

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

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

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

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

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

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

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Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

STATEMENT OF QA/QC PERFORMANCE

SE158347 R0

CLIENT DETAILS

Contact	Jake Cashman
Client	Jeffery & Katauskas Pty Ltd
Address	Rear 115 Wicks Road MACQUARIE PARK MACQUARIE PARK NSW 2113
Telephone	(02) 9888 5000
Facsimile	(02) 9888 5004
Email	jcashman@jkgroup.net.au
Project	**E29853K**
Order Number	(Not specified)
Samples	11

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
SGS Reference	**SE158347 R0**
Date Received	21 Oct 2016
Date Reported	31 Oct 2016

COMMENTS

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

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

All Data Quality Objectives were met (within the SGS Alexandria Environmental laboratory).

SAMPLE SUMMARY

Sample counts by matrix	11 Soil	Type of documentation received	COC
Date documentation received	21/10/2016	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	16.3°C
Sample container provider	Client	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	None	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

HOLDING TIME SUMMARY

SE158347 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Conductivity (1:2) in soil

Method: ME-(AU)-[ENV]AN106

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1 1.4-1.5	SE158347.002	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH1 2.5-3.0	SE158347.003	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH1 4.0-4.5	SE158347.004	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH1 8.5-9.0	SE158347.005	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH1 10.5-11.0	SE158347.006	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH2 1.3-1.5	SE158347.008	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH2 2.7-3.0	SE158347.009	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH2 4.1-4.5	SE158347.010	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH2 5.0-6.0	SE158347.011	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1 0.4-0.5	SE158347.001	LB112668	20 Oct 2016	21 Oct 2016	17 Nov 2016	28 Oct 2016	17 Nov 2016	31 Oct 2016
BH2 0.2-0.5	SE158347.007	LB112668	20 Oct 2016	21 Oct 2016	17 Nov 2016	28 Oct 2016	17 Nov 2016	31 Oct 2016

Moisture Content

Method: ME-(AU)-[ENV]AN002

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1 0.4-0.5	SE158347.001	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	29 Oct 2016
BH1 1.4-1.5	SE158347.002	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	31 Oct 2016
BH1 2.5-3.0	SE158347.003	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	31 Oct 2016
BH1 4.0-4.5	SE158347.004	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	31 Oct 2016
BH1 8.5-9.0	SE158347.005	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	31 Oct 2016
BH1 10.5-11.0	SE158347.006	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	31 Oct 2016
BH2 0.2-0.5	SE158347.007	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	29 Oct 2016
BH2 1.3-1.5	SE158347.008	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	31 Oct 2016
BH2 2.7-3.0	SE158347.009	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	31 Oct 2016
BH2 4.1-4.5	SE158347.010	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	31 Oct 2016
BH2 5.0-6.0	SE158347.011	LB112573	20 Oct 2016	21 Oct 2016	03 Nov 2016	27 Oct 2016	01 Nov 2016	31 Oct 2016

pH in soil (1:2)

Method: ME-(AU)-[ENV]AN101

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1 1.4-1.5	SE158347.002	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH1 2.5-3.0	SE158347.003	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH1 4.0-4.5	SE158347.004	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH1 8.5-9.0	SE158347.005	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH1 10.5-11.0	SE158347.006	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH2 1.3-1.5	SE158347.008	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH2 2.7-3.0	SE158347.009	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH2 4.1-4.5	SE158347.010	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016
BH2 5.0-6.0	SE158347.011	LB112456	20 Oct 2016	21 Oct 2016	27 Oct 2016	26 Oct 2016	27 Oct 2016	26 Oct 2016

Soil Texture (AS4419)

Method: ME-(AU)-[ENV]AN051

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1 1.4-1.5	SE158347.002	LB112822	20 Oct 2016	21 Oct 2016	18 Apr 2017	31 Oct 2016	18 Apr 2017	31 Oct 2016
BH1 2.5-3.0	SE158347.003	LB112822	20 Oct 2016	21 Oct 2016	18 Apr 2017	31 Oct 2016	18 Apr 2017	31 Oct 2016
BH1 4.0-4.5	SE158347.004	LB112822	20 Oct 2016	21 Oct 2016	18 Apr 2017	31 Oct 2016	18 Apr 2017	31 Oct 2016
BH1 8.5-9.0	SE158347.005	LB112822	20 Oct 2016	21 Oct 2016	18 Apr 2017	31 Oct 2016	18 Apr 2017	31 Oct 2016
BH1 10.5-11.0	SE158347.006	LB112822	20 Oct 2016	21 Oct 2016	18 Apr 2017	31 Oct 2016	18 Apr 2017	31 Oct 2016
BH2 1.3-1.5	SE158347.008	LB112822	20 Oct 2016	21 Oct 2016	18 Apr 2017	31 Oct 2016	18 Apr 2017	31 Oct 2016
BH2 2.7-3.0	SE158347.009	LB112822	20 Oct 2016	21 Oct 2016	18 Apr 2017	31 Oct 2016	18 Apr 2017	31 Oct 2016
BH2 4.1-4.5	SE158347.010	LB112822	20 Oct 2016	21 Oct 2016	18 Apr 2017	31 Oct 2016	18 Apr 2017	31 Oct 2016
BH2 5.0-6.0	SE158347.011	LB112822	20 Oct 2016	21 Oct 2016	18 Apr 2017	31 Oct 2016	18 Apr 2017	31 Oct 2016

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH1 1.4-1.5	SE158347.002	LB112339	20 Oct 2016	21 Oct 2016	27 Oct 2016	25 Oct 2016	22 Nov 2016	31 Oct 2016
BH1 2.5-3.0	SE158347.003	LB112339	20 Oct 2016	21 Oct 2016	27 Oct 2016	25 Oct 2016	22 Nov 2016	31 Oct 2016
BH1 4.0-4.5	SE158347.004	LB112339	20 Oct 2016	21 Oct 2016	27 Oct 2016	25 Oct 2016	22 Nov 2016	31 Oct 2016
BH1 8.5-9.0	SE158347.005	LB112339	20 Oct 2016	21 Oct 2016	27 Oct 2016	25 Oct 2016	22 Nov 2016	31 Oct 2016
BH1 10.5-11.0	SE158347.006	LB112339	20 Oct 2016	21 Oct 2016	27 Oct 2016	25 Oct 2016	22 Nov 2016	31 Oct 2016
BH2 1.3-1.5	SE158347.008	LB112339	20 Oct 2016	21 Oct 2016	27 Oct 2016	25 Oct 2016	22 Nov 2016	31 Oct 2016
BH2 2.7-3.0	SE158347.009	LB112339	20 Oct 2016	21 Oct 2016	27 Oct 2016	25 Oct 2016	22 Nov 2016	31 Oct 2016

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

HOLDING TIME SUMMARY

SE158347 R0

SGS holding time criteria are drawn from current regulations and are highly dependent on sample container preservation as specified in the SGS “Field Sampling Guide for Containers and Holding Time” (ref: GU-(AU)-ENV.001). Soil samples guidelines are derived from NEPM "Schedule B(3) Guideline on Laboratory Analysis of Potentially Contaminated Soils". Water sample guidelines are derived from "AS/NZS 5667.1 : 1998 Water Quality - sampling part 1" and APHA "Standard Methods for the Examination of Water and Wastewater" 21st edition 2005.

Extraction and analysis holding time due dates listed are calculated from the date sampled, although holding times may be extended after laboratory extraction for some analytes. The due dates are the suggested dates that samples may be held before extraction or analysis and still be considered valid.

Extraction and analysis dates are shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria. If the sampled date is not supplied then compliance with criteria cannot be determined. If the received date is after one or both due dates then holding time will fail by default.

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography (continued) — **Method: ME-(AU)-[ENV]AN245**

Sample Name	Sample No.	QC Ref	Sampled	Received	Extraction Due	Extracted	Analysis Due	Analysed
BH2 4.1-4.5	SE158347.010	LB112339	20 Oct 2016	21 Oct 2016	27 Oct 2016	25 Oct 2016	22 Nov 2016	31 Oct 2016
BH2 5.0-6.0	SE158347.011	LB112339	20 Oct 2016	21 Oct 2016	27 Oct 2016	25 Oct 2016	22 Nov 2016	31 Oct 2016

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

Surrogate results are evaluated against upper and lower limit criteria established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). At least two of three routine level soil sample surrogate spike recoveries for BTEX/VOC are to be within 70-130% where control charts have not been developed and within the established control limits for charted surrogates. Matrix effects may void this as an acceptance criterion. Water sample surrogate spike recoveries are to be within 40-130%. The presence of emulsions, surfactants and particulates may void this as an acceptance criterion.

Result is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No surrogates were required for this job.

Blank results are evaluated against the limit of reporting (LOR), for the chosen method and its associated instrumentation, typically 2.5 times the statistically determined method detection limit (MDL).

Result is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity (1:2) in soil

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result
LB112456.001	Conductivity (1:2) @25 C*	µS/cm	1	<1

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result
LB112339.001	Chloride	mg/kg	0.25	<0.25
	Sulphate	mg/kg	0.5	<0.5

Duplicates are calculated as Relative Percentage Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

Conductivity (1:2) in soil

Method: ME-(AU)-[ENV]AN106

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE158347.011	LB112456.013	Conductivity (1:2) @25 C*	µS/cm	1	420	410	30	1
		Resistivity (1:2)*	ohm cm	-	2400	2400	15	1

Moisture Content

Method: ME-(AU)-[ENV]AN002

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE158347.010	LB112573.011	% Moisture	%w/w	0.5	13.2	14.1	37	7
SE158351.012	LB112573.022	% Moisture	%w/w	0.5	<0.5	<0.5	200	0
SE158363.002	LB112573.033	% Moisture	%w/w	0.5	13.8	11.5	38	18
SE158363.010	LB112573.042	% Moisture	%w/w	0.5	26.3	26.5	34	1

pH in soil (1:2)

Method: ME-(AU)-[ENV]AN101

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE158347.011	LB112456.013	pH (1:2)	pH Units	-	7.6	7.7	31	0

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Original	Duplicate	Parameter	Units	LOR	Original	Duplicate	Criteria %	RPD %
SE158347.011	LB112339.012	Chloride	mg/kg	0.25	15	16	32	3
		Sulphate	mg/kg	0.5	110	110	32	4

LABORATORY CONTROL SAMPLES

SE158347 R0

Laboratory Control Standard (LCS) results are evaluated against an expected result, typically the concentration of analyte spiked into the control during the sample preparation stage, producing a percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA /QC plan (Ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended dagger symbol (†) when outside suggested criteria.

Conductivity (1:2) in soil

Method: ME-(AU)-[ENV]AN106

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB112456.002	Conductivity (1:2) @25 C*	µS/cm	1	300	303	85 - 115	100

Exchangeable Cations and Cation Exchange Capacity (CEC/ESP/SAR)

Method: ME-(AU)-[ENV]AN122

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB112668.002	Exchangeable Sodium, Na	mg/kg	2	NA	390	80 - 120	98
	Exchangeable Potassium, K	mg/kg	2	NA	343	80 - 120	98
	Exchangeable Calcium, Ca	mg/kg	2	NA	2570	80 - 120	90
	Exchangeable Magnesium, Mg	mg/kg	2	NA	635	80 - 120	92

pH in soil (1:2)

Method: ME-(AU)-[ENV]AN101

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB112456.003	pH (1:2)	pH Units	-	7.4	7.415	98 - 102	99

Soluble Anions in Soil from 1:2 DI Extract by Ion Chromatography

Method: ME-(AU)-[ENV]AN245

Sample Number	Parameter	Units	LOR	Result	Expected	Criteria %	Recovery %
LB112339.002	Chloride	mg/kg	0.25	39	40	70 - 130	98
	Sulphate	mg/kg	0.5	39	40	70 - 130	98

Matrix Spike (MS) results are evaluated as the percentage recovery of an expected result, typically the concentration of analyte spiked into a field sub -sample during the sample preparation stage. The original sample's result is subtracted from the sub-sample result before determining the percentage recovery. The criteria applied to the percentage recovery is established in the SGS QA/QC plan (ref: MP-(AU)-[ENV]QU-022). For more information refer to the footnotes in the concluding page of this report.

Recovery is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spikes were required for this job.

MATRIX SPIKE DUPLICATES

SE158347 R0

Matrix spike duplicates are calculated as Relative Percent Difference (RPD) using the formula: RPD = | OriginalResult - ReplicateResult | x 100 / Mean

The original result is the analyte concentration of the matrix spike. The Duplicate result is the analyte concentration of the matrix spike duplicate.

The RPD is evaluated against the Maximum Allowable Difference (MAD) criteria and can be graphically represented by a curve calculated from the Statistical Detection Limit (SDL) and Limiting Repeatability (LR) using the formula: MAD = 100 x SDL / Mean + LR

Where the Maximum Allowable Difference evaluates to a number larger than 200 it is displayed as 200.

RPD is shown in **Green** when within suggested criteria or **Red** with an appended reason identifer when outside suggested criteria. Refer to the footnotes section at the end of this report for failure reasons.

No matrix spike duplicates were required for this job.

Samples analysed as received.

Solid samples expressed on a dry weight basis.

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

*	NATA accreditation does not cover tthe performance of this service.
-	Sample not analysed for this analyte.

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
LOR	Limit of reporting.
QFH	QC result is above the upper tolerance.
QFL	QC result is below the lower tolerance.

①	At least 2 of 3 surrogates are within acceptance criteria.
②	RPD failed acceptance criteria due to sample heterogeneity.
③	Results less than 5 times LOR preclude acceptance criteria for RPD.
④	Recovery failed acceptance criteria due to matrix interference.
⑤	Recovery failed acceptance criteria due to the presence of significant concentration of analyte (i.e. the concentration of analyte exceeds the spike level).
⑥	LOR was raised due to sample matrix interference.
⑦	LOR was raised due to dilution of significantly high concentration of analyte in sample.
⑧	Reanalysis of sample in duplicate confirmed sample heterogeneity and inconsistency of results.
⑨	Recovery failed acceptance criteria due to sample heterogeneity.
⑩	LOR was raised due to high conductivity of the sample (required dilution).
†	Refer to Analytical Report comments for further information.

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source: MI630_SR_20161024092240.pdf page: 1 SGS Ref: SE158347_COC

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
SGS ENVIRONMENTAL SERVICES UNIT 16, 33 MADDOX STREET ALEXANDRIA NSW 2015 P: (02) 85940400 F: (02) 85940499 Attention: DANIEL / TRENT	EIS Job Number: E29853K Date Results Required: STANDARD Page: 1 of 1	ENVIRONMENTAL INVESTIGATION SERVICES REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Jake Cashman Email: jcashman@jkgroup.net.au

Location: Jamisontown
Sampler: AK
Sample Preserved in Esky on Ice
Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	CA5 (CEC)	AG3 (pH, EC, Res, S04,Cl)	Soil Texture (AS4419)
20/10/2016	1	BH1	0.4-0.5	P	–	Silty Clay	X		
	2		1.4-1.5					X	X
	3		2.5-3			↓		X	X
	4		4-4.5			Silty Sand		X	X
			5.5-5.6			Silty Sandy gravel			
	5		8.5-9			Silty Sand		X	X
			9.5-10.5			Clayey Sand			
	6	↓	10.5-11			↓		X	X
	7	BH2	0.2-0.5			Fill	X		
	8		1.3-1.5			Silty Clay		X	X
	9		2.7-3			↓		X	X
	10		4.1-4.5					X	X
↓	11	↓	5-6	↓	↓	Silty Clayey gravel		X	X

SGS EHS Alexandria Laboratory

SE158347 COC
Received: 21–Oct–2016

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Jake Cashman	21/10/2016			21/10/16 @ 5:00

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

SAMPLE RECEIPT ADVICE

SE158347

CLIENT DETAILS

Contact	Jake Cashman
Client	Jeffery & Katauskas Pty Ltd
Address	Rear 115 Wicks Road MACQUARIE PARK MACQUARIE PARK NSW 2113
Telephone	(02) 9888 5000
Facsimile	(02) 9888 5004
Email	jcashman@jkgroup.net.au
Project	**E29853K**
Order Number	(Not specified)
Samples	11

LABORATORY DETAILS

Manager	Huong Crawford
Laboratory	SGS Alexandria Environmental
Address	Unit 16, 33 Maddox St Alexandria NSW 2015
Telephone	+61 2 8594 0400
Facsimile	+61 2 8594 0499
Email	au.environmental.sydney@sgs.com
Samples Received	Fri 21/10/2016
Report Due	Mon 31/10/2016
SGS Reference	**SE158347**

SUBMISSION DETAILS

This is to confirm that 11 samples were received on Friday 21/10/2016. Results are expected to be ready by Monday 31/10/2016. Please quote SGS reference SE158347 when making enquiries. Refer below for details relating to sample integrity upon receipt.

Sample counts by matrix	11 Soil	Type of documentation received	COC
Date documentation received	21/10/2016	Samples received in good order	Yes
Samples received without headspace	Yes	Sample temperature upon receipt	16.3°C
Sample container provider	Client	Turnaround time requested	Standard
Samples received in correct containers	Yes	Sufficient sample for analysis	Yes
Sample cooling method	None	Samples clearly labelled	Yes
Complete documentation received	Yes	Number of eskies/boxes received	

Unless otherwise instructed, water and bulk samples will be held for one month from date of report, and soil samples will be held for two months.

COMMENTS

Samples received at 21/10/16 @ 5:00pm. Request was not registered until the next business day.
2 soil samples have been placed on hold.

To the extent not inconsistent with the other provisions of this document and unless specifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/en/terms-and-conditions as at the date of this document. Attention is drawn to the limitations of liability and to the clauses of indemnification.

Document Set ID: 7663113
Version: 1, Version Date: 19/05/2017

SAMPLE RECEIPT ADVICE

SE158347

CLIENT DETAILS

Client Jeffery & Katauskas Pty Ltd

Project E29853K

SUMMARY OF ANALYSIS

No.	Sample ID	Conductivity (1:2) in soil	Exchangeable Cations and Cation Exchange Capacity	Moisture Content	pH in soil (1:2)	Soil Texture (AS4419)	Soluble Anions in Soil from 1:2 DI Extract by Ion
001	BH1 0.4-0.5	-	13	1	-	-	-
002	BH1 1.4-1.5	2	-	1	1	1	2
003	BH1 2.5-3.0	2	-	1	1	1	2
004	BH1 4.0-4.5	2	-	1	1	1	2
005	BH1 8.5-9.0	2	-	1	1	1	2
006	BH1 10.5-11.0	2	-	1	1	1	2
007	BH2 0.2-0.5	-	13	1	-	-	-
008	BH2 1.3-1.5	2	-	1	1	1	2
009	BH2 2.7-3.0	2	-	1	1	1	2
010	BH2 4.1-4.5	2	-	1	1	1	2
011	BH2 5.0-6.0	2	-	1	1	1	2

The above table represents SGS' interpretation of the client-supplied Chain Of Custody document.
The numbers shown in the table indicate the number of results requested in each package.
Please indicate as soon as possible should your request differ from these details .
Testing as per this table shall commence immediately unless the client intervenes with a correction .

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source: MI630_SR_20161024092240.pdf page: 1 SGS Ref: SE158347_COC

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
SGS ENVIRONMENTAL SERVICES UNIT 16, 33 MADDOX STREET ALEXANDRIA NSW 2015 P: (02) 85940400 F: (02) 85940499 Attention: DANIEL / TRENT	EIS Job Number: E29853K Date Results Required: STANDARD Page: 1 of 1	ENVIRONMENTAL INVESTIGATION SERVICES REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Jake Cashman Email: jcashman@jkgroup.net.au

Location: Jamisontown
Sampler: AK
Sample Preserved in Esky on Ice
Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	CA5 (CEC)	AG3 (pH, EC, Res, S04,Cl)	Soil Texture (AS4419)
20/10/2016	1	BH1	0.4-0.5	P	–	Silty Clay	X		
	2		1.4-1.5					X	X
	3		2.5-3			↓		X	X
	4		4-4.5			Silty Sand		X	X
			5.5-5.6			Silty Sandy gravel			
	5		8.5-9			Silty Sand		X	X
			9.5-10.5			Clayey Sand			
	6	↓	10.5-11			↓		X	X
	7	BH2	0.2-0.5			Fill	X		
	8		1.3-1.5			Silty Clay		X	X
	9		2.7-3			↓		X	X
	10		4.1-4.5					X	X
↓	11	↓	5-6	↓	↓	Silty Clayey gravel		X	X

SGS EHS Alexandria Laboratory

SE158347 COC
Received: 21–Oct–2016

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Jake Cashman	21/10/2016			21/10/16 @ 5:00

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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.

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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
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.

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SAMPLE AND CHAIN OF CUSTODY FORM

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SGS ENVIRONMENTAL SERVICES UNIT 16, 33 MADDOX STREET ALEXANDRIA NSW 2015 P: (02) 85940400 F: (02) 85940499 Attention: DANIEL / TRENT	EIS Job Number: E29853K Date Results Required: STANDARD Page: 1 of 1	ENVIRONMENTAL INVESTIGATION SERVICES REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Jake Cashman Email: jcashman@jkgroup.net.au

Location: Jamisontown
Sampler: AK
Sample Preserved in Esky on Ice
Tests Required

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			9.5-10.5			Clayey Sand			
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	7	BH2	0.2-0.5			Fill	X		
	8		1.3-1.5			Silty Clay		X	X
	9		2.7-3			↓		X	X
	10		4.1-4.5					X	X
↓	11	↓	5-6	↓	↓	Silty Clayey gravel		X	X

SGS EHS Alexandria Laboratory

SE158347 COC
Received: 21–Oct–2016

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By:	Date:	Time:	Received By:	Date:
Jake Cashman	21/10/2016			21/10/16 @ 5:00

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Appendix D: Report Explanatory Notes

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STANDARD SAMPLING PROCEDURE (SSP)

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.

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 AS1726-1993[23].
- 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. 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.

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.

[23] Standards Australia, (1993), *Geotechnical Site Investigations.* (AS1726-1993)

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- 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.
- 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.

Groundwater Sampling

Groundwater samples are more sensitive to contamination than soil samples and therefore adhesion to this protocol is particularly important to obtain reliable, reproducible results. The recommendations detailed in AS/NZS 5667.1:1998 are considered to form a minimum standard.

The basis of this protocol is to maintain the security of the borehole and obtain accurate and representative groundwater samples. The following procedure should be used for collection of groundwater samples from previously installed groundwater monitoring wells.

- After monitoring well installation, at least three bore volumes should be pumped from the monitoring wells (well development) to remove any water introduced during the drilling process and/or the water that is disturbed during installation of the monitoring well. This should be completed prior to purging and sampling.
- Groundwater monitoring wells should then be left to recharge for at least three days before purging and sampling. Prior to purging or sampling, the condition of each well should observed and any anomalies recorded on the field data sheets. The following information should be noted: the condition of the well, noting any signs of damage, tampering or complete destruction; the condition and operation of the well lock; the condition of the protective casing and the cement footing (raised or cracked); and, the presence of water between protective casing and well.
- Take the groundwater level from the collar of the piezometer/monitoring well using an electronic dip meter. The collar level should be taken (if required) during the site visit using a dumpy level and staff.
- Purging and sampling of piezometers/monitoring wells is done on the same site visit when using micro-purge (or other low flow) techniques.
- Layout and organize all equipment associated with groundwater sampling in a location where they will not interfere with the sampling procedure and will not pose a risk of contaminating samples. Equipment generally required includes:
  - Micropore filtration system or Stericup single-use filters (for heavy metals samples);
  - Filter paper for Micropore filtration system; Bucket with volume increments;
  - Sample containers: teflon bottles with 1 ml nitric acid, 75mL glass vials with 1 mL hydrochloric acid, 1 L amber glass bottles;
  - Bucket with volume increments;
  - Flow cell;
  - pH/EC/Eh/T meters;
  - Plastic drums used for transportation of purged water;
  - Esky and ice;
  - Nitrile gloves;
  - Distilled water (for cleaning);
  - Electronic dip meter;

- Low flow pump pack and associated tubing; and
- Groundwater sampling forms.

- If single-use stericup filtration is not used, clean the Micropore filtration system thoroughly with distilled water prior to use and between each sample. Filter paper should be changed between samples. 0.45um filter paper should be placed below the glass fibre filter paper in the filtration system.
- Ensure all non-disposable sampling equipment is decontaminated or that new disposable equipment is available prior to any work commencing at a new location. The procedure for decontamination of groundwater equipment is outlined at the end of this section.
- Disposable gloves should be used whenever samples are taken to protect the sampler and to assist in avoidance of contamination.
- Groundwater samples are obtained from the monitoring wells using low flow/micro-purge sampling equipment to reduce the disturbance of the water column and loss of volatiles.
- During pumping to purge the well, the pH, temperature, conductivity, dissolved oxygen, redox potential and groundwater levels are monitored (where possible) using calibrated field instruments to assess the development of steady state conditions. Steady state conditions are generally considered to have been achieved when the difference in the pH measurements was less than 0.2 units and the difference in conductivity was less than 10%.
- All measurements are recorded on specific data sheets.
- Once steady state conditions are considered to have been achieved, groundwater samples are obtained directly from the pump tubing and placed in appropriate glass bottles, BTEX vials or plastic bottles.
- All samples are preserved in accordance with water sampling requirements detailed in the NEPM 2013 and placed in an insulated container with ice. Groundwater samples are preserved by immediate storage in an insulated sample container with ice as outlined in the report text.
- Record the sample on the appropriate log in accordance with AS1726:1993. At the end of each water sampling complete a chain of custody form.

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[24]) methods and those described in *Environmental Sampling and Analysis, A Practical Guide,* (H. Keith 1991[25]).

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 (MDL) 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.

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). Acceptable targets for precision in this report will be less than 50% RPD for concentrations greater than ten times the PQL, less than 75% RPD for concentrations between five and ten times the PQL and less than 100% RPD for concentrations that are less than five times the PQL.

Accuracy

Accuracy is a measure of the agreement between an experimental result and the true value of the parameter being measured. 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.

The proximity of an averaged result to the true value, where all random errors have been statistically removed. Accuracy is measured by percent recovery. Acceptable limits for accuracy generally lie between 70% to 130% recoveries. Certain laboratory methods may allow for values that lie outside these limits.

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 handing and analysis protocols and use of proper chain-of-custody and documentation procedures.

[24] US EPA, (1994), *SW-846: Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* (US EPA SW-846)

[25] Keith., H, (1991), *Environmental Sampling and Analysis, A Practical Guide.*

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; 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.

Comparability

Comparability is the evaluation of the similarity of conditions (eg. 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).

Blanks

The purpose of laboratory and field blanks is to check for artifacts and interferences that may arise during sampling and analysis.

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%.

$$\frac{\text{(Spike Sample Result – Sample Result) x 100}}{\text{Concentration of Spike Added}}$$

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.

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:

$$\frac{(D1 - D2) \times 100}{\{(D1 + D2)/2\}}$$