CONSULTING EARTH SCIENTISTS

# STAGE I - PRELIMINARY SITE INVESTIGATION

18 RANDWICK CLOSE, CASULA, NEW SOUTH WALES

CES DOCUMENT REFERENCE: CES161003-HC-AC

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**STAGE I - PRELIMINARY SITE INVESTIGATION**
**18 RANDWICK CLOSE, CASULA, NEW SOUTH WALES**
PREPARED FOR HEYMANN COHEN PTY LTD

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# EXECUTIVE SUMMARY

The site (18 Randwick Close, Casula) (Lot 104 in Deposited Plan (DP) 863214) covering an area of approximately 1.3 hectares, was purchased in 2015 by Besol Pty Ltd. The site was previously owned Ingham Processing Pty Ltd and used for the processing of poultry.

The objective of the Stage I – Preliminary Site Investigation was to assess whether the site is likely to be suitable for the future mixed use and aged care development of the site or whether further investigation is required. Soil samples were collected during the geotechnical investigation (CES Document Reference: CES161003-HC-AB) and subjected to environmental testing for this preliminary site investigation report.

In order to meet the objectives of the investigation, CES has completed the following scope of works:

- Research of publicly available documentation to assess the history of the site, the identification of potential sources of contamination and the review of sensitive human and environmental receptors on or in the vicinity of the site;
- A site inspection to visually identify potential sources of contamination;
- Evaluation of data obtained from the geotechnical investigation; and
- Preparation of this Stage I – Preliminary Site Investigation.

No exceedance of human health or environmental criteria was identified in the analysis results for the fill samples from the ten borehole locations. Additionally, results were compared to NSW EPA waste classification criteria and were within the criteria for classification as general solid waste. Further sampling and analysis could confirm the fill materials to be classified as ENM and the underlying soil as VENM.

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| ACM | Asbestos Containing Material |
| AHD | Australian Height Datum |
| ASS | Acid Sulfate Soil |
| BTEX | Benzene, Toluene, Ethylbenzene and Total Xylenes |
| CES | Consulting Earth Scientists Pty Ltd |
| CLM | Contaminated Land Management |
| COPC | Contaminants of Potential Concern |
| DECCW | Department of Environment and Climate Change and Water |
| DLWC | Department of Land and Water Conservation |
| EPA | Environment Protection Authority |
| ESA | Environmental Site Assessment |
| km | Kilometre |
| LGA | Local Government Area |
| LPI | Land and Property Information Division |
| LEP | Local Environmental Plan |
| m | Metre |
| mbgl | metres Below Ground Level |
| NEPM | National Environment Protection Measure |
| NSW | New South Wales |
| OCP | Organochlorine Pesticide |
| PAH | Polycyclic Aromatic Hydrocarbon |
| PSP | Project Safety Plan |
| TRH | Total Recoverable Hydrocarbons |
| UST | Underground Storage Tank |
| VOC | Volatile Organic Compounds |

# 1 INTRODUCTION

## 1.1 *BACKGROUND*

Consulting Earth Scientists Pty Ltd (CES) was commissioned by Heymann Cohen Pty Ltd (HC) (on behalf of Besol Pty Ltd (the Client)) to carry out a Stage I – Preliminary Site Investigation of the property located at 18 Randwick Close, Casula, New South Wales (NSW) (the site) (**Figure 1**).

This report has been prepared in accordance with the CES proposal dated 7 October 2016. It has also been prepared in general accordance with the requirements specified for a Stage I – Preliminary Site Investigation as published by the NSW Environment Protection Authority (EPA) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA), 2011 and the National Environmental Protection Measure (NEPM) *Guidelines on Site Characterisation* (Schedule B2) 1999, as amended 2013.

CES understands that HC is considering the site for purchase with the intention of redeveloping the site for proposed mixed use and aged care development, undertaken by SummitCare.

The findings of this report are based on a site inspection conducted on 24 November 2016 and a review of environmental site data and some limited soil sampling and analysis.

## 1.2 *OBJECTIVES*

The objective of the Stage I – Preliminary Site Investigation was to assess whether the site is likely to be suitable for the future proposed mixed use and aged care development, or whether further investigation is required.

## 1.3 *SCOPE OF WORK*

CES has completed the following scope of works:

- Research of publicly available documentation to assess the history of the site, the identification of potential sources of contamination and the review of sensitive human and environmental receptors on or in the vicinity of the site;
- A site inspection to visually identify potential sources of contamination;
- Evaluation of soil sampling and analysis data obtained from geotechnical investigation; and
- Preparation of this Stage I – Preliminary Site Investigation.

# 2 SITE INFORMATION

The site information presented below is based on a review of government and publicly available information sources.

## 2.1 *SITE IDENTIFICATION*

The site is located at 18 Randwick Close, Casula, New South Wales (NSW) 2170, within the Local Government Area (LGA) of Liverpool. The site covers an area of approximately 1.3 hectares, and is legally identified as a single lot, Lot 104 in Deposited Plan (DP) 863214 (**Figure 1**). The geographical extent of the site is presented in Table 2.1 below.

**Table 2.1: Geographical extent of site**

| Corner/point of site | Eastings | Northings |
|---|---|---|
| Southeast corner of site | 305670mE | 6241732.88mN |
| Northeast corner of site | 305688.92mE | 6241763.18mN |
| Southwest corner of site | 305590.52mE | 6241660.05mN |
| Northwest corner of site | 305627.56mE | 6295070.50mN |
| Western point of site | 305538.63mE | 6241737.21mN |
| Centre of site | 305626.49mE | 6241723.03mN |

## 2.2 *SITE ZONING*

Liverpool Local Environmental Plan (LEP) 2008 indicates that the site is currently zoned "R4 – High Density Residential".

## 2.3 *SITE DESCRIPTION*

The subject site is located within a mixed public recreation and residential district of Casula. The site is accessed via Randwick Close and is largely trapezoidal in shape. At the time of the site inspection, the property included:

- Open space with stockpiled timber material along the centre of the northern boundary. No buildings were observed on site at the time of the site inspection.

During the site inspection there were no signs of distressed vegetation (an indication of potential environmental impacts) and in the accessible areas observed, no surface staining indicative of surface spills that could have impacted underlying soil and groundwater.

There was no evidence of above ground or below ground fuel storage tanks on the site.

A photographic log is presented in **Appendix A**.

## 2.4 *SURROUNDING LAND USE*

Based on observations from the site inspection, the surrounding land use comprised the following:

- **North** – Kurrajong Road runs parallel with the northern boundary of the site, and further south lies residential properties and Lurnea High School (approximately 430m north-northwest);
- **East** – Daruk Park lies to the east of the site, and adjacent, Casula Mall shopping centre, lying further east. Beyond Casula Mall are residential properties.
- **South** – Single and double story residential properties, Liverpool City Council Library (approximately 150 m south-southeast) and Casula High School (approximately 550m southwest); and
- **West** –Immediately bordered by single and double story residential properties and the M5 Motorway, Prestons Public School (approximately 500m west) and NTL Transmitting Station (approximately 1.1km west-northwest). Further west lies an industrial area.

## 2.5 *TOPOGRAPHY*

The site was observed during the site inspection to have a downward east facing slope.

## 2.6 *SURFACE WATER*

The nearest surface water features are Georges River, located approximately 1,540 m east of the site boundary. The likely discharge point for groundwater / surface water run-off, based on local topography is Georges River.

## 2.7 *GEOLOGY*

Reference to the Penrith 1:100 000 Geological Series Sheet 9030 (1991) indicates that the majority of the site is underlain by Bringelly Shale of the Wianamatta Group of Middle Triassic Age. This formation typically comprises of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff. The nature of the formation is considered alluvial and estuarine.

## 2.8 *HYDROGEOLOGY*

It is expected that groundwater would flow to the east, towards Georges River.

A search of the Department of Primary Industries Office of Water database (http://allwaterdata.water.nsw.gov.au/water.stm, accessed 28 November 2016) indicates there are nine registered groundwater abstraction wells located between 1,590 and 1,921 m from the site boundary. All nine wells are used for monitoring and extend between 5.5 and 22.8 m below ground level. The groundwater standing water level is not provided. Further details are provided within the Lot Search report in **Appendix B**.

## 2.9 *SENSITIVE LOCAL ENVIRONMENTS*

The site is not located within an Underground Petroleum Storage System (UPSS) environmentally sensitive zone. UPSS environmentally sensitive zones represent areas that are likely to be vulnerable to the contamination from leaking UPSS due to geology or groundwater properties.

### 2.10 *ACID SULFATE SOILS*

The classification of acid sulphate soils (ASS) is based on the likelihood that these soils will be present in particular areas at specific depths. Soils are classed from 1 (high probability presence) to 5 (low probability presence).

There is no acid sulfate soil risk mapped for the site in the Liverpool LEP (2008) Acid sulfate soils map (sheet: ASS-013)

### 2.11 *METEOROLOGY*

Information on meteorology has been obtained from the Bureau of Meteorology website (http://www.bom.gov.au/ accessed 28 November 2016).

- Mean annual temperature – 23.2 degrees Celsius;
- Mean annual lowest temperature – 12.0 degrees Celsius; and
- Mean annual rainfall – 648.2 millimetres (mm).

### 2.12 *NSW CONTAMINATED SITE REGISTER*

The site is located within proximity to one site listed under the NSW EPA Contaminated Lands List:

- Caltex Service Station located 971m south;

### 2.13 *PREVIOUS ENVIRONMENTAL REPORTS*

CES is not aware of any pre-existing environmental reports pertaining to the site.

## 3 SITE HISTORY

Information pertaining to the history of the site was obtained through a review of information available from external sources including historical title searches, aerial photographs and council records and WorkCover NSW Dangerous Goods search presented in **Appendices B** and **C**.

### 3.1 *PROPERTY TITLE INFORMATION*

A title deeds search was conducted by Lot Search. A summary of the results is provided in **Table 3.1**. Where available, the original title and lease documents are provided in **Appendix D**.

**Table 3.1: Summary of Proprietors**

| Date | Proprietor |
|---|---|
| 2015 – to date | Besol Pty Ltd |
| 2014-2015 | Inghams Property Management Pty Limited |
| 2008 – 2014 | Inghams Enterprises Pty Ltd |
| 1996 – 2008 | Inghams Processed Poultry Pty Ltd |
| | **(Lot 1707 DP 827089)** |
| 1992 – 1996 | Inghams Processed Poultry Pty Ltd |

| Date | Proprietor |
|---|---|
| | **(Lot 2 DP 775813)** |
| 1988 – 1992 | Inghams Processed Poultry Pty Ltd |
| | **(Lot 60 DP 738407)** |
| 1986 – 1988 | Inghams Processed Poultry Pty Ltd |
| | **(Lot 248 DP 717422)** |
| 1985 – 1986 | Inghams Processed Poultry Pty Ltd |
| | **(Lots 24 to 27 DP 7507 – CTVol 9726 Fol 148)** |
| 1985 – 1985 | Inghams Processed Poultry Pty Ltd |
| 1966 – 1985 | Ingham Enterprises Pty Limited |
| 1964 – 1966 | John Horace Ingham, poultry farmer<br>Robert Walter Ingham, poultry farmer |
| | **(Lots 24 to 27 DP 7507 – Area 42 Acres 2 Roods 27 Perches – CTVol 3399 Fol 152)** |
| 1954 – 1964 | John Horace Ingham, poultry farmer<br>Robert Walter Ingham, poultry farmer |
| 1925 – 1954 | Walter Horace Ingham, poultry farmer |
| 1922 – 1925 | Walter Henry Ingham, poultry farmer<br>Walter Horace Ingham, poultry farmer |
| | **(Portion 271 Parish St Luke – Area 304 Acres 2 Roods 29 ¼ Perches – CTVol 1152 Fol 19)** |
| 1922 – 1922 | William Cope, grazier & solicitor |
| 1895 – 1922 | Francis Henry Biddulph, merchant |

A review of the past owners of the site indicates that there may have been site uses that would have resulted in potential contamination at the site (e.g. poultry hatcheries and processing).

## 3.2 *HISTORICAL AERIAL PHOTOGRAPH INTERPRETATION*

Aerial photographs taken from 1930 to 2014 were obtained from Lot Search and reviewed to assess the history of development of the site and indications of potential sources of contamination. **Table 3.2** presents a summary of the review. The photographs are included in **Appendix B**.

**Table 3.2: Aerial Photograph Interpretation**

| Year | Description |
|---|---|
| **1955** | **Site:** The site consists of open space with coverage of trees.<br>**Surrounds:** The surrounding spaces around the site consist of mainly open spaces (north and west) and crops (south and east). |
| **1961** | **Site:** The majority of area of the site has been cleared, with only the western portion remaining open space.<br>**Surrounds:** A dam has been constructed to the west of the site and additional structures have been built south-west of the site. The remaining surrounding areas have no observable changes. |
| **1965** | **Site:** The construction of a large building (shed) in the northern half of the site.<br>**Surrounds:** Land to the north-west of the site has been cleared. A smaller building to the south of the site has occurred since the previous photograph was taken. The remaining surrounding areas have no observable changes. |
| **1970** | **Site:** Two more large sheds have been constructed adjoining the original shed.<br>**Surrounds:** A larger building has replaced the smaller building to the south of the site since the previous photograph was taken. All surrounding crops to the south of the site have been cleared. |

| Year | Description |
|---|---|
| **1982** | **Site:** The site appears largely unchanged.<br>**Surrounds:** The surrounding area to the south has been cleared further, and all farming buildings to the east have been demolished. Residential areas have been constructed north of the site since the previous photograph was taken. |
| **1991** | **Site:** The site appears largely unchanged, with the exception of a residential building being constructed in the south-eastern corner of the site.<br>**Surrounds:** Residential development has expanded to the area immediately south of the site, replacing the large building previously occupying the immediate south of the site. A large building (presumed to be the original Casula Mall) has been constructed the east of the site. |
| **2004** | **Site:** The site appears largely unchanged, with the exception of an additional residential building being constructed in the south-western corner of the site. |
| **2004** | **Surrounds:** The surrounding areas of the site have remained largely unchanged, with the exception of the newly constructed M5 motorway and bridge to the northwest of the site and the expansion of Casula Mall. Further residential development to the southwest of the site and the construction of Liverpool City Council Library to the southeast is also apparent, |
| **2009** | **Site:** The site appears largely unchanged.<br>**Surrounds:** The surrounding area appears largely unchanged, with the exception of residential development appearing to the west of the M5 Motorway. |
| **2014** | **Site:** The site appears largely unchanged.<br>**Surrounds:** The surrounding area appears largely unchanged. |

A review of the historical aerial photographs obtained from Lot Search revealed the site has been in use for poultry processing from 1965 to 2014. The review also indicates the surrounds of the site did not undergo many noteworthy changes until 2004 when the construction of the M5 motorway commenced.

### 3.3 *WORKCOVER NSW RECORDS*

A search of the WorkCover NSW Stored Chemical Information Database and microfiche records is provided in **Appendix C**. The search resulted in no records being found pertaining to the site.

### 3.4 *SECTION 149 PLANNING CERTIFICATES*

Review of Planning Certificates under Section 149 of the Environmental Planning and Assessment Act (1979) indicates the following for the subject site:

- The land has not been proclaimed as within a Mine Subsidence District;
- The land is not biodiversity certified land;
- The land does not include or comprise critical habitat;
- The land is not in a conservation area;
- The land has not been identified as bush fire prone land; and
- Development on the land is not subject to flood related development controls.

The following matters are prescribed under section 59 (2) of the Contaminated Land Management Act (1997):

- The land is not significantly contaminated;
- The land is not subject to a management order;
- The land is not subject of an approved voluntary management proposal;
- The land is not subject to an on-going maintenance order; and
- The land is not subject to an audit statement.

A copy of the Section 149 certificates is provided in **Appendix E**.

### 3.5 *SEWER AND SERVICE PLANS*

A review of Dial-Before-You-Dig (DBYD) plans indicate the presence of two sewer property connection points along the eastern boundary in the north of the site which may serve as a preferential pathway of contaminant migration on the site. In addition, the site inspection conducted on the 24 November 2016 found evidence of PVC conduits within brick constructed pits in three locations along the eastern boundary of the site, two of which are covered with metal road plates (see Appendix A, Plate 5 and Plate 6 for photographs). It is unclear the purpose of these conduits and the extent of the pipeline, however it is a possibility that these conduits have connected to the sewer line during past uses at the site.

A cope of the Dial Before You Dig plans are included in **Appendix F.**

### 3.6 *SITE WALKOVER*

CES carried out a site walkover on 24 November 2016. The following was identified:

- No buildings were observed on-site.
- No evidence of below or above ground fuel storage tanks were observed (e.g. manhole covers, vent stacks, fill points or bowsers);
- No significant odours were detected;
- No evidence of chemical storage was observed;
- Vegetation across the site appeared dry and brown in some areas, however, it did not appear stressed;
- A tap and water meter were identified on the northern boundary of the site;
- Three small trenches (approximately 1 square metre), constructed of bricks, two of which were covered with metal road plates and the third with no cover, were observed along the eastern boundary of the site containing PVC conduits openings; and
- Three pre-existing groundwater monitoring bores (previously installed by CES) were visible during the site walkover.

## 4 PRELIMINARY CONCEPTUAL SITE MODEL

A Preliminary Conceptual Site Model (CSM) was developed in consideration of the historical information and current site conditions. The CSM takes into account the possible future residential redevelopment.

## 4.1 *POTENTIAL SOURCES OF CONTAMINATION*

***Historic Agricultural/ Commercial Activities***

The historical review and site inspection suggests the site has been occupied by agricultural and commercial operators including poultry processing plant. The use of petroleum products such as fuels, oils, and hydraulic oils, as well as the use of pesticides may be associated with this use. Elevated nutrient levels may also be associated with waste products of poultry processing activities. Contaminants of potential concern (COPC) include:

- Petroleum hydrocarbons (TRH/BTEX);
- Polycylic Aromatic Hydrocarbons (PAHs);
- Volatile Organic Hydrocarbons (VOCs);
- Organophosphate Pesticides;
- Nutrients; and
- Heavy Metals.

***Uncontrolled Fill***

The site slopes moderately to the northeast and it is assumed some cut and fill activities would have occurred during the development of the site. The origin of the fill is unknown and the potential exists for this material to be contaminated. COPC typically encountered in uncontrolled fill include:

- TRH and BTEX;
- PAHs;
- Heavy Metals;
- Organochlorine Pesticides (OCPs);
- Polychlorinated biphenyls (PCBs) and
- Asbestos.

## 4.2 *POTENTIAL OFF-SITE SOURCES OF CONTAMINATION*

There have been no potential off-site sources of contamination identified within the surrounds of the site.

## 4.3 *POTENTIAL PATHWAYS*

The pathways through which contaminants may reach receptors are in part dependent on the nature and behaviour of the contaminant. The following potential pathways have been identified:

- Ingestion / dermal contact during construction;
- Inhalation of contaminants in the particulate form (dust);
- Leaching of contaminants from site soils into groundwater; and
- Lateral migration of contaminants in groundwater (dissolved and immiscible phases) to surface waters.

### 4.4 *RECEPTORS*

Potential sensitive receptors (on and off-site) are listed below:

- Future construction workers during the construction of the proposed redevelopment;
- Future residents and employees;
- Groundwater beneath the site; and
- Neighbouring residents.

## 5 SAMPLING AND ANALYTICAL PROGRAMME

The following sampling programme has been carried out based on the CES Fee Proposal (CES Document Reference: CES161003-HC-AA) dated 7 October 2016, knowledge of the potential contamination issues resulting from past activities undertaken at the site and takes into consideration the objectives of the environmental investigation. The sampling and analysis programme only assesses the contamination status of fill and natural soil.

### 5.1 *SAMPLING PATTERN*

To determine the degree of potential contamination across the site, CES carried out a systematic sampling pattern where sampling points were selected at regular and even intervals, within the constraints of the site.

The location of the boreholes is presented in Figure 2.

### 5.2 *SAMPLING DENSITY*

A total of ten assessment locations were identified

### 5.3 *DEPTH INTERVALS OF SAMPLING*

Soil samples were collected from the fill. Details on sample locations and depths are presented in Table 1.

### 5.4 *METHOD OF SAMPLING COLLECTION*

Care was taken to ensure that representative samples are obtained from the depth required and that the integrity is maintained.
All soil samples were collected directly from the hand auger using new nitrile gloves. Care was taken when collecting auger samples to ensure the most representative sample of the targeted material was sampled.
The soil was transferred to the sample jar using new nitrile gloves.

#### 5.4.1 Decontamination Procedures

The following decontamination procedures were adopted for the sampling equipment.

#### 5.4.1.1 *Sample Containers*

The soil samples were collected in laboratory prepared glass jars with a Teflon lined lids. The jars were completely filled with soil, sealed, labelled with the job number, date, unique sampling point identification and depth. Details of sample containers, preservation requirements and holding times are presented as Table 2.

## 5.5 *METHOD OF SAMPLE STORAGE AND HANDLING*

The full soil jars were immediately placed in a cool box in which ice had been added to keep the samples below a temperature of approximately 4$^{o}$C. Samples were then transported directly to the laboratory.

## 5.6 *DOCUMENTATION*

While on site, the supervising engineer/scientist filled out a copy of CES "sample register", which documents:

- Time of sample collection;
- Weather;
- Unique sample identification number; and
- Sample location and depth.

All samples were classified in the field based on soil/fill characteristics and obvious signs of contamination such as discolouration or odour were noted on a log.

All samples, including QA samples, were transported to the primary and check laboratories under Chain-of Custody procedures and maintained in an ice-filled cooler. The COC details the following information:

- Site identification;
- The sampler's name;
- Nature of the sample;
- Collection time and date;
- Analyses to be performed;
- Sample preservation method;
- Departure time from site; and
- Dispatch courier(s)

During excavation, a borehole log was completed by a qualified geotechnical engineer. The log recorded the following data:

- Sample number and depth;
- Soil classification, colour, consistency or density, and moisture content;
- Unusual characteristics such as odour and staining;
- Depth of excavation;
- Push tube rig refusal;
- Groundwater well installation details (where relevant);
- Method of excavation; and
- The depth of first encountered free water.

Borehole logs are presented as **Appendix G**.

## 5.7 *ANALYTICAL PROGRAMME*

### 5.7.1 Number of Samples for Analysis

A total of ten soil samples for were scheduled for analysis. The analytical programme is summarised below:

- Ten soil samples for TRH, BTEX, Heavy Metals, PAH, OCPs, OPPs, PCBs, and Asbestos;
- Quality control one blind replicate and one split replicate samples analysed for TRH, BTEX, Heavy Metals, PAH, OCPs, OPPs, PCBs, and Asbestos;
- One trip spike per day for TRH and BTEX; and
- One trip blank per day for TRH and BTEX.

### 5.7.2 Laboratory

CES used Envirolab Services Pty Ltd (Envirolab) as the primary lab and Australian Laboratory Services Pty Ltd (ALS) as the secondary or 'check' laboratory for all chemical testing. Both laboratories are NATA registered for the chemical testing.

### 5.7.3 Analytical Methods

The soil/fill was analysed in accordance with NEPC 1999 (2013) Guideline on Laboratory Analysis of Potentially Contaminated Soils using US EPA and APHA approved analytical methods and will provide analytical results consistent with amended NEPM. That is to say the results for TRH will be presented as the four fraction bands (F1-F4) and speciated PAHs, including benzo(a)pyrene toxicity equivalent quotient (TEQ). Asbestos was analysed in accordance with Australian Standard 4964-2004.

A list of analytical parameters, laboratory Practical Quantitation Limits (PQLs) and laboratory methods are presented as **Table 3**

# 6 SITE ASSESSMENT CRITERIA

The selection of the most appropriate investigation levels for use with a site specific environmental setting and land use scenario should consider factors including the protection of human health and ecosystems.

Investigation and screening levels are provided in *Guideline on Investigation Levels for Soil and Groundwater* (Schedule B1, NEPC, 2013) for commonly encountered contaminants which are applicable to generic land use scenarios and include consideration of, where possible, the soil type and the depth of contamination. Investigation levels and screening levels are the concentrations of a contaminant above which further appropriate investigation and evaluation will be required. Investigation and screening levels provide the basis of Tier 1 risk assessment.

## 6.1 *INVESTIGATION AND SCREENING LEVELS*

*Health investigation levels* (HILs) have been developed for a broad range of metals and organic substances. The HILs are applicable for assessing human health risk via all relevant pathways of exposure. The HILs are generic to all soil types and apply generally to a depth of 3 m below the surface for residential use.

*Health screening levels* (HSLs) have been developed for selected petroleum compounds and fractions and are applicable to assessing human health risk via the inhalation and direct contact pathways. The HSLs depend on specific soil physicochemical properties, land use scenarios, and the characteristics of building structures. They apply to different soil types, and depths below surface to >4 m.

*Ecological investigation levels* (EILs) have been developed for selected metals and organic substances and are applicable for assessing risk to terrestrial ecosystems. EILs depend on specific soil physicochemical properties and land use scenarios and generally apply to the top 2 m of soil.

*Ecological screening levels* (ESLs) have been developed for selected petroleum hydrocarbon compounds and total petroleum hydrocarbon (TPH) fractions and are applicable for assessing risk to terrestrial ecosystems. ESLs broadly apply to coarse- and fine-grained soils and various land uses. They are generally applicable to the top 2 m of soil.

## 6.2 *SOIL*

### 6.2.1 Human Health Assessment

To address potential health impacts at the site, CES compared the analytical testing results against a set of health based soil investigation appropriate for the proposed land-use. That is, the HIL has been set at a level that provides confidence that contaminant concentrations below the HIL will not adversely affect human health. As described in Section 1.1, the future site land-use is proposed mixed use and aged care development; however, as CES is not in possession of development plans and as such cannot confirm the development to take place at the site, the NEPM (2013) HIL A

(residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake (no poultry), including childcare centres, preschools, and primary schools)) criteria has been adopted as a conservative approach for the assessment of human health. Additionally, NEPM (2013) HSL A & HSL B (low-high density residential for clay) criteria has been selected for the assessment of human health.

### 6.2.2 Ecological Assessment

NEPC (1999) indicates that while protection of human health often drives the first stages of assessment, protection of the environment (terrestrial and aquatic) should be a consideration for all site assessments. The closest waterbody, Georges River, is approximately 1.5 km east of the site and may be considered a sensitive ecological receptor.

To address the potential ecological impacts at the site, CES compared the analytical testing results against a set of ecological investigation and screening levels appropriate for the proposed land use of mixed use and aged care development. The NEPM (2013) EIL criteria adopted was generated using the CSIRO for *NEPM Ecological Investigation Level Calculation Spreadshee*t (CSIRO, 2010). Conservative values for pH (7.0 pH), cation exchange capacity (CEC) (20 cmolc/kg), organic content (1%) and clay content (80%) were used in absence of available data. Additionally, the NEPM (2013) ESL (fine soil texture) was adopted for the ecological assessment.

### 6.2.3 Asbestos

Health screening levels for asbestos in soils, which are based on scenario-specific likely exposure levels, are adopted from the Western Australia, Department of Health (WA DoH) guidelines. Based on the proposed end use, mixed use and aged care development, the Residential B exposure setting has been selected. As such, the HSL for bonded asbestos containing materials (ACM) is 0.01% and 0.001% for asbestos fines and fibrous asbestos.

# 7 QAQC DATA EVALUATION

Field and laboratory QA/QC requirements compliant with National Environmental Protection Council (1999 updated 2013) requirements are outlined below. Laboratory certificates of analysis are attached as **Appendix H**.

## 7.1 *DATA ACCEPTANCE CRITERIA*

The QA/QC Data was assessed against the Data Acceptance Criteria (DAC) provided in **Table 5**.

## 7.2 *FIELD QA/QC PROGRAMME*

Soil samples were collected by Mr Miles Thompson of CES, an experienced Geotechnical Engineer, under established CES protocols. CES personnel have been trained in sample collection and handling techniques.

For the purpose of assessing the quality of data presented in this report, CES collected and analysed Quality Control (QC) samples, while the laboratory completed their own QC. Tabulated QC data is provided in Table 6. The current section of this report is focused on the presentation of results of these QC samples and discussion of deviations from the Data Acceptance Criteria (DAC) (**Table 5**).

### 7.2.1 Blind Samples

One blind replicate sample was collected from GW1 (QAQC1). The replicate sample was preserved, stored, transported, prepared and analysed in an identical manner to the primary sample. As a minimum, the results of analyses on the blind replicate sample pair are assessed by calculating the Relative Percentage Differences (RPDs) between the results. The RPD is calculated as the difference between the results divided by their mean value and expressed as a percentage. The RPD were all within the DAC listed in **Table 5**

In summary, it is considered that the blind replicates confirm that the primary laboratory (Envirolab) analyses of the soil samples are repeatable and accurate.

### 7.2.2 Split Samples

One split sample was collected from MW1 (QAQC2), otherwise known as ‘inter-laboratory duplicates’, which provide a check on the analytical proficiency of the laboratories. Split samples are taken from the same location as the blind replicate, thus becoming a triplicate sample.

The results of the split sample analysis confirms the reliability of the laboratory analysis from Envirolab, since the all the RPD were compliant with the DAC, with the exception of chromium and nickel. The concentrations are only marginally different (that is to say not different by an order of magnitude) to the average concentrations detected at Envirolab. As such, the concentrations are likely to be a result of heterogeneity within the soil, rather than errors in laboratory analysis, field procedures or significant bands of contaminants within the sample.

The results of the RPD analysis indicates the analytical proficiency of the laboratories.

### 7.2.3 Trip Blanks

A trip blank consisting of pre-washed bottle containing acid-washed quartz sand was supplied by the analytical laboratory. The role of trip blank is to detect potential contamination during sample transport. These samples reside in transport vessels during sampling activities and are not opened in the field. Trip blanks are analysed at the laboratory as regular samples or only for volatile organic compounds, as deemed appropriate.

For soil sampling programmes, the trip blank consists of laboratory-supplied sand blank containing acid-washed quartz sand.

For the trip blank (TB) all analytes assessed were below the laboratory PQL, and therefore confirm to the DAC.

### 7.2.4 Laboratory-Prepared Trip Spike

Laboratory-prepared trip or VOC spikes consisting of sand spiked with known concentrations of BTEX. These samples are to be submitted for BTEX analysis with results compared with the known additions. The purpose of these samples is to monitor VOC losses during transit.

For the trip spike (TS) all analyte recoveries were within the DAC.

## 7.3 *LABORATORY QA/QC PROGRAMME*

The reliability of test results from the analytical laboratories will be monitored according to the QA/QC procedures used by the NATA accredited laboratory. The QA/QC programme employed by Envirolab (the primary laboratory) will specify holding times, extraction dates, method descriptions, Chain of Custody (COC) requirements, analysis, EQLs and acceptance criteria for the results. Laboratory QA/QC requirements undertaken by ALS are based on NEPM requirements and are outlined below (NEPC, 1999).

### 7.3.1 Laboratory Duplicate Samples

Laboratory duplicates provide data on analytical precision for each batch of samples. Where required and in order to provide sufficient sample for analysis of laboratory duplicate, two batches of samples are collected at the first site listed on the Chain of Custody form. This is done in order to ensure that sufficient sample is collected.

All laboratory duplicate samples' RPDs conformed to the DAC.

### 7.3.2 Laboratory Control Samples

Laboratory control samples consist of a clean matrix (de-ionised water or clean sand) spiked with a known concentration of the analyte being measured. These samples monitor method recovery in clean samples and can also be used to evaluate matrix interference by comparison with matrix spikes. Laboratory control samples may be certified reference materials.

All laboratory control samples conformed with the laboratory assessment criteria and therefore the DAC.

### 7.3.3 Surrogates

A surrogate is added at the extraction stage in order to verify method effectiveness. The surrogate is then analysed with the batch of samples. Percent recovery is calculated.

All laboratory surrogate samples conformed with the laboratory assessment criteria and therefore the DAC.

### 7.3.4 Matrix Spike

A matrix spikes consist of samples spiked with a known concentration of the analyte being measured, in order to identify properties of the matrix that may hinder method effectiveness. Samples are spiked with concentrations equivalent to 5 to 10 times the EQL. Percent recovery is calculated.

All matrix spikes conformed with the laboratory assessment criteria and therefore to the DAC.

### 7.3.5 Method Blanks

Method blanks are carried through all stages of sample preparation and analysis. Analyte concentrations in blanks should be less than the stated EQL. Reagent blanks are run if the method blank exceeds the EQL. The purpose of method blanks is to detect laboratory contamination.

All method blanks conformed with the laboratory assessment criteria and therefore to the DAC.

## 7.4 *QAQC ASSESSMENT SUMMARY*

CES has a high degree of confidence in the quality of the field data (that is to say that the soil samples were representative of the material sampled, the samples were collected by an experienced sampler and that the chain of custody documentation was accurate) and the laboratory data (that is to say that Envirolab and ALS are NATA accredited laboratories, and undertake strict internal QA/QC of the results issued, uses appropriate methodology and practical quantification limits (PQL) to analyse soil samples and has completed sample documentation).

In consideration of the QAQC assessment, it is the opinion of CES that the data collected is suitable for the assessment of the site.

# 8 INVESTIGATION RESULTS

## 8.1 *FIELDWORK*

Fieldwork was carried out on 3 and 4 November 2016 (before the site inspection completed on the 24 November 2016). An underground services search was carried out and each borehole location was cleared for underground services prior to commencement of fieldwork

Borehole drilling and sample collection was carried out using a continuous flight auger. Boreholes were advanced through fill to a maximum depth of 0.5m into natural soils. One soil sample was collected from each borehole from the fill material between depths of 0.1m bgl to 0.7m bgl.

Fill was encountered in eight boreholes to a maximum depth of 2.2 m bgl in borehole GW2. No fill was encountered in the remaining two boreholes.

A summary of borehole locations, termination depth, and sample depth is presented as Table 1. Borehole logs are presented as **Appendix G**.

Three boreholes were converted to groundwater monitoring wells on part of the geotechnical study; measurement of water levels indicated that groundwater flow is towards the east.

## 8.2 *SOIL LABORATORY ANALYTICAL RESULTS*

Soil analytical results are presented as Table 7. The laboratory Certificates of Analysis are presented in **Appendix H**.

### 8.2.1 TRH and BTEX

TRH and BTEX results for fill samples were all below laboratory PQLs and therefore below the Site Acceptance Criteria (SAC).

### 8.2.2 PAH

PAH results in fill samples were below laboratory PQL and therefore the SAC.

### 8.2.3 Heavy Metals

Heavy metal concentrations in natural soil samples are all below the SAC.

### 8.2.4 OCPs

OCP results in fill samples were below laboratory PQL and therefore the SAC.

### 8.2.5 OPPs

OPP results in fill samples were below laboratory PQL and therefore the SAC.

### 8.2.6 PCBs

PCB results in fill samples were below laboratory PQL and therefore the SAC.

### 8.2.7 Asbestos

No asbestos was detected in the fill samples analysed. In addition, no potential asbestos containing materials were observed within the site soils.

# 9 DISCUSSION

Based on information provided by the client, the proposed redevelopment consists of a potential mixed use and aged care development. It is understood that the proposed development will occupy 50% of the available floor space ratio (FSR) with a residential aged care facility that is to be integrated into a larger mixed development of suitable complimentary tenancies. It is understood that the project may also include two levels of basement car parking to an indeterminate depth. Based on this information, receptors of the site, including workers, residents, visitors etc., will likely have access to surface soils and may be at risk of ingestion or inhalation of soils.

## 9.1 *SITE ASSESSMENT*

As there we no analysed fill samples that exceeded the SAC, it is understood that there is no potential risk to human health or ecological health at the site for the proposed mixed use and aged care development land use. However, as only ten boreholes were tested, further sampling to characterise the site and to comply with the Sampling Design Guidelines (NSW EPA, 1995), would require an additional 13 borehole sampling points to satisfy the minimum sampling points for site characterisation based on detecting circular hotspots for a site area of up to 1.3 ha.

Asbestos was not detected in any of the samples collected or observed in site soils.

## 9.2 *WASTE CLASSIFICATION*

The preliminary investigation of the soil at the site indicate that the fill material can be classified as General Solid Waste. Further investigation in accordance with the NSW EPA Excavated Natural Material Order 2014 at the time of excavation can confirm whether the fill materials can be classified as Excavated Natural Materials (ENM). Underlying natural soils at the site may be classified as Virgin Excavated Natural Materials (VENM) due to the nature of the fill material overlying the soils. Further sampling and analysis will be required to classify and validate these soils at time of the proposed excavation and development.

# 10 SUMMARY AND RECOMMENDATION

The results of this Stage 1 – Preliminary Site Investigation indicate that the site and surrounding areas have a history of commercial land use. Potentially contaminating land use activities that have been identified to have occurred onsite include:

- Poultry farming and processing; and
- Application of uncontrolled fill on the site;

The environmental investigation undertaken at the site to characterise the soils and to determine a preliminary waste classification of the soils consisted of sampling fill material from 10 boreholes at the site. The drilling of the boreholes showed the fill materials to consist of clay with gravels and sand to a maximum depth of 2.2m bgl (GW2). The investigation of the soil has indicated no presence of contamination at concentrations exceeding the SAC.

Contaminant concentrations of the fill material also indicated a preliminary waste classification to be general solid waste. Fill materials may be potentially classified as ENM with further sampling in accordance with the NSW EPA (2014) The excavated natural material order 2014. Natural soil underlying the fill materials may be classified as VENM due to the low concentrations of analytes detected in the fill materials, however, additional sampling would be required to confirm this waste classification.

Investigation of groundwater was not included in the scope of works for this environmental investigation, however, it is unlikely that groundwater is impacted by onsite sources of contamination. If discoloured or odorous soils are discovered during excavation works, further investigation of the soils and groundwater should be undertaken by a qualified environmental scientist/engineer.

# 11 LIMITATIONS OF THIS REPORT

This report has been prepared for use by the client who commissioned the works in accordance with the project brief and based on information provided by the client. The advice contained in this report relates only to the current project and all results, conclusions and recommendations should be reviewed by a competent person with experience in geotechnical and environmental investigations before being used for any other purpose. CES accepts no liability for use or interpretation by any person or body other than the client. This report must not be reproduced except in full and must not be amended in any way without prior approval by the client and CES.

This report does not provide a complete assessment of the environmental status of the site and is limited to the scope defined therein. It is noted that areas of the site could not be investigated due to the presence of structures including the residential property and presence of ponds. Should information become available regarding conditions at the site including previously unknown sources of contamination, CES reserves the right to review the report in the context of the additional information.

# 12 REFERENCES


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# Figures

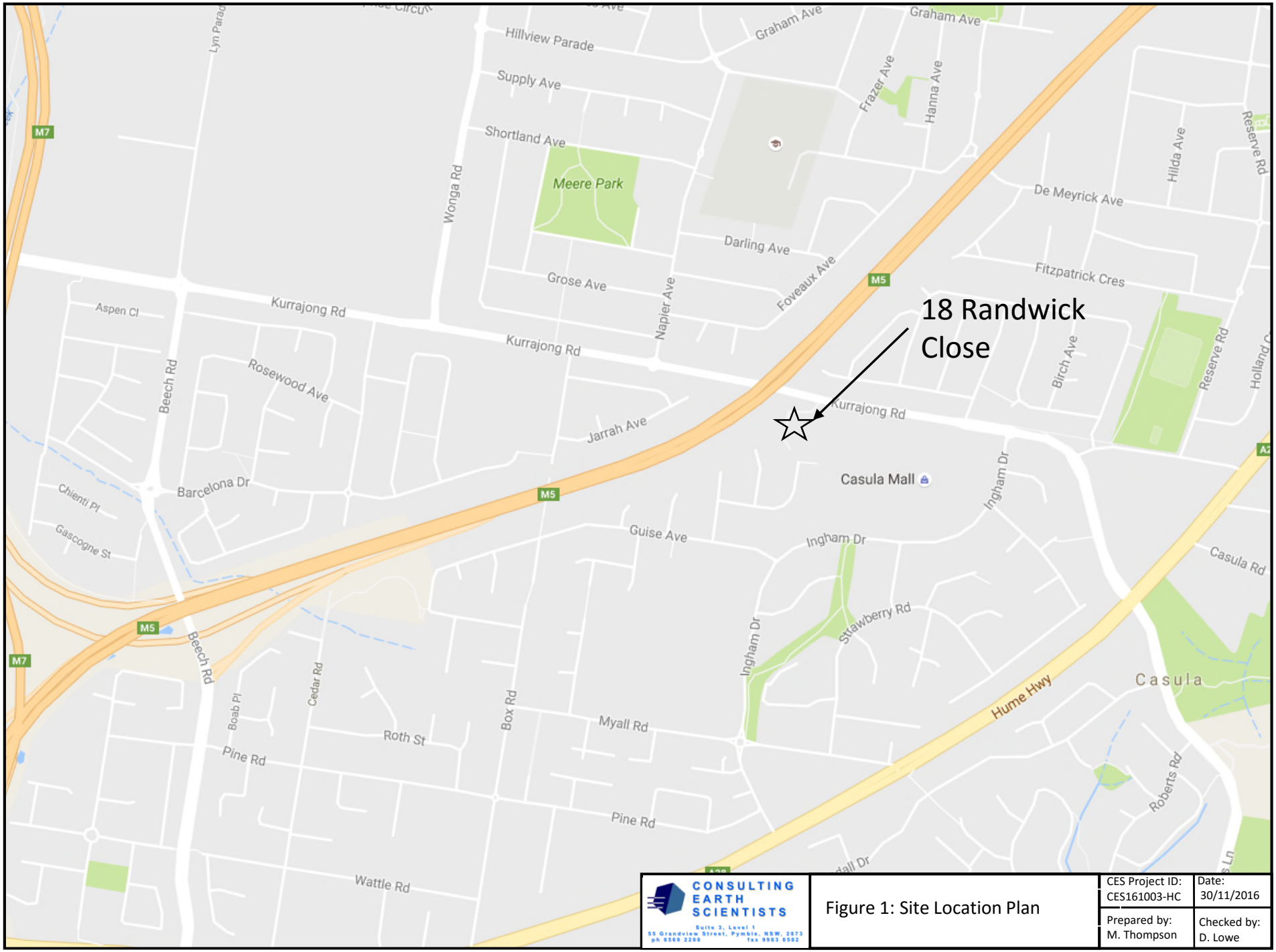


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Figure 1: Site Location Plan

| | |
|---|---|
| CES Project ID: CES161003-HC | Date: 30/11/2016 |
| Prepared by: M. Thompson | Checked by: D. Lowe |


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Title

**Figure 2: Borehole Location Plan**

| CES Project ID: | Date: |
|---|---|
| CES161003-HC | 24/10/2016 |
| Prepared By: M. Thompson | Checked By; D. Lowe |

# Tables

**Table 1: Summary of Borehole Information**

| Sample Point | Date Drilled/Sampled | Easting | Northing | Ground Level (mAHD) | Termination Depth (m) | RL (mAHD) | Depth of analysed sample (m) |
|---|---|---|---|---|---|---|---|
| BH1 | 2-Nov | 305666 | 6241713 | 39 | 8.7 | 30.3 | 0.5-0.7 |
| BH2 | 3-Nov | 305642 | 6241753 | 39 | 7.2 | 31.8 | 0.3-0.5 |
| BH3 | 3-Nov | 305498 | 6241570 | 40 | 6.7 | 33.3 | 0.3-0.5 |
| BH4 | 4-Nov | 305590 | 6241727 | 41 | 7 | 34 | 0.3-0.5 |
| BH5 | 4-Nov | 305573 | 6241714 | 42 | 9 | 33 | 0.4-0.6 |
| BH6 | 2-Nov | 305614 | 6241677 | 40 | 7.1 | 32.9 | 0.1-0.3 |
| BH7 | 2-Nov | 305631 | 6241722 | 40 | 7.8 | 32.2 | 0.5-0.7 |
| GW1 | 2-Nov | 305590 | 6241727 | 40 | 8.6 | 31.4 | 0.2-0.5 |
| GW2 | 2-Nov | 305661 | 6241682 | 39 | 8.5 | 30.5 | 0.4-0.6 |
| GW3 | 3-Nov | 305672 | 6241750 | 39 | 8.7 | 30.3 | 0.3-0.5 |

**Table 2: Containers, preservation requirements, holding times and samples analysed - soil**

| Parameter | Container | Recommended Preservation | Maximum holding time | Number of samples analysed |
|---|---|---|---|---|
| Acid digestible metals and metalloids - Total and TCLP (As,Cd,Cu,Cr,Ni,Pb,Zn) | Glass with Teflon lid | Cool to <6$^{o}$C | 6 months | 10 |
| Mercury | Glass with Teflon lid | Cool to <6$^{o}$C | 28 days | 10 |
| Asbestos | Bag | Nil | Indefinate | 10 |
| TPH/BTEX | Glass with Teflon lid | 4oC, zero headspace | 14 days | 10 |
| PAHs (total and TCLP) | Glass with Teflon lid | 4oC | 14 days [1] | 10 |
| OCPs | Glass with Teflon lid | Cool to <6$^{o}$C | 14 days | 10 |
| OPPs | Glass with Teflon lid | Cool to <6$^{o}$C | 14 days | 10 |
| PCBs | Glass with Teflon lid | Cool to <6$^{o}$C, dark | 28 days | 10 |

Note 1: Extraction within 14 days. Analysis within 40 days.

## Table 3: Analytical parameters, PQLs and methods - Soil

| Parameter | Unit | PQL | Method based on |
|---|---|---|---|
| **Metals in Soil** | | | |
| As [1] | mg $kg^{-1}$ | 4 | USEPA 200.7 |
| Cd [1] | mg $kg^{-1}$ | 0.4 | USEPA 200.7 |
| Cr [1] | mg $kg^{-1}$ | 1 | USEPA 200.7 |
| Cu [1] | mg $kg^{-1}$ | 1 | USEPA 200.7 |
| Hg [2] | mg $kg^{-1}$ | 0.1 | USEPA 7471A |
| Ni [1] | mg $kg^{-1}$ | 1 | USEPA 200.7 |
| Pb [1] | mg $kg^{-1}$ | 1 | USEPA 200.7 |
| Zn [1] | mg $kg^{-1}$ | 1 | USEPA 200.7 |
| **Total Petroleum Hydrocarbons (TPH) in Soil** | | | |
| $C_6$-$C_9$ fraction | mg $kg^{-1}$ | 25 | USEPA 8015B |
| $C_{10}$-$C_{14}$ fraction | mg $kg^{-1}$ | 50 | USEPA 8015B |
| $C_{15}$-$C_{28}$ fraction | mg $kg^{-1}$ | 100 | USEPA 8015B |
| $C_{29}$-$C_{36}$ fraction | mg $kg^{-1}$ | 100 | USEPA 8015B |
| **BTEX in Soil** | | | |
| Benzene | mg $kg^{-1}$ | 0.2 | USEPA 8021A |
| Toluene | mg $kg^{-1}$ | 0.5 | USEPA 8021A |
| Ethylbenzene | mg $kg^{-1}$ | 1 | USEPA 8021A |
| m&p-xylene | mg $kg^{-1}$ | 2 | USEPA 8021A |
| o-xylenes | mg $kg^{-1}$ | 1 | USEPA 8021A |
| **Organic Contaminants in Soil** | | | |
| PAHs | mg $kg^{-1}$ | 0.1 | USEPA 8270 SIM |
| **Organochlorine Pesticides (OPC) in Soil** | | | |
| OCPs | mg kg-1 | 0.1 | USEPA 8081 |
| **Organophosphate Pesticides (OPP) in Soil** | | | |
| OPPs | mg kg-1 | 0.1 | USEPA 8270 or 8141 |
| **Polychlorinated Biphenyls (PCB) in Soil** | | | |
| PCBs | mg kg-1 | 0.1 | USEPA 8082 |
| **Asbestos in Soil** | | | |
| Asbestos in Soil | g/kg | 0.1 | AS4964-2004 |

Note 1: Acid soluble metals by ICP-AES.

Note 2: Total recoverable mercury.

**Table 4: Site Assessment Criteria - Soil**

| Contaminant | HIL (Setting A)[1] (mg/kg) | HSL (Settings A & B)[2] (mg/kg) | EIL (urban residential and public open space)[3] (mg/kg) | ESL (Urban Residential and public open space)[4] (mg/kg) |
|---|---|---|---|---|
| TRH C6 - C9 | | | | |
| TRH C6 - C10 | | | | |
| FRACTION 1 | | **50** | | **180** |
| TRH C10 - C14 | | | | |
| TRH C15 - C28 | | | | |
| TRH C29 - C36 | | | | |
| TRH total C10 - C36 | | | | |
| TRH C10-C36 | | | | |
| TRH >C10-C16 | | | | |
| FRACTION 2 | | **280** | | **120** |
| TRH >C16-C34 | | | | **1300** |
| TRH >C34-C40 | | | | **5600** |
| TRH total >C10-C40 | | | | |
| Benzene | | **0.7** | | **65** |
| Toluene | | **480** | | **105** |
| Ethylbenzene | | | | **125** |
| m+p-xylene | | | | |
| o-Xylene | | | | |
| Xylenes | | **110** | | **45** |
| Naphthalene | | **5** | **170** | |
| Acenaphthylene | | | | |
| Acenaphthene | | | | |
| Fluorene | | | | |
| Phenanthrene | | | | |
| Anthracene | | | | |
| Fluoranthene | | | | |
| Pyrene | | | | |
| Benzo(a)anthracene | | | | |
| Chrysene | | | | |
| Benzo(b+k)fluoranthene | | | | |
| Benzo(a)pyrene | | | | **0.7** |
| Indeno(1,2,3-c,d)pyrene | | | | |
| Dibenzo(a,h)anthracene | | | | |
| Benzo(g,h,i)perylene | | | | |
| Benzo(a)pyrene TEQ | **3** | | | |
| Total +ve | **300** | | | |
| HCB | **10** | | | |
| alpha-BHC | | | | |
| gamma-BHC | | | | |
| beta-BHC | | | | |
| Heptachlor | **6** | | | |
| delta-BHC | | | | |
| Aldrin | | | | |
| Heptachlor Epoxide | | | | |
| gamma-Chlordane | | | | |
| alpha-chlordane | | | | |
| Endosulfan I | **270** | | | |
| pp-DDE | | | | |
| Dieldrin | | | | |
| Endrin | | | | |
| pp-DDD | | | | |
| Endosulfan II | | | | |
| pp-DDT | | | **180** | |
| Endrin Aldehyde | | | | |
| Endosulfan Sulphate | | | | |
| Methoxychlor | **300** | | | |
| Endosulfan (Endosulfan I + Endosulfan 2 + Endosulfan sulphate) | | | | |
| Azinphos-methyl (Guthion) | | | | |
| Bromophos-ethyl | | | | |
| Chlorpyriphos | | | | |
| Chlorpyriphos-methyl | | | | |
| Diazinon | | | | |
| Dichlorvos | | | | |
| Dimethoate | | | | |
| Ethion | | | | |
| Fenitrothion | | | | |
| Malathion | | | | |
| Parathion | | | | |
| Ronnel | | | | |
| Aroclor 1016 | | | | |
| Aroclor 1221 | | | | |
| Aroclor 1232 | | | | |
| Aroclor 1242 | | | | |
| Aroclor 1248 | | | | |
| Aroclor 1254 | | | | |
| Aroclor 1260 | | | | |
| PCBs | | | | |
| Arsenic | **100** | | **100** | |
| Cadmium | **20** | | | |
| Chromium | **100** | | **810** | |
| Copper | **6000** | | **240** | |
| Lead | **300** | | **1100** | |
| Mercury | **40** | | | |
| Nickel | **400** | | **270** | |
| Zinc | **7400** | | **820** | |
| Asbestos | | | | |

Note 1: NEPC (1999, as amended 2013) – Schedule B1 Guideline on Investigation Levels for Soil and Groundwater, HIL A (Residential with garden accessible soil)
Note 2: (NEPC< 1999, as amended 2013) - Schedule B1, Guideline on Invesitgation Levels For Soil and Groundwater, HSL A (Clay, 0m to <1m)
Note 3: (NEPC< 1999, as amended 2013) - Schedule B1, Guideline on Invesitgation Levels For Soil and Groundwater, EIL (urban residential and public open space)
Note 4: (NEPC< 1999, as amended 2013) - Schedule B1, Guideline on Invesitgation Levels For Soil and Groundwater, ESL (urban residential and public open space)

**Table 4 (continued): Waste Classification Criteria - Soil**

| Contaminant | CT1 Values - General Solid Waste[1] (mg/kg) | CT2 Values - Restricted Solid Waste[2] (mg/kg) |
|---|---|---|
| TRH C6 - C9 | **650** | **2600** |
| TRH C6 - C10 | | |
| FRACTION 1 | | |
| TRH C10 - C14 | | |
| TRH C15 - C28 | | |
| TRH C29 - C36 | | |
| TRH total C10 - C36 | | |
| TRH C10-C36 | | |
| TRH >C10-C16 | | |
| FRACTION 2 | | |
| TRH >C16-C34 | | |
| TRH >C34-C40 | | |
| TRH total >C10-C40 | **10000** | **40000** |
| Benzene | **10** | **40** |
| Toluene | **288** | **1152** |
| Ethylbenzene | **600** | **2400** |
| m+p-xylene | | |
| o-Xylene | | |
| Xylenes | **1000** | **4000** |
| Naphthalene | | |
| Acenaphthylene | | |
| Acenaphthene | | |
| Fluorene | | |
| Phenanthrene | | |
| Anthracene | | |
| Fluoranthene | | |
| Pyrene | | |
| Benzo(a)anthracene | | |
| Chrysene | | |
| Benzo(b+k)fluoranthene | | |
| Benzo(a)pyrene | **0.8** | **3.2** |
| Indeno(1,2,3-c,d)pyrene | | |
| Dibenzo(a,h)anthracene | | |
| Benzo(g,h,i)perylene | | |
| Benzo(a)pyrene TEQ | | |
| Total +ve | **200** | **800** |
| HCB | | |
| alpha-BHC | | |
| gamma-BHC | | |
| beta-BHC | | |
| Heptachlor | | |
| delta-BHC | | |
| Aldrin | | |
| Heptachlor Epoxide | | |
| gamma-Chlordane | | |
| alpha-chlordane | | |
| Endosulfan I | **60** | **240** |
| pp-DDE | | |
| Dieldrin | | |
| Endrin | | |
| pp-DDD | | |
| Endosulfan II | | |
| pp-DDT | | |
| Endrin Aldehyde | | |
| Endosulfan Sulphate | | |
| Methoxychlor | | |
| Endosulfan (Endosulfan I + Endosulfan 2 + Endosulfan sulphate) | **60** | **240** |
| Azinphos-methyl (Guthion) | | |
| Bromophos-ethyl | | |
| Chlorpyriphos | **4** | **16** |
| Chlorpyriphos-methyl | | |
| Diazinon | | |
| Dichlorvos | | |
| Dimethoate | | |
| Ethion | | |
| Fenitrothion | | |
| Malathion | | |
| Parathion | | |
| Ronnel | | |
| Aroclor 1016 | | |
| Aroclor 1221 | | |
| Aroclor 1232 | | |
| Aroclor 1242 | | |
| Aroclor 1248 | | |
| Aroclor 1254 | | |
| Aroclor 1260 | | |
| PCBs | **<50** | **<50** |
| Arsenic | **100** | **400** |
| Cadmium | **20** | **80** |
| Chromium | **100** | **400** |
| Copper | | |
| Lead | **100** | **400** |
| Mercury | **4** | **16** |
| Nickel | **40** | **160** |
| Zinc | | |
| Asbestos | | |

Note 1: Maximum values of specific contamininat concentration (SCC) for classification without TCLP - CT1 (General Solid Waste) (NSW EPA, 2014)
Note 2: Maximum values of specific contamininat concentration (SCC) for classification without TCLP - CT2 (Restricted Solid Waste) (NSW EPA, 2014)

**Table 5: QC Sample Data Acceptance Criteria**

| QC Sample Type | Method of Assessment | Acceptable Range |
|---|---|---|
| **Field QC** | | |
| Blind Replicates and Split Samples | The assessment of split replicate is undertaken by calculating the Relative Percent Difference (RPD) of the replicate concentration compared with the original sample concentration. The RPD is defined as:<br><br>$RPD = 100 \times \frac{\lvert X_1 - X_2 \rvert}{Average}$<br><br>Where: $X_1$ and $X_2$ are the concentration of the original and replicate samples. | The acceptable range depends upon the levels detected:<br>▪ 0 – 100% RPD (When the average concentration is < 5 times the LOR/EQL)<br>▪ 0 – 75% RPD (When the average concentration is 5 to 10 times the LOR/EQL)<br>▪ 0 – 50% RPD (When the average concentration is > 10 times the LOR/EQL) |
| Blanks (Rinsate and Trip Blanks) | Each blank is analysed as per the original samples. | Analytical Result < LOR/EQL |
| Laboratory-prepared Trip Spike | The trip spike is analysed after returning from the field and the % recovery of the known spike is calculated. | 70% - 130% |
| **Laboratory QC** | | |
| Laboratory Duplicates | Assessment as per Blind Replicates and Split Samples. | The acceptable range depends upon the levels detected:<br>▪ 0 – 100% RPD (When the average concentration is < 4 times the LOR/EQL)<br>▪ 0 – 50% RPD (When the average concentration is 4 to 10 times the LOR/EQL)<br>▪ 0 – 30% RPD (When the average concentration is > 10 times the LOR/EQL) |
| Surrogates<br><br>Matrix Spikes<br>Laboratory Control Samples | Assessment is undertaken by determining the percent recovery of the known spike or addition to the sample.<br>$\% \text{ Recovery} = 100 \times \frac{C - A}{B}$<br>Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; C = Calculated Concentration. | 70% - 130% (General Analytes)<br><br>50% - 130% (Phenols)<br>60% - 130% (OP Pesticides)<br><br>If the result is outside the above ranges, the result must be < 3x Standard Deviation of the Historical Mean (calculated over past 12 months) |
| Method Blanks | Each blank is analysed as per the original samples. | Analytical Result < LOR/EQL |

**Note:** EQL = Laboratory Estimated Quantitation Limit (EQL) or the minimum detection limit for a particular analyte. LOR = Limit of Reporting or the minimum

**Table 6: QA/QC tabulated results**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Soil Sample | GW1 | QAQC1 | QAQC2 | Average | Blind RPD | Average | Split RPD |
| | | | | Sample Type | Original | Blind replicate | Split replicate | | | | |
| | | | | Laboratory report | 156683 | 156683 | ES1625137 | | | | |
| Parameters | Unit | Primary PQL | Blind PQL | Split PQL | | | | | % | | % |
| TRH C6 - C9 | mg/kg | 25 | 25 | 10 | <25 | <25 | <10 | N/A | N/A | N/A | N/A |
| TRH C6 - C10 | mg/kg | 25 | 25 | 10 | <25 | <25 | <10 | N/A | N/A | N/A | N/A |
| FRACTION 1 | mg/kg | 25 | 25 | 10 | <25 | <25 | <10 | N/A | N/A | N/A | N/A |
| TRH C10 - C14 | mg/kg | 50 | 50 | 50 | <50 | <50 | <50 | N/A | N/A | N/A | N/A |
| TRH C15 - C28 | mg/kg | 100 | 100 | 100 | <100 | <100 | <100 | N/A | N/A | N/A | N/A |
| TRH C29 - C36 | mg/kg | 100 | 100 | 100 | <100 | <100 | <100 | N/A | N/A | N/A | N/A |
| TRH >C10-C16 | mg/kg | 50 | 50 | 50 | <50 | <50 | <50 | N/A | N/A | N/A | N/A |
| FRACTION 2 | mg/kg | 50 | 50 | 50 | <50 | <50 | <50 | N/A | N/A | N/A | N/A |
| TRH >C16-C34 | mg/kg | 100 | 100 | 100 | <100 | <100 | <100 | N/A | N/A | N/A | N/A |
| TRH >C34-C40 | mg/kg | 100 | 100 | 100 | <100 | <100 | <100 | N/A | N/A | N/A | N/A |
| | | | | | | | | N/A | N/A | N/A | N/A |
| Benzene | mg/kg | 0.2 | 0.2 | 0.2 | <0.2 | <0.2 | <0.2 | N/A | N/A | N/A | N/A |
| Toluene | mg/kg | 0.5 | 0.5 | 0.5 | <0.5 | <0.5 | <0.5 | N/A | N/A | N/A | N/A |
| Ethylbenzene | mg/kg | 1 | 1 | 0.5 | <1 | <1 | <0.5 | N/A | N/A | N/A | N/A |
| m+p-xylene | mg/kg | 2 | 2 | 0.5 | <2 | <2 | <0.5 | N/A | N/A | N/A | N/A |
| o-Xylene | mg/kg | 1 | 1 | 0.5 | <1 | <1 | <0.5 | N/A | N/A | N/A | N/A |
| | | | | | | | | N/A | N/A | N/A | N/A |
| Naphthalene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Acenaphthylene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Acenaphthene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Fluorene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Phenanthrene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Anthracene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Fluoranthene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Pyrene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Benzo(a)anthracene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Chrysene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Benzo(b+k)fluoranthene | mg/kg | 0.2 | 0.2 | 0.5 | <0.2 | <0.2 | <0.5 | N/A | N/A | N/A | N/A |
| Benzo(a)pyrene | mg/kg | 0.05 | 0.05 | 0.5 | <0.05 | <0.05 | <0.5 | N/A | N/A | N/A | N/A |
| Indeno(1,2,3-c,d)pyrene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Dibenzo(a,h)anthracene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Benzo(g,h,i)perylene | mg/kg | 0.1 | 0.1 | 0.5 | <0.1 | <0.1 | <0.5 | N/A | N/A | N/A | N/A |
| Benzo(a)pyrene TEQ | mg/kg | 0.5 | 0.5 | 0.5 | <0.5 | <0.5 | <0.5 | N/A | N/A | N/A | N/A |
| Total +ve | mg/kg | - | - | 0.5 | NIL (+)VE | NIL (+)VE | <0.5 | N/A | N/A | N/A | N/A |
| | | | | | | | | N/A | N/A | N/A | N/A |
| HCB | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| alpha-BHC | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| gamma-BHC | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| beta-BHC | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Heptachlor | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| delta-BHC | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Aldrin | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Heptachlor Epoxide | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| gamma-Chlordane | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| alpha-chlordane | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Endosulfan I | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| pp-DDE | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Dieldrin | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Endrin | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| pp-DDD | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Endosulfan II | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| pp-DDT | mg/kg | 0.1 | 0.1 | 0.2 | <0.1 | <0.1 | <0.2 | N/A | N/A | N/A | N/A |
| Endrin Aldehyde | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Endosulfan Sulphate | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Methoxychlor | mg/kg | 0.1 | 0.1 | 0.2 | <0.1 | <0.1 | <0.2 | N/A | N/A | N/A | N/A |
| | | | | | | | | N/A | N/A | N/A | N/A |
| Azinphos-methyl (Guthion) | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Bromophos-ethyl | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Chlorpyriphos | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Chlorpyriphos-methyl | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Diazinon | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Dichlorvos | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Dimethoate | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Ethion | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Fenitrothion | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Malathion | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| Parathion | mg/kg | 0.1 | 0.1 | 0.2 | <0.1 | <0.1 | <0.2 | N/A | N/A | N/A | N/A |
| Ronnel | mg/kg | 0.1 | 0.1 | 0.05 | <0.1 | <0.1 | <0.05 | N/A | N/A | N/A | N/A |
| | | | | | | | | N/A | N/A | N/A | N/A |
| Aroclor 1016 | mg/kg | 0.1 | 0.1 | - | <0.1 | <0.1 | nt | N/A | N/A | N/A | N/A |
| Aroclor 1221 | mg/kg | 0.1 | 0.1 | - | <0.1 | <0.1 | nt | N/A | N/A | N/A | N/A |
| Aroclor 1232 | mg/kg | 0.1 | 0.1 | - | <0.1 | <0.1 | nt | N/A | N/A | N/A | N/A |
| Aroclor 1242 | mg/kg | 0.1 | 0.1 | - | <0.1 | <0.1 | nt | N/A | N/A | N/A | N/A |
| Aroclor 1248 | mg/kg | 0.1 | 0.1 | - | <0.1 | <0.1 | nt | N/A | N/A | N/A | N/A |
| Aroclor 1254 | mg/kg | 0.1 | 0.1 | - | <0.1 | <0.1 | nt | N/A | N/A | N/A | N/A |
| Aroclor 1260 | mg/kg | 0.1 | 0.1 | - | <0.1 | <0.1 | nt | N/A | N/A | N/A | N/A |
| | | | | | | | | N/A | N/A | N/A | N/A |
| Arsenic | mg/kg | 4 | 4 | 5 | 8 | 6 | 10 | 7 | 28.6% | 9.0 | 22.2% |
| Cadmium | mg/kg | 0.4 | 0.4 | 1 | <0.4 | <0.4 | <1 | N/A | N/A | N/A | N/A |
| Chromium | mg/kg | 1 | 1 | 2 | 17 | 26 | 9 | 21.5 | 41.9% | 13.0 | 61.5% |
| Copper | mg/kg | 1 | 1 | 5 | 20 | 19 | 20 | 19.5 | 5.1% | 20.0 | 0.0% |
| Lead | mg/kg | 1 | 1 | 5 | 10 | 10 | 10 | 10 | 0.0% | 10.0 | 0.0% |
| Mercury | mg/kg | 0.1 | 0.1 | 0.1 | <0.1 | <0.1 | <0.1 | N/A | N/A | N/A | N/A |
| Nickel | mg/kg | 1 | 1 | 2 | 11 | 17 | 2 | 14 | 42.9% | 6.5 | 138.5% |
| Zinc | mg/kg | 1 | 1 | 5 | 17 | 18 | 12 | 17.5 | 5.7% | 14.5 | 34.5% |

**Table 6: QA/QC tabulated results (continued)**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | **Soil Sample** | TB | TB | TS | TS |
| | | | | **Sample Type** | Trip Blank | Trip Blank | Trip Spike | Trip Spike |
| | | | | **Laboratory report** | 156683 | 156717 | 156883 | 156717 |
| **Parameters** | **Unit** | **Primary PQL** | **Blind PQL** | **Split PQL** | | | % | % |
| TRH C6 - C9 | mg/kg | 25 | 25 | 10 | <25 | <25 | | |
| TRH C6 - C10 | mg/kg | 25 | 25 | 10 | <25 | <25 | | |
| FRACTION 1 | mg/kg | 25 | 25 | 10 | <25 | | | |
| TRH C10 - C14 | mg/kg | 50 | 50 | 50 | <50 | | | |
| TRH C15 - C28 | mg/kg | 100 | 100 | 100 | <100 | | | |
| TRH C29 - C36 | mg/kg | 100 | 100 | 100 | <100 | | | |
| TRH >C10-C16 | mg/kg | 50 | 50 | 50 | <50 | | | |
| FRACTION 2 | mg/kg | 50 | 50 | 50 | <50 | | | |
| TRH >C16-C34 | mg/kg | 100 | 100 | 100 | <100 | | | |
| TRH >C34-C40 | mg/kg | 100 | 100 | 100 | <100 | | | |
| | | | | | | | | |
| Benzene | mg/kg | 0.2 | 0.2 | 0.2 | <0.2 | <0.2 | 100% | 95% |
| Toluene | mg/kg | 0.5 | 0.5 | 0.5 | <0.5 | <0.5 | 85% | 98% |
| Ethylbenzene | mg/kg | 1 | 1 | 0.5 | <1 | <1 | 96% | 108% |
| m+p-xylene | mg/kg | 2 | 2 | 0.5 | <2 | <2 | 99% | 108% |
| o-Xylene | mg/kg | 1 | 1 | 0.5 | <1 | <1 | 86% | 111% |
| | | | | | | | | |
| Naphthalene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Acenaphthylene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Acenaphthene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Fluorene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Phenanthrene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Anthracene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Fluoranthene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Pyrene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Benzo(a)anthracene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Chrysene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Benzo(b+k)fluoranthene | mg/kg | 0.2 | 0.2 | 0.5 | | | | |
| Benzo(a)pyrene | mg/kg | 0.05 | 0.05 | 0.5 | | | | |
| Indeno(1,2,3-c,d)pyrene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Dibenzo(a,h)anthracene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Benzo(g,h,i)perylene | mg/kg | 0.1 | 0.1 | 0.5 | | | | |
| Benzo(a)pyrene TEQ | mg/kg | 0.5 | 0.5 | 0.5 | | | | |
| Total +ve | mg/kg | - | - | 0.5 | | | | |
| | | | | | | | | |
| HCB | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| alpha-BHC | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| gamma-BHC | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| beta-BHC | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Heptachlor | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| delta-BHC | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Aldrin | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Heptachlor Epoxide | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| gamma-Chlordane | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| alpha-chlordane | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Endosulfan I | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| pp-DDE | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Dieldrin | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Endrin | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| pp-DDD | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Endosulfan II | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| pp-DDT | mg/kg | 0.1 | 0.1 | 0.2 | | | | |
| Endrin Aldehyde | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Endosulfan Sulphate | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Methoxychlor | mg/kg | 0.1 | 0.1 | 0.2 | | | | |
| | | | | | | | | |
| Azinphos-methyl (Guthion) | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Bromophos-ethyl | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Chlorpyriphos | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Chlorpyriphos-methyl | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Diazinon | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Dichlorvos | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Dimethoate | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Ethion | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Fenitrothion | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Malathion | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| Parathion | mg/kg | 0.1 | 0.1 | 0.2 | | | | |
| Ronnel | mg/kg | 0.1 | 0.1 | 0.05 | | | | |
| | | | | | | | | |
| Aroclor 1016 | mg/kg | 0.1 | 0.1 | - | | | | |
| Aroclor 1221 | mg/kg | 0.1 | 0.1 | - | | | | |
| Aroclor 1232 | mg/kg | 0.1 | 0.1 | - | | | | |
| Aroclor 1242 | mg/kg | 0.1 | 0.1 | - | | | | |
| Aroclor 1248 | mg/kg | 0.1 | 0.1 | - | | | | |
| Aroclor 1254 | mg/kg | 0.1 | 0.1 | - | | | | |
| Aroclor 1260 | mg/kg | 0.1 | 0.1 | - | | | | |
| | | | | | | | | |
| Arsenic | mg/kg | 4 | 4 | 5 | | | | |
| Cadmium | mg/kg | 0.4 | 0.4 | 1 | | | | |
| Chromium | mg/kg | 1 | 1 | 2 | | | | |
| Copper | mg/kg | 1 | 1 | 5 | | | | |
| Lead | mg/kg | 1 | 1 | 5 | | | | |
| Mercury | mg/kg | 0.1 | 0.1 | 0.1 | | | | |
| Nickel | mg/kg | 1 | 1 | 2 | | | | |
| Zinc | mg/kg | 1 | 1 | 5 | | | | |

**Table 7 - Soil Analytical Results**

| Sample Location | | | BH1 | BH2 | BH3 | BH4 | BH5 | BH6 | BH7 | GW1 | GW2 | GW2 | GW3 | NEPM (2013) HIL - Residential A | NEPM (2013) HSL - A & B: Low - high density residential - clay; 0 - <1m | NEPM (2013) EIL (urban residential and public open space) | NEPM (2013) ESL (Urban Residential and public open space) | CT1 Values - General Solid Waste | CT2 Values - Restricted Solid Waste | max | min | mean | standard deviation | 95%UCL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (m) | | | 0.5-0.07 | 0.3-0.5 | 0.3-0.5 | 0.3-0.5 | 0.4-0.6 | 0.1-0.3 | 0.5-0.7 | 0.2-0.5 | 0.4-0.6 | 0.4-0.6 | 0.3-0.5 | | | | | | | | | | | |
| Date Sampled | | | 02-Nov-16 | 03-Nov-16 | 03-Nov-16 | 04-Nov-16 | 04-Nov-16 | 02-Nov-16 | 02-Nov-16 | 03-Nov-16 | 02-Nov-16 | 02-Nov-16 | 03-Nov-16 | | | | | | | | | | | |
| Unit | | | Fill | Fill | Fill | Fill | Fill | Fill | Fill | Fill | Fill | Fill | Fill | | | | | | | | | | | |
| Laboratory report | | | 156683 | 156683 | 156683 | 156717 | 156717 | 156683 | 156683 | 156683 | 156683 | 156683 | 156683 | | | | | | | | | | | |
| Sample Type | | | N | N | N | N | N | N | N | N | N | REP | N | | | | | | | | | | | |
| **Parameters** | **Unit** | **PQL** | | | | | | | | | | | | | | | | | | | | | | |
| TRH C6 - C9 | mg/kg | 25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | | | | | **650** | **2600** | 0 | 0 | N/A | N/A | N/A |
| TRH C6 - C10 | mg/kg | 25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| FRACTION 1 | mg/kg | 25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | <25 | | **50** | | **180** | | | 0 | 0 | N/A | N/A | N/A |
| TRH C10 - C14 | mg/kg | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| TRH C15 - C28 | mg/kg | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| TRH C29 - C36 | mg/kg | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| TRH C10-C36 | mg/kg | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | | | | | **10,000** | **40,000** | 0 | 0 | N/A | N/A | N/A |
| TRH >C10-C16 | mg/kg | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| FRACTION 2 | mg/kg | 50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | | **280** | | **120** | | | 0 | 0 | N/A | N/A | N/A |
| TRH >C16-C34 | mg/kg | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | | | | **1300** | | | 0 | 0 | N/A | N/A | N/A |
| TRH >C34-C40 | mg/kg | 100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | | | | **5600** | | | 0 | 0 | N/A | N/A | N/A |
| | | | | | | | | | | | | | | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Benzene | mg/kg | 0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | | **0.7** | | **65** | **10** | **40** | 0 | 0 | N/A | N/A | N/A |
| Toluene | mg/kg | 0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | | **480** | | **105** | **288** | **1152** | 0 | 0 | N/A | N/A | N/A |
| Ethylbenzene | mg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | | | **125** | **600** | **2400** | 0 | 0 | N/A | N/A | N/A |
| m+p-xylene | mg/kg | 2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| o-Xylene | mg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Xylenes | mg/kg | 2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | | **110** | | **45** | **1000** | **4000** | 0 | 0 | N/A | N/A | N/A |
| | | | | | | | | | | | | | | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Naphthalene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | **5** | **170** | | | | 0 | 0 | N/A | N/A | N/A |
| Acenaphthylene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Acenaphthene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Fluorene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Phenanthrene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | 0.2 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0.2 | 0.2 | 0.2 | N/A | N/A |
| Anthracene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Fluoranthene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Pyrene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Benzo(a)anthracene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Chrysene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Benzo(b+k)fluoranthene | mg/kg | 0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Benzo(a)pyrene | mg/kg | 0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | | | | **0.7** | **0.8** | **3.2** | 0 | 0 | N/A | N/A | N/A |
| Indeno(1,2,3-c,d)pyrene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Dibenzo(a,h)anthracene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Benzo(g,h,i)perylene | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Benzo(a)pyrene TEQ | mg/kg | 0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | **3** | | | | | | 0 | 0 | N/A | N/A | N/A |
| Total +ve | mg/kg | - | NIL (+)VE | NIL (+)VE | NIL (+)VE | NIL (+)VE | NIL (+)VE | 0.19 | NIL (+)VE | NIL (+)VE | NIL (+)VE | NIL (+)VE | NIL (+)VE | **300** | | | | **200** | **800** | 0.19 | 0.19 | 0.19 | N/A | N/A |
| | | | | | | | | | | | | | | | | | | | | 0 | 0 | N/A | N/A | N/A |
| HCB | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | **10** | | | | | | 0 | 0 | N/A | N/A | N/A |
| alpha-BHC | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| gamma-BHC | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| beta-BHC | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Heptachlor | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | **6** | | | | | | 0 | 0 | N/A | N/A | N/A |
| delta-BHC | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Aldrin | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Heptachlor Epoxide | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| gamma-Chlordane | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| alpha-chlordane | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Endosulfan I | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | **270** | | | | **60** | **240** | 0 | 0 | N/A | N/A | N/A |
| pp-DDE | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Dieldrin | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Endrin | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| pp-DDD | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Endosulfan II | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| pp-DDT | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | **180** | | | | 0 | 0 | N/A | N/A | N/A |
| Endrin Aldehyde | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Endosulfan Sulphate | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Methoxychlor | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | **300** | | | | | | 0 | 0 | N/A | N/A | N/A |
| | | | | | | | | | | | | | | | | | | | | 0 | 0 | N/A | N/A | N/A |
| | | | | | | | | | | | | | | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Azinphos-methyl (Guthion) | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Bromophos-ethyl | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Chlorpyriphos | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | **4** | **16** | 0 | 0 | N/A | N/A | N/A |
| Chlorpyriphos-methyl | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Diazinon | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Dichlorvos | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Dimethoate | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Ethion | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Fenitrothion | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Malathion | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Parathion | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Ronnel | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| | | | | | | | | | | | | | | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Aroclor 1016 | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Aroclor 1221 | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Aroclor 1232 | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Aroclor 1242 | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Aroclor 1248 | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Aroclor 1254 | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Aroclor 1260 | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | | | | | | | 0 | 0 | N/A | N/A | N/A |
| PCBs | mg/kg | 0.1 | | | | | | | | | | | | | | | | **<50** | **<50** | 0 | 0 | N/A | N/A | N/A |
| | | | | | | | | | | | | | | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Arsenic | mg/kg | 4 | <4 | 7 | 9 | 9 | 7 | <4 | 7 | 8 | 5 | 7 | 4 | **100** | | **100** | | **100** | **400** | 9.0 | 4.0 | 7.0 | 1.7 | 8.03 |
| Cadmium | mg/kg | 0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | **20** | | | | **20** | **80** | 0 | 0 | N/A | N/A | N/A |
| Chromium | mg/kg | 1 | 13 | 20 | 20 | 19 | 7 | 63 | 17 | 17 | 11 | 13 | 14 | **100** | | **810** | | | | 63.0 | 7.0 | 19.5 | 15.0 | 27.6 |
| Copper | mg/kg | 1 | 13 | 14 | 13 | 23 | 12 | 27 | 12 | 20 | 14 | 16 | 17 | **6000** | | **240** | | | | 27.0 | 12.0 | 16.5 | 4.9 | 19.1 |
| Lead | mg/kg | 1 | 11 | 18 | 17 | 19 | 8 | 12 | 16 | 10 | 10 | 12 | 11 | **300** | | **1100** | | **100** | **400** | 19.0 | 8.0 | 13.1 | 3.7 | 15.1 |
| Mercury | mg/kg | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | **40** | | | | **4** | **16** | 0 | 0 | N/A | N/A | N/A |
| Nickel | mg/kg | 1 | 8 | 4 | 5 | 12 | 2 | 63 | 2 | 11 | 5 | 8 | 12 | **400** | | **270** | | **40** | **160** | 63.0 | 2.0 | 12.0 | 17.3 | 21.5 |
| Zinc | mg/kg | 1 | 31 | 19 | 17 | 38 | 12 | 49 | 10 | 17 | 17 | 18 | 14 | **7400** | | **820** | | | | 49.0 | 10.0 | 22.0 | 12.1 | 28.6 |
| | | | | | | | | | | | | | | | | | | | | 0 | 0 | N/A | N/A | N/A |
| Asbestos | - | - | No Detected | No Detected | No Detected | No Detected | No Detected | No Detected | No Detected | No Detected | No Detected | No Detected | No Detected | | | | | | | 0 | 0 | N/A | N/A | N/A |

**Notes:**

Health investigation levels for Residential land use with garden accessible soil (home grown products <10%minimal opportunities for soil access (Schedule B1, NEPM)
Health screening levels for Low to high density residential land use for clay 0m - <1m (Schedule B1, NEPM)
Ecological Investigation Level for urban residential and public open space (CSIRO EIL Calculation Spreadsheet)
Ecological Screening Level for urban residential and public open space (Schedule B1, NEPM)
Maximum values of specific contamininat concentration (SCC) for classification without TCLP - CT1 (General Solid Waste) (NSW EPA, 2014)
Maximum values of specific contamininat concentration (SCC) for classification without TCLP - CT2 (Restricted Solid Waste) (NSW EPA, 2014)

# Appendix A
# Photographic Log

CONSULTING EARTH SCIENTISTS

# Photographic Log

| Client Name: | Site Location: | Project Number: |
|---|---|---|
| Heymann-Cohen Pty Ltd | 18 Randwick Close, Casula New South Wales | CES161003-HC |

| Date: | Plate No: |
|---|---|
| 24/11/16 | 1 |

**Description:**

Site entry point from Randwick Close looking towards the southwestern corner of the site. Gravel 'driveway' seen in the foreground. Photograph shows the slope of the site increasing to the west.

**Direction Photo Taken:**

West

CONSULTING EARTH SCIENTISTS

# Photographic Log

| Client Name: | Site Location: | Project Number: |
|---|---|---|
| Heymann-Cohen Pty Ltd | 18 Randwick Close, Casula New South Wales | CES161003-HC |

| Date: | Plate No: |
|---|---|
| 24/11/16 | 2 |

**Description:**
South-eastern corner taken from the southern portion of the site. Gravel surface in the foreground, may have been parking area or driveway. Daruk Park in the background with Casula Mall further east.

**Direction Photo Taken:**
Southeast

CONSULTING EARTH SCIENTISTS

# Photographic Log

| Client Name: | Site Location: | Project Number: |
|---|---|---|
| Heymann-Cohen Pty Ltd | 18 Randwick Close, Casula New South Wales | CES161003-HC |

| Date: | Plate No: |
|---|---|
| 24/11/16 | 3 |

**Description:**
Centre of the southern portion of the site looking South-southwest towards the sit entry via Randwick Close. The foreground of the photograph shows dry path of grass which may indicate the footprint of the demolished building (completed in 2014). The background shows residential properties of Randwick Close.

**Direction Photo Taken:**

South-southwest

CONSULTING EARTH SCIENTISTS

# Photographic Log

| Client Name: | Site Location: | Project Number: |
|---|---|---|
| Heymann-Cohen Pty Ltd | 18 Randwick Close, Casula New South Wales | CES161003-HC |

| Date: | Plate No: |
|---|---|
| 24/11/16 | 4 |

**Description:**

Photograph taken from the centre of the site looking towards the northeast. The foreground of the photograph shows a gravel / road base surface.

**Direction Photo Taken:**
Northeast

# Photographic Log

| Client Name: | Site Location: | Project Number: |
|---|---|---|
| Heymann-Cohen Pty Ltd | 18 Randwick Close, Casula New South Wales | CES161003-HC |

| Date: | Plate No: |
|---|---|
| 24/11/16 | 5 |

**Description:**
One of two metal road plate covered pits on the eastern boundary of the site. In the background is Daruk park and Casula Mall.

**Direction Photo Taken:**

East

# Photographic Log

| Client Name: | Site Location: | Project Number: |
|---|---|---|
| Heymann-Cohen Pty Ltd | 18 Randwick Close, Casula New South Wales | CES161003-HC |

| Date: | Plate No: |
|---|---|
| 24/11/16 | 6 |

**Description:**
One of three brick constructed pits containing 150mm PVC conduit. Size of pit approximately 600mm x 600mm

**Direction Photo Taken:**
West

# Photographic Log

| Client Name: | Site Location: | Project Number: |
|---|---|---|
| Heymann-Cohen Pty Ltd | 18 Randwick Close, Casula New South Wales | CES161003-HC |

| Date: | Plate No: |
|---|---|
| 24/11/16 | 7 |

**Description:**

Looking east along the northern boundary of the site. To the left of the photo is Kurrajong Road. In the foreground is stockpiles of timber. In the background is Casula Mall.

**Direction Photo Taken:**

East

# Photographic Log

| Client Name: | Site Location: | Project Number: |
|---|---|---|
| Heymann-Cohen Pty Ltd | 18 Randwick Close, Casula New South Wales | CES161003-HC |

| Date: | Plate No: |
|---|---|
| 24/11/16 | 8 |

**Description:**

Centre of the northern half of the site looking towards the north-western corner. Gravel access driveway previously used on the site is shown in the foreground.

**Direction Photo Taken:**

Northwest

# Appendix B
# Lot Search

Lotsearch

# Environmental Risk and Planning Report

**18 Randwick Close, Casula, NSW 2170**

**Report Buffer: 1000m**

**Report Date: 17 Nov 2016 14:53:02**

# Table of Content



# Location Confidence

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 | 17/11/2016 | 17/11/2016 | 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 | 01/11/2016 | 30/08/2016 | Monthly | 0 | 0 | 1 |
| Contaminated Land: Records of Notice | Environment Protection Authority | 11/11/2016 | 11/11/2016 | Monthly | 0 | 0 | 0 |
| Former Gasworks | Environment Protection Authority | 01/11/2016 | 10/05/2013 | Monthly | 0 | 0 | 0 |
| National Waste Management Site Database | Geoscience Australia | 01/11/2016 | 15/11/2012 | Quarterly | 0 | 0 | 0 |
| Licensed Activities under the POEO Act 1997 | Environment Protection Authority | 03/11/2016 | 18/10/2016 | Monthly | 0 | 0 | 0 |
| Delicensed POEO Activities still Regulated by the EPA | Environment Protection Authority | 03/11/2016 | 18/10/2016 | Monthly | 0 | 0 | 0 |
| Former POEO Licensed Activities now revoked or surrendered | Environment Protection Authority | 03/11/2016 | 18/10/2016 | Monthly | 0 | 2 | 7 |
| UPSS Environmentally Sensitive Zones | Department of Environment, Climate Change and Water (NSW) | 14/04/2015 | 12/01/2010 | As required | 0 | 0 | 1 |
| UBD Business to Business Directory 1991 | Hardie Grant | | | Not required | 0 | 1 | 1 |
| UBD Business Directory 1991 Motor Garages/Service Stations | Hardie Grant | | | Not required | 0 | 0 | 2 |
| UBD Business Directory 1970 | Hardie Grant | | | Not required | 0 | 3 | 3 |
| UBD Business Directory 1970 Drycleaners & Motor Garages/Service Stations | Hardie Grant | | | Not required | 0 | 0 | 6 |
| UBD Business Directory 1950 | Hardie Grant | | | Not required | 0 | 3 | 3 |
| UBD Business Directory 1950 Drycleaners & Motor Garages/Service Stations | Hardie Grant | | | Not required | 0 | 0 | 1 |
| Points of Interest | Land and Property Information | 10/04/2015 | 01/04/2015 | Annually | 0 | 2 | 29 |
| 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 | 6 |
| 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 | 1 |
| 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 | 9 |
| Geological Units 1:100,000 | NSW Department of Industry, Resources & Energy | 20/08/2014 | | None planned | 1 | - | 4 |
| Geological Structures 1:100,000 | NSW Department of Industry, Resources & Energy | 20/08/2014 | | None planned | 0 | - | 1 |
| 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 | - | 3 |
| 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 | 0 |
| Mining Subsidence Districts | Land and Property Information | 17/11/2016 | 17/11/2016 | 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 | 0 |
| Local Environmental Plan - Land Zoning | NSW Planning and Environment | 07/11/2016 | 04/09/2016 | Quarterly | 1 | 7 | 50 |
| Local Environmental Plan - Minimum Subdivision Lot Size | NSW Planning and Environment | 07/11/2016 | 04/09/2016 | Quarterly | 1 | - | - |
| Local Environmental Plan - Height of Building | NSW Planning and Environment | 07/11/2016 | 04/09/2016 | Quarterly | 1 | - | - |
| Local Environmental Plan - Floor Space Ratio | NSW Planning and Environment | 07/11/2016 | 04/09/2016 | Quarterly | 2 | - | - |
| Local Environmental Plan - Land Application | NSW Planning and Environment | 07/11/2016 | 04/09/2016 | Quarterly | 1 | - | - |
| Local Environmental Plan - Land Reservation Acquisition | NSW Planning and Environment | 07/11/2016 | 04/09/2016 | Quarterly | 0 | - | - |
| State Heritage Items | NSW Planning and Environment | 07/11/2016 | 30/10/2015 | Quarterly | 0 | 0 | 0 |
| Local Heritage Items | NSW Planning and Environment | 07/11/2016 | 04/09/2016 | Quarterly | 0 | 0 | 0 |
| Bushfire Prone Land | NSW Rural Fire Service | 11/11/2016 | 12/08/2016 | Quarterly | 0 | 0 | 3 |
| Native Vegetation of the Sydney Metropolitan Area | NSW Office of Environment and Heritage | 08/10/2014 | 11/10/2013 | As required | 2 | 4 | 5 |
| 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 | 17/11/2016 | 17/11/2016 | Daily | - | - | - |

# Aerial Imagery 2016

**18 Randwick Close, Casula, NSW 2170**


Scale:
0 25 50 100
Meters

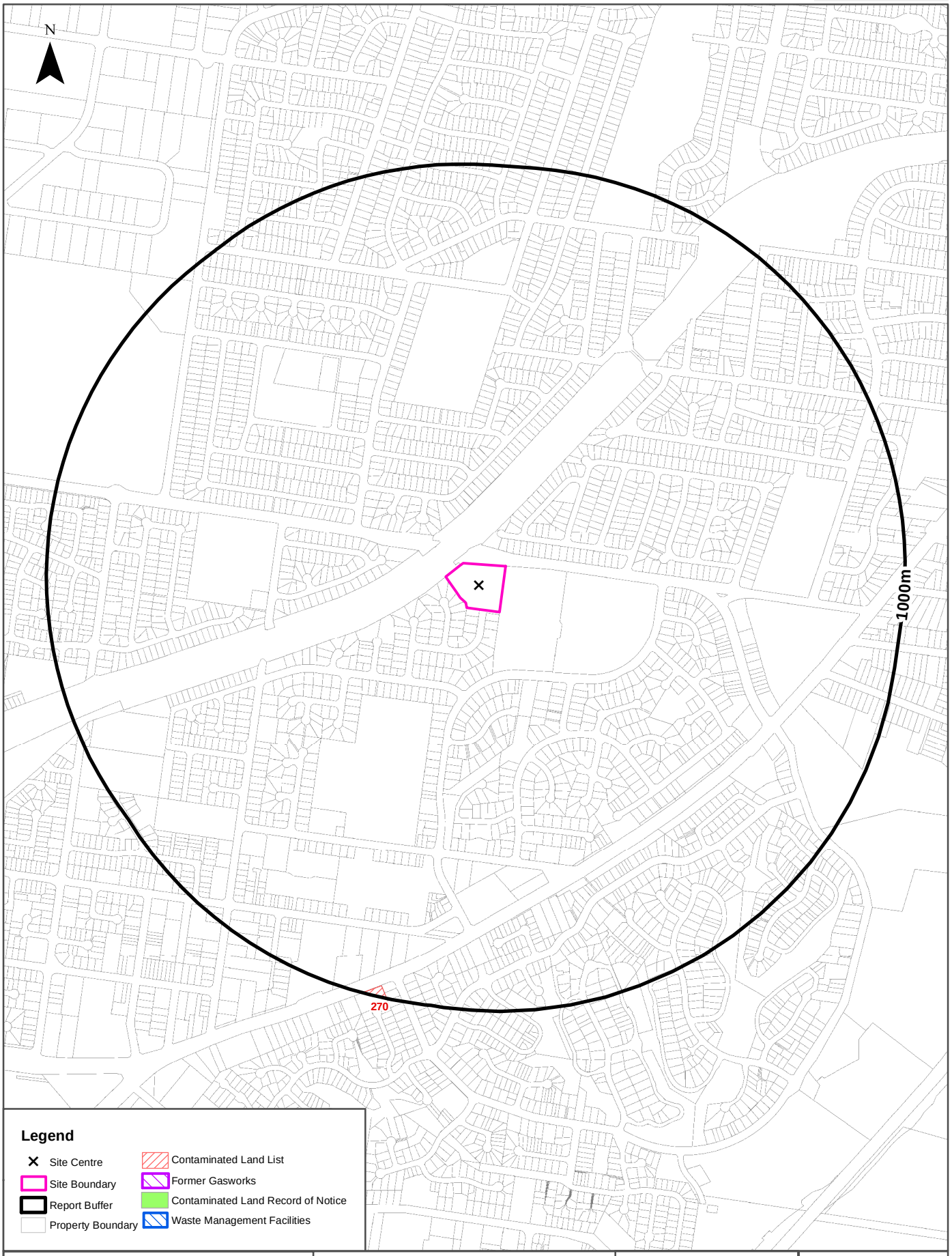
Data Sources: Aerial Imagery © 2016 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 16November, 2016

# Contaminated Land & Waste Management Facilities

**18 Randwick Close, Casula, NSW 2170**




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: 17November 2016

# Contaminated Land & Waste Management Facilities

**18 Randwick Close, Casula, NSW 2170**

## 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 |
|---|---|---|---|---|---|---|---|---|---|
| 270 | Caltex Service Station | 646 Hume Highway | Casula | Service Station | Regulation under CLM Act not required | Current EPA List | 971m | South | 1 |

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

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

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

# Contaminated Land & Waste Management Facilities

**18 Randwick Close, Casula, NSW 2170**

## Contaminated Land: Records of Notice

Record of Notices within the report buffer:

| Map Id | Area No | Name | Address | Suburb | Notices | Distance | Direction | LC |
|---|---|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | | | |

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

## Former Gasworks

Former Gasworks within the 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
Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

# EPA Activities

**18 Randwick Close, Casula, NSW 2170**

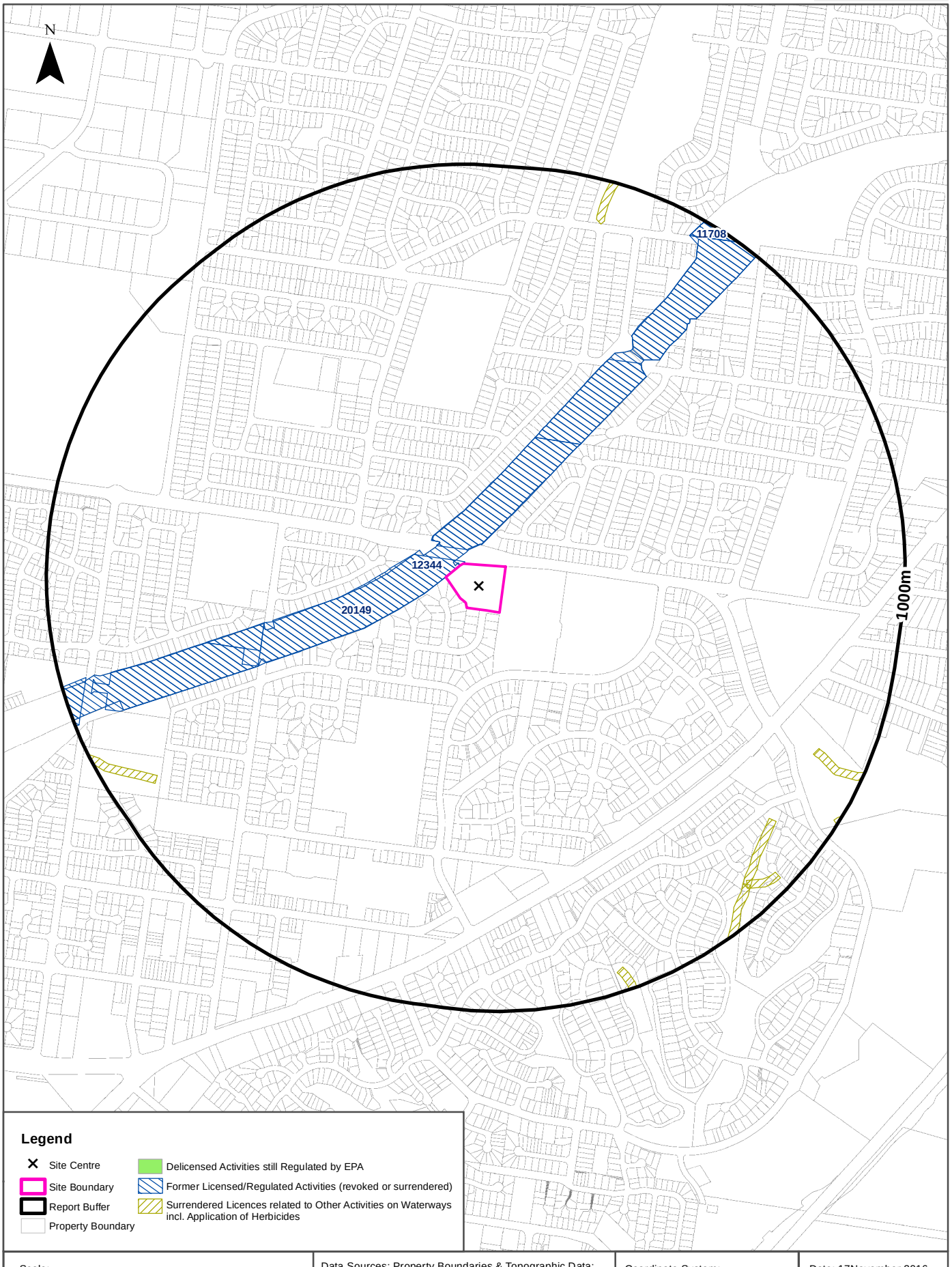
## Licensed Activities under the POEO Act 1997

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 | | | | | | | |

# Delicensed & Former Licensed EPA Activities

**18 Randwick Close, Casula, NSW 2170**




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: 17November 2016

# EPA Activities

**18 Randwick Close, Casula, NSW 2170**

## 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


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

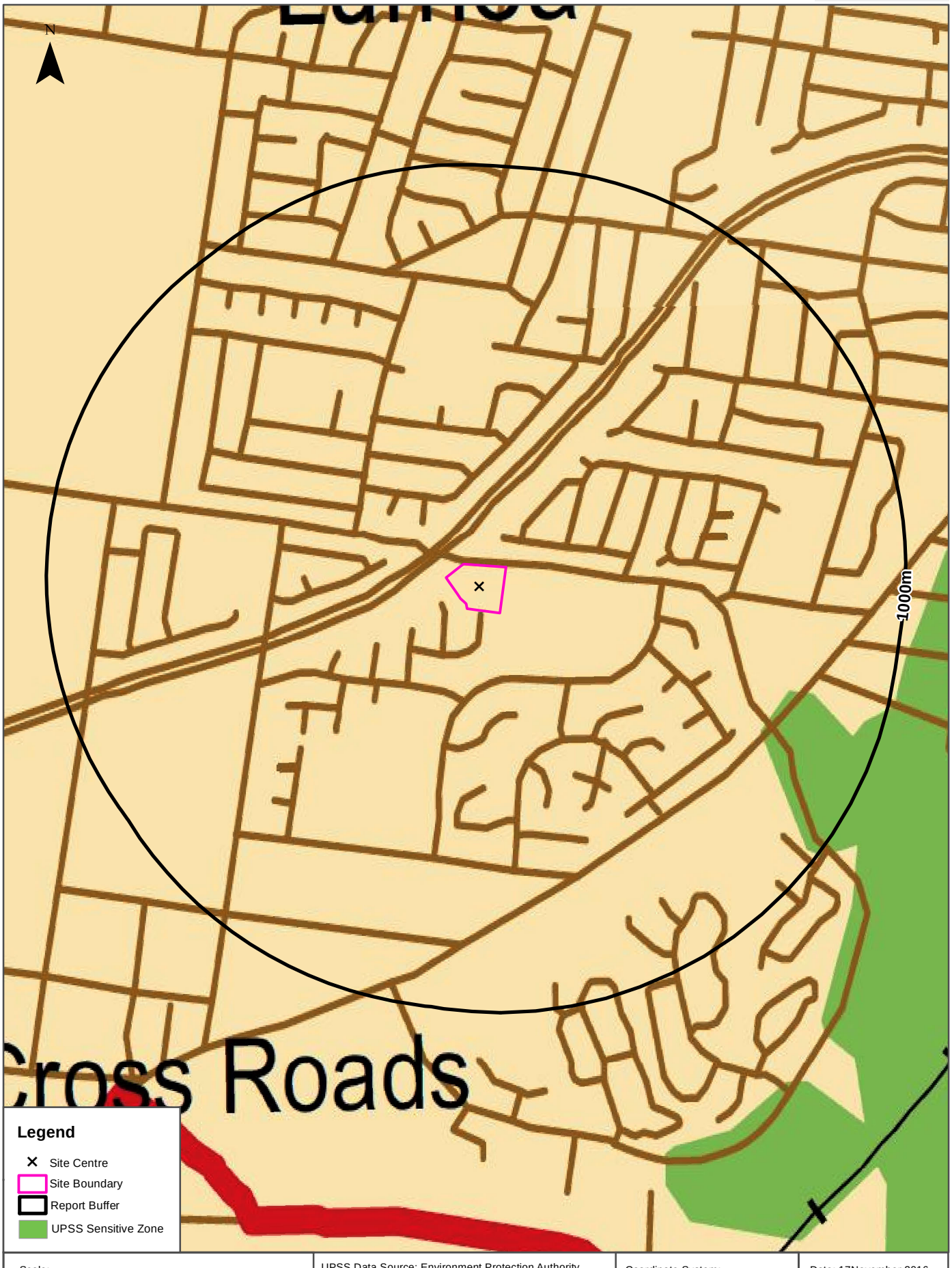
Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the report buffer:

| Licence No | Organisation | Location | Status | Issued Date | Activity | Loc Conf | Distance | Direction |
|---|---|---|---|---|---|---|---|---|
| 12344 | INTERLINK ROADS PTY LTD | M5 (between Georges River and Camden Valley Way), MOOREBANK, NSW 2170 | Surrendered | 04/08/2005 | Road construction | 3 | 0m | North |
| 20149 | LEND LEASE ENGINEERING PTY LIMITED | M5 West Widening - Kings Georges Rd to Camden Valley Way, PO Box 5700, WEST CHATSWOOD | Surrendered | 07/08/2012 | Road construction | 3 | 0m | West |
| 4653 | LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD | WATERWAYS THROUGHOUT NSW | Surrendered | | Other Activities / Non Scheduled Activity - Application of Herbicides | 7 | 849m | - |
| 4838 | Robert Orchard | Various Waterways throughout New South Wales - SYDNEY NSW 2000 | Surrendered | | Other Activities / Non Scheduled Activity - Application of Herbicides | 7 | 849m | - |
| 5176 | LIVERPOOL CITY COUNCIL | WATERWAYS OF LIVERPOOL CITY | Surrendered | 17/04/2001 | Other Activities / Non Scheduled Activity - Application of Herbicides | 7 | 849m | - |
| 6630 | SYDNEY WEED & PEST MANAGEMENT PTY LTD | WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148 | Surrendered | | Other Activities / Non Scheduled Activity - Application of Herbicides | 7 | 849m | - |
| 11708 | INTERLINK ROADS PTY LTD | M5 MOTORWAY , HAMMONDVILLE, NSW 2170 | Surrendered | 18/09/2002 | Extractive Industries | 3 | 948m | North East |

Former Licensed Activities Data Source: Environment Protection Authority

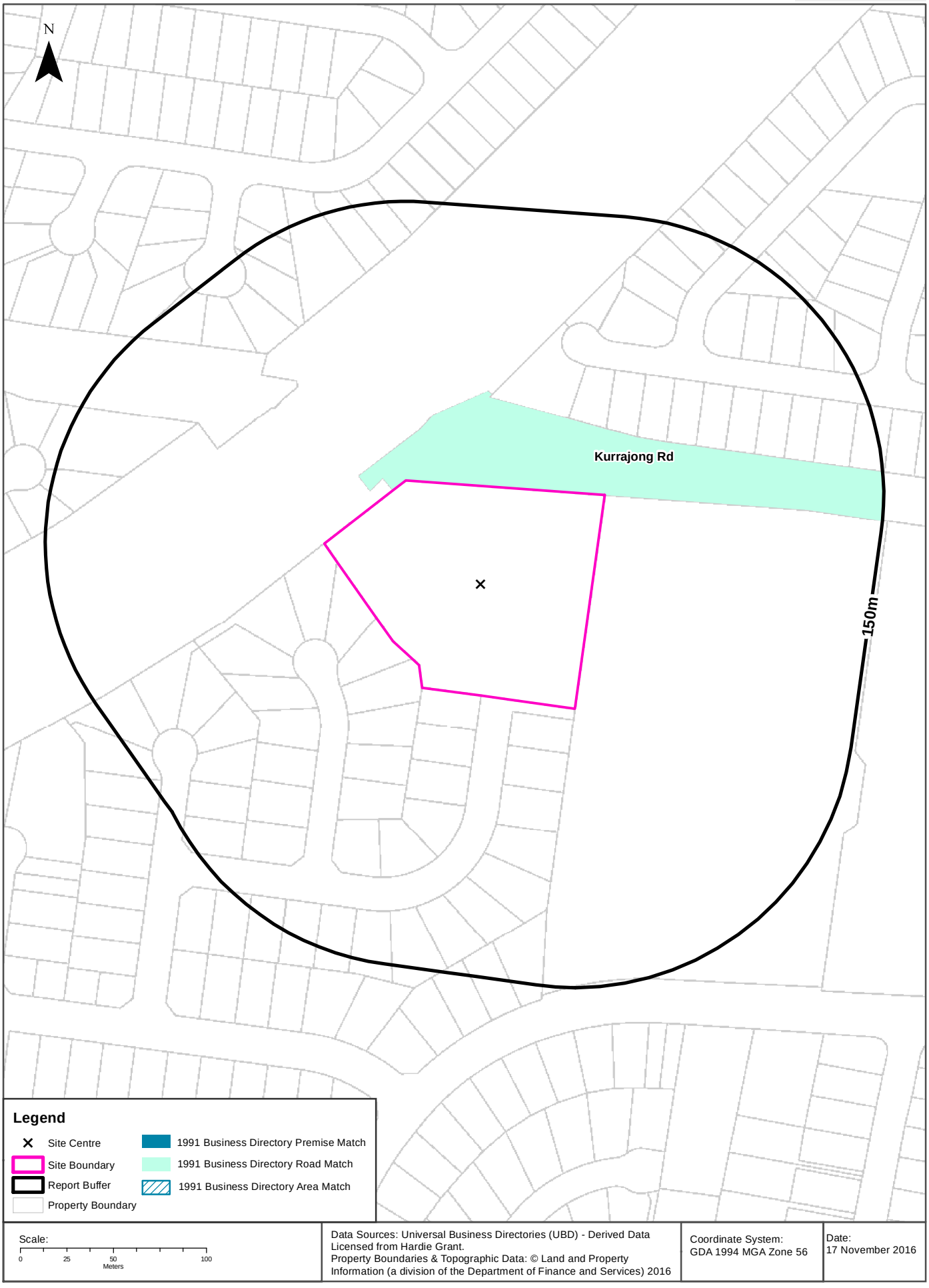
# UPSS Sensitive Zones

**18 Randwick Close, Casula, NSW 2170**



# 1991 Historical Business Directory Records

**18 Randwick Close, Casula, NSW 2170**



# Historical Business Directories

**18 Randwick Close, Casula, NSW 2170**

## 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 |
|---|---|---|---|---|---|---|
| Poultry Dealers Wholesale | Inghams Enterprises Pty Ltd | Kurrajong Rd Casula 2170 | 58486 | Road Match | 0m | East |

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

## 1991 Business Directory Motor Garages & Service Stations

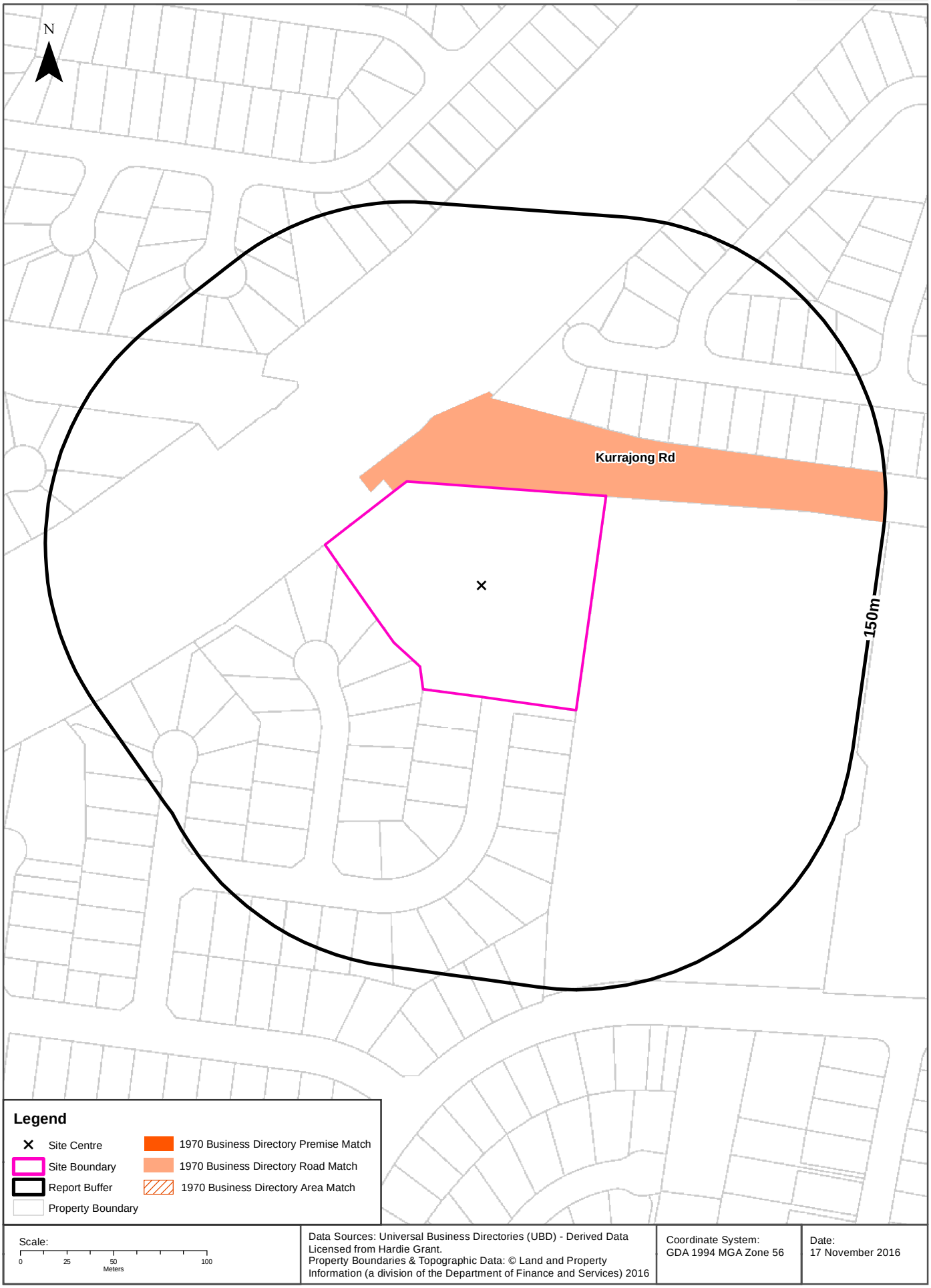
Motor Garages & Service Stations from the 1991 UBD Business Directory within 1km of the site:

| Business Activity | Organisation | Address | Ref No. | Location Confidence | Distance | Direction |
|---|---|---|---|---|---|---|
| Motor Garages & Service Stations | BP Casula Service Station | Hume H'way., Casula. 2170 | 53575 | Road Match | 640m | South East |
| Motor Garages & Service Stations | Derli Transport Service Station | Hume Hway, Casula 2170 | 53684 | Road Match | 640m | South East |

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

# 1970 Historical Business Directory Records

**18 Randwick Close, Casula, NSW 2170**



# Historical Business Directories

**18 Randwick Close, Casula, NSW 2170**

## 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 |
|---|---|---|---|---|---|
| HATCHERIES (H310) | Ingham,W. H.,Kurrajong Rd.,Casula | 315605 | Road Match | 0m | East |
| POULTRY DEALERS-RETAIL (P692) | Ingham,W. H.,Kurrajong Rd.,Casula | 351248 | Road Match | 0m | East |
| POULTRY DEALERS-W'SALE (P696) | Ingham's Enterprises Pty. Ltd.,Kurrajong Rd.,Casula | 351320 | Road Match | 0m | East |

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

## 1970 Business Directory Drycleaners & Service Stations

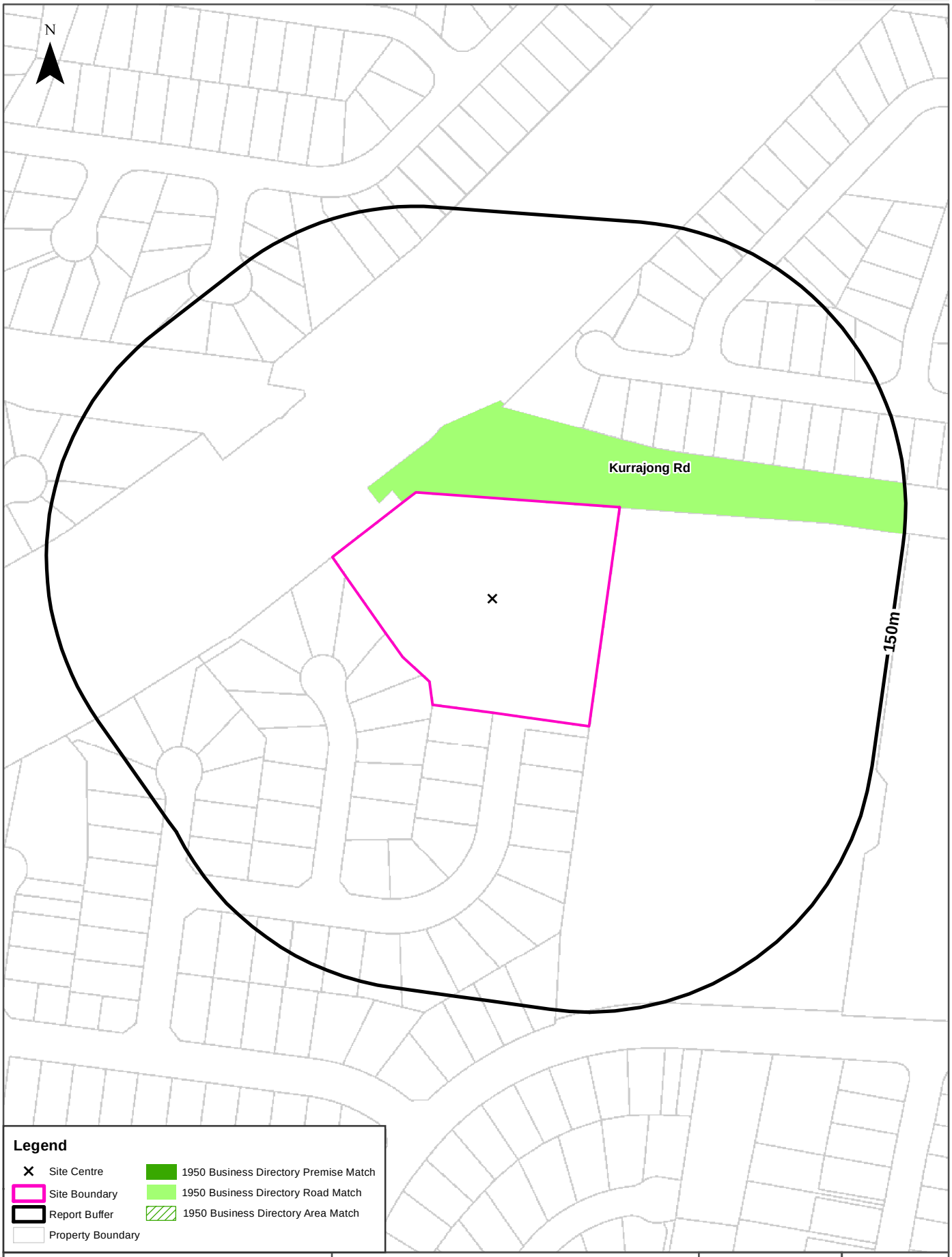
Drycleaners, Motor Garages & Service Stations from the 1970 UBD Business Directory within 1km of the site:

| Business Activity | Organisation & Premise | Ref No. | Location Confidence | Distance | Direction |
|---|---|---|---|---|---|
| MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716) | B.P. Casula,Hume Highway.,CasuiaCASULA | 340796 | Road Match | 640m | South East |
| MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716) | Casula Auto Port,Hume Highway.CASULA | 340955 | Road Match | 640m | South East |
| MOTOR GARAGES & ENGINEERS (M6S6) | Derll Transport & Service Station,Hume Highway.CASULA | 337673 | Road Match | 640m | South East |
| MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716) | Gee's Cafe & Service Station (Ampol),Hume Highway.CASULA | 341136 | Road Match | 640m | South East |
| MOTOR GARAGES & ENGINEERS (M6S6) | Green Hills Service Station,Hume Highway.CASULA | 337935 | Road Match | 640m | South East |
| MOTOR SERVICE STATIONS-PETROL,OIL,Etc. (M716) | Williams Service Station,Hume Highway.CASULA | 341632 | Road Match | 640m | South East |

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

# 1950 Historical Business Directory Records

**18 Randwick Close, Casula, NSW 2170**




Data Sources: Universal Business Directories (UBD) - Derived Data Licensed from Hardie Grant.
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: 17 November 2016

# Historical Business Directories

**18 Randwick Close, Casula, NSW 2170**

## 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 |
|---|---|---|---|---|---|
| POULTRY FARMERS | Burton, T. P., Kurrajong Rd., Casula | 93905 | Road Match | 0m | East |
| POULTRY FARMERS | Curtis, V., Kurrajong Rd., Casula | 93963 | Road Match | 0m | East |
| POULTRY FARMERS | Ingham, W. H., Kurrajong Rd., Casula | 94092 | Road Match | 0m | East |

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 |
|---|---|---|---|---|---|
| MOTOR GARAGES &/OR ENGINEERS | Bare, R. H., Hume Hghwy., Casula | 83421 | Road Match | 640m | South East |

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

# Aerial Imagery 2014

**18 Randwick Close, Casula, NSW 2170**


Scale:
0 25 50 100
Meters

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

Coordinate System:
GDA 1994 MGA Zone 56

Date: 17 November 2016

# Aerial Imagery 2009

**18 Randwick Close, Casula, NSW 2170**


Scale:
0 25 50 100
Meters

Data Sources: Aerial Imagery © 2016 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 16November, 2016

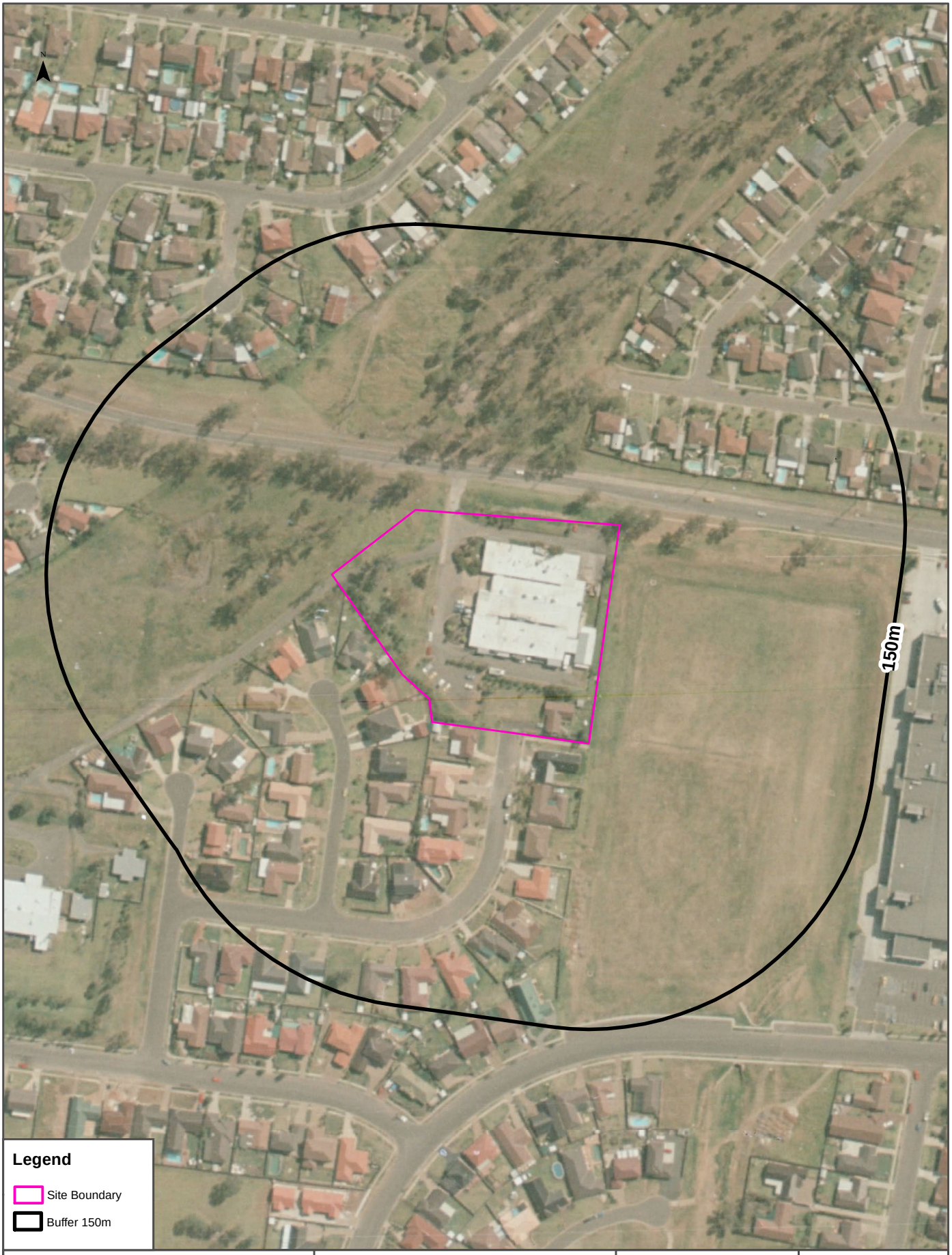
# Aerial Imagery 2004

**18 Randwick Close, Casula, NSW 2170**


| Scale: 0 25 50 100 Meters | Data Sources: Aerial Imagery © 2016 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc. | Coordinate System: GDA 1994 MGA Zone 56 | Date: 16November, 2016 |
|---|---|---|---|

# Aerial Imagery 1991

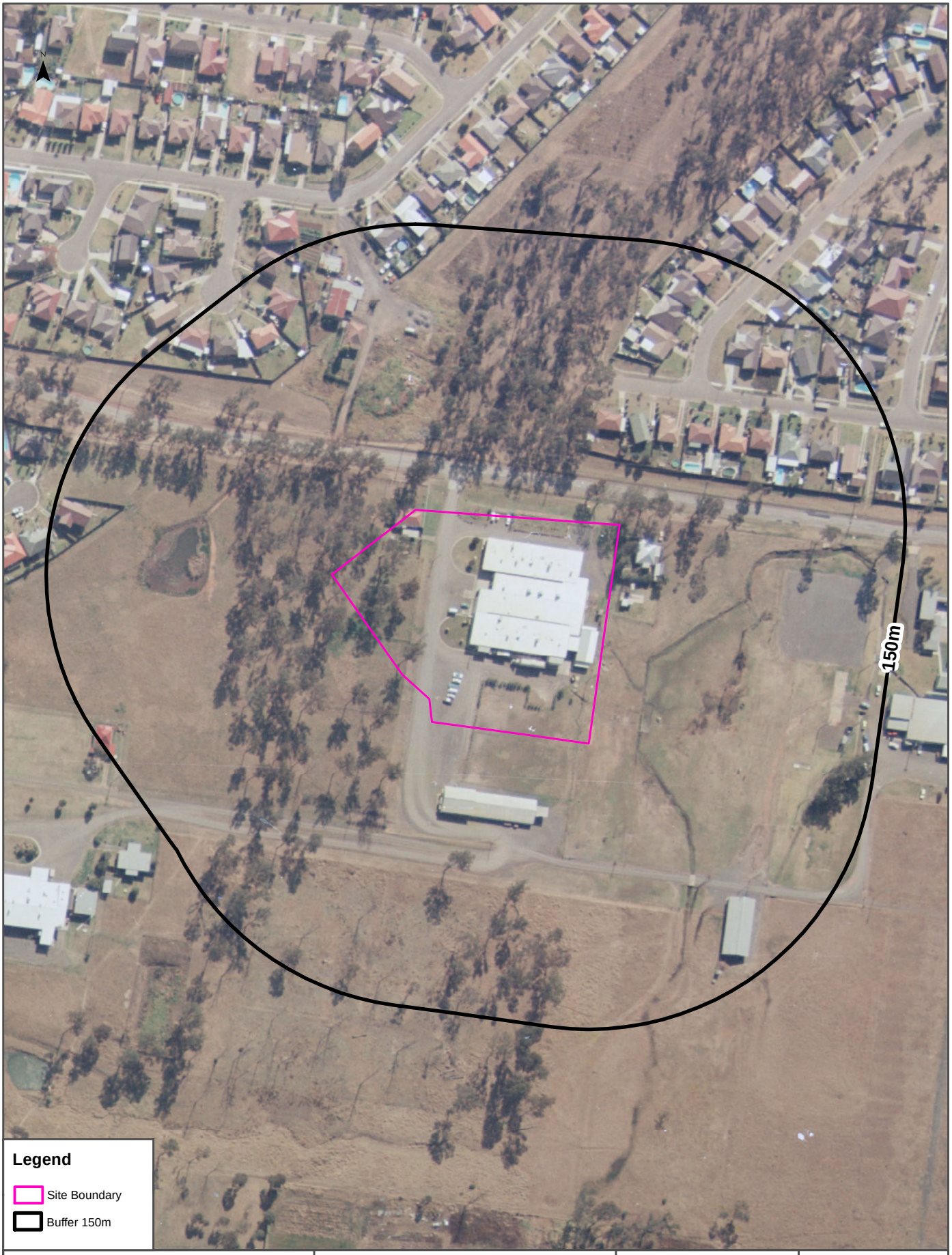
**18 Randwick Close, Casula, NSW 2170**




| | | | |
|---|---|---|---|
| Scale: 0 25 50 100 Meters | Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services) | Coordinate System: GDA 1994 MGA Zone 56 | Date: 16November 2016 |

# Aerial Imagery 1982

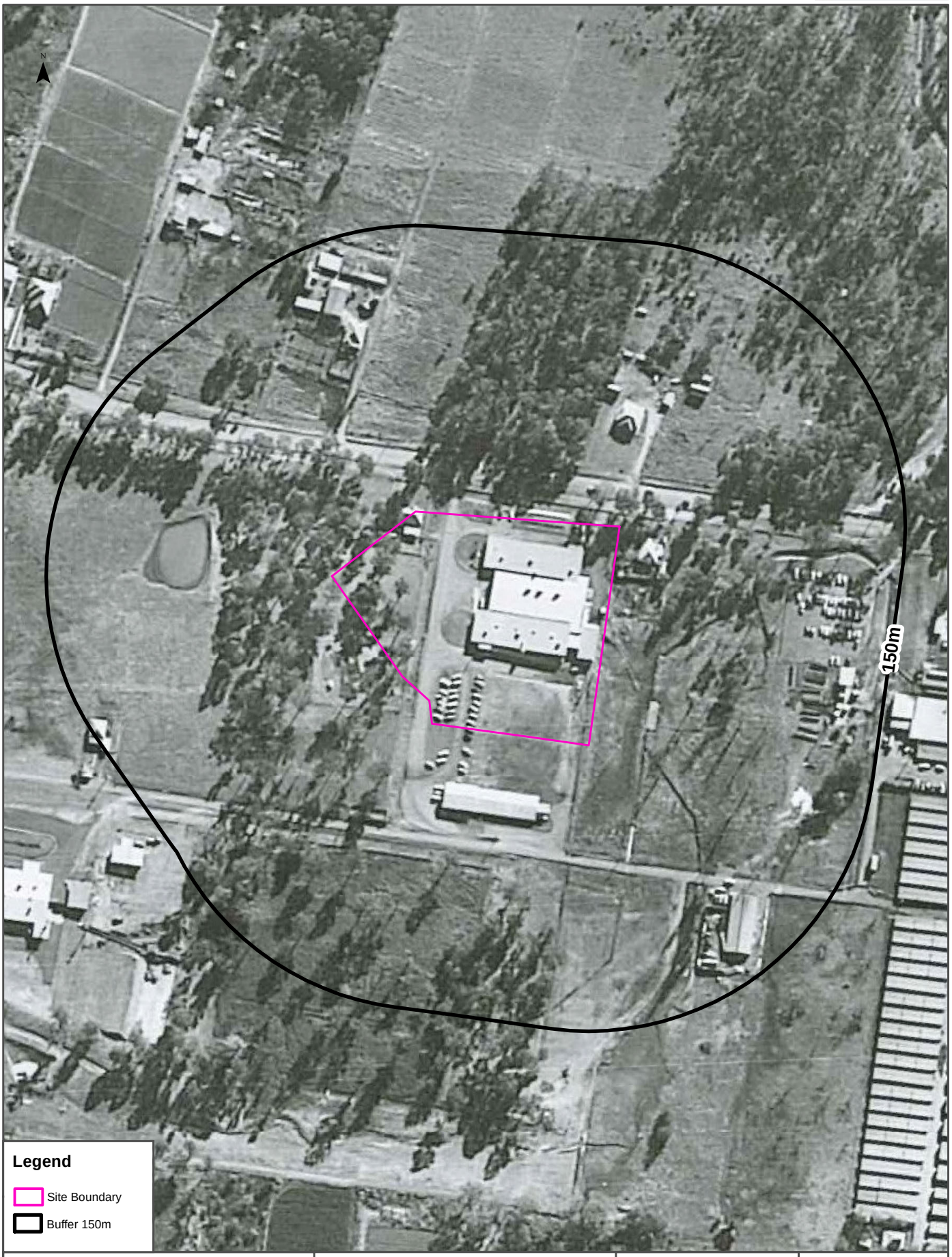
**18 Randwick Close, Casula, NSW 2170**




| Scale: 0 25 50 100 Meters | Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services) | Coordinate System: GDA 1994 MGA Zone 56 | Date: 16November 2016 |
|---|---|---|---|

# Aerial Imagery 1970

**18 Randwick Close, Casula, NSW 2170**



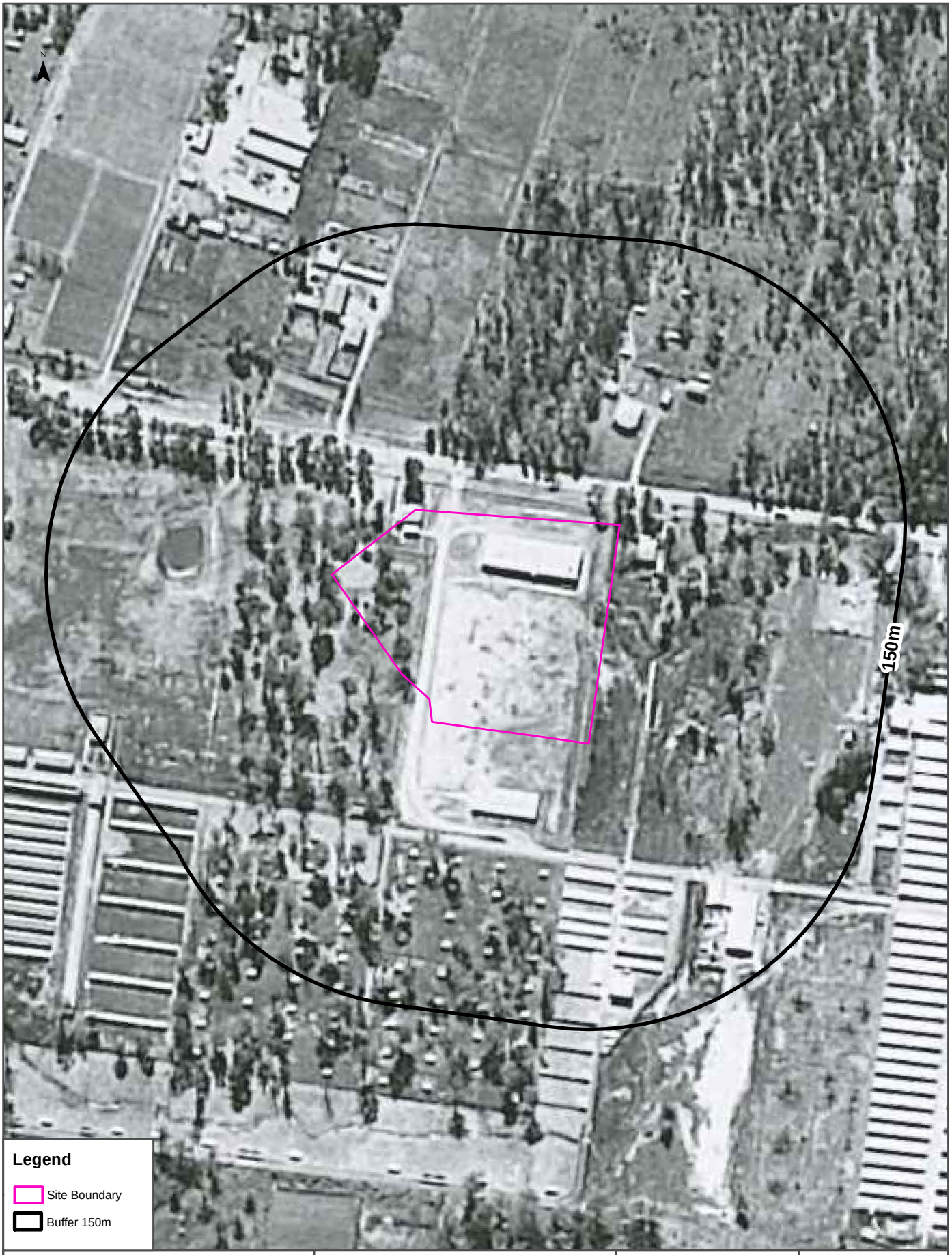

Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)

Coordinate System: GDA 1994 MGA Zone 56

Date: 16November 2016

# Aerial Imagery 1965

**18 Randwick Close, Casula, NSW 2170**



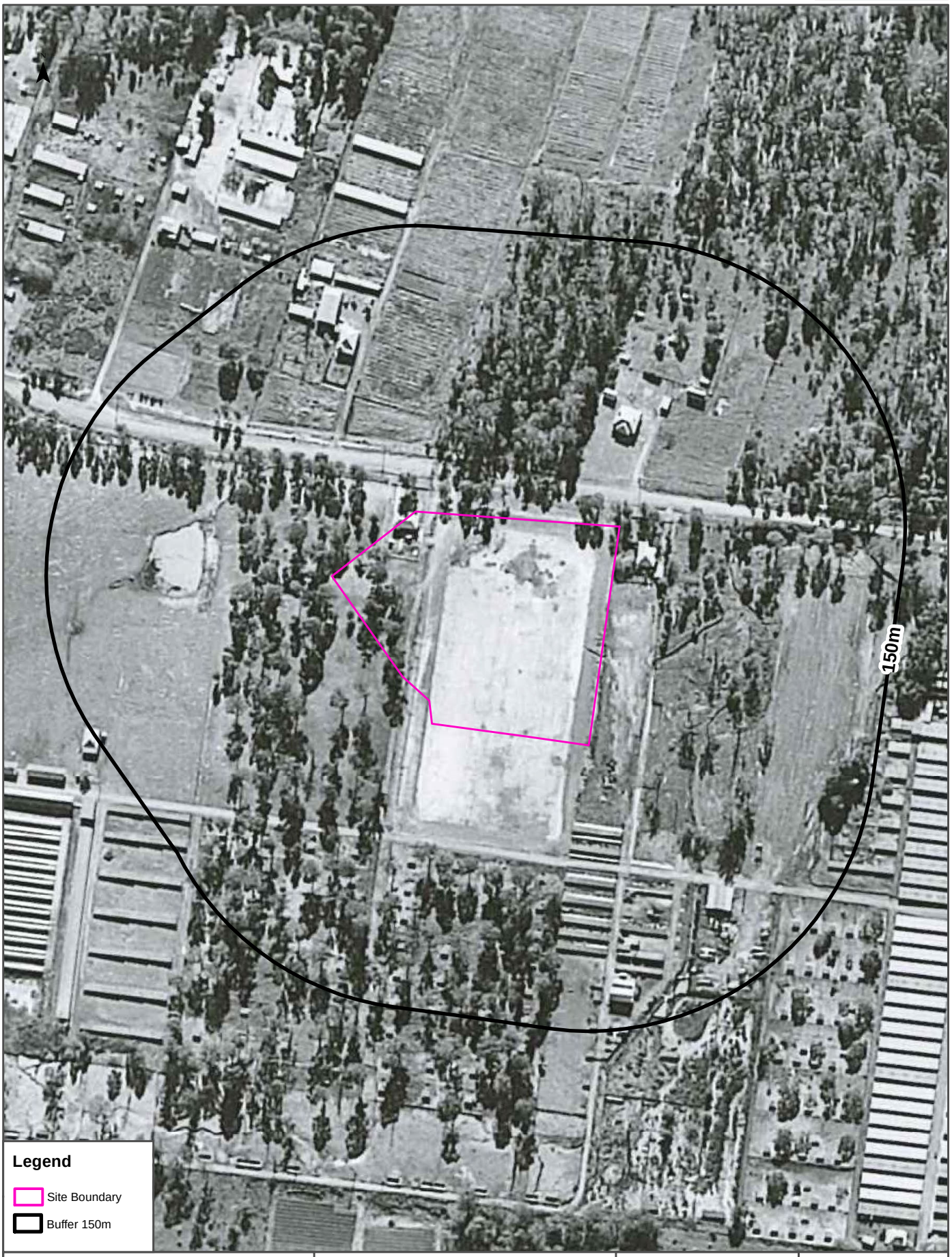

Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)

Coordinate System: GDA 1994 MGA Zone 56

Date: 16November 2016

# Aerial Imagery 1961

**18 Randwick Close, Casula, NSW 2170**

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Coordinate System: GDA 1994 MGA Zone 56

Date: 16November 2016

# Aerial Imagery 1955

**18 Randwick Close, Casula, NSW 2170**

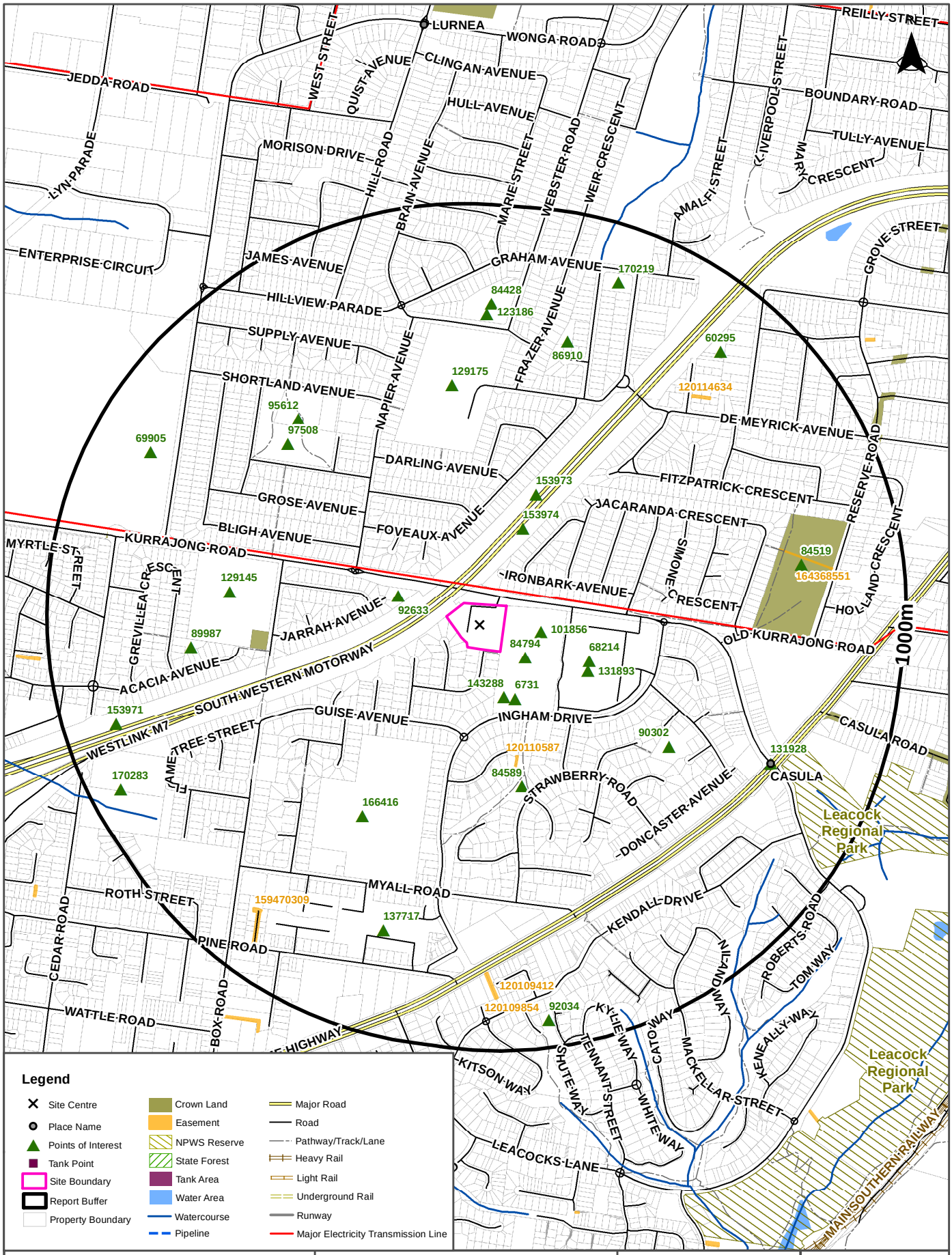

Data Sources: Historical Aerials: © Land and Property Information (a division of the Department of Finance and Services)

Coordinate System: GDA 1994 MGA Zone 56

Date: 16November 2016

# Topographic Features

**18 Randwick Close, Casula, NSW 2170**




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: 17November 2016

# Topographic Features

**18 Randwick Close, Casula, NSW 2170**

## Points of Interest

What Points of Interest exist within the report buffer?

| Map Id | Feature Type | Label | Distance | Direction |
|---|---|---|---|---|
| 84794 | Park | DARUK PARK | 64m | South East |
| 101856 | Sports Field | BASEBALL FIELDS | 94m | East |
| 143288 | Library | CASULA LIBRARY | 113m | South |
| 6731 | Community Facility | CASULA COMMUNITY CENTRE | 123m | South East |
| 92633 | Park | JARRAH AVENUE RESERVE | 131m | West |
| 153974 | Roadside Emergency Telephone | 93 | 199m | North East |
| 68214 | Shopping Centre | CASULA MALL | 224m | East |
| 131893 | Post Office | CASULA MALL POST OFFICE | 225m | South East |
| 153973 | Roadside Emergency Telephone | 94 | 289m | North East |
| 84589 | Park | GANDANGARA PARK | 341m | South |
| 90302 | Park | THARAWAL PARK | 484m | South East |
| 166416 | High School | CASULA HIGH SCHOOL | 497m | South West |
| 129145 | Primary School | PRESTONS PUBLIC SCHOOL | 545m | West |
| 129175 | High School | LURNEA HIGH SCHOOL | 547m | North |
| 97508 | Sports Court | TENNIS COURTS | 587m | North West |
| 95612 | Park | MEERE PARK | 617m | North West |
| 89987 | Park | ACACIA PARK | 644m | West |
| 86910 | Park | BAKER PARK | 680m | North |
| 123186 | Community Facility | FRANK CALABRO COMMUNITY CENTRE | 725m | North |
| 131928 | Suburb | CASULA | 732m | South East |
| 137717 | Retirement Village | AVEO MAPLE GROVE | 739m | South |
| 84519 | Park | JARDINE PARK | 745m | East |
| 84428 | Park | MUNRO PARK | 752m | North |
| 60295 | Place Of Worship | JEHOVAHS WITNESSES CHURCH | 832m | North East |
| 69905 | Transmission Station | NTL TRANSMITTING STATION | 847m | North West |
| 170219 | Place Of Worship | LIVERPOOL SOUTH ANGLICAN CHURCH | 858m | North |
| 153971 | Roadside Emergency Telephone | 96 | 869m | West |
| 170283 | Park | PETER MILLER RESERVE | 923m | South West |
| 92034 | Park | TALL GUMS PARK | 930m | South |

# Topographic Features

**18 Randwick Close, Casula, NSW 2170**

## 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 | | | | | | |



## 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 |
|---|---|---|---|---|---|
| 120110587 | Primary | Undefined | | 263m | South |
| 164368551 | Primary | Electricity | var | 696m | East |
| 120114634 | Primary | Undefined | | 700m | North East |
| 120109412 | Primary | Undefined | | 803m | South |
| 120109854 | Primary | Undefined | | 806m | South |
| 159470309 | Primary | Right of way | 7.955m and Var | 835m | South West |

# Topographic Features

**18 Randwick Close, Casula, NSW 2170**

## State Forest

What State Forest exist within the report buffer?

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



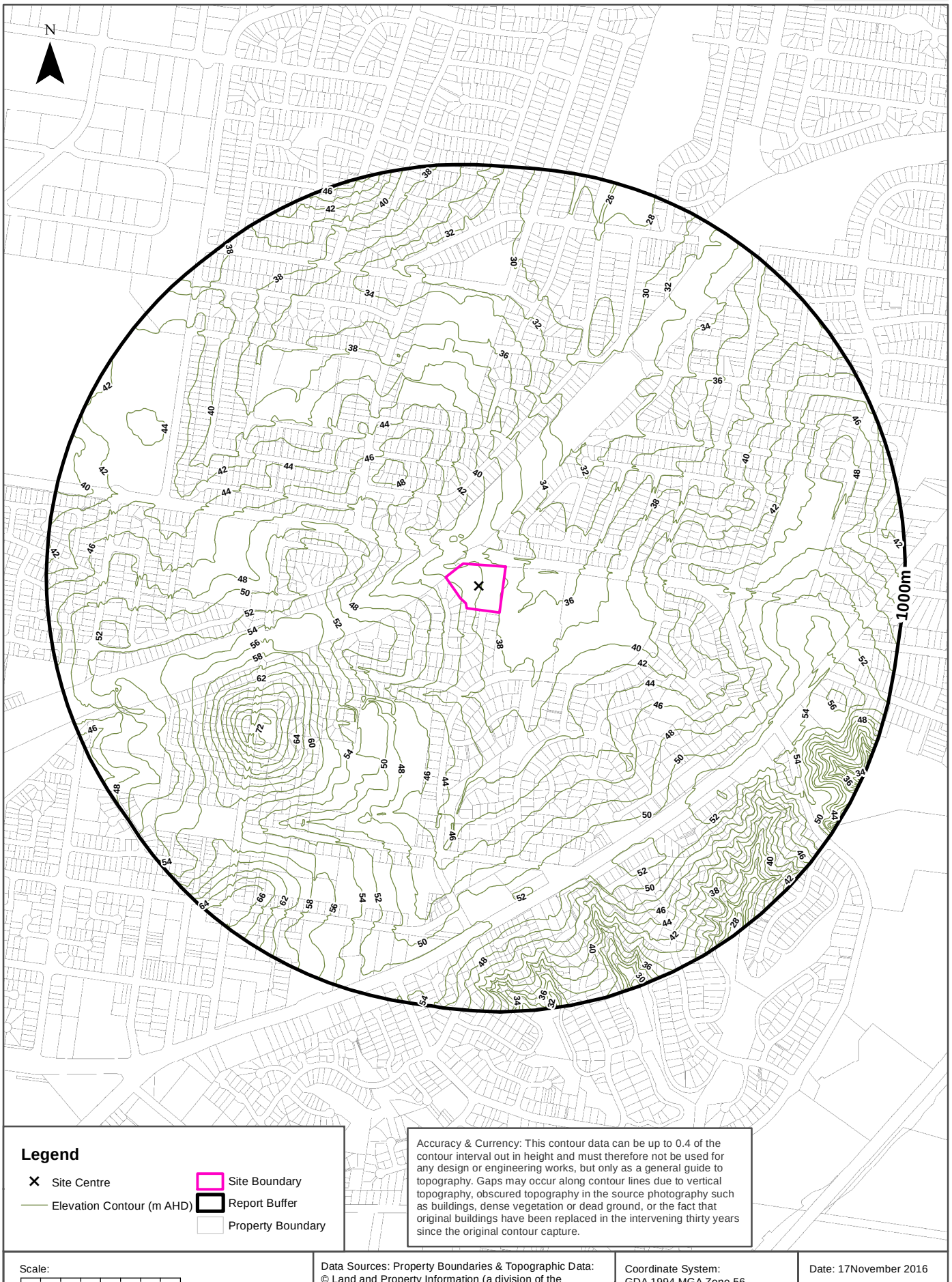
## National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the report buffer?

| Reserve Number | Reserve Type | Reserve Name | Gazetted Date | Distance | Direction |
|---|---|---|---|---|---|
| N0633 | REGIONAL PARK | Leacock Regional Park | 05/09/1997 | 758m | South East |

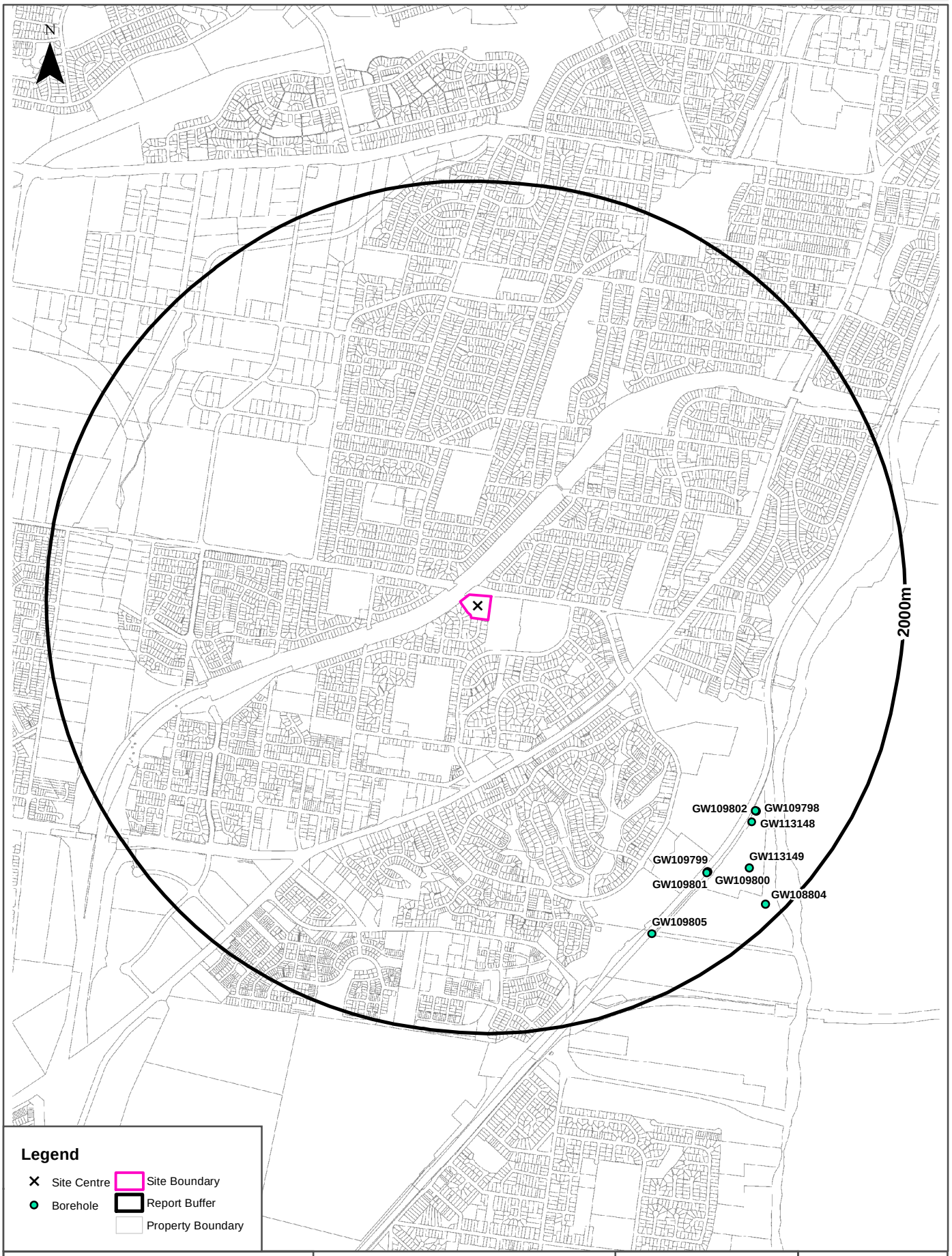
# Elevation Contours (m AHD)

**18 Randwick Close, Casula, NSW 2170**



# Groundwater Boreholes

**18 Randwick Close, Casula, NSW 2170**




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: 17November 2016

# Hydrogeology & Groundwater

**18 Randwick Close, Casula, NSW 2170**

## Hydrogeology

Description of aquifers on-site:

| Description |
|---|
| Porous, extensive aquifers of low to moderate productivity |

Description of aquifers within the report buffer:

| Description |
|---|
| Porous, extensive aquifers of low to moderate productivity |

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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GW109802 | 10BL601720 | Bore | Private | Monitoring | Macquarie Drilling | 29/01/2007 | 10.00 | 10.00 | | | | | 1590m | South East |
| GW109798 | 10BL601720 | Bore | Private | Monitoring | Macquarie Drilling | 29/01/2007 | 29.80 | 29.80 | | | | | 1593m | South East |
| GW113148 | 10BL604291 | Bore | Private | Monitoring | Macquarie Drilling | 22/04/2010 | 5.50 | 5.50 | | | | | 1609m | South East |
| GW109799 | 10BL601720 | Bore | Private | Monitoring | Macquarie Drilling | 29/01/2007 | 22.80 | 22.80 | | | | | 1617m | South East |
| GW109801 | 10BL601720 | Bore | Private | Monitoring | Macquarie Drilling | 30/01/2007 | 14.00 | 14.00 | | | | | 1617m | South East |
| GW109800 | 10BL601720 | Bore | Private | Monitoring | Macquarie Drilling | 29/01/2007 | 11.00 | 11.00 | | | | | 1618m | South East |
| GW109805 | 10BL601722 | Bore | Private | Monitoring | Macquarie Drilling | 29/01/2007 | 12.00 | 12.00 | | | | | 1714m | South East |
| GW113149 | 10BL604291 | Bore | Private | Monitoring | Macquarie Drilling | 22/04/2010 | 6.00 | 6.00 | | | | | 1743m | South East |
| GW108804 | 10BL601719 | Bore | Private | Monitoring | | 22/04/2008 | 11.00 | 11.00 | | | | | 1921m | South East |

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

**18 Randwick Close, Casula, NSW 2170**

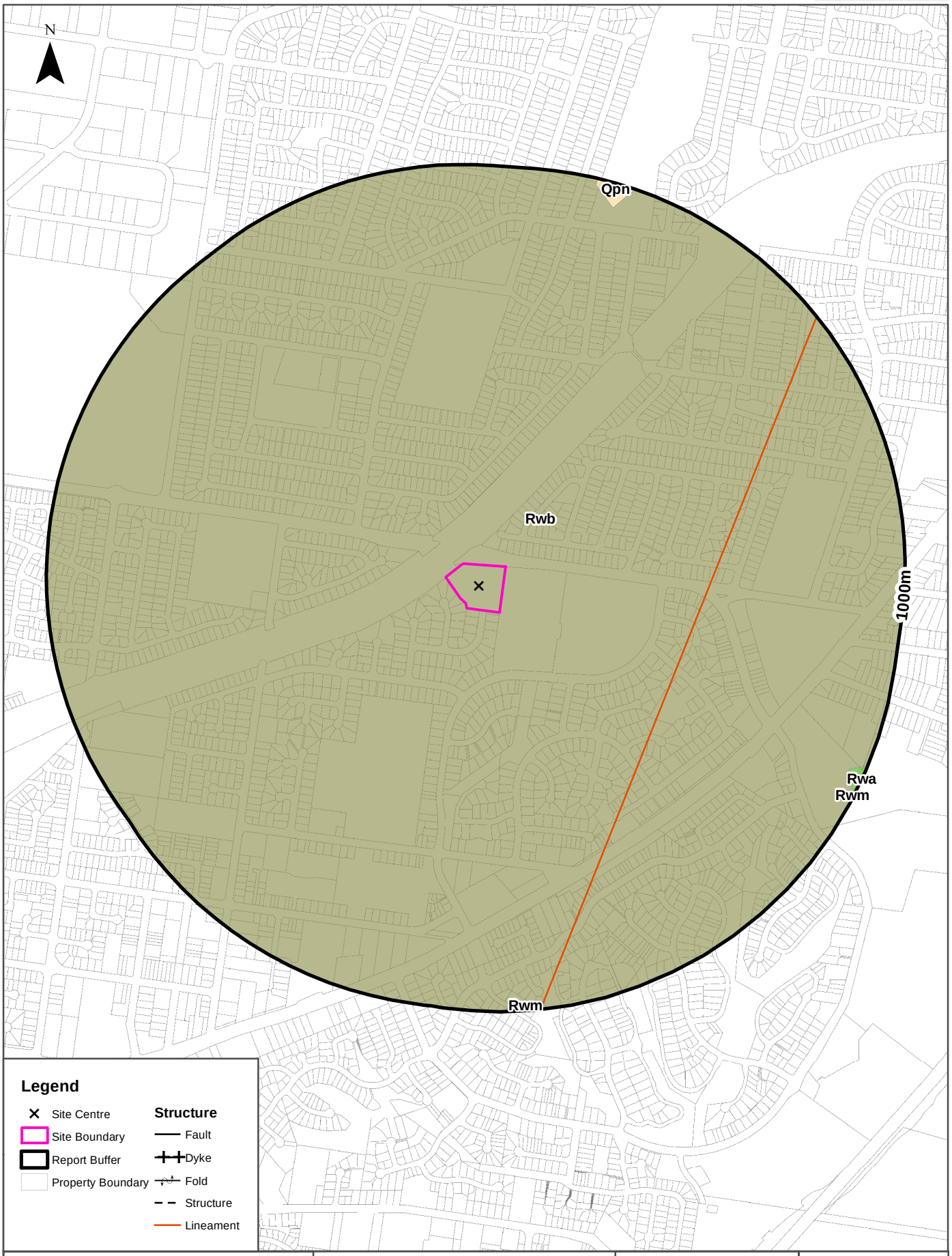
## Driller's Logs

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

| Groundwater No | Drillers Log | Distance | Direction |
|---|---|---|---|
| GW109802 | 0.00m-3.50m SANDY CLAY,BROWN,FINE TO MEDIUM GRAINED,TRACE CLAY,DRY<br>3.50m-9.00m SANDY CLAY,LIGHT GREY,DRY TO MOIST<br>9.00m-10.00m SILTY SAND,WET,BROWN,DARK GREY | 1590m | South East |
| GW109798 | 0.00m-3.50m SANDY CLAY, BROWN,FINE TO MEDIUM GRAINED<br>3.50m-9.00m SANDY CLAY,LIGHT GREY,DRY TO MOIST<br>9.00m-10.00m SILTY SAND,WET BROWN,DARK GREY,COURSE GRAINED<br>10.00m-20.50m SHALE,DARK GREY,MEDIUM STRENGTH,TRACE CLAY<br>20.50m-22.50m SHALE.LAMINATED SANDSTONE,DARK GREY<br>22.50m-29.80m SANDSTONE,LIGHT GREY,MEDIUM GRAINED | 1593m | South East |
| GW109799 | 0.00m-3.00m SANDY CLAY LOAM,BROWN,FINE TO MEDIUM GRAIN,DRY<br>3.00m-7.50m SILTY SANDY CLAY,BROWN,MEDIUM GRAINED,DRY<br>7.50m-8.50m CLAYEY SAND,LIGHT GREY,MEDIUM GRAINED,DRY TO MOIST<br>8.50m-13.00m SHALE,DARK GREY,MEDIUM STRENGTH,WATER FROM8m<br>13.00m-15.00m WEATHERED SHALE AND LAMINATED SANDSTONE,GREY<br>15.00m-22.80m SANDSTONE,LIGHT GREY,FINE TO MEDIUM GRAINED | 1617m | South East |
| GW109801 | 0.00m-3.00m SANDY CLAY LOAM,BROWN,FINE TO MEDIUM GRAIN,DRY<br>3.00m-4.00m SILTY SANDY CLAY,BROWN,MEDIUM GRAINED,DRY<br>4.00m-7.50m SAND,GREY,FINE TO MEDIUM GRAINED<br>7.50m-8.50m CLAYEY SAND,LIGHT GREY,MEDIUM GRAINED,DRY TO MOIST<br>8.50m-10.00m WEATHERED SHALE,DARK GREY,HARDER WITH DEPTH<br>10.00m-14.00m SHALE,DARK GREY | 1617m | South East |
| GW109800 | 0.00m-2.00m SILTY CLAY LOAM,BROWN,FINE TO MEDIUM GRAIN,DRY<br>2.00m-3.50m SILTY CLAY,DARK BROWN,FIRM<br>3.50m-4.30m SILTY SAND,DARK GREY MEDIUM TO COARSE GRAINED,MOIST<br>4.30m-10.50m CLAYEY SAND,LIGHT GREY,MEDIIUM GRAINED,DRY TO MOIST<br>10.50m-11.00m WEATHERED SHALE,DARK GREY,HARDER WITH DEPTH | 1618m | South East |
| GW109805 | 0.00m-1.80m SILTY CLAY LOAM,BROWN,DRY<br>1.80m-2.80m SANDY LOAM,TRACE SILT, GREY/BROWN<br>2.80m-9.80m SAND,LIGHT BROWN, MEDIUM GRAINED,TRACE SILT<br>9.80m-12.00m SAND,GREY,MEDIUM GRAINED,WET,WEATHERED SHALE AT 12m | 1714m | South East |
| GW108804 | 0.00m-7.50m SAND,BROWN,FINE TO MEDIUM GRAINED<br>7.50m-10.00m CLAY,ORANGE,GREY,CLAYEY SAND,DRY<br>10.00m-11.00m WEATHERED SHALE.DARK GREY | 1921m | South East |

# Geology 1:100,000

**18 Randwick Close, Casula, NSW 2170**




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: 17November 2016

# Geology

**18 Randwick Close, Casula, NSW 2170**

## Geological Units

What are the Geological Units onsite?

| Symbol | Description | Unit Name | Group | Sub Group | Age | Dom Lith | Map Sheet | Dataset |
|---|---|---|---|---|---|---|---|---|
| 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 |

What are the Geological Units within the report buffer?

| Symbol | Description | Unit Name | Group | Sub Group | Age | Dom Lith | Map Sheet | Dataset |
|---|---|---|---|---|---|---|---|---|
| Qpn | Medium-grained sand, clay and silt | | | | 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 |
| Rwm | Fine to medium-grained quartz-lithic sandstone | Minchinbury Sandstone | 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 |
|---|---|---|---|---|
| Lineament | | Coastal Lineament | Penrith | 1:100,000 |

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

# Naturally Occurring Asbestos Potential

**18 Randwick Close, Casula, NSW 2170**

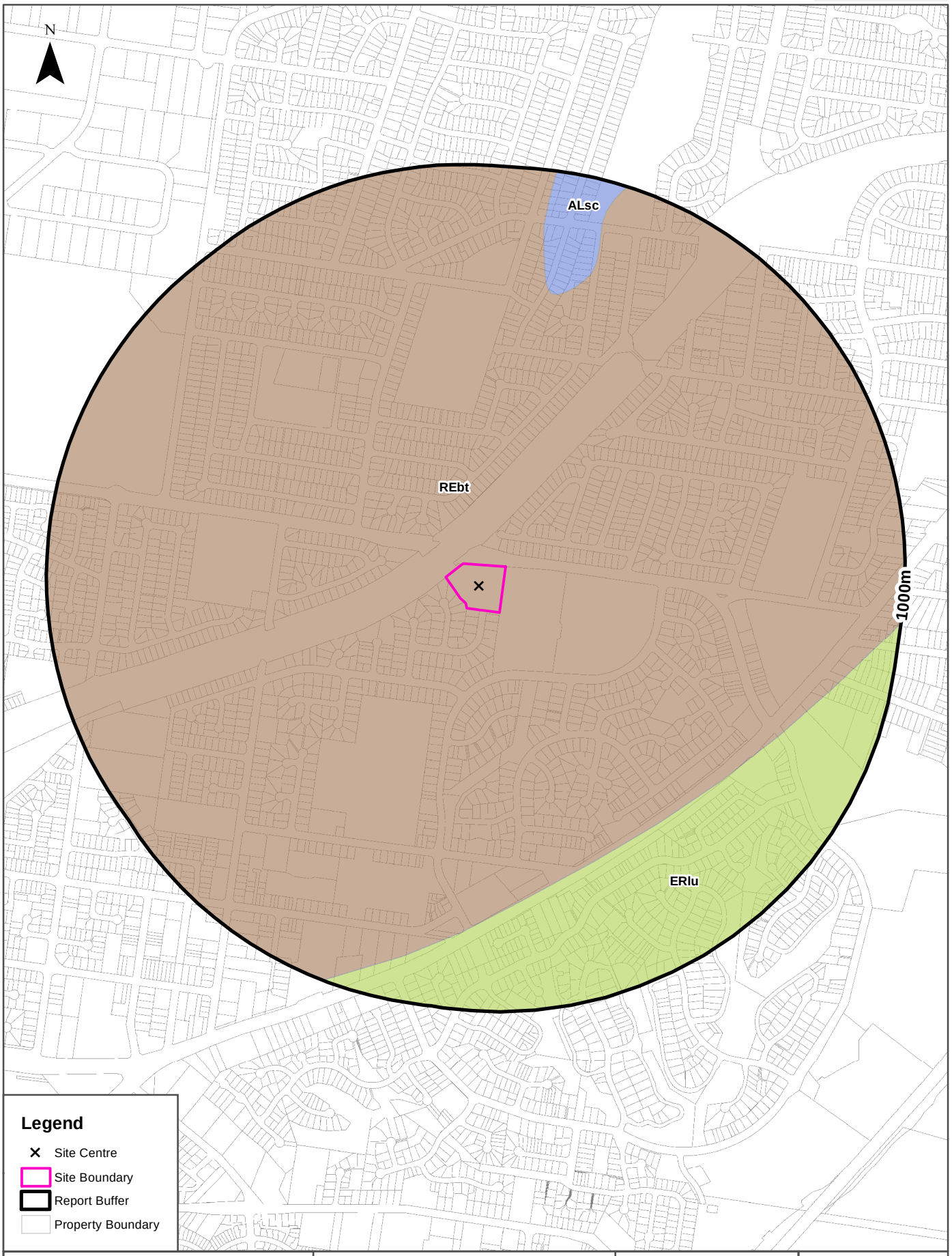
## Naturally Occurring Asbestos Potential

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 | | | | | | | | | | | | |

# Soil Landscapes

**18 Randwick Close, Casula, NSW 2170**



# Soils

**18 Randwick Close, Casula, NSW 2170**

## Soil Landscapes

What are the onsite Soil Landscapes?

| Soil Code | Name | Group | Process | Map Sheet | Scale |
|---|---|---|---|---|---|
| REbt | BLACKTOWN | | RESIDUAL | Penrith | 1:100,000 |

What are the Soil Landscapes within the report buffer?

| Soil Code | Name | Group | Process | Map Sheet | Scale |
|---|---|---|---|---|---|
| ALsc | SOUTH CREEK | | ALLUVIAL | Penrith | 1:100,000 |
| ERlu | LUDDENHAM | | EROSIONAL | Penrith | 1:100,000 |
| REbt | BLACKTOWN | | RESIDUAL | Penrith | 1:100,000 |

# Standard Local Environmental Plan Acid Sulfate Soils

**18 Randwick Close, Casula, NSW 2170**

## 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 | | | | |

# Dryland Salinity

**18 Randwick Close, Casula, NSW 2170**

## Dryland Salinity

Is there Dryland Salinity data onsite?

**No**

Is there Dryland Salinity data within the report buffer?

**No**

What Dryland Salinity assessments are given?

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

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

# Mining Subsidence Districts

**18 Randwick Close, Casula, NSW 2170**

## Mining Subsidence Districts

Mining Subsidence Districts within the report buffer?

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

# Environmental Zoning

**18 Randwick Close, Casula, NSW 2170**

## 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


## State Environmental Planning Policy Major Developments (2005)

State Environmental Planning Policy Major Developments within the report buffer?

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

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


## State Environmental Planning Policy Strategic Land Use Areas

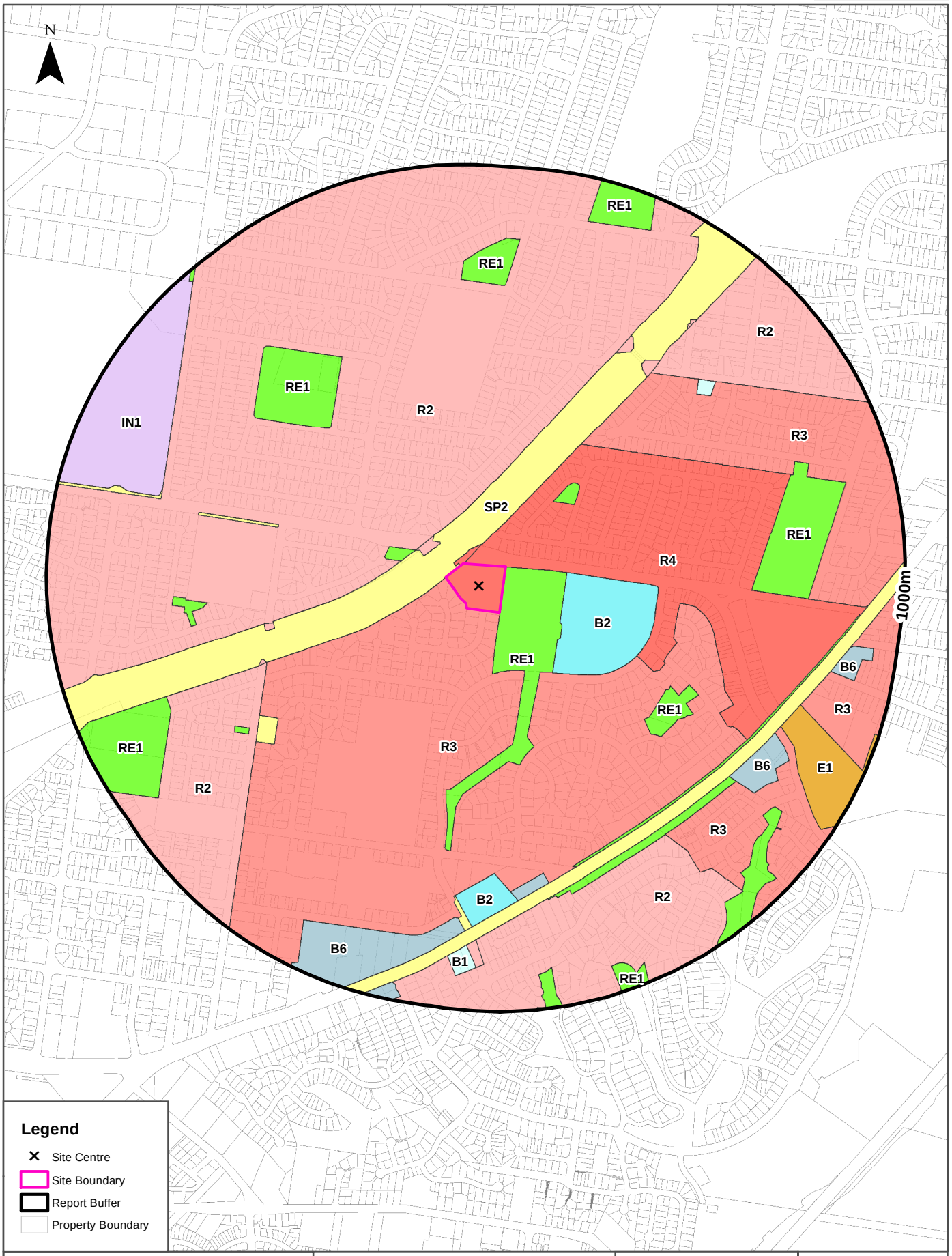
State Environmental Planning Policy Strategic Land Use Areas onsite or within the report buffer?

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

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

# LEP Planning Zones

**18 Randwick Close, Casula, NSW 2170**




Data Sources: Property Boundaries & Topographic Data: © Land and Property Information (a division of the Department of Finance and Services) 2016
Planning: NSW Crown Copyright - Planning & Environment

Coordinate System: GDA 1994 MGA Zone 56

Date: 17November 2016

# Local Environmental Plan

**18 Randwick Close, Casula, NSW 2170**

## 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 | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 0m | Onsite |
| R3 | Medium Density Residential | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 0m | South |
| R4 | High Density Residential | | Liverpool Local Environmental Plan 2008 | 26/08/2011 | 26/08/2011 | 12/08/2016 | Amendment No 8 | 0m | North West |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 0m | South East |
| SP2 | Infrastructure | Classified Road | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 0m | West |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 26/08/2011 | 26/08/2011 | 12/08/2016 | Amendment No 8 | 74m | North West |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 100m | North West |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 101m | West |
| B2 | Local Centre | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 152m | East |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 202m | North East |
| R3 | Medium Density Residential | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 359m | East |
| SP2 | Infrastructure | Local Road | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 438m | West |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 28/06/2011 | 28/06/2011 | 12/08/2016 | Amendment No 8 | 447m | West |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 450m | South East |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 475m | North West |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 496m | South West |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 26/08/2011 | 26/08/2011 | 12/08/2016 | Amendment No 8 | 497m | West |
| SP2 | Infrastructure | Water Supply System | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 547m | South West |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 26/08/2011 | 26/08/2011 | 12/08/2016 | Amendment No 8 | 592m | North East |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 600m | West |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 26/08/2011 | 26/08/2011 | 12/08/2016 | Amendment No 8 | 601m | North East |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 606m | North East |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 617m | East |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 620m | South West |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 634m | South East |
| SP2 | Infrastructure | Classified Road | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 640m | South |
| B1 | Neighbourhood Centre | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 645m | North East |
| B2 | Local Centre | | Liverpool Local Environmental Plan 2008 | 17/04/2014 | 17/04/2014 | 12/08/2016 | Amendment No 30 | 654m | South |
| B6 | Enterprise Corridor | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 662m | South |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 672m | South East |

| Zone | Description | Purpose | LEP or SEPP | Published Date | Commenced Date | Currency Date | Amendment | Distance | Direction |
|---|---|---|---|---|---|---|---|---|---|
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 692m | South |
| R3 | Medium Density Residential | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 693m | South East |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 703m | North |
| B6 | Enterprise Corridor | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 706m | South East |
| SP2 | Infrastructure | Local Road | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 717m | South |
| SP2 | Infrastructure | Local Road | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 740m | North West |
| IN1 | General Industrial | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 744m | North West |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 26/08/2011 | 26/08/2011 | 12/08/2016 | Amendment No 8 | 748m | North East |
| E1 | National Parks and Nature Reserves | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 758m | South East |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 761m | South West |
| B6 | Enterprise Corridor | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 771m | South |
| R3 | Medium Density Residential | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 787m | East |
| R2 | Low Density Residential | | Liverpool Local Environmental Plan 2008 | 26/08/2011 | 26/08/2011 | 12/08/2016 | Amendment No 8 | 821m | South |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 831m | South East |
| B1 | Neighbourhood Centre | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 836m | South |
| B6 | Enterprise Corridor | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 841m | East |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 889m | North East |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 897m | South |
| B6 | Enterprise Corridor | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 956m | South West |
| RE1 | Public Recreation | | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 974m | North West |

# Local Environmental Plan

**18 Randwick Close, Casula, NSW 2170**

## 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 |
|---|---|---|---|---|---|---|---|
| U | 1000 m² | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 10/06/2016 | | 95.54 |

## 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 |
|---|---|---|---|---|---|---|---|
| O | 15.00 m | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 99 |

## 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 |
|---|---|---|---|---|---|---|---|
| N | 1.00 | LEP | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 98.6 |
| D | 0.50 | LEP | 29/08/2008 | 29/08/2008 | 12/08/2016 | | 1.4 |

## 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 | Liverpool Local Environmental Plan 2008 | 29/08/2008 | 29/08/2008 | 12/06/2015 | | 100 |

## Land Reservation Acquisition

What are the onsite Local Environmental Plan Land Reservation Acquisitions?

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

# Heritage

**18 Randwick Close, Casula, NSW 2170**

## State Heritage Items

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

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



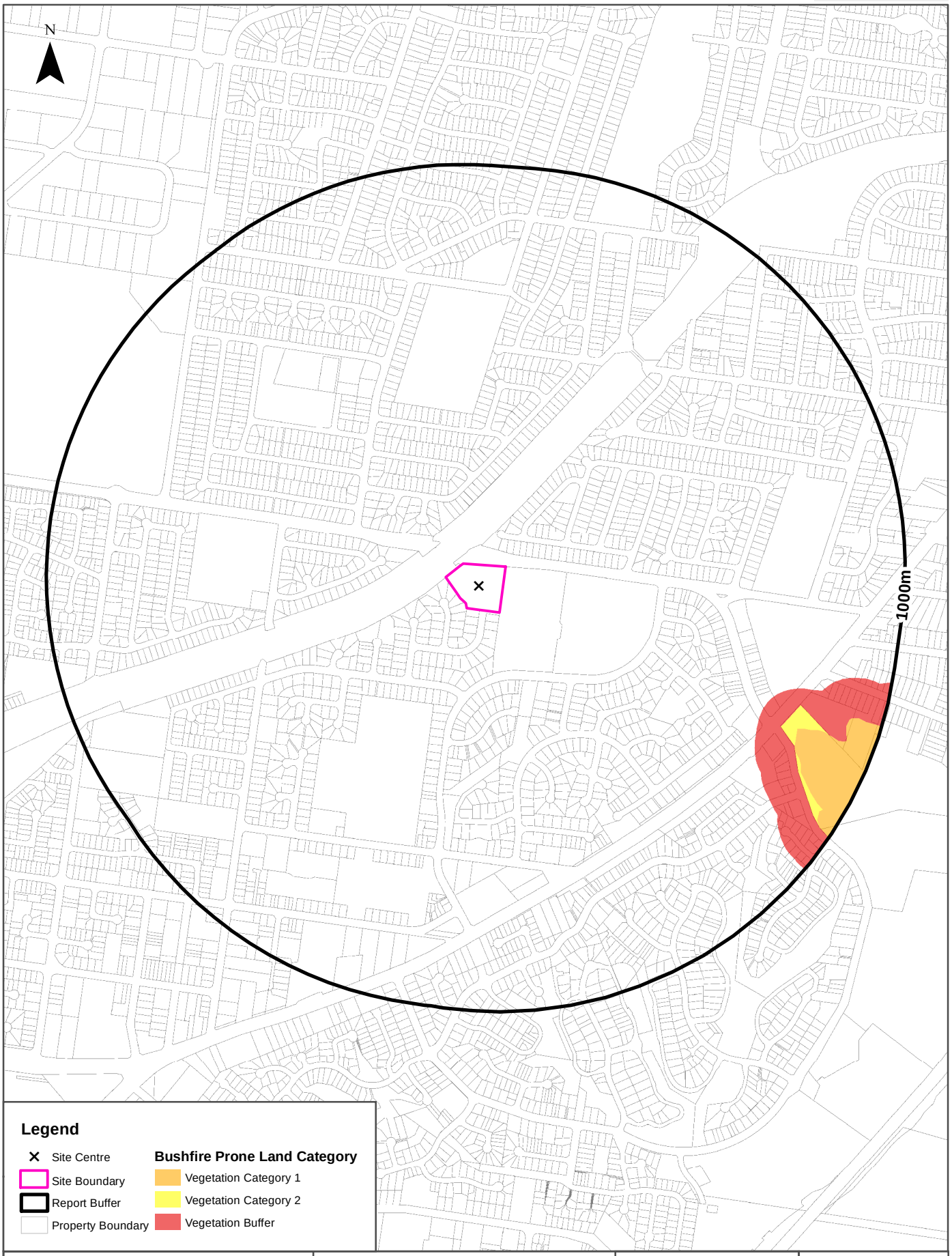
## Local Heritage Items

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

| Map Id | Name | Classification | Significance | LEP or Act | Published Date | Commenced Date | Currency Date | Distance | Direction |
|---|---|---|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | | | | |

# Natural Hazards - Bushfire Prone Land

**18 Randwick Close, Casula, NSW 2170**




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

Coordinate System:
GDA 1994 MGA Zone 56

Date: 17November 2016

# Natural Hazards

**18 Randwick Close, Casula, NSW 2170**

## Bushfire Prone Land

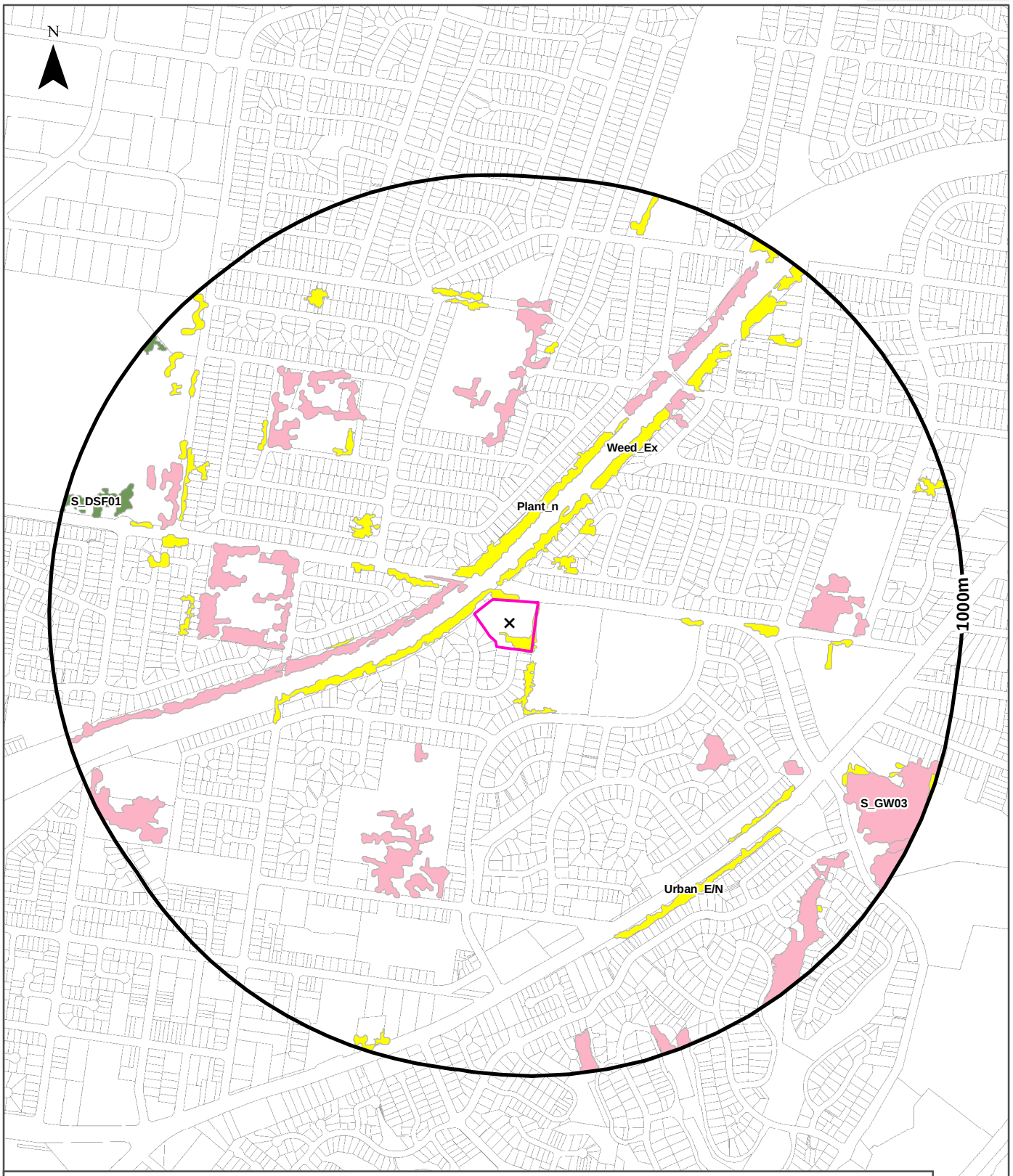
What are the nearest Bushfire Prone Land Categories that exist within the report buffer?

| Bushfire Prone Land Category | Distance | Direction |
|---|---|---|
| Vegetation Buffer | 699m | East |
| Vegetation Category 2 | 758m | South East |
| Vegetation Category 1 | 799m | South East |

Bushfire Prone Land Data Reference - NSW RFS GIS Data Set

# Ecological Constraints - Native Vegetation & RAMSAR Wetlands

**18 Randwick Close, Casula, NSW 2170**




**Legend**

- Site Centre
- Site Boundary
- Report Buffer
- Property Boundary
- Rainforest
- Wet Sclerophyll Forests
- Dry Sclerophyll Forests
- Forested Wetlands
- Grassy Woodlands
- Heathlands
- Grasslands
- Freshwater Wetlands
- Saline Wetlands
- Artificial Wetlands
- Water
- Other
- RAMSAR Wetlands

Scale: 0 100 200 400 Meters

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

Coordinate System: GDA 1994 MGA Zone 56

Date: 17November 2016

# Ecological Constraints

**18 Randwick Close, Casula, NSW 2170**

## Native Vegetation

What native vegetation exists within the report buffer?

| Map ID | Map Unit Name | Threatened Ecological Community NSW | Threatened Ecological Community EPBC Act | Understorey | Disturbance | Disturbance Index | Dominant Species | Dist | Direction |
|---|---|---|---|---|---|---|---|---|---|
| Plant_n | Plant_n: Plantation (native and/or exotic) | | | 00: Not assessed | 00: Not assessed | 0: Not assessed | Native or Exotic Plantations | 0m | Onsite |
| Weed_Ex | Weed_Ex: Weeds and Exotics | | | 00: Not assessed | 00: Not assessed | 0: Not assessed | Exotic Species >90%cover | 0m | Onsite |
| S_GW03 | S_GW03: Cumberland Shale Plains Woodland | Cumberland Plain Woodland | Cumberland Plain Woodland/ Shale Gravel Forest (possible) | 13: Dry shrubs and grasses | 31: Parkland open understorey | 3: High | E.tereticornis/ E.molucanna+/ - E.crebra/ E.eugeinioides | 58m | West |
| Urban_E/N | Urban_E/N: Urban Exotic/Native | | | 00: Not assessed | 00: Not assessed | 0: Not assessed | Urban Exotic/ Native | 90m | North East |
| S_DSF01 | S_DSF01: Castlereagh Ironbark Forest | Castlereagh/ Cooks River Ironbark Forest | | 15: Grassy natives and exotics | 15: Regrowth | 3: High | M.decora/ M.nodosa+/ - scattered Eucalypts | 841m | West |



## 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 | | | | | |

# Ecological Constraints

**18 Randwick Close, Casula, NSW 2170**

## 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 | 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 | Accipitridae | Pandion cristatus | Eastern Osprey | No | Vulnerable, Protected, Category 3 Sensitive Species | |
| Aves | Ardeidae | Botaurus poiciloptilus | Australasian Bittern | No | Endangered, Protected | Endangered |
| 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 | Falconidae | Falco subniger | Black Falcon | No | Vulnerable, Protected | |
| Aves | Meliphagidae | Anthochaera phrygia | Regent Honeyeater | No | Critically Endangered Species, Protected | Critically Endangered |
| Aves | Meliphagidae | Epthianura albifrons | White-fronted Chat | No | Vulnerable, Protected | |
| Aves | Meliphagidae | Epthianura albifrons | White-fronted Chat population in the Sydney Metropolitan Catchment Management Area | No | Endangered Population, Vulnerable, Protected | |
| Aves | Meliphagidae | Melithreptus gularis gularis | Black-chinned Honeyeater (eastern subspecies) | No | Vulnerable, Protected | |
| Aves | Neosittidae | Daphoenositta chrysoptera | Varied Sittella | 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 | 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 | |
| Gastropoda | Camaenidae | Meridolum corneovirens | Cumberland Plain Land Snail | No | Endangered | |
| Mammalia | Burramyidae | Cercartetus nanus | Eastern Pygmy-possum | No | Vulnerable, Protected | |
| Mammalia | Dasyuridae | Dasyurus maculatus | Spotted-tailed Quoll | No | Vulnerable, Protected | Endangered |

| Class | Family | Scientific | Common | Exotic | NSW Status | Commonwealth Status |
|---|---|---|---|---|---|---|
| Mammalia | Emballonuridae | Saccolaimus flaviventris | Yellow-bellied Sheathtail-bat | No | Vulnerable, Protected | |
| Mammalia | Macropodidae | Petrogale penicillata | Brush-tailed Rock-wallaby | No | Endangered, Protected | Vulnerable |
| Mammalia | Molossidae | Mormopterus norfolkensis | Eastern Freetail-bat | 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 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 | |
| Flora | Anthericaceae | Caesia parviflora var. minor | Small Pale Grass-lily | No | Endangered, Protected | |
| Flora | Apocynaceae | Cynanchum elegans | White-flowered Wax Plant | No | Endangered, Protected | Endangered |
| 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 diminuta subsp. mimica | Allocasuarina diminuta subsp. mimica L.A.S.Johnson population in the Sutherland and Liverpool local government areas | No | Endangered Population | |
| Flora | Casuarinaceae | Allocasuarina glareicola | | No | Endangered, Protected | Endangered |
| Flora | Dilleniaceae | Hibbertia sp. Bankstown | | No | Critically Endangered Species, Protected | Critically Endangered |
| Flora | Ericaceae | Leucopogon exolasius | Woronora Beard-heath | No | Vulnerable, Protected | Vulnerable |
| Flora | Fabaceae (Faboideae) | Dillwynia tenuifolia | | No | Vulnerable, Protected | |
| Flora | Fabaceae (Faboideae) | Pultenaea pedunculata | Matted Bush-pea | No | Endangered, Protected | |
| Flora | Fabaceae (Mimosoideae) | Acacia pubescens | Downy Wattle | No | Vulnerable, Protected | Vulnerable |
| Flora | Gyrostemonaceae | Gyrostemon thesioides | | No | Endangered, Protected, Category 3 Sensitive Species | |
| Flora | Lamiaceae | Prostanthera saxicola | Prostanthera saxicola population in Sutherland and Liverpool local government areas | No | Endangered Population | |
| Flora | Myrtaceae | Callistemon linearifolius | Netted Bottle Brush | No | Vulnerable, Protected, Category 3 Sensitive Species | |
| Flora | Myrtaceae | Eucalyptus nicholii | Narrow-leaved Black Peppermint | No | Vulnerable, Protected | Vulnerable |
| Flora | Myrtaceae | Eucalyptus scoparia | Wallangarra White Gum | No | Endangered, Protected | Vulnerable |
| Flora | Myrtaceae | Melaleuca deanei | Deane's Paperbark | No | Vulnerable, Protected | Vulnerable |
| Flora | Orchidaceae | Diuris aequalis | Buttercup Doubletail | No | Endangered, Protected, Category 2 Sensitive Species | Vulnerable |
| Flora | Orchidaceae | Pterostylis nigricans | Dark Greenhood | 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 parviflora subsp. parviflora | Small-flower Grevillea | No | Vulnerable, Protected | Vulnerable |
| Flora | Proteaceae | Persoonia hirsuta | Hairy Geebung | No | Endangered, Protected, Category 3 Sensitive Species | Endangered |

| Class | Family | Scientific | Common | Exotic | NSW Status | Commonwealth Status |
|---|---|---|---|---|---|---|
| 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 16/11/2016

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# Appendix C
# WorkCover Dangerous Goods Search

NSW GOVERNMENT | SafeWork NSW

Locked Bag 2906, Lisarow NSW 2252
Customer Experience 13 10 50
ABN 81 913 830 179 | www.safework.nsw.gov.au

Our Ref: D17/060368
Your Ref: Erin Millar

Attention: Erin Millar
Consulting Earth Scientists
Suite 3
Level 1
55 Grandview St
Pymble NSW 2073

Dear Ms Millar,

**RE SITE: 18 Randwick Cl Casula NSW**

I refer to your site search request received by SafeWork NSW on 11 January 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 us on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely,

Customer Service Officer
Customer Experience - Operations
SafeWork NSW

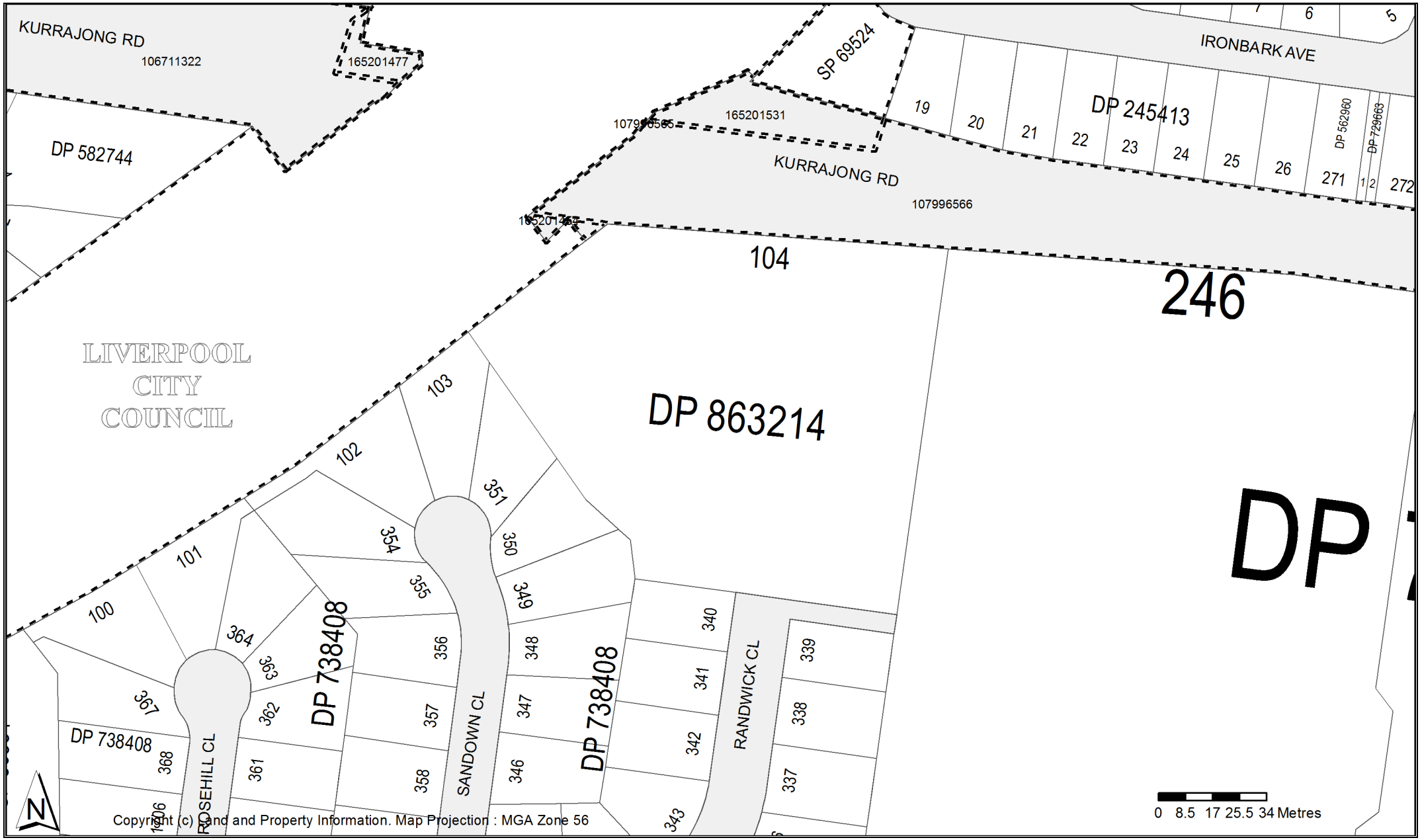
# Appendix D
# Historical Title Information

# Cadastral Records Enquiry Report

**Ref :** Lotsearch - Casula

**Requested Parcel :** Lot 104 DP 863214 **Identified Parcel :** Lot 104 DP 863214

**Locality :** CASULA **LGA :** LIVERPOOL **Parish :** ST LUKE **County :** CUMBERLAND






Report Generated 2:31:54 PM, 18 November, 2016



**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.**

**Requested Parcel :** Lot 104 DP 863214 **Identified Parcel :** Lot 104 DP 863214

**Locality :** CASULA **LGA :** LIVERPOOL **Parish :** ST LUKE **County :** CUMBERLAND

| | Status | Surv/Comp | Purpose |
|---|---|---|---|
| DP1045129 | | | |
| Lot(s): 1002 | | | |
| DP3866 | HISTORICAL | SURVEY | UNRESEARCHED |
| DP775813 | HISTORICAL | SURVEY | RESUMPTION OR ACQUISITION |
| DP846610 | HISTORICAL | SURVEY | RESUMPTION OR ACQUISITION |
| DP847277 | HISTORICAL | SURVEY | RESUMPTION OR ACQUISITION |
| NSW GAZ. 27-12-2002 Folio : 11440<br>ACQUIRED FOR THE PURPOSES OF THE ROADS ACT, 1993<br>LOTS 1001-1002 DP1045129 | | | |
| NSW GAZ. 04-05-2012 Folio : 1147<br>DEDICATED PUBLIC ROAD<br>LOTS 1-7 DP108413, THE AREA OF 18 3/4 PERCHES SHOWN ON DP361939, BEING PART OF LOT 9 DP17620, LOT 1 DP345211 AND LOTS 1-4 DP336498 | | | |
| SP69524 | | | |
| DP245413 | HISTORICAL | SURVEY | SUBDIVISION |
| DP810287 | HISTORICAL | SURVEY | SUBDIVISION |
| DP1035283 | REGISTERED | SURVEY | SUBDIVISION |
| DP1048266 | REGISTERED | SURVEY | SUBDIVISION |
| Road | | | |
| Polygon Id(s): 106711322 | | | |
| NSW GAZ. 21-02-2003 Folio : 2451<br>TRANSFER OF CROWN ROAD TO LIVERPOOL COUNCIL | | | |
| Polygon Id(s): 107996565, 107996566, 165201531 | | | |
| NSW GAZ. 21-02-2003 Folio : 2451<br>OLD KURRAJONG ROAD - TRANSFER OF CROWN ROAD TO LIVERPOOL COUNCIL | | | |
| Polygon Id(s): 165201454, 165201477, 165201531 | | | |
| NSW GAZ. 17-12-2010 Folio : 5901<br>DEDICATED PUBLIC ROAD<br>LOTS 7-11 DP847277. ORDER PUBLISHED IN GOV. GAZ. 30-6-1993 FOL. 3337 IS REPEALED | | | |

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

**Requested Parcel :** Lot 104 DP 863214 **Identified Parcel :** Lot 104 DP 863214

**Locality :** CASULA **LGA :** LIVERPOOL **Parish :** ST LUKE **County :** CUMBERLAND

| Plan | Surv/Comp | Purpose |
|---|---|---|
| DP245413 | SURVEY | SUBDIVISION |
| DP253949 | SURVEY | SUBDIVISION |
| DP562960 | COMPILATION | SUBDIVISION |
| DP582744 | SURVEY | SUBDIVISION |
| DP717422 | SURVEY | SUBDIVISION |
| DP729663 | COMPILATION | CROWN FOLIO CREATION |
| DP738408 | SURVEY | SUBDIVISION |
| DP827089 | SURVEY | SUBDIVISION |
| DP863214 | SURVEY | SUBDIVISION |
| DP1045129 | COMPILATION | ROADS ACT, 1993 |
| SP56384 | COMPILATION | STRATA PLAN |
| SP69524 | COMPILATION | STRATA PLAN |

PLAN FORM 2

Plan Drawing only to appear in this space

*OFFICE USE ONLY

DP 862314

SIGNATURE AND SEALS ONLY.

Registered: 10.9.1996

CA: NO. SA 86/95 OF 6.8.1996

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: PARISH #

Last Plan: D.P.858456

PLAN OF SUBDIVISION OF LOT 13 IN D.P. ~~851931~~ 858456

Lengths are in metres. Reduction Ratio 1: 2500

LGA HAWKESBURY

Locality: KURRAJONG

Parish: MERROO

County: COOK

This sheet of my plan is ... sheets. (Delete if inapplicable)

I, GORDON P. WREN of BOWDENS, P.O. BOX 216, PARRAMATTA.

a surveyor registered under the Surveyors Act 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Survey Practice Regulation 1990 and was completed on 25/6/96

Signature ... Surveyor registered under the Surveyors Act 1929

AZIMUTH : S.S.M. 57949 - S.S.M. 56490

Plans used in preparation of survey/compilation.

D.P.'s 164963, 251501, 570681, 620391, 802295, 811729, 851931, D.5429, 1603

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

PURSUANT TO SEC. 88B OF THE CONVEYANCING ACT 1919-1964, IT IS INTENDED TO CREATE:-

1) RESTRICTION ON THE USE OF LAND.

KURR 4N

Crown Lands Office Approval

PLAN APPROVED .....
Authorised Officer

Land District .....

Paper No .....

Field Book ..... pages .....

Council's Certificate

I hereby certify that —

(a) the requirements of the Local Government Act 1919 (other than the requirements for the registration of plans), and

*(b) the requirements of †Part 3 Division 2 of the Water Board Act 1987, or †Part 5 Division 7 of the Hunter Water Board (Corporatisation) Act 1991

have been complied with by the applicant in relation to the proposed Subdivision (Insert "new road", "subdivision" or "consolidated lot") set out herein

Subdivision No. SA 86/95

Date 6 August 1996

(Signature) ... (Delete as Appropriate)

Council File No. SA 86/95

* This part of certificate to be deleted where the application is only for a consolidated lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Water Board and the Hunter Water Corporation Ltd.

† Delete if inapplicable

SURVEYOR'S REFERENCE: 25883 / 12 CHECK LIST

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

## INSTRUCTIONS FOR COMPLETION

This dealing should be marked by the Commissioner of Stamp Duties before lodgment by hand at the Land Titles Office.

Typewriting and handwriting should be clear, legible and in permanent dense black or dark blue non copying ink.

Alterations are not to be made by erasure; the words rejected are to be ruled through and initialled by the parties to the dealing in the left hand margin.

If the space provided is insufficient, additional sheets of the same size and quality of paper and having the same margins as this form should be used. Each additional sheet must be identified as an annexure and signed by the parties and the attesting witnesses.

If it is intended to create easements, covenants, &c., use forms RP13A, RP13B, RP13C as appropriate.

Rule up all blanks.

The following instructions relate to the SIDE NOTES on the form.

(a) Description of land:

(i) TORRENS TITLE REFERENCE.—For a manual reference insert the Volume and Folio (e.g., Vol. 8514 Fol. 126)—For a computer folio insert the folio identifier (e.g., 12/701924). Title references should be listed in numerical sequence.

(ii) PART/WHOLE.—If part only of the land in the folio of the Register is being transferred, delete the word "WHOLE" and insert the lot and plan number, portion, &c. See also sections 327 and 327AA of the Local Government Act, 1919.

(iii) LOCATION.—Insert the locality shown on the Certificate of Title/Crown Grant, e.g., at Chullora. If the locality is not shown, insert the Parish and County, e.g., Ph. Lismore Co. Rous.

(b) Show the full name of the transferor(s).

(c) If the estate being transferred is a lesser estate than an estate in fee simple, delete "fee simple" and insert appropriate estate.

(d) Show the full name, address and occupation or description of the transferee(s).

(e) Delete if only one transferee. If more than one transferee, delete either "joint tenants" or "tenants in common", and, if the transferees hold as tenants in common, state the shares in which they hold.

(f) In the memorandum of prior encumbrances, state only the registered number of any mortgage, lease, charge or writ to which this dealing is subject.

(g) Execution:

GENERALLY (i) Should there by insufficient space for execution of this dealing, use an annexure sheet.
(ii) The certificate of correctness under the Real Property Act, 1900, must be signed by all parties to the transfer, each party to execute the dealing in the presence of an adult witness, not being a party to the dealing, to whom he is personally known.
The solicitor for the transferee may sign the certificate on behalf of the transferee, the solicitor's name (not that of his firm), to be typewritten or printed adjacent to his signature.
Any person falsely or negligently certifying is liable to the penalties provided by section 117 of the Real Property Act, 1900.

ATTORNEY (iii) If the transfer is executed by an attorney for the transferor/transferee pursuant to a registered power of attorney, the form of attestation must set out the full name of the attorney, and the form of execution must indicate the source of his authority, e.g., "AB by his attorney (or receiver or delegate, as the case may be) XY pursuant to power of attorney registered Book No. , and I declare that I have no notice of the revocation of the said power of attorney".

AUTHORITY (iv) If the transfer is executed pursuant to an authority (other than specified in (iii)) the form of execution must indicate the statutory, judicial or other authority pursuant to which the transfer has been executed.

CORPORATION (v) If the transfer is executed by a corporation under seal, the form of execution should include a statement that the seal has been properly affixed, e.g., in accordance with the Articles of Association of the corporation. Each person attesting the affixing of the seal must state his position (e.g., director, secretary) in the corporation.

(h) Insert the name, postal address, Document Exchange reference, telephone number and delivery box number of the lodging party.

(i) The lodging party is to complete the LOCATION OF DOCUMENTS panel. Place a tick in the appropriate box to indicate the whereabouts of the Certificate of Title. List, in an abbreviated form, other documents lodged, e.g., stat. dec. for statutory declaration, pbte for probate, L/A. for letters of administration, &c.

OFFICE USE ONLY

### FIRST SCHEDULE DIRECTIONS

| (A) FOLIO IDENTIFIER | (B) DIRECTION | (C) NAME |
|---|---|---|
| | PROP | MINISTER ADMINISTERING THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979 of part being Lot1 in DP775813 and INGHAMS PROCESSED POULTRY PTY. LIMITED as to the residue being Lot2 in DP775813. |

### SECOND SCHEDULE AND OTHER DIRECTIONS

| (D) FOLIO IDENTIFIER | (E) DIRECTION | (F) NOTFN TYPE | (G) DEALING NUMBER | (H) DETAILS |
|---|---|---|---|---|
| | | | | |

1989 W. C. Penfold, The Stationer Tel: 212-2666 Prod 480421

PLAN FORM 2

Plan Drawing only to appear in this space

*OFFICE USE ONLY

**DP 863214**

SIGNATURES AND SEAL OF OWNERS

SIGNATURES CONTINUED ON SHEET 2

Crown Lands Office Approval

PLAN APPROVED ..... Authorised Officer

Land District .....

Paper No. .....

Land Book .....

pages .....

Council's Certificate

I hereby certify that –

(a) the requirements of the Local Government Act, 1919 (other than the requirements for the registration of plans), and

(b) the requirements of † Part 3 Division 2 of the Water Board Act 1987, or † Part 5 Division 7 of the Hunter Water Board (Corporatisation) Act 1991,

have been complied with by the applicant in relation to the proposed ..... subdivision or consolidation (insert 'new road', 'subdivision' or 'consolidation of lot') set out herein

Subdivision No. 1995/91

Date 21-4-1995

(Signature) .....

Council File No. 5446-140

†Delete if inapplicable

*This part of certificate to be deleted where the application is only for a consolidation of lot or the opening of a new road or where the land to be subdivided is wholly outside the areas of operations of the Water Board and the Hunter Water Corporation Ltd.

SURVEYOR'S REFERENCE 52588/1-CHECKLIST

| SURVEY PRACTICE REGULATION 1990 CLAUSE 32 (2) | | | | |
|---|---|---|---|---|
| MARK | I.S.G. CO-ORDINATES | | ZONE | ACC. |
| | EASTING | NORTHING | | |
| PM 44100 | 290364.780 | 12427322.987 | 56/1 | 2 |
| PM 44101 | 291196.851 | 12421164.987 | 56/1 | 2 |
| PM 44099 | 289856.846 | 12424271.244 | 56/1 | 2 |
| SOURCE: I.S.G. CO-ORDINATES ADOPTED FROM N.S.W. LANDS DEPT AT 16TH JUNE 1987 | | | | |

(X) EASEMENT TO DRAIN WATER 1·2 WIDE. (VIDE DP.738408).
(Y) LAND EXCLUDES MINERALS - SEE CROWN GRANT
(Z) BENEFITTED BY EASEMENT TO DRAIN WATER 1·2 WIDE (VIDE D.P. 738408)

(V) RESTRICTION ON USER - D.P. 738408
(W) RESTRICTION ON USER - D.P. 738407

SCHEDULE OF CURVED BOUNDARIES

| No | CHORD | ARC | RAD |
|---|---|---|---|
| ① | 204°30'35" 9·56 | 9·835 | 12 |
| ② | 251°23'25" 9·53 | 9·8 | 12 |
| ③ | 298°10'55" 9·53 | 9·8 | 12 |
| ④ | 344°58'25" 9·53 | 9·8 | 12 |
| ⑤ | 20°18'20" 4·965 | 5 | 12 |
| ⑥ | 217°01'05" 10·62 | 11 | 12 |
| ⑦ | 269°32'20" 10·62 | 11 | 12 |
| ⑧ | 330°42'15" 13·73 | 14·62 | 12 |
| ⑨ | 358°23'05" 12·66 | 12·74 | 32·5 |
| ⑩ | 344°23'20" 2 | 2 | 32·5 |
| ⑪ | 354°09'15" 26·08 | 16·36 | 51·97 |

Registered: 23-10-1996

C.A. NO. 1995/91 OF 21-4-1995

Title System: TORRENS

Purpose: SUBDIVISION

Ref. Map: 8237-6 #

Last Plan: D.P. 738408, D.P. 827089

PLAN OF SUBDIVISION OF LOTS 352, 353, 365 & 366 D.P. 738408 & LOT 1707 D.P. 827089

Lengths are in metres. Reduction Ratio 1:800

LGA: LIVERPOOL

Locality: CASULA

Parish: ST LUKE

County: CUMBERLAND

This is Sheet 1 of my plan in 2 sheets (Delete if inapplicable)

I, STEPHEN J. ABBOTT of LEAN LACKENBY & HAYWARD L'POOL P/L, 173 BIGGE STREET LIVERPOOL 2170 a surveyor registered under the Surveyors Act, 1929, as amended, hereby certify that the survey represented in this plan is accurate and has been made in accordance with the Survey Practice Regulation 1990 and was completed on # OCTOBER 1992 & FEBRUARY 1993

Signature: .....
Surveyor registered under Surveyors Act, 1929, as amended.
Datum Line of Azimuth: 'A' - 'B'
Date of survey: #

Plans used in preparation of survey/compilation: D.P. 827089 D.P. 738408 D.P. 7117422

PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

PLAN FORM 3 | To be used in conjunction with Plan Form 2 | WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION | *OFFICE USE ONLY

**DP 863214**

Registered: 23-10-1996

This is sheet 2 of my plan in 2 sheets dated

Surveyor registered under Surveyors Act 1929

This is sheet of the plan of sheets covered by my Certificate No. of

General Manager/Authorised Person

For use where space is insufficient in any panel on Plan Form 2.

Reduction Ratio 1:

Common Seal A.C.N. 000 248 635 — INGHAMS PROCESSED POULTRY PTY. LIMITED

THE COMMON SEAL of INGHAMS PROCESSED POULTRY PTY. LIMITED was hereunto affixed by authority of its Board of Directors in the presence of:

THE COMMON SEAL of [redacted] B2W SERVICES LIMITED is affixed in accordance with its articles of Association in the presence of:

SECRETARY

DIRECTOR

SIGNATURES ONLY

Signed for and on behalf of Defence Housing Authority by Kingsley Wayne Prior its duly constituted attorney who declares that he has no knowledge of the revocation of Power of Attorney dated 30 May 1991 registered Book 3844 No. 898 on 3 July 1991 under the authority of which he has executed this instrument.

Witnessed by

EXECUTED BY ESANDA FINANCE CORPORATION LIMITED A.C.N. 004 346 043 by being signed, sealed and delivered by its Attorney Ian Macleay Ellery (who certifies that he is the Acting Manager, Securities in the New South Wales Division of Bonds Finance Corporation Limited) pursuant to Power of Attorney registered No. 867 Book 3685, in the presence of:

Christina Chirenni Secretary/Agent
C/- 116 Miller St, Nth Sydney
Finance Officer

Signed for and on behalf of ANZ Capel Court Limited by Steven Keith Dowey its duly constituted attorney who declares that he has not received any notices of the Revocation of the Power of Attorney dated 16 June 1993 under the authority of which he has executed this instrument.

Witnessed by

Plan Drawing only to appear in this space

SURVEYOR'S REFERENCE: 52588

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

---

SEARCH DATE
---
18/11/2016 2:44PM

FOLIO: 2/775813
---

First Title(s): OLD SYSTEM VOL 10847 FOL 219
Prior Title(s): 60/738407

| Recorded | Number | Type of Instrument | C.T. Issue |
|---|---|---|---|
| 23/6/1988 | DP775813 | DEPOSITED PLAN | LOT RECORDED<br>FOLIO NOT CREATED |
| 25/8/1988 | X660435 | TRANSFER | FOLIO CREATED<br>EDITION 1 |
| 17/9/1991 | Z920502 | MORTGAGE | EDITION 2 |
| 1/12/1992 | DP827089 | DEPOSITED PLAN | FOLIO CANCELLED |

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
18/11/2016 2:45PM

FOLIO: 60/738407

First Title(s): OLD SYSTEM VOL 10847 FOL 219
Prior Title(s): 248/717422 VOL 5178 FOL 136
VOL 11815 FOL 19 VOL 13080 FOL 161
VOL 15384 FOL 210

| Recorded | Number | Type of Instrument | C.T. Issue |
|---|---|---|---|
| 22/12/1986 | DP738407 | DEPOSITED PLAN | FOLIO CREATED EDITION 1 |
| 23/6/1988 | DP775813 | DEPOSITED PLAN | |
| 24/8/1988 | X660435 | TRANSFER | |
| 24/8/1988 | X792113 | DEPARTMENTAL DEALING | FOLIO CANCELLED |
| 24/7/2000 | 6968061 | DEPARTMENTAL DEALING | |

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

---

SEARCH DATE
---
18/11/2016 2:34PM

FOLIO: 104/863214
---

First Title(s): OLD SYSTEM
Prior Title(s): 1707/827089

| Recorded | Number | Type of Instrument | C.T. Issue |
|---|---|---|---|
| 25/10/1996 | DP863214 | DEPOSITED PLAN | FOLIO CREATED EDITION 1 |
| 12/6/2008 | AE15517 | TRANSFER | EDITION 2 |
| 5/3/2009 | AE528986 | DISCHARGE OF MORTGAGE | |
| 5/3/2009 | AE528993 | MORTGAGE | EDITION 3 |
| 18/10/2012 | AH290669 | DEPARTMENTAL DEALING | |
| 3/7/2013 | AH855062 | DISCHARGE OF MORTGAGE | EDITION 4 |
| 8/10/2013 | AI71523 | MORTGAGE | EDITION 5 |
| 7/10/2014 | AI940972 | DISCHARGE OF MORTGAGE | |
| 7/10/2014 | AI940978 | TRANSFER WITHOUT MONETARY CONSIDERATION | |
| 7/10/2014 | AI940079 | MORTGAGE | EDITION 6 |
| 13/5/2015 | AJ475438 | CAVEAT | |
| 4/6/2015 | AJ542427 | DISCHARGE OF MORTGAGE | |
| 4/6/2015 | AJ542428 | TRANSFER | EDITION 7 |

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

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SEARCH DATE
---
18/11/2016 2:59PM

FOLIO: 248/717422
---

First Title(s): OLD SYSTEM VOL 10847 FOL 219
Prior Title(s): VOL 9726 FOL 148

| Recorded | Number | Type of Instrument | C.T. Issue |
|---|---|---|---|
| 11/10/1985 | DP717422 | DEPOSITED PLAN | FOLIO CREATED EDITION 1 |
| 5/12/1986 | DP738408 | DEPOSITED PLAN | FOLIO CANCELLED RESIDUE REMAINS |
| 27/4/1994 | U212448 | DEPARTMENTAL DEALING | |

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

---

SEARCH DATE
---
18/11/2016 2:42PM

FOLIO: 1707/827089
---

First Title(s): OLD SYSTEM
Prior Title(s): 2/775813

| Recorded | Number | Type of Instrument | C.T. Issue |
|---|---|---|---|
| 1/12/1992 | DP827089 | DEPOSITED PLAN | FOLIO CREATED EDITION 1 |
| 5/7/1993 | I456814 | TRANSFER OF MORTGAGE | EDITION 2 |
| 23/10/1996 | DP863214 | DEPOSITED PLAN | FOLIO CANCELLED |

*** END OF SEARCH ***

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 104/863214

| SEARCH DATE | TIME | EDITION NO | DATE |
|---|---|---|---|
| 18/11/2016 | 2:32 PM | 7 | 4/6/2015 |

LAND

LOT 104 IN DEPOSITED PLAN 863214
AT CASULA
LOCAL GOVERNMENT AREA LIVERPOOL
PARISH OF ST LUKE COUNTY OF CUMBERLAND
TITLE DIAGRAM DP863214

FIRST SCHEDULE

BESOL PTY LTD (T AJ542428)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 LAND EXCLUDES MINERALS BY THE CROWN GRANT WITHIN THE PART SHOWN SO DESIGNATED IN THE TITLE DIAGRAM
3 DP738407 RESTRICTION(S) ON THE USE OF LAND

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

# Appendix E
# Planning Certificate under Section 149

LIVERPOOL CITY COUNCIL

# PLANNING CERTIFICATE UNDER SECTION 149
# ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

**Ref.:** LS000827:40889
**Ppty:** 42720

**Cert. No.:** 2956
**Page No.:** **1 of 11**

**Applicant:**
MR J LEE
LEVEL 3, 68 ALFRED ST
MILSONS POINT NSW 2061

**Receipt No.:** 3475091
**Receipt Amt.:** 133.00
**Date:** 17-Nov-2016

The information in this certificate is provided pursuant to Section 149(2)&(5) of the Environmental Planning and Assessment Act (EP&A Act) 1979, as prescribed by Schedule 4 of the Environmental Planning and Assessment Regulation (EP&A Regulation) 2000. The information has been extracted from Council's records, as they existed at the date listed on the certificate. Please note that the accuracy of the information contained within the certificate may change after the date of this certificate due to changes in Legislation, planning controls or the environment of the land.

The information in this certificate is applicable to the land described below.

**Legal Description:** **LOT 104 DP 863214**
**Street Address:** **18 RANDWICK CLOSE, CASULA NSW 2170**

*Note: Items marked with an asterisk (*) may be reliant upon information transmitted to Council by a third party public authority. The accuracy of this information cannot be verified by Council and may be out-of-date. If such information is vital for the proposed land use or development, applicants should instead verify the information with the appropriate authority.*

*Note: Commonly Used Abbreviations:*
*LEP: Local Environmental Plan*
*DCP: Development Control Plan*
*SEPP: State Environmental Planning Policy*
*EPI: Environmental Planning Instrument*

## 1. Names of relevant planning instruments and DCPs

(a) The name of each EPI that applies to the carrying out of development on the land is/are listed below:

LEPs:

**Liverpool LEP 2008**

SEPPs*:

**SEPP No 19 – Bushland in Urban Areas**
**SEPP No 21 – Caravan Parks**
**SEPP No 30 – Intensive Agriculture**
**SEPP No 33 – Hazardous and Offensive Development**
**SEPP No 44 – Koala Habitat Protection**
**SEPP No 50 – Canal Estate Development**
**SEPP No 55 – Remediation of Land**
**SEPP (Exempt and Complying Development Codes) 2008**
**SEPP No 62 – Sustainable Aquaculture**
**SEPP No 64 – Advertising and Signage**
**SEPP No 65 – Design Quality of Residential Flat Development**
**SEPP (Building Sustainability Index: BASIX) 2004**
**SEPP No. 70 – Affordable Housing (Revised Schemes)**
**SEPP (Infrastructure) 2007**
**SEPP (Mining, Petroleum Production and Extractive Industries) 2007**
**SEPP (Miscellaneous Consent Provisions) 2007**
**SEPP (Affordable Rental Housing) 2009**
**SEPP (Housing for Seniors or People with a Disability) 2004**
**SEPP (State and Regional Development) 2011**

Deemed SEPPs*:

**Greater Metropolitan Regional Environmental Plan No 2 – Georges River Catchment**

(b) The name of each draft EPI, or Planning Proposal (which has been subject to community consultation).

Draft LEPs:

**N/A**

Draft SEPPs*:

**Draft SEPP (Competition) 2010**

(c) The name of each DCP that applies to the carrying out of development on the land.

**Liverpool DCP 2008**

## 2. Zoning and land use under relevant LEPs and /or SEPPs

This section contains information required under subclauses 2 and 2A of Schedule 4 of the EP&A Regulation 2000. Subclause 2 of the regulation requires Council to provide information with respect to zoning and land-use in areas zoned by, or proposed to be zoned by, a LEP. Subclause 2A of Schedule 4 of the regulation requires Council to provide information with respect to zoning and land-use in areas which are zoned by, or proposed to be zoned by, the SEPP (Sydney Region Growth Centres) 2006. The land use and zoning information under any EPI applying to the land is given below.

(a) Name of zone, and the EPI from which the land zoning information is derived.

**R4 High Density Residential - Liverpool LEP 2008**

(b) The purposes for which development may be carried out within the zone without the need for development consent

**Home-based child care; Home occupations**

(c) The purposes for which development may not be carried out within the zone except with development consent

**Attached dwellings; Bed and breakfast accommodation; Boarding houses; Building identification signs; Business identification signs; Child care centres; Community facilities; Dwelling houses; Educational establishments; Environmental facilities; Environmental protection works; Exhibition homes; Exhibition villages; Flood mitigation works; Home businesses; Home industries; Hostels; Hotel or motel accommodation; Kiosks; Multi dwelling housing; Neighbourhood shops; Places of public worship; Public administration buildings; Recreation areas; Residential care facilities; Residential flat buildings; Respite day care centres; Roads; Secondary dwellings; Serviced apartments; Shop top housing**

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

**Any development not specified in item (b) or (c)**

---

(e) If a dwelling house is a permitted use, are there any principal development standards applying to the land that fix minimum land dimensions for the erection of a dwelling house?

**No**

(f) Does the land include or comprise critical habitat?

**No**

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

**No**

(h) Is there an item of environmental heritage (however described) situated on the land

**No**

## 3. Complying development

The information below outlines whether complying development is permitted on the land as per the provisions of clauses 1.17A (1) (c) to (e), (2), (3) and (4), 1.18(1) (c3) and 1.19 SEPP of the (Exempt and Complying Development Codes) 2008.

The first column identifies the code(s). The second column describes the extent of the land in which exempt and complying development is permitted for the code(s) given to the immediate left. The third column indicates the reason as to why exempt and complying development is prohibited on some or all of the land, and will be blank if such development is permitted on all of the land.

| Code | Extent of the land for which development is permitted: | The reason(s) as to why development is prohibited: |
|---|---|---|
| General Housing Code and Rural Housing Code | **All** | |
| Commercial and Industrial (New Buildings and Additions) Code | **All** | |
| General Development Code, Fire Safety Code, Housing Alterations Code, Commercial and Industrial Alterations Code, Subdivisions Code, and Demolition Code | **All** | |

Note: If council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land, a statement below will describe that a restriction applies to the land, but it may not apply to all of the land, and that council does not have sufficient information to ascertain the extent to which complying development may or may not be carried out on the land.

**Nil**

## 4. Coastal protection*

Has the Department of Finance, Services and Innovation notified Council of the land being affected by 38 or 39 of the Coastal Protection Act, 1979?

**No**

## 4A. Certain information relating to beaches and coasts*

(a) Has an order has been made under Part 4D of the Coastal Protection Act 1979 on the land (or on public land adjacent to that land)?

**No**

(b) Has Council been notified under section 55X of the Coastal Protection Act 1979 that temporary coastal protection works have been placed on the land (or on public land adjacent to that land), and if works have been so placed, is council is satisfied that the works have been removed and the land restored in accordance with that Act?

**Not applicable**

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

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

**No**

## 5. Mine subsidence*

Is the land a proclaimed to mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961?

**No**

## 6. Road widening and road realignment

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

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

**No**

(b) An EPI?

**No**

(c) A resolution of the council?

**No**

## 7. Council and other public authority policies on hazard risk restrictions

The following table lists hazard/risk and the policies that have been adopted by Council (or prepared by another public authority and subsequently adopted by Council). The right-most column indicates whether the land is subject to controls from those policies.

| Hazard/Risk | Adopted Policy | Is the land subject to development controls under that policy? |
|---|---|---|
| **Landslip hazard** | Nil | **No** |
| **Bushfire hazard** | Liverpool DCP 2008 | **No** |
| | Liverpool Growth Centre Precincts DCP* | **No** |
| | Edmondson Park South DCP 2012 | **No** |
| | Planning for Bushfire Protection (Rural Fire Services, 2006)* | **No** |
| | Pleasure Point Bushfire Management Plan | **No** |
| **Tidal inundation** | Nil | **No** |
| **Subsidence** | Nil | **No** |
| **Acid Sulphate Soils** | Liverpool LEP 2008 | **No** |
| | Liverpool DCP 2008 | **No** |
| **Potentially Contaminated Land** | Liverpool DCP 2008 | **Potentially**, see section 10 of Part 1 of the Liverpool DCP 2008 |
| | Liverpool Growth Centre Precincts DCP* | **No** |
| **Potentially Saline Soils** | Liverpool DCP 2008 | **Yes** |
| | Liverpool Growth Centre Precincts DCP* | **No** |

Note: Land that is subject to salinity controls under the Liverpool DCP 2008 is derived from salinity potential maps issued by NSW Government. The information in the table above neither confirms nor denies the presence of saline soils.

Note: The information in the table above neither confirms nor denies whether the land is contaminated. The relevant DCP outlines the triggers which may warrant additional investigation, and/or development controls if contamination is confirmed.

## 7A. Flood related development controls information

(a) For the purpose of residential accommodation (excluding group homes or seniors housing), is the land, or part of the land, within the flood planning area and subject to flood planning controls?

**No**

For details of these controls, please refer to the flooding section of the relevant DCP(s) as specified in Section 1(c) of this certificate.

(b) Is development on that land, or part of the land, for any other purpose subject to flood related development controls?

**No**

For details of these controls, please refer to the flooding section of the relevant DCP(s) as specified in Section 1(c) of this certificate.

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

## 8. Land reserved for acquisition

Does a LEP, draft LEP, SEPP or draft SEPP identify the acquisition of the land, or part of the land, by a public authority, as referred to in section 27 of the Act?

**No**

## 9. Contribution Plans

**Liverpool Contributions Plan 2009**

## 9A. Biodiversity certified land*

Is the land, or part of the land, biodiversity certified land (within the meaning of Part 7AA of the Threatened Species Conservation Act 1995)?

**No**

## 10. Biobanking agreements*

Is the land subject to a bio-banking agreement under Part 7A of the Threatened Species Conservation Act 1995, as notified to Council by the Chief Executive of the Office of Environment and Heritage?

**No**

## 11. Bushfire prone land

Is the land or part of the land, bushfire prone land as defined by the EP&A Act 1979?

**No**

## 12. Property vegetation plans*

Is Council aware of the land being subject to a Property Vegetation Plan under the Native Vegetation Act 2003?

**No, Liverpool is excluded from the operation of the Native Vegetation Act 2003**

## 13. Orders under Trees (Disputes between Neighbours) Act 2006*

Does an order, made under the Trees (Disputes Between Neighbours) Act 2006 in relation to carrying out of work in relation to a tree on the land, apply?

**No**, Council has not been notified of an order

## 14. Directions under Part 3A*

Is there a direction (made by the Minister) that a provision of an EPI in relation to a development does not have effect?

**No**

## 15. Site compatibility certificates and conditions for seniors housing*

(a) Is there is a current site compatibility certificate (seniors housing), in respect of proposed development on the land?

**No**, Council has not been notified of an order.

## 16. Site compatibility certificates for infrastructure*

(a) Is there is a current site compatibility certificate (infrastructure), in respect of proposed development on the land?

**No**, Council has not been notified of an order

## 17. Site compatibility certificates and conditions for affordable rental housing*

Is there is a current site compatibility certificate (Affordable housing), in respect of proposed development on the land?

**No**, Council has not been notified of an order.

## 18. Paper subdivision information*

Does any development plan adopted by a relevant authority (or proposed plan subject to a consent ballot) apply to the land? If so the date of the subdivision order that applies to the land.

**No**

## 19. Site verification certificates*

Does a current site verification certificate, apply to the land?

**No**, Council is not aware of a site verification certificate

## 20. Loose-fill asbestos insulation *

Is a dwelling on the land listed on the register (maintained by the NSW Department of Fair Trading) as containing loose-fill asbestos insulation?

**No**

Note: despite any listing on the register, any buildings constructed before 1980 may contain loose-fill asbestos insulation or other asbestos products.

## 21. Contaminated land

Is the land:

(a) Significantly contaminated land within the meaning of that Act?

**No**

(b) Subject to a management order within the meaning of that Act?

**No**

(c) Subject of an approved voluntary management proposal within the meaning of that Act?

**No**

(d) Subject to an ongoing maintenance order within the meaning of that Act?

**No**

(e) Subject of a site audit statement within the meaning of that Act? *

**No**

Note: in this clause 'the Act' refers to the Contaminated Land Management Act 1997.

**THE FOLLOWING INFORMATION IS PROVIDED PURSUANT TO SECTION 149(5) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT ACT (EP&A ACT) 1979**

## 1. Controlled access road

Does the land have a boundary to a controlled access road?

**Yes**

## 2. Sewer Access and On-site Management

**Nil**

## 3. Other Information in Relation to Water Restrictions

**Nil**

## 4. Contaminated Land

**Nil**

## 5. Airport Noise Affectation*

**Nil**

## 6. Environmentally Significant Land

**Nil**

## 7. Archaeological Management Plan

**Nil**

## 8. Offensive Odour and Rural Land Uses

**Nil**

[redacted]

Luke West
Administration Services Coordinator
Liverpool City Council

For further information, please contact
CALL CENTRE – 1300 36 2170

# Appendix F
# Dial Before You Dig Plans

# Job No 11408138

Phone: 1100
**www.1100.com.au**

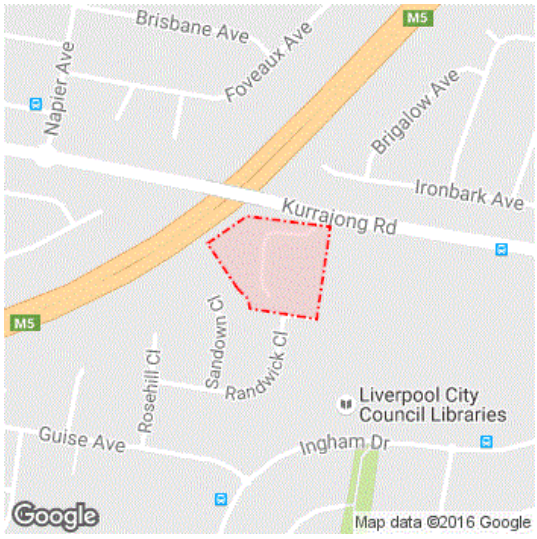
## Caller Details

**Contact:** Mr Miles Thompson
**Company:** Consulting Earth Scientists Pty Ltd
**Address:** Grandview Street
Pymble NSW 2073

**Caller Id:** 1598835 **Phone:** 0497018918
**Mobile:** Not Supplied **Fax:** Not Supplied
**Email:** miles.thompson@consultingearth.com.au

## Dig Site and Enquiry Details

**WARNING:** The map below only displays the location of the proposed dig site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.




**User Reference:** CES161003
**Working on Behalf of:**
Private

| Enquiry Date: | Start Date: | End Date: |
|---|---|---|
| 24/10/2016 | 31/10/2016 | 04/11/2016 |

**Address:**
18 Randwick Close
Casula NSW 2170

**Job Purpose:** Excavation
**Onsite Activity:** Vertical Boring
**Location of Workplace:** Private Property
**Location in Road:** Not Supplied

- Check that the location of the dig site is correct. If not you must submit a new enquiry.
- Should the scope of works change, or plan validity dates expire, you must submit a new enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

**Notes/Description of Works:**
Geotechnical and environment drilling

## Your Responsibilities and Duty of Care

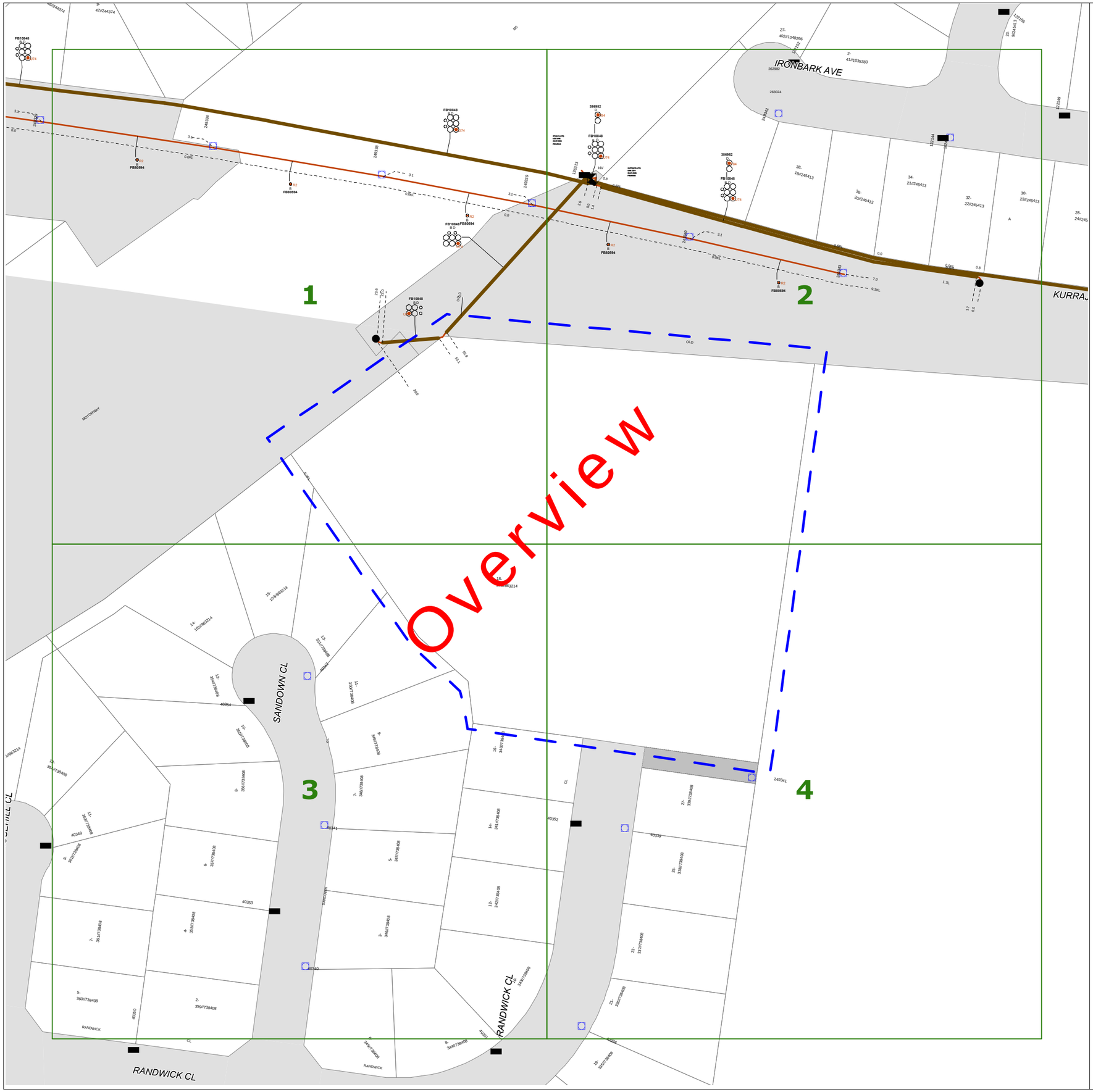
- If plans are not received within 2 working days, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you MUST advise the asset owner immediately.
- By using this service, you agree to Privacy Policy and the terms and disclaimers set out at **www.1100.com.au**
- **For more information on safe excavation practices, visit www.1100.com.au**

## Asset Owner Details

The assets owners listed below have been requested to contact you with information about their asset locations within 2 working days. Additional time should be allowed for information issued by post. It is **your responsibility** to identify the presence of any underground assets in and around your proposed dig site. Please be aware, that not all asset owners are registered with the Dial Before You Dig service, so it is **your responsibility** to identify and contact any asset owners not listed here directly.
** Asset owners highlighted by asterisks ** require that you visit their offices to collect plans.
# Asset owners highlighted with a hash require that you call them to discuss your enquiry or to obtain plans.

| Seq. No. | Authority Name | Phone | Status |
|---|---|---|---|
| 56510214 | Endeavour Energy | 0298534161 | NOTIFIED |
| 56510216 | Jemena Gas West | 1300880906 | NOTIFIED |
| 56510213 | PIPE Networks, Nsw | 1800201100 | NOTIFIED |
| 56510212 | Roads and Maritime Services | 0288370285 | NOTIFIED |
| 56510217 | Sydney Water | 132092 | NOTIFIED |
| 56510215 | Telstra NSW, Central | 1800653935 | NOTIFIED |

END OF UTILITIES LIST




Endeavour Energy

## WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty **(20)** working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.

## INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

## DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

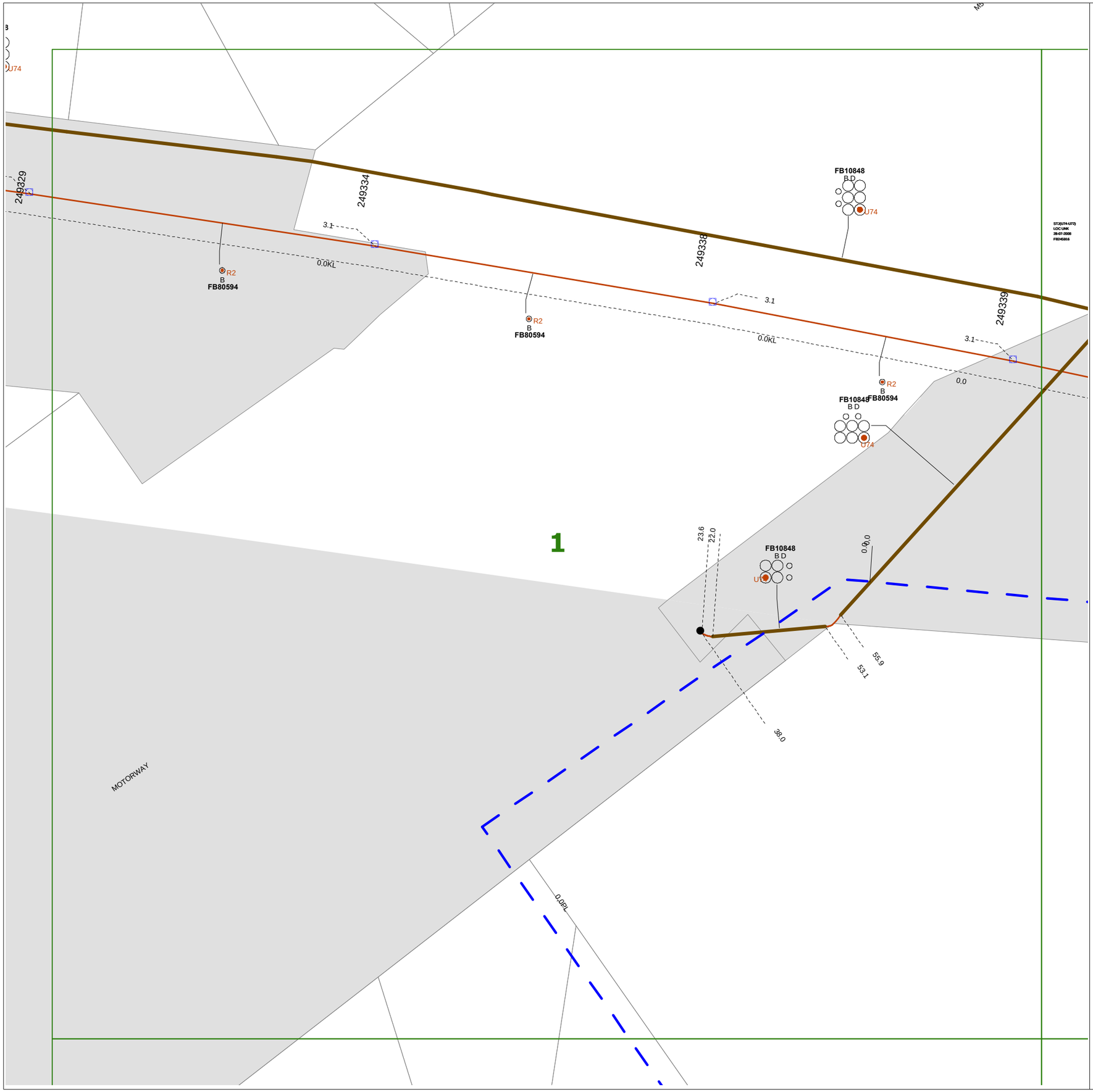
## LEGEND

- Street light column
- Padmount substation
- Overground pillar (O.G.Box)
- Underground pit
- Duct run
- Cable run
- Typical duct section
- Asbestos warning

N

**NOT TO SCALE**

| | |
|---|---|
| DBYD Sequence No.: | 56510214 |
| Issued Date: | 24/10/2016 |

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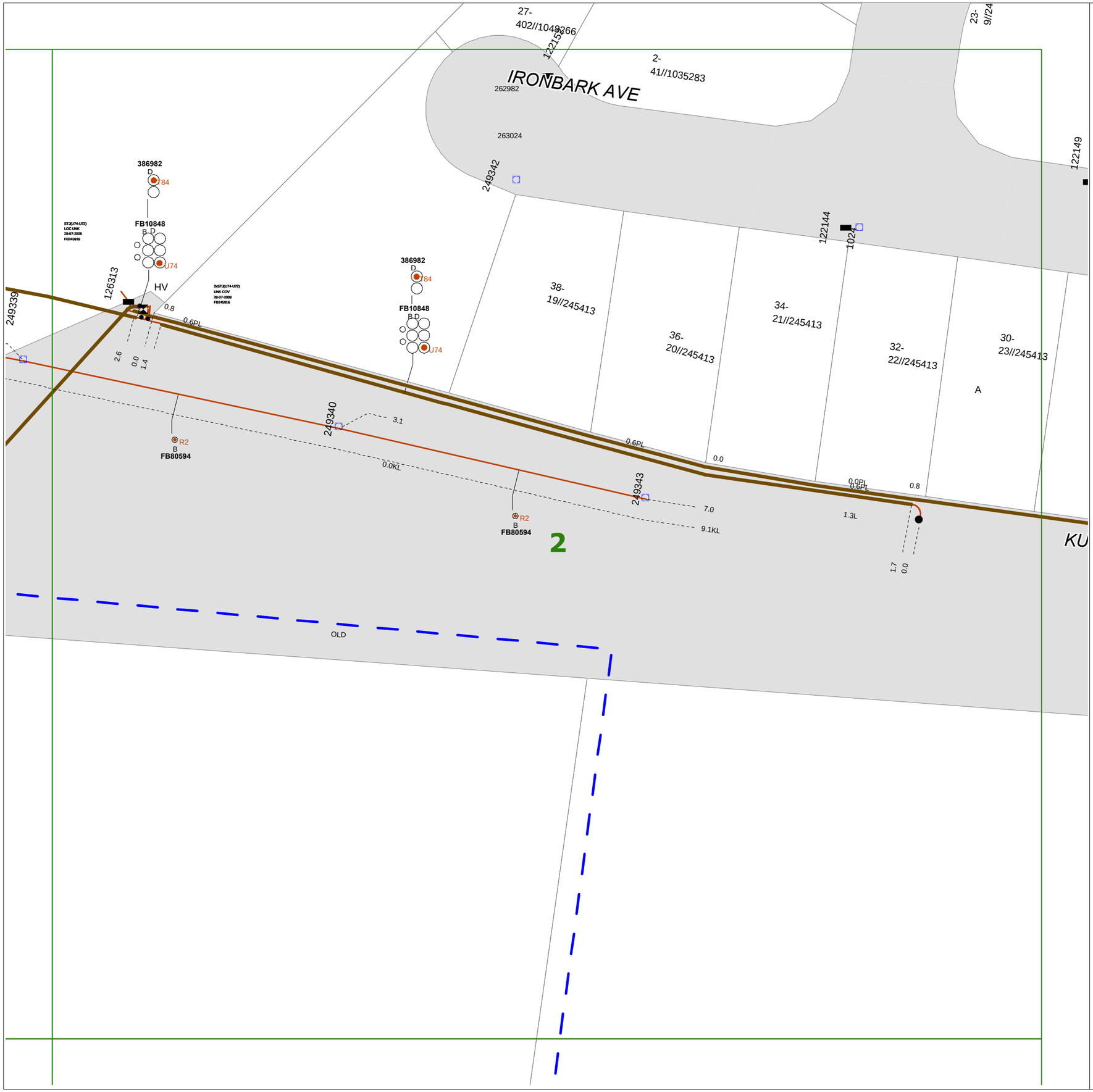


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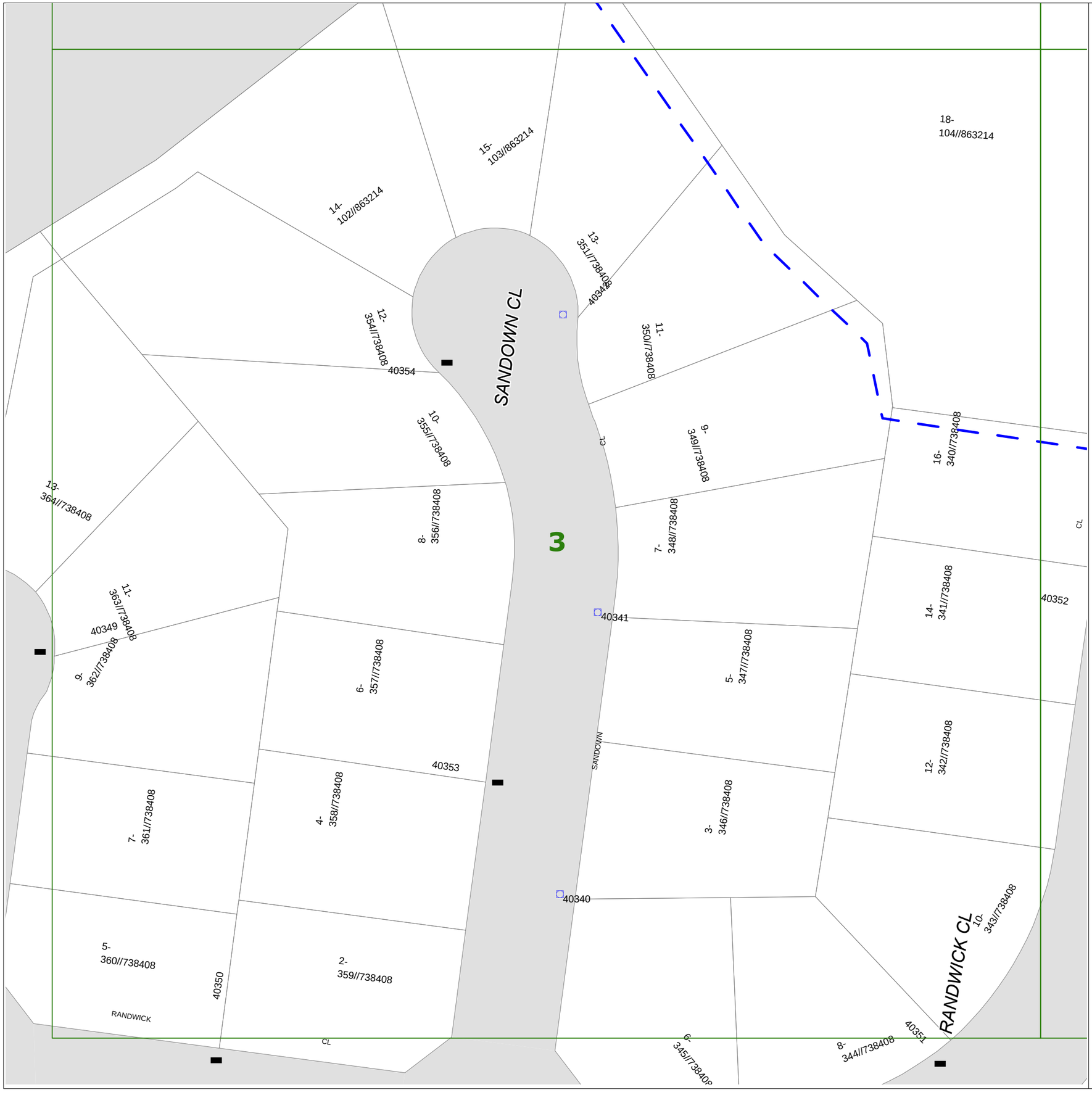


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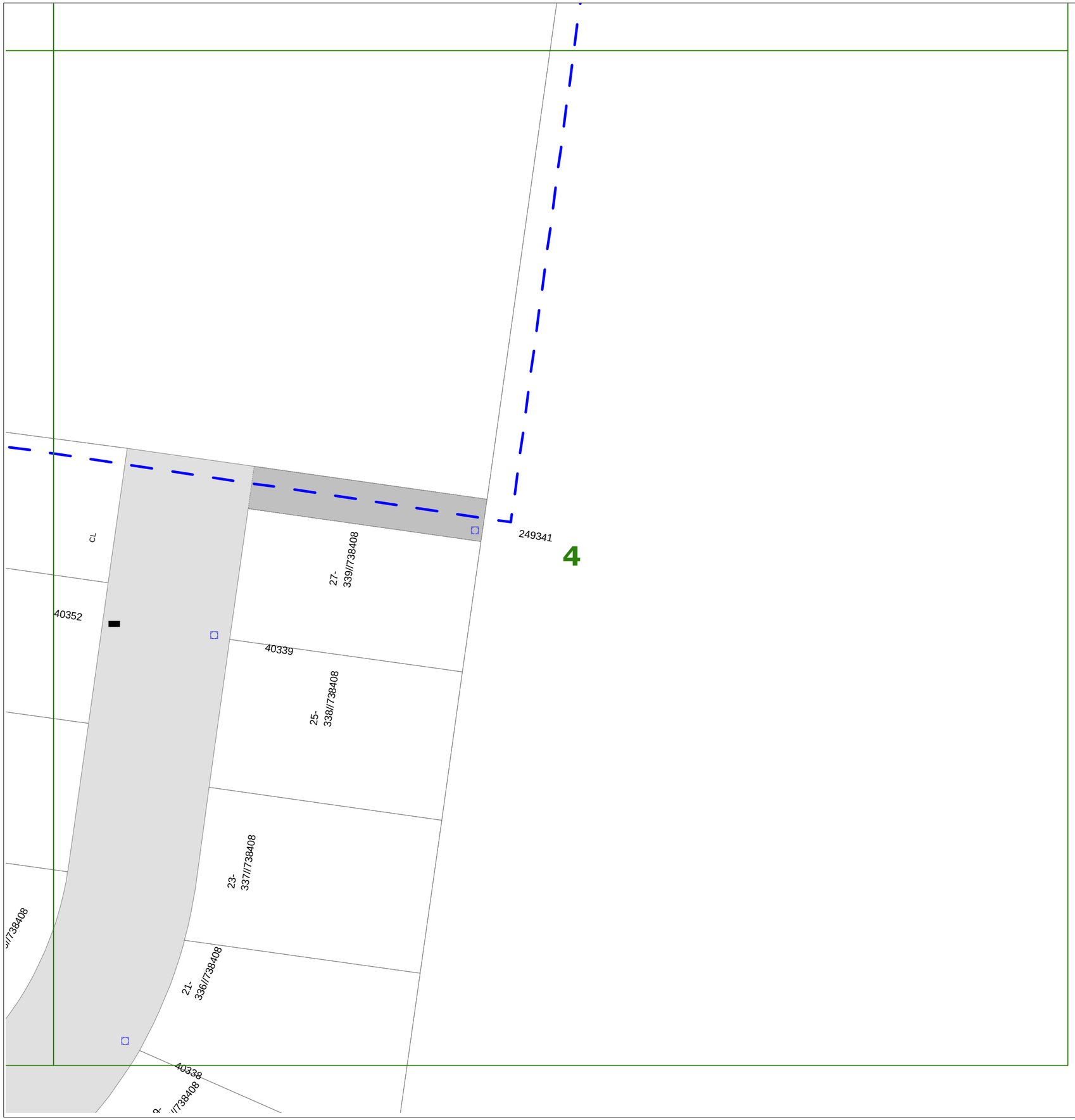


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**LEGEND**

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- Padmount substation
- or — Overground pillar (O.G.Box)
- Underground pit
- Duct run
- Cable run
- Typical duct section
- Asbestos warning

N

**NOT TO SCALE**

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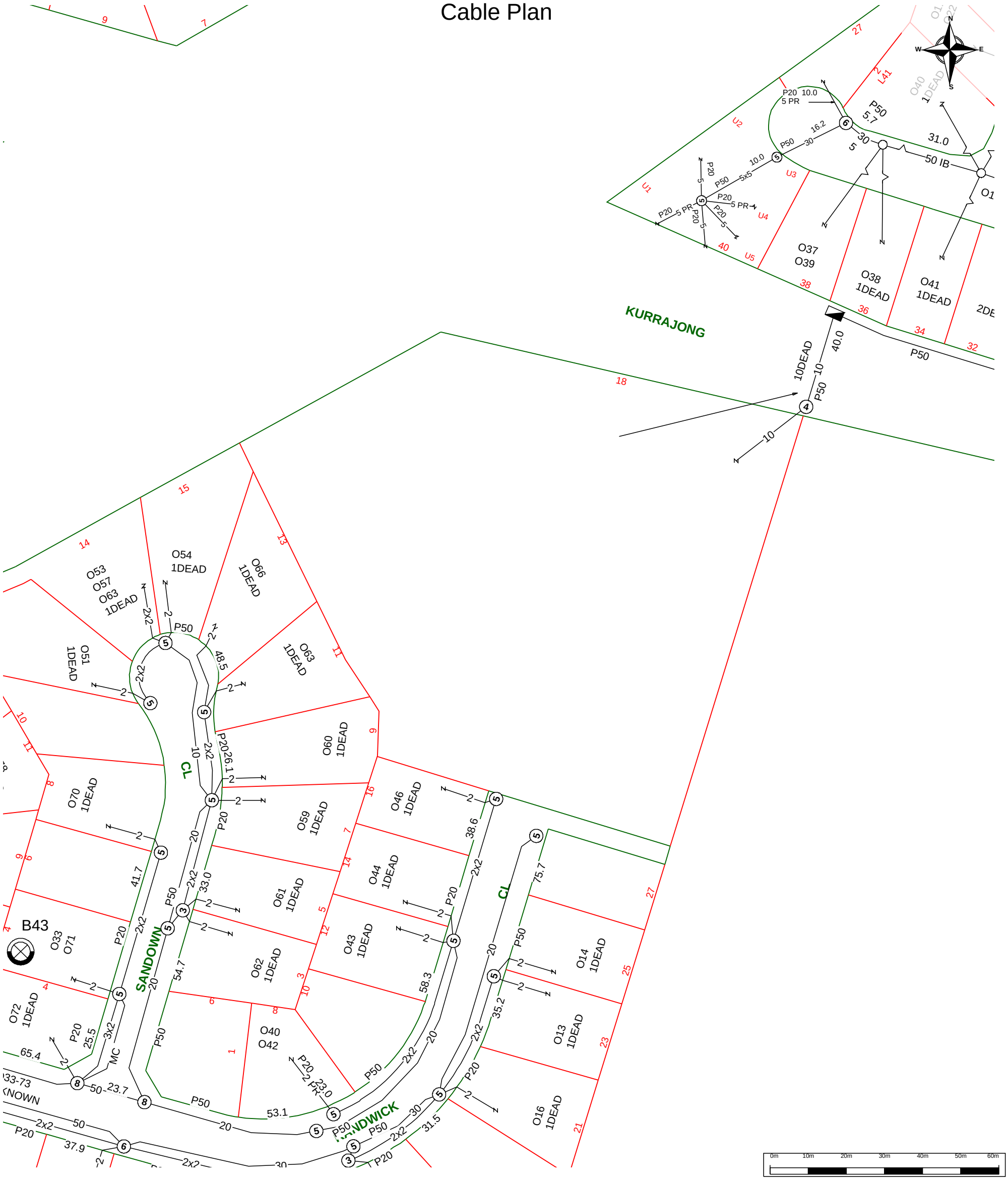
|---|---|
| DBYD Sequence No.: | 56510214 |
| Issued Date: | 24/10/2016 |

# Cable Plan




| | |
|---|---|
| Telstra | For all Telstra DBYD plan enquiries -<br>email - Telstra.Plans@team.telstra.com<br>For urgent onsite contact only - ph 1800 653 935 (bus hrs) |
| TELSTRA CORPORATION LIMITED A.C.N. 051 775 556 | |
| Generated On 24/10/2016 11:07:22 | Sequence Number: 56510215 |
| | CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance. |

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

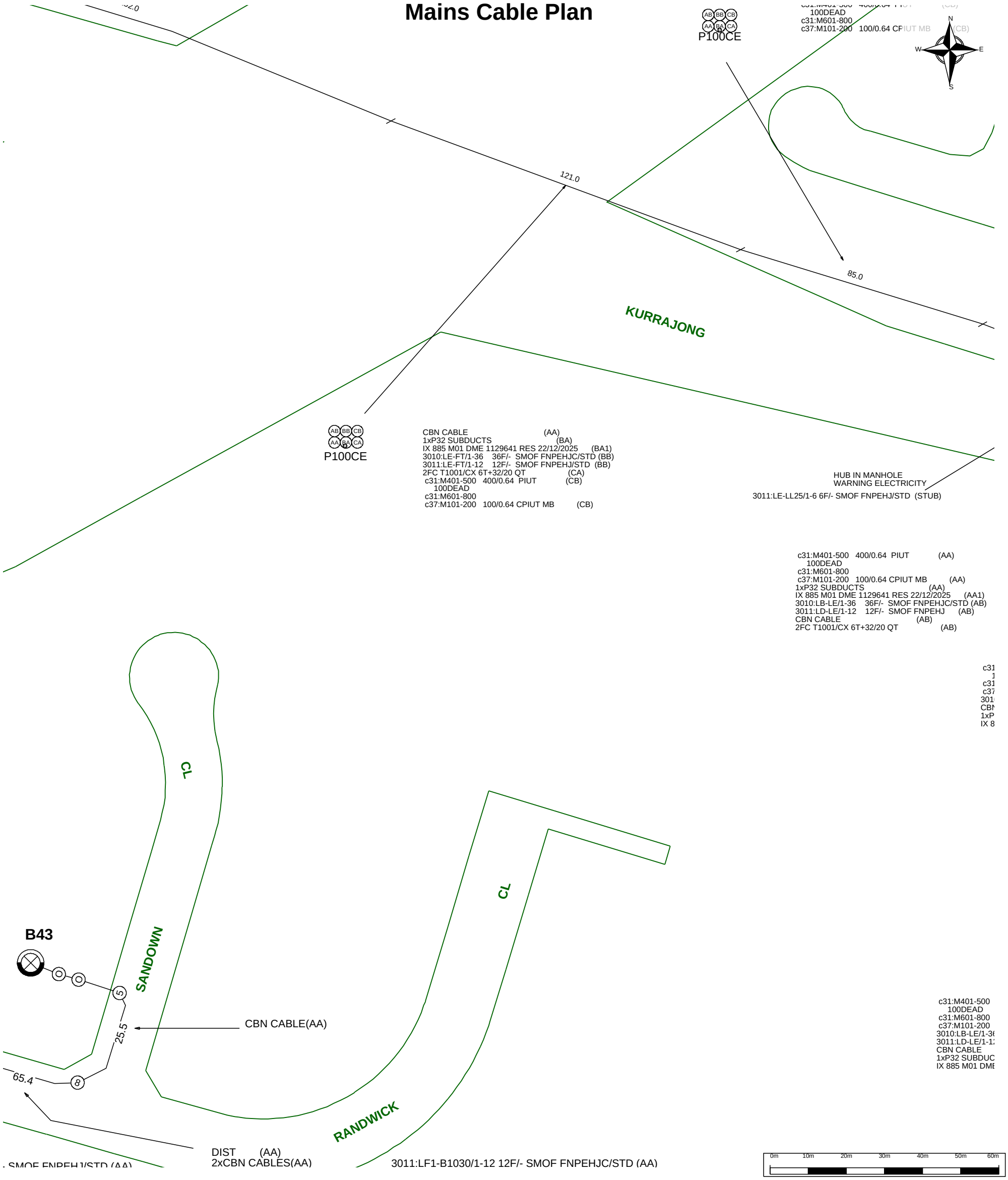
WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

# Mains Cable Plan




| | |
|---|---|
| Telstra | For all Telstra DBYD plan enquiries -<br>email - Telstra.Plans@team.telstra.com<br>For urgent onsite contact only - ph 1800 653 935 (bus hrs) |
| TELSTRA CORPORATION LIMITED A.C.N. 051 775 556 | |
| Generated On 24/10/2016 11:07:28 | |

Sequence Number: 56510215

CAUTION: Fibre optic and/ or major network present in plot area. Please read the Duty of Care and contact Telstra Plan Services should you require any assistance.

A3

RD

AVE

AVE

MWY

KURRAJONG

ROBINSON CL

BRIGALOW AVE

IRONBARK RD

IRONBARK

CL

SADDOWN CL

RANDWICK

DOOMBEN CL

ROSEHILL

6.0W. PHWY

DBYD Address:
18 Randwick Close
Casula NSW 2170

DBYD Job No: 11408138

DBYD Sequence No: 56510217



Scale: 1:1500

Date of Production: 24/10/2016

Plan 1 of 1

N

0m 9m 18m 27m 36m

# Appendix G
# Borehole Logs

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

CONSULTING EARTH SCIENTISTS
Suite 3, Level 1
55 Grandview Street, Pymble NSW 2073
PH: (02) 8569 2200 FAX: (02) 9983 0582
www.consultingearth.com.au

# LOG ID: BH1

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305666 | **Date Commenced:** | 3/11/16 | **Logged by:** | MT |
| **Y-Coord:** | 6241713 | **Date Completed:** | 3/11/16 | **Checked by:** | DL |
| **Surface Elevation (R.L) :** | 39 m AHD | **Hole Diameter (mm):** | 110 | | |

| Drilling Information | | | | LITHOLOGY | | | | | Samples | Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (mBGL) | R.L. (m) | Method (Support) | Water | Symbol | USCS Symbol | Description<br>SOIL TYPE:<br>plasticity or particle characteristics colour, moisture, secondary and minor component | Consistency / Density | Moisture | Sample ID | SPT | Pocket Penetrometer (kPa)<br>100 200 300 400 | Notes and additional observations |
| 0 | 39 | ADV | | | | FILL: Brown to light brown CLAY, moist to dry, medium plasticity, with trace fine gravel and sand. | | | BH1 0.5-0.7 | | | |
| 1 | 38 | | | | | CLAY: grey mottled dark red, medium to high plasticity, moist, firm. | | | | 1.5-1.95m<br>1,3,3<br>N=6 | | |
| 2 | 37 | | | | | Shaley CLAY: light brown, medium plasticity, distinct platey structure, friable. | | | | | | |
| 3 | 36 | | | | | Clayey SHALE: grey, dry, distinct hard iron stained lenses, hard. | | | | 3.5-3.95m<br>25 for<br>130mm<br>N>50 | | |
| 4 | 35 | | | | | SHALE: dark grey, hard.<br>at 8.4m, drilling becoming slow. | | | | | | |
| 5 | 34 | | | | | | | | | | | |
| 6 | 33 | | | | | | | | | | | |
| 7 | 32 | | | | | | | | | | | |
| 8 | 31 | | | | | End of hole at 8.7m. Target depth. No refusal of auger. | | | | | | |
| 9 | 30 | | | | | | | | | | | |

| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | | |

Refer to Standard Sheets for details of abbreviations

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

CONSULTING EARTH SCIENTISTS
Suite 3, Level 1
55 Grandview Street, Pymble NSW 2073
PH: (02) 8569 2200 FAX: (02) 9983 0582
www.consultingearth.com.au

# LOG ID: BH2

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305642 | **Date Commenced:** | 3/11/16 | **Logged by:** | MT |
| **Y-Coord:** | 6241753 | **Date Completed:** | 3/11/16 | **Checked by:** | DL |
| **Surface Elevation (R.L.) :** | 39 m AHD | **Hole Diameter (mm):** | 110 | | |

| Drilling Information | | | | LITHOLOGY | | | | | Samples | Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (mBGL) | R.L. (m) | Method (Support) | Water | Symbol | USCS Symbol | Description<br>SOIL TYPE:<br>plasticity or particle characteristics colour, moisture, secondary and minor component | Consistency / Density | Moisture | Sample ID | SPT | Pocket Penetrometer (kPa)<br>100 200 300 400 | Notes and additional observations |
| 0 | 39 | ADV | | | | FILL: Mixed brown CLAY/GRAVEL, moist, medium plasticity, fine grained, angular. | | | BH3 0.3-0.5 | | | |
| 1 | 38 | | | | | Gravelly SAND: grey to black, medium to coarse; gravel, fine grained; wet. | | | | | | |
| 2 | 37 | | | | | CLAY: brown, dry to moist, with trace fine gravel, high plasticity, very stiff. | | | | 1.5-1.95m<br>3,6,13<br>N=19 | | |
| 3 | 36 | | | | | at 3.0m, becoming predominately grey. | | | | 3.0-3.45m<br>4,9,10<br>N=19 | | |
| 4 | 35 | | | | | Shaley CLAY: reddish brown, with trace gravel of shale, low plasticity, friable. | | | | | | |
| 5 | 34 | | | | | Clayey SHALE: Yellowish brown to dark brown, dry. | | | | | | |
| 6 | 33 | | | | | | | | | | | |
| 7 | 32 | | | | | SHALE: dark grey, hard. | | | | | | |
| 8 | 31 | | | | | End of hole at 7.2m. Refusal of auger.<br>No groundwater observed during drilling. Standing water at 4.1m 0700 4/11/16. | | | | | | |
| 9 | 30 | | | | | | | | | | | |

| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | | |

Refer to Standard Sheets for details of abbreviations

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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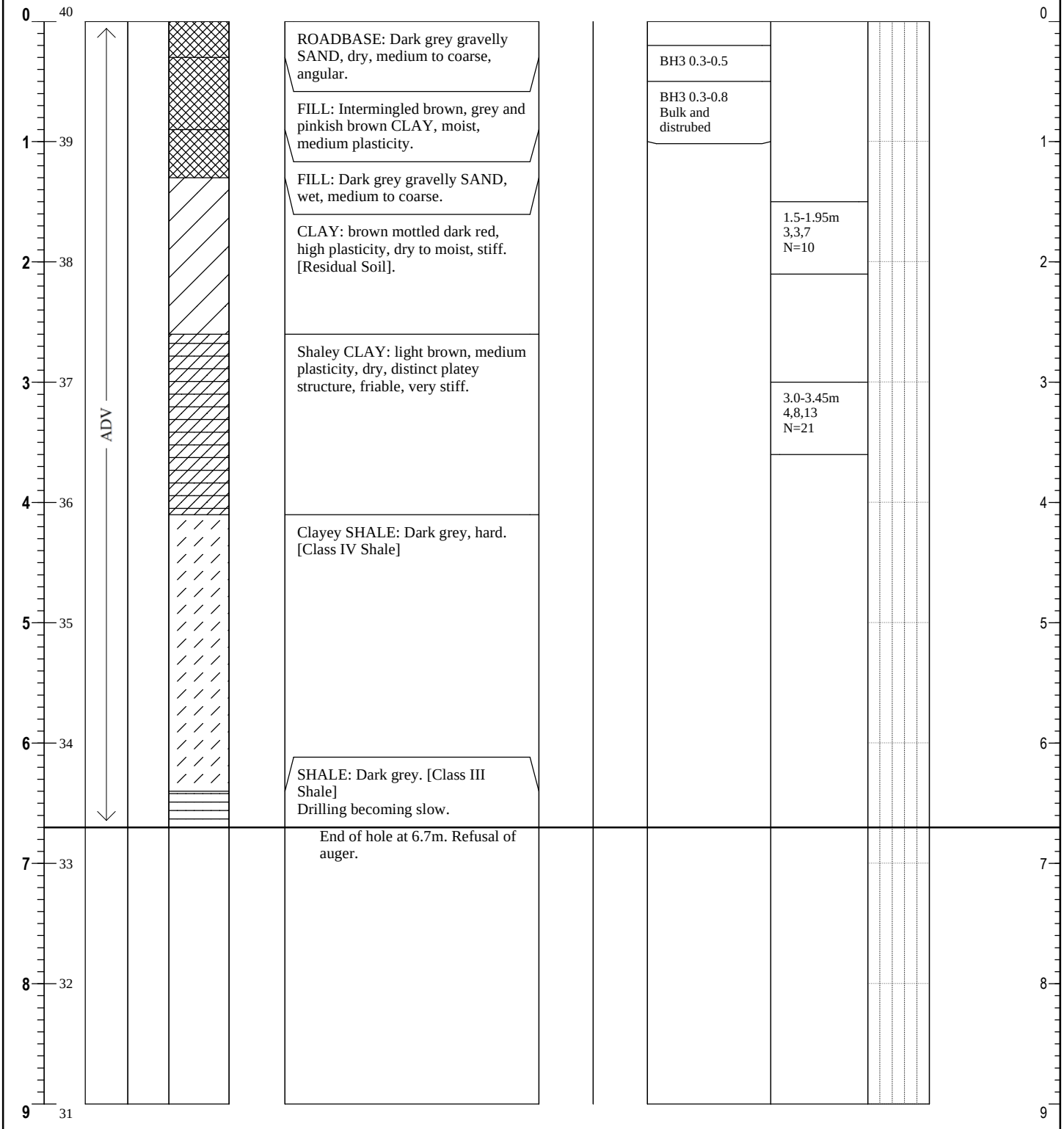
# LOG ID: BH3

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305498 | **Date Commenced:** | 3/11/16 | **Logged by:** | MT |
| **Y-Coord:** | 6241570 | **Date Completed:** | 3/11/16 | **Checked by:** | DL |
| **Surface Elevation (R.L) :** | 40 m AHD | **Hole Diameter (mm):** | 110 | | |

| Drilling Information | | | | LITHOLOGY | | | | | Samples | Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (mBGL) | R.L. (m) | Method (Support) | Water | Symbol | USCS Symbol | Description<br>SOIL TYPE:<br>plasticity or particle characteristics colour, moisture, secondary and minor component | Consistency / Density | Moisture | Sample ID | SPT | Pocket Penetrometer (kPa)<br>100 200 300 400 | Notes and additional observations |




| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | | |

Refer to Standard Sheets for details of abbreviations

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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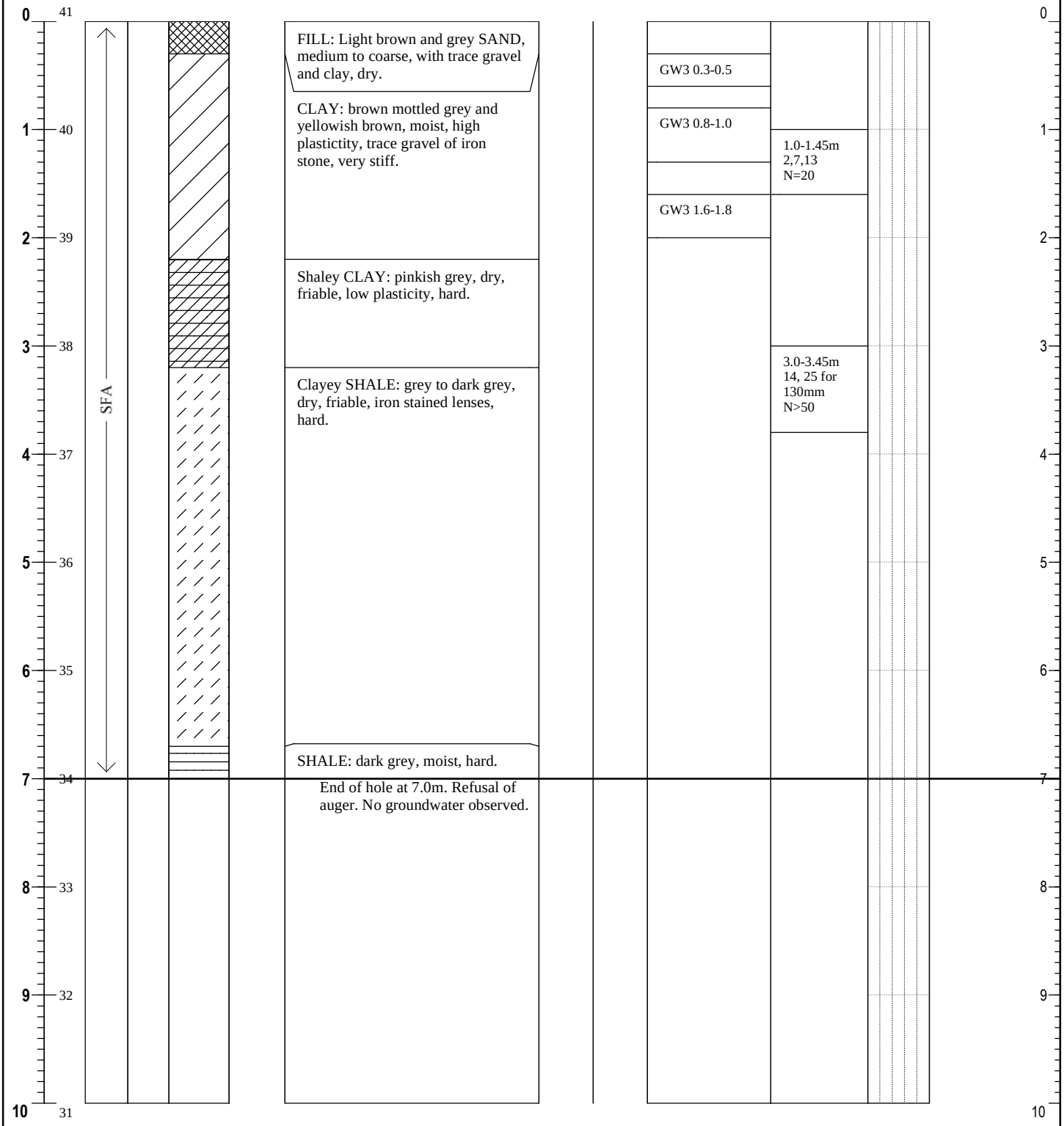
# LOG ID: BH4

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305590 | **Date Commenced:** | 4/11/16 | **Logged by:** | MT |
| **Y-Coord:** | 6241727 | **Date Completed:** | 4/11/16 | **Checked by:** | DL |
| **Surface Elevation (R.L) :** | 41 m AHD | **Hole Diameter (mm):** | 110 | | |

| Drilling Information | | | | LITHOLOGY | | | | | Samples | Tests | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (mBGL) | R.L. (m) | Method (Support) | Water | Symbol | USCS Symbol | Description<br>SOIL TYPE:<br>plasticity or particle characteristics colour, moisture, secondary and minor component | Consistency / Density | Moisture | Sample ID | SPT | Pocket Penetrometer (kPa)<br>100 200 300 400 | Notes and additional observations |




| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | | |

Refer to Standard Sheets for details of abbreviations

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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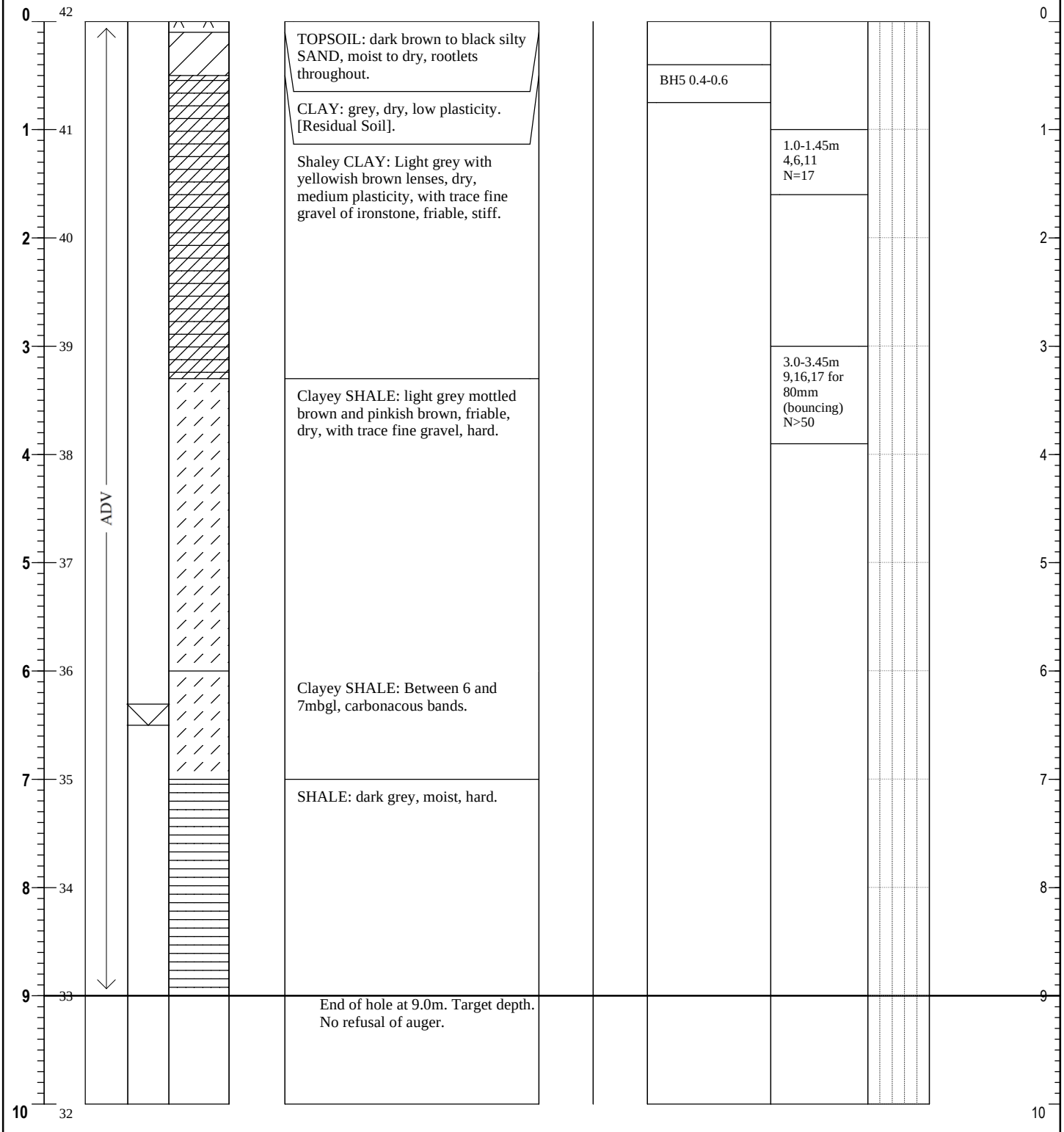
# LOG ID: BH5

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305573 | **Date Commenced:** | 4/11/16 | **Logged by:** | MT |
| **Y-Coord:** | 6241714 | **Date Completed:** | 4/11/16 | **Checked by:** | DL |
| **Surface Elevation (R.L) :** | 42 m AHD | **Hole Diameter (mm):** | 110 | | |




| | | | | |
|---|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller | Refer to Standard Sheets for details of abbreviations |
| **Machine Type:** | Edson 100 | | | |

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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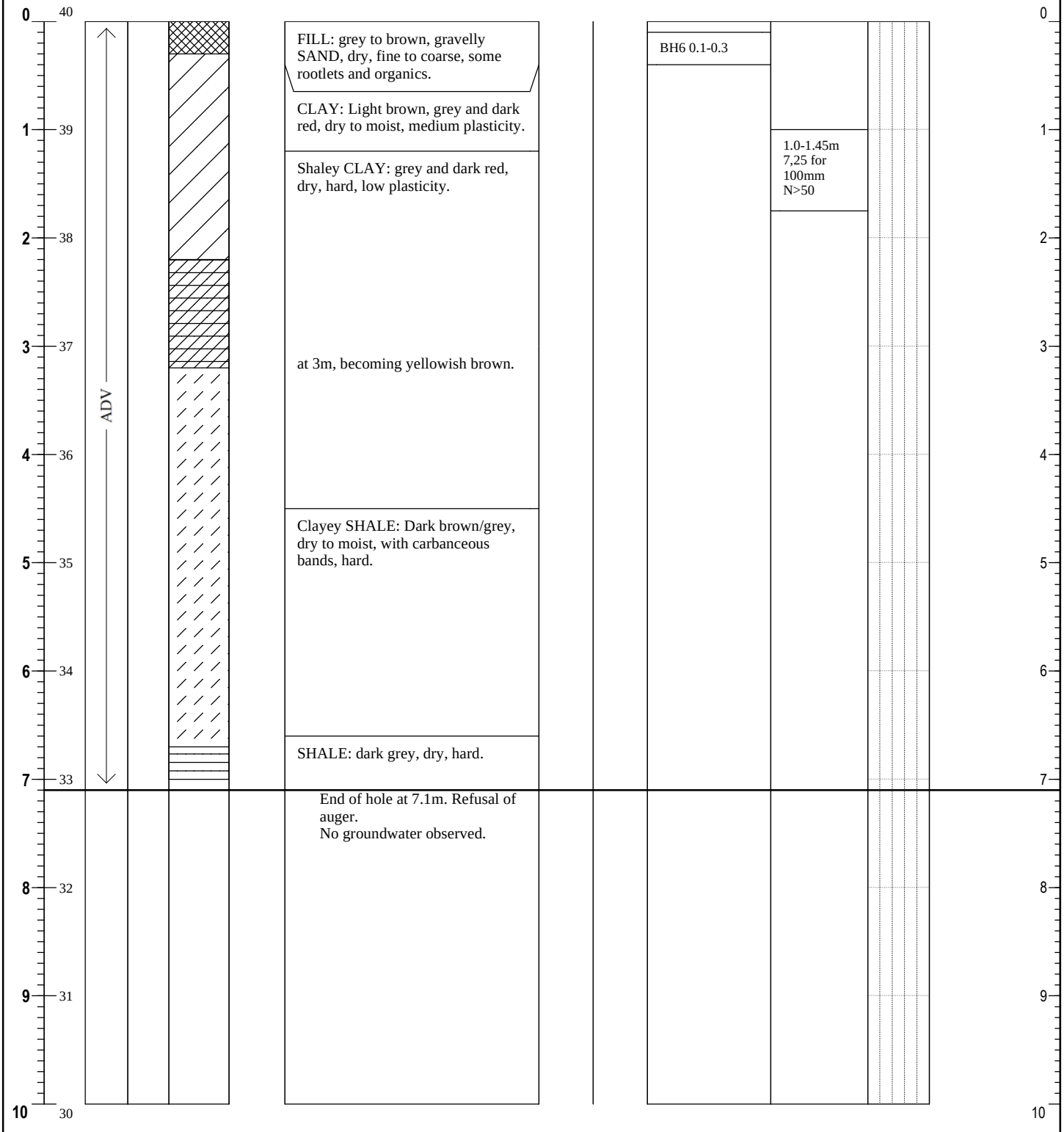
# LOG ID: BH6

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305614 | **Date Commenced:** | 2/11/16 | **Logged by:** | MT |
| **Y-Coord:** | 6241677 | **Date Completed:** | 2/11/16 | **Checked by:** | DL |
| **Surface Elevation (R.L) :** | 40 m AHD | **Hole Diameter (mm):** | 110 | | |




| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | | |

Refer to Standard Sheets for details of abbreviations

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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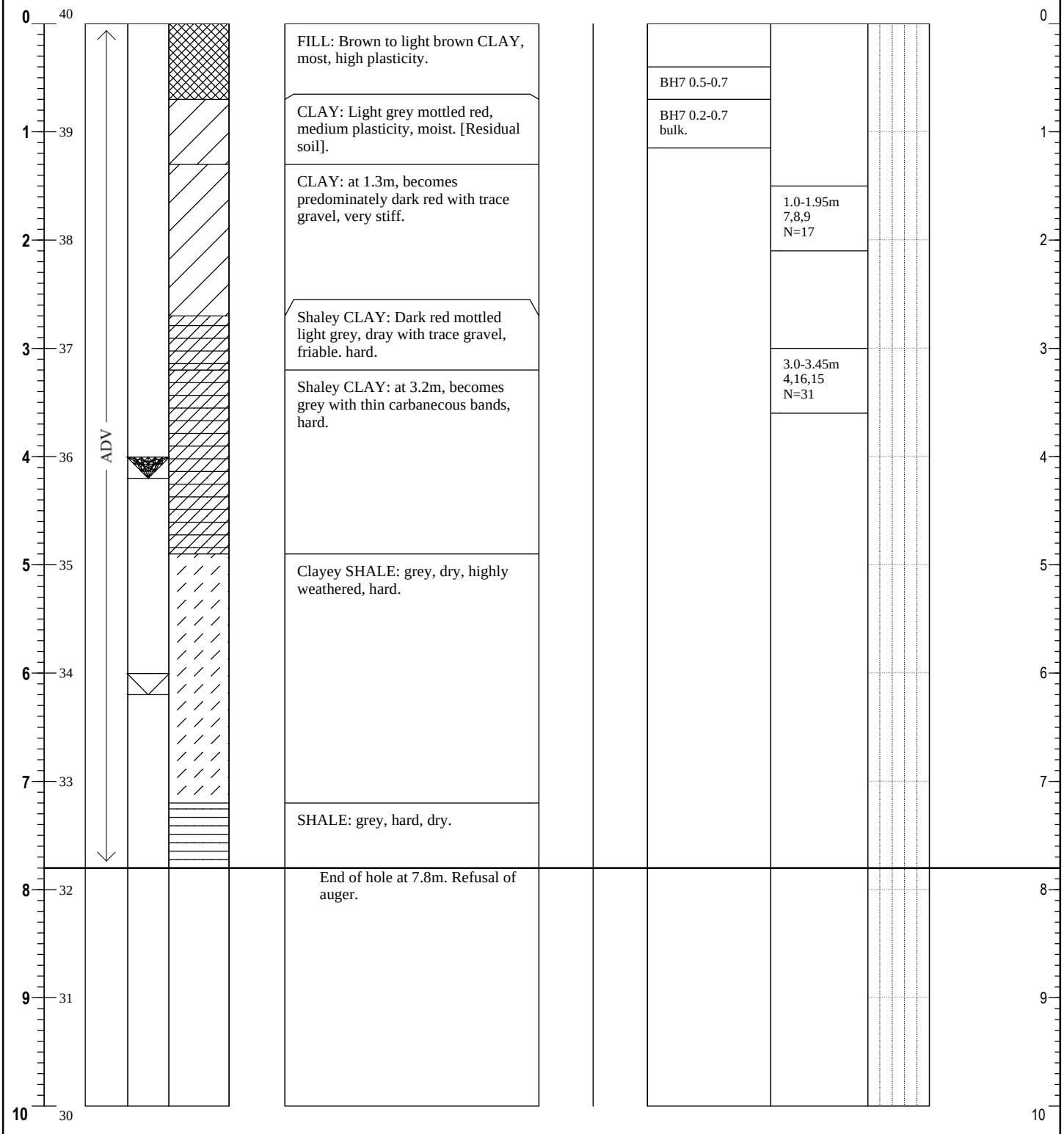
# LOG ID: BH7

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305631 | **Date Commenced:** | 2/11/16 | **Logged by:** | MT |
| **Y-Coord:** | 6241722 | **Date Completed:** | 2/11/16 | **Checked by:** | DL |
| **Surface Elevation (R.L) :** | 40 m AHD | **Hole Diameter (mm):** | 110 | | |




| | | | | |
|---|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller | Refer to Standard Sheets for details of abbreviations |
| **Machine Type:** | Edson 100 | | | |

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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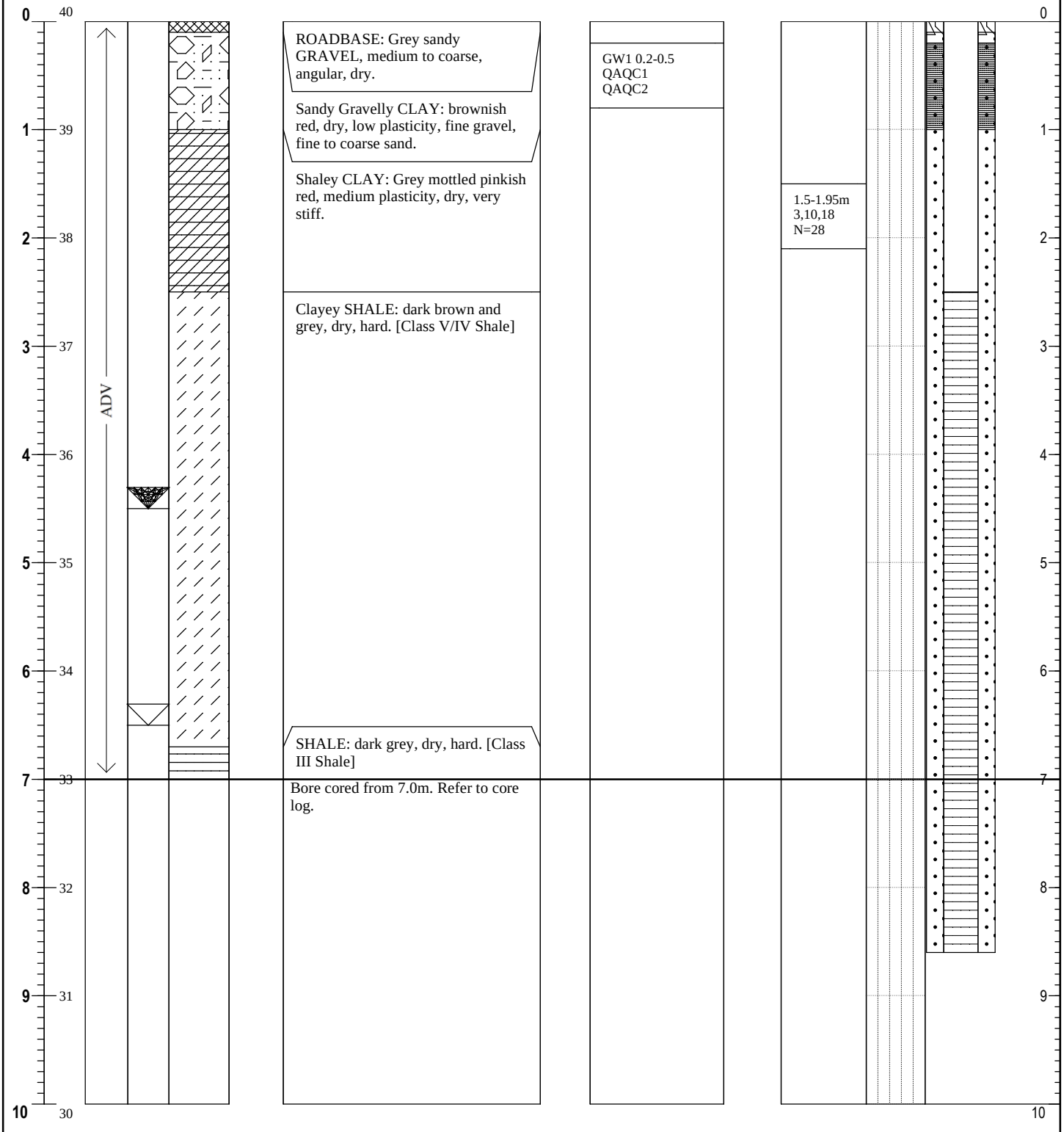
# LOG ID: GW1

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305590 | GDA 94 MGA 56 | **Date Commenced:** | 3/11/16 | **Logged by:** MT |
| **Y-Coord:** | 6241727 | | **Date Completed:** | 3/11/16 | **Checked by:** DL |
| **Surface Elevation (R.L) :** | 40 | m AHD | **Hole Diameter (mm):** | 110 | |




| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | **Operators Licence No.:** | - |

Refer to Standard Sheets for details of abbreviations

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann-Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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# Corehole ID: GW1

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 6241727 | **Date Commenced:** | 3/11/16 | **Logged by:** | MT |
| **Y-Coord:** | 305590 | **Date Completed:** | 3/11/16 | **Checked by:** | DL |
| **Surface Elevation (R.L.):** | Surf Elevation AHD | **Hole Diameter (mm):** | 63mm | | |

| Drilling Information | | | | | LITHOLOGY | | | | | Natural Defects | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (mBGL) | R.L. (m) | Method (Support) | % Coreloss | Water | Symbol | Rock Description<br>ROCK TYPE: grain characteristics, colour structure, minor components | Weathering | Estimated Strength MPa (0.03 EL, 0.1 VL, 0.3 L, 1 M, 3 H, 10 VH, EH) | Is (50) MPa | RQD % | Spacing (mm) (20, 60, 200, 600, 2000) | Description |
| 7 | -7 | NMLC | 0% | | | Continue from GW1 borelog. Start coring at 7.0m.<br>SHALE; fine grained, dark grey, hard, slightly weathered, thinly laminated. | SW | | | 90/100=90% | | DB<br>BP, 5 o, CN, UN, RF<br>BP, 15 o, FE, UN, RF<br>BP,5 o, FE, UN, RF<br>BP, HZ, FE, PL, RF<br>JT, 30 o, PL, SO<br>BP, 5 o, CN, UN, RF<br>BP, HZ, CN, UN, RF<br>BP, HZ, CN, UN, RF |
| 8 | -8 | | | | | | | | | 250/600=42% | | BP, HZ, FE, PL, RF<br>BP, HZ, FE, UL, RF<br>DB<br>BP, HZ, FE, PL, RF |
| 9 | | | | | | End of hole at 8.6m. Target Depth. | | | | | | |

| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | | |

Refer to Standard Sheets for details of abbreviations


GW1
8.60 EoH
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RANDWICK CLOSE
CASULA
GW1 7.0 -8.6
NOV2016

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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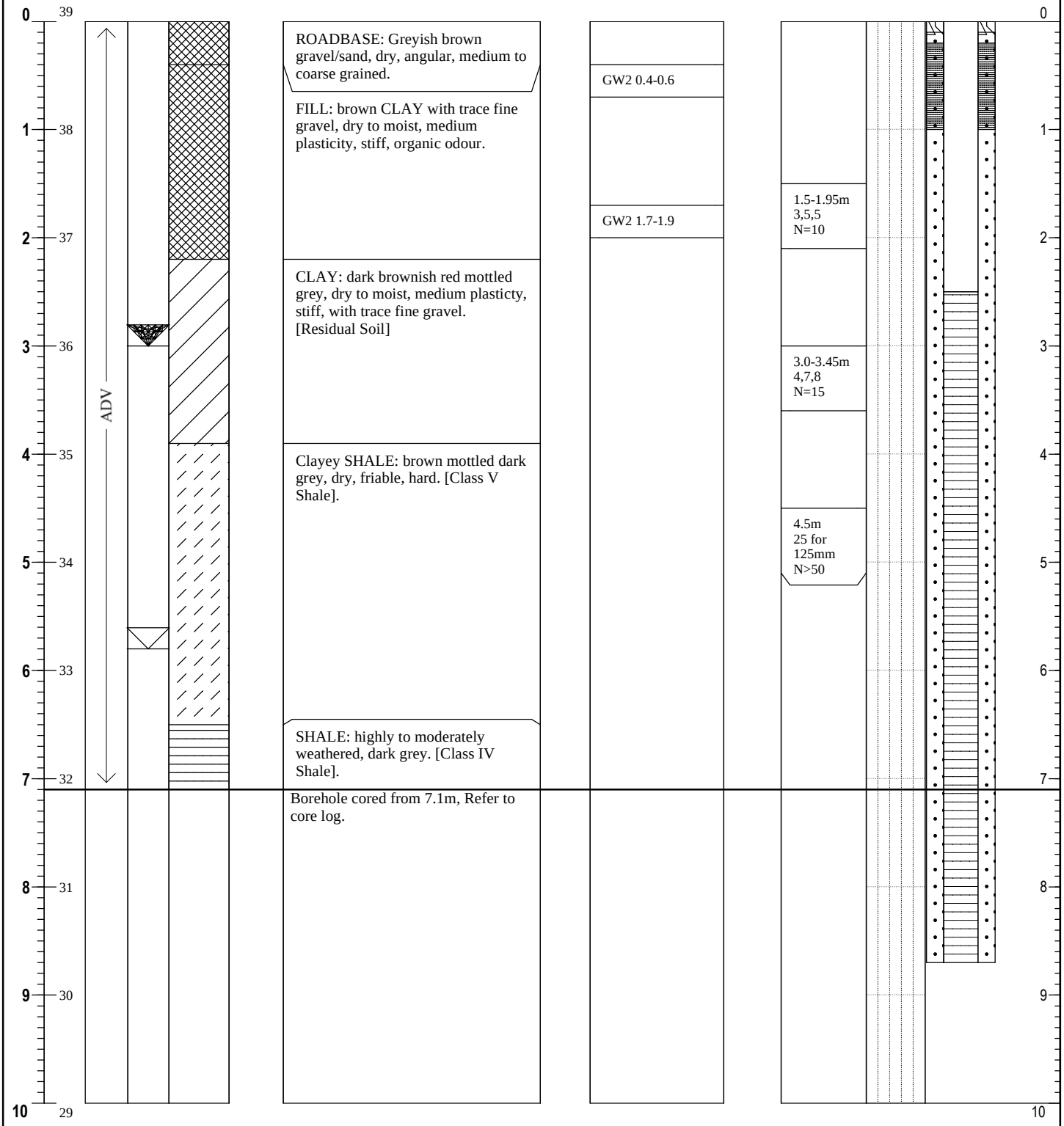
# LOG ID: GW2

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305661 | GDA 94 MGA 56 | **Date Commenced:** | 2/11/16 | **Logged by:** MT |
| **Y-Coord:** | 6241682 | | **Date Completed:** | 2/11/16 | **Checked by:** DL |
| **Surface Elevation (R.L.) :** | 39 | m AHD | **Hole Diameter (mm):** | 110 | |




| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | **Operators Licence No.:** | - |

Refer to Standard Sheets for details of abbreviations

**Project ID:** CES161003-HC
**Client:** Heymann-Cohen Pty Ltd
**Project:** SummitCare, Randwick Close
**Location:** Casula

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# Corehole ID: GW2

Sheet: 1 of 1

**X-Coord:** 6241682
**Y-Coord:** 305661
**Surface Elevation (R.L.):** 39 m AHD

**Date Commenced:** 2/11/16
**Date Completed:** 2/11/16
**Hole Diameter (mm):** 63mm

**Logged by:** MT
**Checked by:** DL

| Drilling Information | | | | | LITHOLOGY | | | | | Natural Defects | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (mBGL) | R.L. (m) | Method (Support) | % Coreloss | Water | Symbol | Rock Description<br>ROCK TYPE: grain characteristics, colour structure, minor components | Weathering | Estimated Strength MPa (0.03 EL, 0.1 VL, 0.3 L, 1 M, 3 H, 10 VH, EH) | Is (50) MPa | RQD % | Spacing (mm) (20, 60, 200, 600, 2000) | Description |
| 8 | 31 | NMLC | 0% | | | SHALE: Commence coring from 7.1m.<br>SHALE; fine grained, grey, hard, moderately weathered, thinly laminated, iron stained bands. | MW | | | 42/100=42% | | BP, HZ, FE, UN, SO<br>DB |
| | | | | | | SHALE: grey, hard, slightly weathered, thinly laminated. | SW | | | | | BP, HZ, FE, PL, SO<br>DB<br>BP, HZ, FE, PL, RF<br>DB<br>DB<br>DB<br>BP, 10 o, CA, UN, RF |
| 9 | 30 | | | | | SHALE: 8.65-8.66, carbonaceous band.<br>End of hole at 8.7m. Target Depth. | | | | 38/60=63% | | DB<br>DB<br>JT, 20 o, FE, PL, SO<br>JT, 20 o, FE, UN, RF<br>IJ, 45 o<br>DB |
| 10 | | | | | | | | | | | | |

**Drill Company:** SDI
**Machine Type:** Edson 100
**Operator Name:** Doug Miller

Refer to Standard Sheets for details of abbreviations


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RANDWICK CLOSE
CASULA
GW2 7·1 -8·1
NOV2016

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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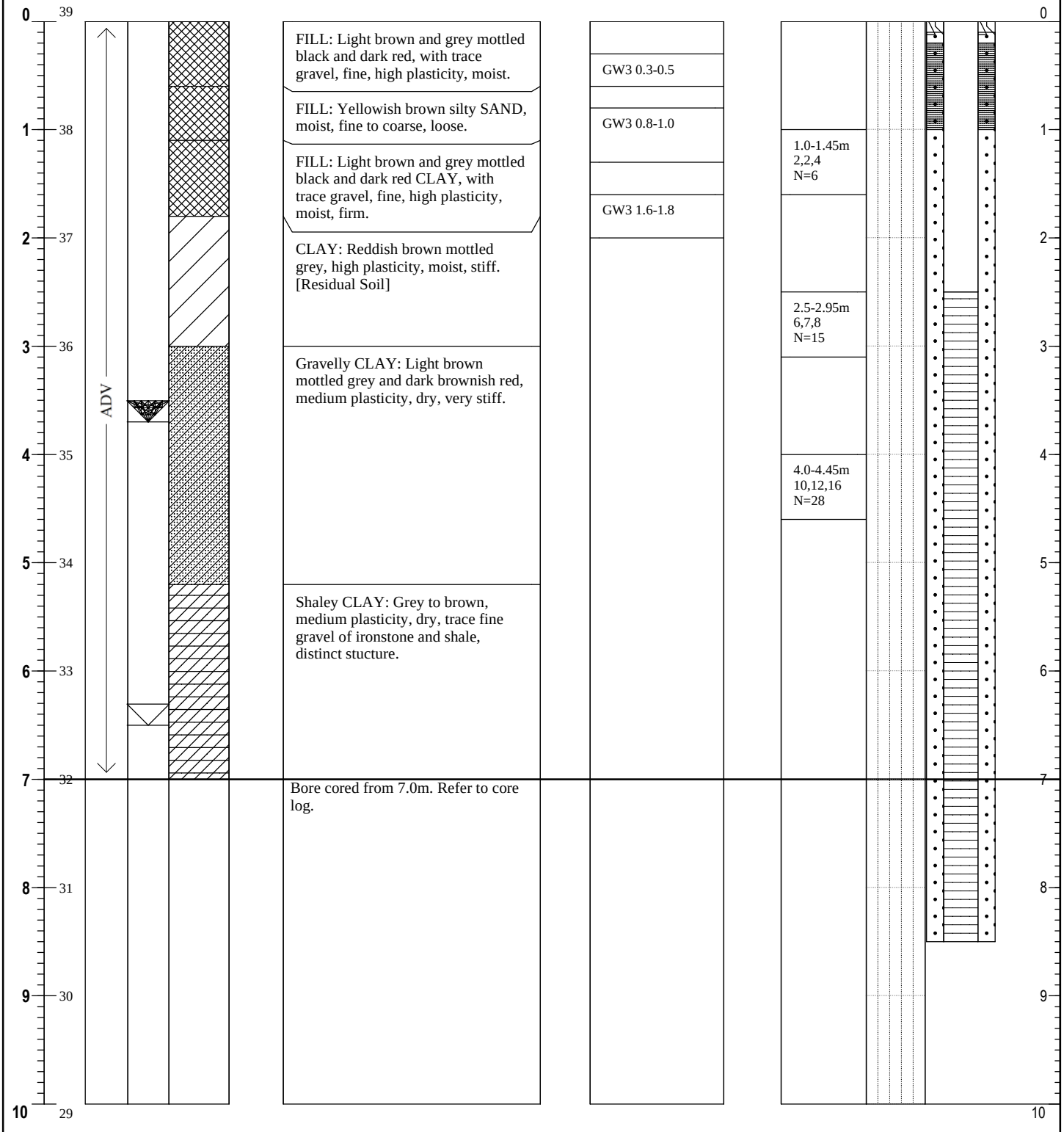
# LOG ID: GW3

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 305672 | GDA 94 MGA 56 | **Date Commenced:** | 3/11/16 | **Logged by:** MT |
| **Y-Coord:** | 6241750 | | **Date Completed:** | 3/11/16 | **Checked by:** DL |
| **Surface Elevation (R.L.) :** | 39 | m AHD | **Hole Diameter (mm):** | 110 | |




| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | **Operators Licence No.:** | - |

Refer to Standard Sheets for details of abbreviations

| | |
|---|---|
| **Project ID:** | CES161003-HC |
| **Client:** | Heymann-Cohen Pty Ltd |
| **Project:** | SummitCare, Randwick Close |
| **Location:** | Casula |

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# Corehole ID: GW3

Sheet: 1 of 1

| | | | | | |
|---|---|---|---|---|---|
| **X-Coord:** | 6241750 | **Date Commenced:** | 3/11/16 | **Logged by:** | MT |
| **Y-Coord:** | 305672 | **Date Completed:** | 3/11/16 | **Checked by:** | DL |
| **Surface Elevation (R.L.):** | 39 m AHD | **Hole Diameter (mm):** | 63mm | | |

| Drilling Information | | | | | LITHOLOGY | | | | | Natural Defects | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (mBGL) | R.L. (m) | Method (Support) | % Coreloss | Water | Symbol | Rock Description<br>ROCK TYPE: grain characteristics, colour structure, minor components | Weathering | Estimated Strength MPa (0.03 EL, 0.1 VL, 0.3 L, 1 M, 3 H, 10 VH, EH) | Is (50) MPa | RQD % | Spacing (mm) (20, 60, 200, 600, 2000) | Description |

7 — 32

CORE LOSS: 7.0-7.1
Commence coring at 7.0m.

SHALE; fine grained, grey/light brown, very thinly laminated. [Class IV Shale]

MW

DB

SHALE: grey, hard, slightly weathered, thinly laminated.

SW

BP, 5 o, UN, SO
BP, 5 o, X, PL, SO
BP, 5 o, X, PL, SO
BP, 5 o, X, PL, SO
BP, HZ, X, PL, RF

8 — 31

Coal wisps between 7.98 and 8.04m.

BP, HZ, X, UN, RF
JT, 85 o, PL, RF
BP, 5 o, PL, RF, CA
BP, HZ, CN, PL, RF
BP, HZ, CN, PL, RF

BP, HZ, CN, PL, RF

BP, 5 o, FE, PL, RF

End of hole at 8.5m. Target Depth.

9 — 30

10

NMLC

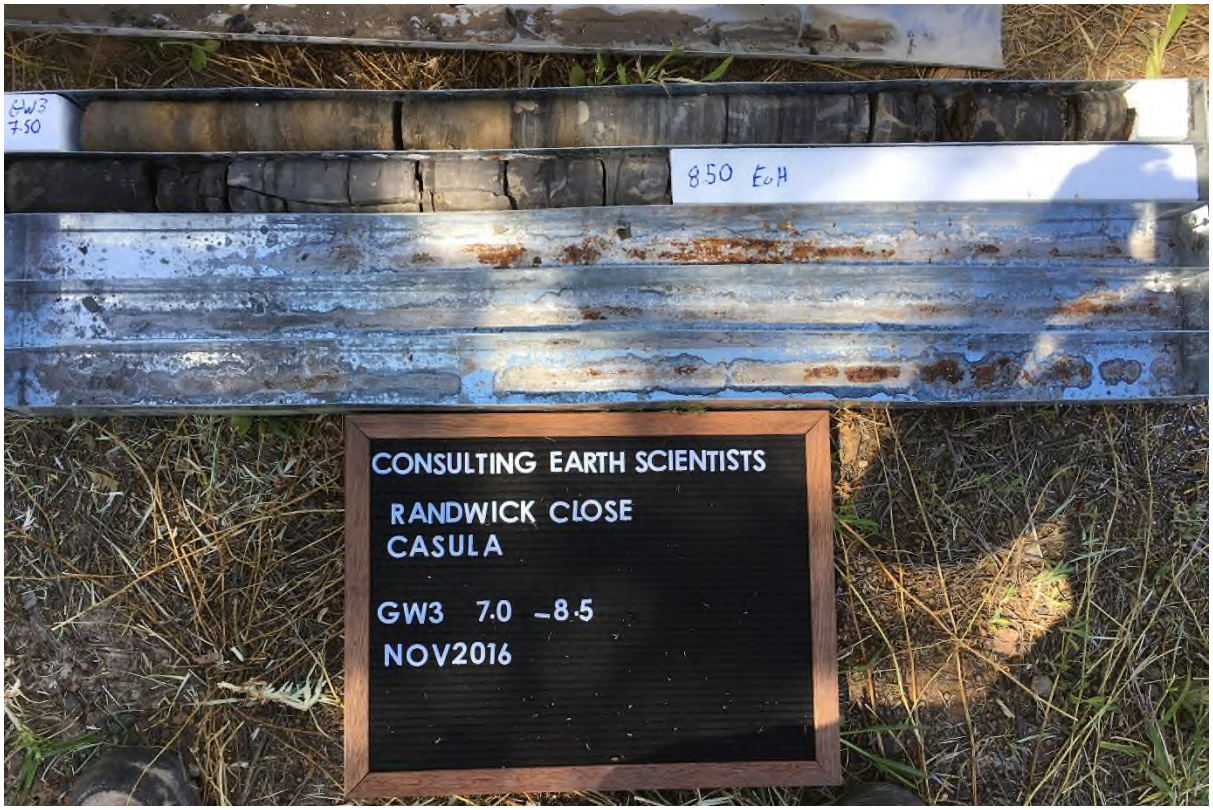
10/150=6%

0%

0%

| | | | |
|---|---|---|---|
| **Drill Company:** | SDI | **Operator Name:** | Doug Miller |
| **Machine Type:** | Edson 100 | | |

Refer to Standard Sheets for details of abbreviations


GW3
7.50
8.50 EoH
CONSULTING EARTH SCIENTISTS
RANDWICK CLOSE
CASULA
GW3 7.0 -8.5
NOV2016

# Appendix H
# Laboratory Certificates

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 156683

**Client:**

**Consulting Earth Scientists Pty Ltd**
Suite 3, Level 1
55 Grandview Street
Pymble
NSW 2073

**Attention:** Miles Thompson

**Sample log in details:**

| | |
|---|---|
| Your Reference: | **CES163003-HC, 18 Randwick Close, Casula** |
| No. of samples: | 15 Soils |
| Date samples received / completed instructions received | 03/11/16 / 03/11/16 |

**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: | 10/11/16 / 10/11/16 |
| Date of Preliminary Report: | Not Issued |

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

**Results Approved By:**

[redacted]

| vTRH(C6-C10)/BTEXN in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-1 | 156683-3 | 156683-4 | 156683-5 | 156683-7 |
| Your Reference | ---------- - | GW2 | BH1 | BH6 | BH7 | GW3 |
| Depth | ---------- | 0.4-0.6 | 0.5-0.7 | 0.1-0.3 | 0.5-0.7 | 0.3-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 07/11/2016 | 07/11/2016 | 07/11/2016 | 07/11/2016 | 07/11/2016 |
| TRHC$_6$ - C$_9$ | mg/kg | <25 | <25 | <25 | <25 | <25 |
| TRHC$_6$ - C$_{10}$ | mg/kg | <25 | <25 | <25 | <25 | <25 |
| vTPHC$_6$ - 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 | % | 111 | 120 | 117 | 111 | 109 |

| vTRH(C6-C10)/BTEXN in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-10 | 156683-11 | 156683-12 | 156683-13 | 156683-14 |
| Your Reference | ---------- - | BH3 | BH2 | QAQC1 | TB | TS |
| Depth | ---------- | 0.3-0.5 | 0.3-0.5 | - | - | - |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 07/11/2016 | 07/11/2016 | 07/11/2016 | 07/11/2016 | 07/11/2016 |
| TRHC$_6$ - C$_9$ | mg/kg | <25 | <25 | <25 | <25 | [NA] |
| TRHC$_6$ - C$_{10}$ | mg/kg | <25 | <25 | <25 | <25 | [NA] |
| vTPHC$_6$ - C$_{10}$ less BTEX (F1) | mg/kg | <25 | <25 | <25 | <25 | [NA] |
| Benzene | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | 100% |
| Toluene | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | 85% |
| Ethylbenzene | mg/kg | <1 | <1 | <1 | <1 | 96% |
| m+p-xylene | mg/kg | <2 | <2 | <2 | <2 | 99% |
| o-Xylene | mg/kg | <1 | <1 | <1 | <1 | 86% |
| naphthalene | mg/kg | <1 | <1 | <1 | <1 | [NA] |
| *Surrogate* aaa-Trifluorotoluene | % | 108 | 108 | 116 | 132 | 120 |

| vTRH(C6-C10)/BTEXN in Soil | | |
|---|---|---|
| Our Reference: | UNITS | 156683-15 |
| Your Reference | ---------- | GW1 |
| | - | |
| Depth | ---------- | 0.2-0.5 |
| Type of sample | | Soil |
| Date extracted | - | 04/11/2016 |
| Date analysed | - | 07/11/2016 |
| TRHC$_6$ - C$_9$ | mg/kg | <25 |
| TRHC$_6$ - C$_{10}$ | mg/kg | <25 |
| vTPHC$_6$ - C$_{10}$ less BTEX (F1) | mg/kg | <25 |
| Benzene | mg/kg | <0.2 |
| Toluene | mg/kg | <0.5 |
| Ethylbenzene | mg/kg | <1 |
| m+p-xylene | mg/kg | <2 |
| o-Xylene | mg/kg | <1 |
| naphthalene | mg/kg | <1 |
| *Surrogate* aaa-Trifluorotoluene | % | 103 |

| svTRH (C10-C40) in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-1 | 156683-3 | 156683-4 | 156683-5 | 156683-7 |
| Your Reference | ---------- - | GW2 | BH1 | BH6 | BH7 | GW3 |
| Depth | ---------- | 0.4-0.6 | 0.5-0.7 | 0.1-0.3 | 0.5-0.7 | 0.3-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 05/11/2016 | 05/11/2016 | 05/11/2016 | 05/11/2016 | 05/11/2016 |
| TRHC$_{10}$ - C$_{14}$ | mg/kg | <50 | <50 | <50 | <50 | <50 |
| TRHC$_{15}$ - C$_{28}$ | mg/kg | <100 | <100 | <100 | <100 | <100 |
| TRHC$_{29}$ - C$_{36}$ | mg/kg | <100 | <100 | <100 | <100 | <100 |
| TRH>C$_{10}$-C$_{16}$ | mg/kg | <50 | <50 | <50 | <50 | <50 |
| TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2) | mg/kg | <50 | <50 | <50 | <50 | <50 |
| TRH>C$_{16}$-C$_{34}$ | mg/kg | <100 | <100 | <100 | <100 | <100 |
| TRH>C$_{34}$-C$_{40}$ | mg/kg | <100 | <100 | <100 | <100 | <100 |
| *Surrogate* o-Terphenyl | % | 86 | 86 | 89 | 87 | 86 |

| svTRH (C10-C40) in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-10 | 156683-11 | 156683-12 | 156683-13 | 156683-15 |
| Your Reference | ---------- - | BH3 | BH2 | QAQC1 | TB | GW1 |
| Depth | ---------- | 0.3-0.5 | 0.3-0.5 | - | - | 0.2-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 05/11/2016 | 05/11/2016 | 05/11/2016 | 05/11/2016 | 06/11/2016 |
| TRHC$_{10}$ - C$_{14}$ | mg/kg | <50 | <50 | <50 | <50 | <50 |
| TRHC$_{15}$ - C$_{28}$ | mg/kg | <100 | <100 | <100 | <100 | <100 |
| TRHC$_{29}$ - C$_{36}$ | mg/kg | <100 | <100 | <100 | <100 | <100 |
| TRH>C$_{10}$-C$_{16}$ | mg/kg | <50 | <50 | <50 | <50 | <50 |
| TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2) | mg/kg | <50 | <50 | <50 | <50 | <50 |
| TRH>C$_{16}$-C$_{34}$ | mg/kg | <100 | <100 | <100 | <100 | <100 |
| TRH>C$_{34}$-C$_{40}$ | mg/kg | <100 | <100 | <100 | <100 | <100 |
| *Surrogate* o-Terphenyl | % | 87 | 85 | 85 | 88 | 84 |

| PAHs in Soil<br>Our Reference:<br>Your Reference<br><br>Depth<br>Type of sample | UNITS<br>----------<br>-<br>----------<br> | 156683-1<br>GW2<br><br>0.4-0.6<br>Soil | 156683-3<br>BH1<br><br>0.5-0.7<br>Soil | 156683-4<br>BH6<br><br>0.1-0.3<br>Soil | 156683-5<br>BH7<br><br>0.5-0.7<br>Soil | 156683-7<br>GW3<br><br>0.3-0.5<br>Soil |
|---|---|---|---|---|---|---|
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Naphthalene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Acenaphthylene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Acenaphthene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Fluorene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Phenanthrene | mg/kg | <0.1 | <0.1 | 0.2 | <0.1 | <0.1 |
| Anthracene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Fluoranthene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Pyrene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Benzo(a)anthracene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Chrysene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Benzo(b,j+k)fluoranthene | mg/kg | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Benzo(a)pyrene | mg/kg | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Indeno(1,2,3-c,d)pyrene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Dibenzo(a,h)anthracene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Benzo(g,h,i)perylene | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Benzo(a)pyrene TEQ calc (zero) | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene TEQ calc(half) | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene TEQ calc(PQL) | mg/kg | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Total +ve PAH's | mg/kg | NIL (+)VE | NIL (+)VE | 0.19 | NIL (+)VE | NIL (+)VE |
| *Surrogate p*-Terphenyl-d14 | % | 88 | 83 | 85 | 89 | 83 |

| PAHs in Soil<br>Our Reference:<br>Your Reference<br><br>Depth<br>Type of sample | UNITS<br>----------<br>-<br>----------<br> | 156683-10<br>BH3<br><br>0.3-0.5<br>Soil | 156683-11<br>BH2<br><br>0.3-0.5<br>Soil | 156683-12<br>QAQC1<br><br>-<br>Soil | 156683-15<br>GW1<br><br>0.2-0.5<br>Soil |
|---|---|---|---|---|---|
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| 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 +ve PAH's | mg/kg | NIL (+)VE | NIL (+)VE | NIL (+)VE | NIL (+)VE |
| *Surrogate p*-Terphenyl-d14 | % | 83 | 88 | 94 | 105 |

| Organochlorine Pesticides in soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-1 | 156683-3 | 156683-4 | 156683-5 | 156683-7 |
| Your Reference | ---------- | GW2 | BH1 | BH6 | BH7 | GW3 |
| Depth | - ---------- | 0.4-0.6 | 0.5-0.7 | 0.1-0.3 | 0.5-0.7 | 0.3-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| HCB | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| alpha-BHC | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| gamma-BHC | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| beta-BHC | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Heptachlor | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| delta-BHC | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Aldrin | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Heptachlor Epoxide | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| gamma-Chlordane | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| alpha-chlordane | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Endosulfan I | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| pp-DDE | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Dieldrin | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Endrin | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| pp-DDD | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Endosulfan II | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| pp-DDT | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Endrin Aldehyde | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Endosulfan Sulphate | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Methoxychlor | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| *Surrogate* TCMX | % | 114 | 108 | 108 | 117 | 113 |

| Organochlorine Pesticides in soil | | | | |
|---|---|---|---|---|
| Our Reference: | UNITS | 156683-10 | 156683-11 | 156683-12 |
| Your Reference | ---------- | BH3 | BH2 | QAQC1 |
| | - | | | |
| Depth | ---------- | 0.3-0.5 | 0.3-0.5 | - |
| Type of sample | | Soil | Soil | Soil |
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| HCB | mg/kg | <0.1 | <0.1 | <0.1 |
| alpha-BHC | mg/kg | <0.1 | <0.1 | <0.1 |
| gamma-BHC | mg/kg | <0.1 | <0.1 | <0.1 |
| beta-BHC | mg/kg | <0.1 | <0.1 | <0.1 |
| Heptachlor | mg/kg | <0.1 | <0.1 | <0.1 |
| delta-BHC | mg/kg | <0.1 | <0.1 | <0.1 |
| Aldrin | mg/kg | <0.1 | <0.1 | <0.1 |
| Heptachlor Epoxide | mg/kg | <0.1 | <0.1 | <0.1 |
| gamma-Chlordane | mg/kg | <0.1 | <0.1 | <0.1 |
| alpha-chlordane | mg/kg | <0.1 | <0.1 | <0.1 |
| Endosulfan I | mg/kg | <0.1 | <0.1 | <0.1 |
| pp-DDE | mg/kg | <0.1 | <0.1 | <0.1 |
| Dieldrin | mg/kg | <0.1 | <0.1 | <0.1 |
| Endrin | mg/kg | <0.1 | <0.1 | <0.1 |
| pp-DDD | mg/kg | <0.1 | <0.1 | <0.1 |
| Endosulfan II | mg/kg | <0.1 | <0.1 | <0.1 |
| pp-DDT | mg/kg | <0.1 | <0.1 | <0.1 |
| Endrin Aldehyde | mg/kg | <0.1 | <0.1 | <0.1 |
| Endosulfan Sulphate | mg/kg | <0.1 | <0.1 | <0.1 |
| Methoxychlor | mg/kg | <0.1 | <0.1 | <0.1 |
| *Surrogate* TCMX | % | 111 | 112 | 107 |

| Organophosphorus Pesticides<br>Our Reference:<br>Your Reference<br><br>Depth<br>Type of sample | UNITS<br>----------<br>-<br>----------<br> | 156683-1<br>GW2<br><br>0.4-0.6<br>Soil | 156683-3<br>BH1<br><br>0.5-0.7<br>Soil | 156683-4<br>BH6<br><br>0.1-0.3<br>Soil | 156683-5<br>BH7<br><br>0.5-0.7<br>Soil | 156683-7<br>GW3<br><br>0.3-0.5<br>Soil |
|---|---|---|---|---|---|---|
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Azinphos-methyl (Guthion) | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Bromophos-ethyl | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Chlorpyriphos | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Chlorpyriphos-methyl | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Diazinon | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Dichlorvos | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Dimethoate | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Ethion | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Fenitrothion | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Malathion | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Parathion | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Ronnel | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| *Surrogate* TCMX | % | 114 | 108 | 108 | 117 | 113 |

| Organophosphorus Pesticides<br>Our Reference:<br>Your Reference<br><br>Depth<br>Type of sample | UNITS<br>----------<br>-<br>----------<br> | 156683-10<br>BH3<br><br>0.3-0.5<br>Soil | 156683-11<br>BH2<br><br>0.3-0.5<br>Soil | 156683-12<br>QAQC1<br><br>-<br>Soil |
|---|---|---|---|---|
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Azinphos-methyl (Guthion) | mg/kg | <0.1 | <0.1 | <0.1 |
| Bromophos-ethyl | mg/kg | <0.1 | <0.1 | <0.1 |
| Chlorpyriphos | mg/kg | <0.1 | <0.1 | <0.1 |
| Chlorpyriphos-methyl | mg/kg | <0.1 | <0.1 | <0.1 |
| Diazinon | mg/kg | <0.1 | <0.1 | <0.1 |
| Dichlorvos | mg/kg | <0.1 | <0.1 | <0.1 |
| Dimethoate | mg/kg | <0.1 | <0.1 | <0.1 |
| Ethion | mg/kg | <0.1 | <0.1 | <0.1 |
| Fenitrothion | mg/kg | <0.1 | <0.1 | <0.1 |
| Malathion | mg/kg | <0.1 | <0.1 | <0.1 |
| Parathion | mg/kg | <0.1 | <0.1 | <0.1 |
| Ronnel | mg/kg | <0.1 | <0.1 | <0.1 |
| *Surrogate* TCMX | % | 111 | 112 | 107 |

| PCBs in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-1 | 156683-3 | 156683-4 | 156683-5 | 156683-7 |
| Your Reference | ---------- | GW2 | BH1 | BH6 | BH7 | GW3 |
| Depth | - ---------- | 0.4-0.6 | 0.5-0.7 | 0.1-0.3 | 0.5-0.7 | 0.3-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Aroclor 1016 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Aroclor 1221 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Aroclor 1232 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Aroclor 1242 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Aroclor 1248 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Aroclor 1254 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Aroclor 1260 | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| *Surrogate* TCLMX | % | 114 | 108 | 108 | 117 | 113 |

| PCBs in Soil | | | | |
|---|---|---|---|---|
| Our Reference: | UNITS | 156683-10 | 156683-11 | 156683-12 |
| Your Reference | ---------- | BH3 | BH2 | QAQC1 |
| Depth | - ---------- | 0.3-0.5 | 0.3-0.5 | - |
| Type of sample | | Soil | Soil | Soil |
| Date extracted | - | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Aroclor 1016 | mg/kg | <0.1 | <0.1 | <0.1 |
| Aroclor 1221 | mg/kg | <0.1 | <0.1 | <0.1 |
| Aroclor 1232 | mg/kg | <0.1 | <0.1 | <0.1 |
| Aroclor 1242 | mg/kg | <0.1 | <0.1 | <0.1 |
| Aroclor 1248 | mg/kg | <0.1 | <0.1 | <0.1 |
| Aroclor 1254 | mg/kg | <0.1 | <0.1 | <0.1 |
| Aroclor 1260 | mg/kg | <0.1 | <0.1 | <0.1 |
| *Surrogate* TCLMX | % | 111 | 112 | 107 |

| Acid Extractable metals in soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-1 | 156683-3 | 156683-4 | 156683-5 | 156683-7 |
| Your Reference | ---------- | GW2 | BH1 | BH6 | BH7 | GW3 |
| Depth | - ---------- | 0.4-0.6 | 0.5-0.7 | 0.1-0.3 | 0.5-0.7 | 0.3-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Arsenic | mg/kg | 5 | <4 | <4 | 7 | 4 |
| Cadmium | mg/kg | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 |
| Chromium | mg/kg | 11 | 13 | 63 | 17 | 14 |
| Copper | mg/kg | 14 | 13 | 27 | 12 | 17 |
| Lead | mg/kg | 10 | 11 | 12 | 16 | 11 |
| Mercury | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Nickel | mg/kg | 5 | 8 | 63 | 2 | 12 |
| Zinc | mg/kg | 17 | 31 | 49 | 10 | 14 |

| Acid Extractable metals in soil | | | | | |
|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-10 | 156683-11 | 156683-12 | 156683-15 |
| Your Reference | ---------- | BH3 | BH2 | QAQC1 | GW1 |
| Depth | - ---------- | 0.3-0.5 | 0.3-0.5 | - | 0.2-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil |
| Date prepared | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Date analysed | - | 04/11/2016 | 04/11/2016 | 04/11/2016 | 04/11/2016 |
| Arsenic | mg/kg | 9 | 7 | 6 | 8 |
| Cadmium | mg/kg | <0.4 | <0.4 | <0.4 | <0.4 |
| Chromium | mg/kg | 20 | 20 | 26 | 17 |
| Copper | mg/kg | 13 | 14 | 19 | 20 |
| Lead | mg/kg | 17 | 18 | 10 | 10 |
| Mercury | mg/kg | <0.1 | <0.1 | <0.1 | <0.1 |
| Nickel | mg/kg | 5 | 4 | 17 | 11 |
| Zinc | mg/kg | 17 | 19 | 18 | 17 |

| Moisture<br>Our Reference:<br>Your Reference | UNITS<br>---------- | 156683-1<br>GW2 | 156683-3<br>BH1 | 156683-4<br>BH6 | 156683-5<br>BH7 | 156683-7<br>GW3 |
|---|---|---|---|---|---|---|
| Depth | -<br>---------- | 0.4-0.6 | 0.5-0.7 | 0.1-0.3 | 0.5-0.7 | 0.3-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 4/11/2016 | 4/11/2016 | 4/11/2016 | 4/11/2016 | 4/11/2016 |
| Date analysed | - | 7/11/2016 | 7/11/2016 | 7/11/2016 | 7/11/2016 | 7/11/2016 |
| Moisture | % | 17 | 14 | 8.7 | 17 | 17 |

| Moisture<br>Our Reference:<br>Your Reference | UNITS<br>---------- | 156683-10<br>BH3 | 156683-11<br>BH2 | 156683-12<br>QAQC1 | 156683-15<br>GW1 |
|---|---|---|---|---|---|
| Depth | -<br>---------- | 0.3-0.5 | 0.3-0.5 | - | 0.2-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil |
| Date prepared | - | 4/11/2016 | 4/11/2016 | 4/11/2016 | 4/11/2016 |
| Date analysed | - | 7/11/2016 | 7/11/2016 | 7/11/2016 | 7/11/2016 |
| Moisture | % | 17 | 17 | 13 | 12 |

| Asbestos ID - soils | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-1 | 156683-3 | 156683-4 | 156683-5 | 156683-7 |
| Your Reference | ---------- - | GW2 | BH1 | BH6 | BH7 | GW3 |
| Depth | ---------- | 0.4-0.6 | 0.5-0.7 | 0.1-0.3 | 0.5-0.7 | 0.3-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date analysed | - | 9/11/2016 | 9/11/2016 | 9/11/2016 | 9/11/2016 | 9/11/2016 |
| Sample mass tested | g | Approx 40g | Approx 45g | Approx 35g | Approx 35g | Approx 35g |
| Sample Description | - | Brown clayey soil | Brown clayey soil | Brown clayey soil | Brown clayey soil | Brown clayey soil |
| 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 | No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected | No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected | No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected |
| Trace Analysis | - | No asbestos detected | No asbestos detected | No asbestos detected | No asbestos detected | No asbestos detected |

| Asbestos ID - soils | | | | | |
|---|---|---|---|---|---|
| Our Reference: | UNITS | 156683-10 | 156683-11 | 156683-12 | 156683-15 |
| Your Reference | ---------- - | BH3 | BH2 | QAQC1 | GW1 |
| Depth | ---------- | 0.3-0.5 | 0.3-0.5 | - | 0.2-0.5 |
| Type of sample | | Soil | Soil | Soil | Soil |
| Date analysed | - | 9/11/2016 | 9/11/2016 | 9/11/2016 | 9/11/2016 |
| Sample mass tested | g | Approx 35g | Approx 35g | Approx 35g | Approx 30g |
| Sample Description | - | Brown clayey soil | Brown clayey soil | Brown clayey soil | Brown clayey soil |
| 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 | No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected | No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected |
| Trace Analysis | - | No asbestos detected | No asbestos detected | No asbestos detected | No asbestos detected |

| 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.<br>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.<br>For soil results:-<br>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.<br>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.<br>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.<br>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. |

| QUALITY CONTROL<br>vTRH(C6-C10)/BTEXN in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| Date analysed | - | | | 07/11/2016 | 156683-1 | 07/11/2016 \|\| 07/11/2016 | LCS-8 | 07/11/2016 |
| TRHC$_6$ - C$_9$ | mg/kg | 25 | Org-016 | <25 | 156683-1 | <25 \|\| <25 | LCS-8 | 113% |
| TRHC$_6$ - C$_{10}$ | mg/kg | 25 | Org-016 | <25 | 156683-1 | <25 \|\| <25 | LCS-8 | 113% |
| Benzene | mg/kg | 0.2 | Org-016 | <0.2 | 156683-1 | <0.2 \|\| <0.2 | LCS-8 | 102% |
| Toluene | mg/kg | 0.5 | Org-016 | <0.5 | 156683-1 | <0.5 \|\| <0.5 | LCS-8 | 111% |
| Ethylbenzene | mg/kg | 1 | Org-016 | <1 | 156683-1 | <1 \|\| <1 | LCS-8 | 116% |
| m+p-xylene | mg/kg | 2 | Org-016 | <2 | 156683-1 | <2 \|\| <2 | LCS-8 | 119% |
| o-Xylene | mg/kg | 1 | Org-016 | <1 | 156683-1 | <1 \|\| <1 | LCS-8 | 122% |
| naphthalene | mg/kg | 1 | Org-014 | <1 | 156683-1 | <1 \|\| <1 | [NR] | [NR] |
| *Surrogate* aaa-Trifluorotoluene | % | | Org-016 | 121 | 156683-1 | 111 \|\| 111 \|\| RPD: 0 | LCS-8 | 120% |

| QUALITY CONTROL<br>svTRH (C10-C40) in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| Date analysed | - | | | 06/11/2016 | 156683-1 | 05/11/2016 \|\| 05/11/2016 | LCS-8 | 06/11/2016 |
| TRHC$_{10}$ - C$_{14}$ | mg/kg | 50 | Org-003 | <50 | 156683-1 | <50 \|\| <50 | LCS-8 | 97% |
| TRHC$_{15}$ - C$_{28}$ | mg/kg | 100 | Org-003 | <100 | 156683-1 | <100 \|\| <100 | LCS-8 | 88% |
| TRHC$_{29}$ - C$_{36}$ | mg/kg | 100 | Org-003 | <100 | 156683-1 | <100 \|\| <100 | LCS-8 | 100% |
| TRH>C$_{10}$-C$_{16}$ | mg/kg | 50 | Org-003 | <50 | 156683-1 | <50 \|\| <50 | LCS-8 | 97% |
| TRH>C$_{16}$-C$_{34}$ | mg/kg | 100 | Org-003 | <100 | 156683-1 | <100 \|\| <100 | LCS-8 | 88% |
| TRH>C$_{34}$-C$_{40}$ | mg/kg | 100 | Org-003 | <100 | 156683-1 | <100 \|\| <100 | LCS-8 | 100% |
| *Surrogate* o-Terphenyl | % | | Org-003 | 90 | 156683-1 | 86 \|\| 87 \|\| RPD: 1 | LCS-8 | 92% |

| QUALITY CONTROL<br>PAHs in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| Date analysed | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| Naphthalene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 102% |
| Acenaphthylene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Acenaphthene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Fluorene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 98% |
| Phenanthrene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 95% |
| Anthracene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Fluoranthene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 85% |
| Pyrene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 86% |
| Benzo(a)anthracene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Chrysene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Benzo(b,j +k)fluoranthene | mg/kg | 0.2 | Org-012 | <0.2 | 156683-1 | <0.2 \|\| <0.2 | [NR] | [NR] |

| QUALITY CONTROL<br><br>PAHs in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br><br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | mg/kg | 0.05 | Org-012 | <0.05 | 156683-1 | <0.05 \|\| <0.05 | LCS-8 | 87% |
| Indeno(1,2,3-c,d)pyrene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Dibenzo(a,h)anthracene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Benzo(g,h,i)perylene | mg/kg | 0.1 | Org-012 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| *Surrogate p*-Terphenyl-d14 | % | | Org-012 | 99 | 156683-1 | 88 \|\| 86 \|\| RPD: 2 | LCS-8 | 116% |
| QUALITY CONTROL<br><br>Organochlorine Pesticides in soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br><br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
| Date extracted | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| Date analysed | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| HCB | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| alpha-BHC | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 86% |
| gamma-BHC | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| beta-BHC | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 101% |
| Heptachlor | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 103% |
| delta-BHC | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Aldrin | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 103% |
| Heptachlor Epoxide | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 101% |
| gamma-Chlordane | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| alpha-chlordane | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Endosulfan I | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| pp-DDE | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 101% |
| Dieldrin | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 108% |
| Endrin | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 116% |
| pp-DDD | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 107% |
| Endosulfan II | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| pp-DDT | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Endrin Aldehyde | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Endosulfan Sulphate | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 101% |
| Methoxychlor | mg/kg | 0.1 | Org-005 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| *Surrogate* TCMX | % | | Org-005 | 124 | 156683-1 | 114 \|\| 115 \|\| RPD: 1 | LCS-8 | 121% |

| QUALITY CONTROL<br><br>Organophosphorus Pesticides | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br><br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| Date analysed | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| Azinphos-methyl (Guthion) | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Bromophos-ethyl | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Chlorpyriphos | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 95% |
| Chlorpyriphos-methyl | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Diazinon | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Dichlorvos | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 94% |
| Dimethoate | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Ethion | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 100% |
| Fenitrothion | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 109% |
| Malathion | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 118% |
| Parathion | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 106% |
| Ronnel | mg/kg | 0.1 | Org-008 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 106% |
| *Surrogate* TCMX | % | | Org-008 | 124 | 156683-1 | 114 \|\| 115 \|\| RPD: 1 | LCS-8 | 111% |

| QUALITY CONTROL<br><br>PCBs in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br><br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| Date analysed | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 | LCS-8 | 04/11/2016 |
| Aroclor 1016 | mg/kg | 0.1 | Org-006 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Aroclor 1221 | mg/kg | 0.1 | Org-006 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Aroclor 1232 | mg/kg | 0.1 | Org-006 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Aroclor 1242 | mg/kg | 0.1 | Org-006 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Aroclor 1248 | mg/kg | 0.1 | Org-006 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| Aroclor 1254 | mg/kg | 0.1 | Org-006 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | LCS-8 | 101% |
| Aroclor 1260 | mg/kg | 0.1 | Org-006 | <0.1 | 156683-1 | <0.1 \|\| <0.1 | [NR] | [NR] |
| *Surrogate* TCLMX | % | | Org-006 | 124 | 156683-1 | 114 \|\| 115 \|\| RPD: 1 | LCS-8 | 111% |

| QUALITY CONTROL<br>Acid Extractable metals in soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br>Base ll Duplicate ll %RPD |
|---|---|---|---|---|---|---|
| Date prepared | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 |
| Date analysed | - | | | 04/11/2016 | 156683-1 | 04/11/2016 \|\| 04/11/2016 |
| Arsenic | mg/kg | 4 | Metals-020 | <4 | 156683-1 | 5 \|\| 7 \|\| RPD: 33 |
| Cadmium | mg/kg | 0.4 | Metals-020 | <0.4 | 156683-1 | <0.4 \|\| <0.4 |
| Chromium | mg/kg | 1 | Metals-020 | <1 | 156683-1 | 11 \|\| 13 \|\| RPD: 17 |
| Copper | mg/kg | 1 | Metals-020 | <1 | 156683-1 | 14 \|\| 16 \|\| RPD: 13 |
| Lead | mg/kg | 1 | Metals-020 | <1 | 156683-1 | 10 \|\| 12 \|\| RPD: 18 |
| Mercury | mg/kg | 0.1 | Metals-021 | <0.1 | 156683-1 | <0.1 \|\| <0.1 |
| Nickel | mg/kg | 1 | Metals-020 | <1 | 156683-1 | 5 \|\| 8 \|\| RPD: 46 |
| Zinc | mg/kg | 1 | Metals-020 | <1 | 156683-1 | 17 \|\| 18 \|\| RPD: 6 |

| QUALITY CONTROL<br>Acid Extractable metals in soil | UNITS | Dup. Sm# | Duplicate<br>Base + Duplicate + %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|
| Date prepared | - | [NT] | [NT] | LCS-7 | 04/11/2016 |
| Date analysed | - | [NT] | [NT] | LCS-7 | 04/11/2016 |
| Arsenic | mg/kg | [NT] | [NT] | LCS-7 | 112% |
| Cadmium | mg/kg | [NT] | [NT] | LCS-7 | 103% |
| Chromium | mg/kg | [NT] | [NT] | LCS-7 | 111% |
| Copper | mg/kg | [NT] | [NT] | LCS-7 | 104% |
| Lead | mg/kg | [NT] | [NT] | LCS-7 | 106% |
| Mercury | mg/kg | [NT] | [NT] | LCS-7 | 72% |
| Nickel | mg/kg | [NT] | [NT] | LCS-7 | 103% |
| Zinc | mg/kg | [NT] | [NT] | LCS-7 | 105% |

**Report Comments:**

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.

Note: Samples for asbestos testing were sub-sampled from jars 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 |

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

# CERTIFICATE OF ANALYSIS 156717

**Client:**

**Consulting Earth Scientists Pty Ltd**
Suite 3, Level 1
55 Grandview Street
Pymble
NSW 2073

**Attention:** M Thompson

**Sample log in details:**

| | |
|---|---|
| Your Reference: | **18 Randwick close, casula** |
| No. of samples: | 4 soils |
| Date samples received / completed instructions received | 04/11/2016 / 04/11/2016 |

*This report replaces the R00 due to changes in project's ID as client's request.*

**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: | 11/11/16 / 11/11/16 |
| Date of Preliminary Report: | Not Issued |

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with *.**

**Results Approved By:**

[redacted]

| vTRH(C6-C10)/BTEXN in Soil | | | | | |
|---|---|---|---|---|---|
| Our Reference: | UNITS | 156717-1 | 156717-2 | 156717-3 | 156717-4 |
| Your Reference | ---------- - | BH4 | BH5 | TB | TS |
| Depth | ---------- | 0.3-0.5 | 0.4-0.6 | - | - |
| Date Sampled | | 4/11/2016 | 4/11/2016 | 4/11/2016 | 4/11/2016 |
| Type of sample | | soil | soil | soil | soil |
| Date extracted | - | 07/11/2016 | 07/11/2016 | 07/11/2016 | 07/11/2016 |
| Date analysed | - | 10/11/2016 | 10/11/2016 | 10/11/2016 | 10/11/2016 |
| TRHC$_6$ - C$_9$ | mg/kg | <25 | <25 | <25 | [NA] |
| TRHC$_6$ - C$_{10}$ | mg/kg | <25 | <25 | <25 | [NA] |
| vTPHC$_6$ - C$_{10}$ less BTEX (F1) | mg/kg | <25 | <25 | [NA] | [NA] |
| Benzene | mg/kg | <0.2 | <0.2 | <0.2 | 95% |
| Toluene | mg/kg | <0.5 | <0.5 | <0.5 | 98% |
| Ethylbenzene | mg/kg | <1 | <1 | <1 | 108% |
| m+p-xylene | mg/kg | <2 | <2 | <2 | 108% |
| o-Xylene | mg/kg | <1 | <1 | <1 | 111% |
| naphthalene | mg/kg | <1 | <1 | [NA] | [NA] |
| *Surrogate* aaa-Trifluorotoluene | % | 91 | 87 | 92 | 75 |

| svTRH (C10-C40) in Soil | | | |
|---|---|---|---|
| Our Reference: | UNITS | 156717-1 | 156717-2 |
| Your Reference | ---------- | BH4 | BH5 |
| | - | | |
| Depth | ---------- | 0.3-0.5 | 0.4-0.6 |
| Date Sampled | | 4/11/2016 | 4/11/2016 |
| Type of sample | | soil | soil |
| Date extracted | - | 07/11/2016 | 07/11/2016 |
| Date analysed | - | 08/11/2016 | 08/11/2016 |
| TRHC$_{10}$ - C$_{14}$ | mg/kg | <50 | <50 |
| TRHC$_{15}$ - C$_{28}$ | mg/kg | <100 | <100 |
| TRHC$_{29}$ - C$_{36}$ | mg/kg | <100 | <100 |
| TRH>C$_{10}$-C$_{16}$ | mg/kg | <50 | <50 |
| TRH>C$_{10}$ - C$_{16}$ less Naphthalene (F2) | mg/kg | <50 | <50 |
| TRH>C$_{16}$-C$_{34}$ | mg/kg | <100 | <100 |
| TRH>C$_{34}$-C$_{40}$ | mg/kg | <100 | <100 |
| *Surrogate* o-Terphenyl | % | 84 | 86 |

| PAHs in Soil<br>Our Reference:<br>Your Reference<br><br>Depth<br>Date Sampled<br>Type of sample | UNITS<br>----------<br>-<br>----------<br><br><br> | 156717-1<br>BH4<br><br>0.3-0.5<br>4/11/2016<br>soil | 156717-2<br>BH5<br><br>0.4-0.6<br>4/11/2016<br>soil |
|---|---|---|---|
| Date extracted | - | 07/11/2016 | 07/11/2016 |
| Date analysed | - | 07/11/2016 | 07/11/2016 |
| Naphthalene | mg/kg | <0.1 | <0.1 |
| Acenaphthylene | mg/kg | <0.1 | <0.1 |
| Acenaphthene | mg/kg | <0.1 | <0.1 |
| Fluorene | mg/kg | <0.1 | <0.1 |
| Phenanthrene | mg/kg | <0.1 | <0.1 |
| Anthracene | mg/kg | <0.1 | <0.1 |
| Fluoranthene | mg/kg | <0.1 | <0.1 |
| Pyrene | mg/kg | <0.1 | <0.1 |
| Benzo(a)anthracene | mg/kg | <0.1 | <0.1 |
| Chrysene | mg/kg | <0.1 | <0.1 |
| Benzo(b,j+k)fluoranthene | mg/kg | <0.2 | <0.2 |
| Benzo(a)pyrene | mg/kg | <0.05 | <0.05 |
| Indeno(1,2,3-c,d)pyrene | mg/kg | <0.1 | <0.1 |
| Dibenzo(a,h)anthracene | mg/kg | <0.1 | <0.1 |
| Benzo(g,h,i)perylene | mg/kg | <0.1 | <0.1 |
| Benzo(a)pyrene TEQ calc (zero) | mg/kg | <0.5 | <0.5 |
| Benzo(a)pyrene TEQ calc(half) | mg/kg | <0.5 | <0.5 |
| Benzo(a)pyrene TEQ calc(PQL) | mg/kg | <0.5 | <0.5 |
| Total +ve PAH's | mg/kg | NIL (+)VE | NIL (+)VE |
| *Surrogate p*-Terphenyl-d14 | % | 98 | 100 |

| Organochlorine Pesticides in soil | | | |
|---|---|---|---|
| Our Reference: | UNITS | 156717-1 | 156717-2 |
| Your Reference | ---------- | BH4 | BH5 |
| | - | | |
| Depth | ---------- | 0.3-0.5 | 0.4-0.6 |
| Date Sampled | | 4/11/2016 | 4/11/2016 |
| Type of sample | | soil | soil |
| Date extracted | - | 07/11/2016 | 07/11/2016 |
| Date analysed | - | 07/11/2016 | 07/11/2016 |
| HCB | mg/kg | <0.1 | <0.1 |
| alpha-BHC | mg/kg | <0.1 | <0.1 |
| gamma-BHC | mg/kg | <0.1 | <0.1 |
| beta-BHC | mg/kg | <0.1 | <0.1 |
| Heptachlor | mg/kg | <0.1 | <0.1 |
| delta-BHC | mg/kg | <0.1 | <0.1 |
| Aldrin | mg/kg | <0.1 | <0.1 |
| Heptachlor Epoxide | mg/kg | <0.1 | <0.1 |
| gamma-Chlordane | mg/kg | <0.1 | <0.1 |
| alpha-chlordane | mg/kg | <0.1 | <0.1 |
| Endosulfan I | mg/kg | <0.1 | <0.1 |
| pp-DDE | mg/kg | <0.1 | <0.1 |
| Dieldrin | mg/kg | <0.1 | <0.1 |
| Endrin | mg/kg | <0.1 | <0.1 |
| pp-DDD | mg/kg | <0.1 | <0.1 |
| Endosulfan II | mg/kg | <0.1 | <0.1 |
| pp-DDT | mg/kg | <0.1 | <0.1 |
| Endrin Aldehyde | mg/kg | <0.1 | <0.1 |
| Endosulfan Sulphate | mg/kg | <0.1 | <0.1 |
| Methoxychlor | mg/kg | <0.1 | <0.1 |
| *Surrogate* TCMX | % | 95 | 97 |

| Organophosphorus Pesticides | | | |
|---|---|---|---|
| Our Reference: | UNITS | 156717-1 | 156717-2 |
| Your Reference | ---------- | BH4 | BH5 |
| | - | | |
| Depth | ---------- | 0.3-0.5 | 0.4-0.6 |
| Date Sampled | | 4/11/2016 | 4/11/2016 |
| Type of sample | | soil | soil |
| Date extracted | - | 07/11/2016 | 07/11/2016 |
| Date analysed | - | 07/11/2016 | 07/11/2016 |
| Azinphos-methyl (Guthion) | mg/kg | <0.1 | <0.1 |
| Bromophos-ethyl | mg/kg | <0.1 | <0.1 |
| Chlorpyriphos | mg/kg | <0.1 | <0.1 |
| Chlorpyriphos-methyl | mg/kg | <0.1 | <0.1 |
| Diazinon | mg/kg | <0.1 | <0.1 |
| Dichlorvos | mg/kg | <0.1 | <0.1 |
| Dimethoate | mg/kg | <0.1 | <0.1 |
| Ethion | mg/kg | <0.1 | <0.1 |
| Fenitrothion | mg/kg | <0.1 | <0.1 |
| Malathion | mg/kg | <0.1 | <0.1 |
| Parathion | mg/kg | <0.1 | <0.1 |
| Ronnel | mg/kg | <0.1 | <0.1 |
| *Surrogate* TCMX | % | 95 | 97 |

| PCBs in Soil | | | |
|---|---|---|---|
| Our Reference: | UNITS | 156717-1 | 156717-2 |
| Your Reference | ---------- | BH4 | BH5 |
| | - | | |
| Depth | ---------- | 0.3-0.5 | 0.4-0.6 |
| Date Sampled | | 4/11/2016 | 4/11/2016 |
| Type of sample | | soil | soil |
| Date extracted | - | 07/11/2016 | 07/11/2016 |
| Date analysed | - | 07/11/2016 | 07/11/2016 |
| Aroclor 1016 | mg/kg | <0.1 | <0.1 |
| Aroclor 1221 | mg/kg | <0.1 | <0.1 |
| Aroclor 1232 | mg/kg | <0.1 | <0.1 |
| Aroclor 1242 | mg/kg | <0.1 | <0.1 |
| Aroclor 1248 | mg/kg | <0.1 | <0.1 |
| Aroclor 1254 | mg/kg | <0.1 | <0.1 |
| Aroclor 1260 | mg/kg | <0.1 | <0.1 |
| *Surrogate* TCLMX | % | 95 | 97 |

| Acid Extractable metals in soil | | | |
|---|---|---|---|
| Our Reference: | UNITS | 156717-1 | 156717-2 |
| Your Reference | ---------- | BH4 | BH5 |
| | - | | |
| Depth | ---------- | 0.3-0.5 | 0.4-0.6 |
| Date Sampled | | 4/11/2016 | 4/11/2016 |
| Type of sample | | soil | soil |
| Date prepared | - | 07/11/2016 | 07/11/2016 |
| Date analysed | - | 07/11/2016 | 07/11/2016 |
| Arsenic | mg/kg | 9 | 7 |
| Cadmium | mg/kg | <0.4 | <0.4 |
| Chromium | mg/kg | 19 | 7 |
| Copper | mg/kg | 23 | 12 |
| Lead | mg/kg | 19 | 8 |
| Mercury | mg/kg | <0.1 | <0.1 |
| Nickel | mg/kg | 12 | 2 |
| Zinc | mg/kg | 38 | 12 |

| Moisture<br>Our Reference:<br>Your Reference | UNITS<br>----------<br>- | 156717-1<br>BH4 | 156717-2<br>BH5 | 156717-3<br>TB |
|---|---|---|---|---|
| Depth | ---------- | 0.3-0.5 | 0.4-0.6 | - |
| Date Sampled | | 4/11/2016 | 4/11/2016 | 4/11/2016 |
| Type of sample | | soil | soil | soil |
| Date prepared | - | 7/11/2016 | 7/11/2016 | 7/11/2016 |
| Date analysed | - | 8/11/2016 | 8/11/2016 | 8/11/2016 |
| Moisture | % | 16 | 17 | 1.9 |

| Asbestos ID - soils | | | |
|---|---|---|---|
| Our Reference: | UNITS | 156717-1 | 156717-2 |
| Your Reference | ---------- | BH4 | BH5 |
| | - | | |
| Depth | ---------- | 0.3-0.5 | 0.4-0.6 |
| Date Sampled | | 4/11/2016 | 4/11/2016 |
| Type of sample | | soil | soil |
| Date analysed | - | 10/11/2016 | 10/11/2016 |
| Sample mass tested | g | Approx. 35g | Approx. 35g |
| Sample Description | - | Red coarse-grained soil & rocks | Beige coarse-grained soil & rocks |
| Asbestos ID in soil | - | No asbestos detected at reporting limit of 0.1g/kg<br>Organic fibres detected | No asbestos detected at reporting limit of 0.1g/kg<br>Organic fibres detected |
| Trace Analysis | - | No asbestos detected | No asbestos detected |

| 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.<br>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.<br>For soil results:-<br>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.<br>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.<br>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.<br>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. |

| QUALITY CONTROL<br>vTRH(C6-C10)/BTEXN in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| Date analysed | - | | | 10/11/2016 | [NT] | [NT] | LCS-7 | 10/11/2016 |
| TRHC6 - C9 | mg/kg | 25 | Org-016 | <25 | [NT] | [NT] | LCS-7 | 102% |
| TRHC6 - C10 | mg/kg | 25 | Org-016 | <25 | [NT] | [NT] | LCS-7 | 102% |
| Benzene | mg/kg | 0.2 | Org-016 | <0.2 | [NT] | [NT] | LCS-7 | 92% |
| Toluene | mg/kg | 0.5 | Org-016 | <0.5 | [NT] | [NT] | LCS-7 | 96% |
| Ethylbenzene | mg/kg | 1 | Org-016 | <1 | [NT] | [NT] | LCS-7 | 102% |
| m+p-xylene | mg/kg | 2 | Org-016 | <2 | [NT] | [NT] | LCS-7 | 110% |
| o-Xylene | mg/kg | 1 | Org-016 | <1 | [NT] | [NT] | LCS-7 | 108% |
| naphthalene | mg/kg | 1 | Org-014 | <1 | [NT] | [NT] | [NR] | [NR] |
| *Surrogate* aaa-Trifluorotoluene | % | | Org-016 | 94 | [NT] | [NT] | LCS-7 | 92% |

| QUALITY CONTROL<br>svTRH (C10-C40) in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 07/11/2016 | [NT] | [NT] | LCS-6 | 07/11/2016 |
| Date analysed | - | | | 07/11/2016 | [NT] | [NT] | LCS-6 | 07/11/2016 |
| TRHC10 - C14 | mg/kg | 50 | Org-003 | <50 | [NT] | [NT] | LCS-6 | 95% |
| TRHC15 - C28 | mg/kg | 100 | Org-003 | <100 | [NT] | [NT] | LCS-6 | 92% |
| TRHC29 - C36 | mg/kg | 100 | Org-003 | <100 | [NT] | [NT] | LCS-6 | 110% |
| TRH>C10-C16 | mg/kg | 50 | Org-003 | <50 | [NT] | [NT] | LCS-6 | 95% |
| TRH>C16-C34 | mg/kg | 100 | Org-003 | <100 | [NT] | [NT] | LCS-6 | 92% |
| TRH>C34-C40 | mg/kg | 100 | Org-003 | <100 | [NT] | [NT] | LCS-6 | 110% |
| *Surrogate* o-Terphenyl | % | | Org-003 | 79 | [NT] | [NT] | LCS-6 | 84% |

| QUALITY CONTROL<br>PAHs in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| Date analysed | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| Naphthalene | mg/kg | 0.1 | Org-012 | <0.1 | [NT] | [NT] | LCS-7 | 96% |
| 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-7 | 92% |
| Phenanthrene | mg/kg | 0.1 | Org-012 | <0.1 | [NT] | [NT] | LCS-7 | 89% |
| 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-7 | 82% |
| Pyrene | mg/kg | 0.1 | Org-012 | <0.1 | [NT] | [NT] | LCS-7 | 85% |
| 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<br><br>PAHs in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br><br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Benzo(a)pyrene | mg/kg | 0.05 | Org-012 | <0.05 | [NT] | [NT] | LCS-7 | 106% |
| 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 | 99 | [NT] | [NT] | LCS-7 | 120% |
| QUALITY CONTROL<br><br>Organochlorine Pesticides in soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br><br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
| Date extracted | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| Date analysed | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| 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-7 | 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-7 | 81% |
| Heptachlor | mg/kg | 0.1 | Org-005 | <0.1 | [NT] | [NT] | LCS-7 | 75% |
| 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-7 | 83% |
| Heptachlor Epoxide | mg/kg | 0.1 | Org-005 | <0.1 | [NT] | [NT] | LCS-7 | 81% |
| 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-7 | 84% |
| Dieldrin | mg/kg | 0.1 | Org-005 | <0.1 | [NT] | [NT] | LCS-7 | 87% |
| Endrin | mg/kg | 0.1 | Org-005 | <0.1 | [NT] | [NT] | LCS-7 | 70% |
| pp-DDD | mg/kg | 0.1 | Org-005 | <0.1 | [NT] | [NT] | LCS-7 | 85% |
| 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-7 | 71% |
| Methoxychlor | mg/kg | 0.1 | Org-005 | <0.1 | [NT] | [NT] | [NR] | [NR] |
| *Surrogate* TCMX | % | | Org-005 | 94 | [NT] | [NT] | LCS-7 | 116% |

| QUALITY CONTROL<br><br>Organophosphorus Pesticides | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br><br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| Date analysed | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| 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-7 | 81% |
| 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-7 | 108% |
| 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-7 | 74% |
| Fenitrothion | mg/kg | 0.1 | Org-008 | <0.1 | [NT] | [NT] | LCS-7 | 93% |
| Malathion | mg/kg | 0.1 | Org-008 | <0.1 | [NT] | [NT] | LCS-7 | 86% |
| Parathion | mg/kg | 0.1 | Org-008 | <0.1 | [NT] | [NT] | LCS-7 | 91% |
| Ronnel | mg/kg | 0.1 | Org-008 | <0.1 | [NT] | [NT] | LCS-7 | 93% |
| *Surrogate* TCMX | % | | Org-008 | 94 | [NT] | [NT] | LCS-7 | 96% |

| QUALITY CONTROL<br><br>PCBs in Soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br><br>Base ll Duplicate ll %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date extracted | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| Date analysed | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| 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-7 | 102% |
| Aroclor 1260 | mg/kg | 0.1 | Org-006 | <0.1 | [NT] | [NT] | [NR] | [NR] |
| *Surrogate* TCLMX | % | | Org-006 | 94 | [NT] | [NT] | LCS-7 | 96% |

| QUALITY CONTROL<br><br>Acid Extractable metals in soil | UNITS | PQL | METHOD | Blank | Duplicate Sm# | Duplicate results<br><br>Base II Duplicate II %RPD | Spike Sm# | Spike % Recovery |
|---|---|---|---|---|---|---|---|---|
| Date prepared | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| Date analysed | - | | | 07/11/2016 | [NT] | [NT] | LCS-7 | 07/11/2016 |
| Arsenic | mg/kg | 4 | Metals-020 | <4 | [NT] | [NT] | LCS-7 | 114% |
| Cadmium | mg/kg | 0.4 | Metals-020 | <0.4 | [NT] | [NT] | LCS-7 | 106% |
| Chromium | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | LCS-7 | 110% |
| Copper | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | LCS-7 | 109% |
| Lead | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | LCS-7 | 106% |
| Mercury | mg/kg | 0.1 | Metals-021 | <0.1 | [NT] | [NT] | LCS-7 | 90% |
| Nickel | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | LCS-7 | 102% |
| Zinc | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | LCS-7 | 109% |

**Report Comments:**

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 156717-1, 2 were sub-sampled from jars 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
NR: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

## 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.

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **ES1625137** | Page | : 1 of 7 |
| **Amendment** | : **1** | | |
| Client | : **CONSULTING EARTH SCIENTISTS** | Laboratory | : Environmental Division Sydney |
| Contact | : Mr Miles Thompson | Contact | : Customer Services ES |
| Address | : Suite 3, Level 1 55-65 Grandview Street PYMBLE NSW, AUSTRALIA 2073 | Address | : 277-289 Woodpark Road Smithfield NSW Australia 2164 |
| Telephone | : +61 02 8569 2200 | Telephone | : +61-2-8784 8555 |
| Project | : 18 Randwick Cl, Casula | Date Samples Received | : 04-Nov-2016 16:05 |
| Order number | : CES161003-HC | Date Analysis Commenced | : 07-Nov-2016 |
| C-O-C number | : ---- | Issue Date | : 10-Nov-2016 15:48 |
| Sampler | : M.T. | | |
| Site | : 18 Randwick Cl, Casula | | |
| Quote number | : ---- | | |
| No. of samples received | : 1 | | |
| No. of samples analysed | : 1 | | |

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Descriptive Results
- Surrogate Control Limits

**Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.**

## *Signatories*

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

| *Signatories* | *Position* | *Accreditation Category* |
|---|---|---|
| Christopher Owler | Team Leader - Asbestos | Newcastle - Asbestos, Mayfield West, NSW |
| Edwandy Fadjar | Organic Coordinator | Sydney Inorganics, Smithfield, NSW |
| Edwandy Fadjar | Organic Coordinator | Sydney Organics, Smithfield, NSW |
| Wisam Marassa | Inorganics Coordinator | Sydney Inorganics, Smithfield, NSW |

## General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EA200 'Am' Amosite (brown asbestos)
- EA200 'Cr' Crocidolite (blue asbestos)
- EA200 'Trace' - Asbestos fibres ("Free Fibres") detected by trace analysis per AS4964. The result can be interpreted that the sample contains detectable 'respirable' asbestos fibres
- EA200: Asbestos Identification Samples were analysed by Polarised Light Microscopy including dispersion staining.
- EA200 Legend
- EA200 'Ch' Chrysotile (white asbestos)
- EA200: 'UMF' Unknown Mineral Fibres. "-" indicates fibres detected may or may not be asbestos fibres. Confirmation by alternative techniques is recommended.
- EA200: Negative results for vinyl tiles should be confirmed by an independent analytical technique.
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EA200: For samples larger than 30g, the <2mm fraction may be sub-sampled prior to trace analysis as outlined in ISO23909:2008(E) Sect 6.3.2-2
- EA200: 'Yes' - Asbestos detected by polarised light microscopy including dispersion staining.
- EA200: 'No*' - No asbestos found, at the reporting limit of 0.1g/kg, by polarised light microscopy including dispersion staining. Asbestos material was detected and positively identified at concentrations estimated to be below 0.1g/kg.
- EA200: 'No' - No asbestos found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining.

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Client sample ID | QAQC2 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | [03-Nov-2016] | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | ES1625137-001 | -------- | -------- | -------- | -------- |
| | | | | Result | ---- | ---- | ---- | ---- |
| **EA055: Moisture Content** | | | | | | | | |
| Moisture Content (dried @ 103°C) | ---- | 1 | % | **12.5** | ---- | ---- | ---- | ---- |
| **EA200: AS 4964 - 2004 Identification of Asbestos in Soils** | | | | | | | | |
| Asbestos Detected | 1332-21-4 | 0.1 | g/kg | **No** | ---- | ---- | ---- | ---- |
| Asbestos Type | 1332-21-4 | - | -- | **-** | ---- | ---- | ---- | ---- |
| Sample weight (dry) | ---- | 0.01 | g | **16.8** | ---- | ---- | ---- | ---- |
| APPROVED IDENTIFIER: | ---- | - | -- | **C.OWLER** | ---- | ---- | ---- | ---- |
| **EG005T: Total Metals by ICP-AES** | | | | | | | | |
| Arsenic | 7440-38-2 | 5 | mg/kg | **10** | ---- | ---- | ---- | ---- |
| Cadmium | 7440-43-9 | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- |
| Chromium | 7440-47-3 | 2 | mg/kg | **9** | ---- | ---- | ---- | ---- |
| Copper | 7440-50-8 | 5 | mg/kg | **20** | ---- | ---- | ---- | ---- |
| Lead | 7439-92-1 | 5 | mg/kg | **10** | ---- | ---- | ---- | ---- |
| Nickel | 7440-02-0 | 2 | mg/kg | **2** | ---- | ---- | ---- | ---- |
| Zinc | 7440-66-6 | 5 | mg/kg | **12** | ---- | ---- | ---- | ---- |
| **EG035T: Total Recoverable Mercury by FIMS** | | | | | | | | |
| Mercury | 7439-97-6 | 0.1 | mg/kg | <0.1 | ---- | ---- | ---- | ---- |
| **EP066: Polychlorinated Biphenyls (PCB)** | | | | | | | | |
| Total Polychlorinated biphenyls | ---- | 0.1 | mg/kg | <0.1 | ---- | ---- | ---- | ---- |
| **EP068A: Organochlorine Pesticides (OC)** | | | | | | | | |
| alpha-BHC | 319-84-6 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Hexachlorobenzene (HCB) | 118-74-1 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| beta-BHC | 319-85-7 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| gamma-BHC | 58-89-9 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| delta-BHC | 319-86-8 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Heptachlor | 76-44-8 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Aldrin | 309-00-2 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Heptachlor epoxide | 1024-57-3 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| ^ Total Chlordane (sum) | ---- | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| trans-Chlordane | 5103-74-2 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| alpha-Endosulfan | 959-98-8 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| cis-Chlordane | 5103-71-9 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Dieldrin | 60-57-1 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| 4.4`-DDE | 72-55-9 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |
| Endrin | 72-20-8 | 0.05 | mg/kg | <0.05 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | QAQC2 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [03-Nov-2016] | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES1625137-001 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | | |
| beta-Endosulfan | 33213-65-9 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| ^ Endosulfan (sum) | 115-29-7 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| 4.4`-DDD | 72-54-8 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Endrin aldehyde | 7421-93-4 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Endosulfan sulfate | 1031-07-8 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| 4.4`-DDT | 50-29-3 | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| Endrin ketone | 53494-70-5 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Methoxychlor | 72-43-5 | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| ^ Sum of Aldrin + Dieldrin | 309-00-2/60-57-1 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| ^ Sum of DDD + DDE + DDT | 72-54-8/72-55-9/50-2 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| **EP068B: Organophosphorus Pesticides (OP)** | | | | | | | | | |
| Dichlorvos | 62-73-7 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Demeton-S-methyl | 919-86-8 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Monocrotophos | 6923-22-4 | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| Dimethoate | 60-51-5 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Diazinon | 333-41-5 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Chlorpyrifos-methyl | 5598-13-0 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Parathion-methyl | 298-00-0 | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| Malathion | 121-75-5 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Fenthion | 55-38-9 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Chlorpyrifos | 2921-88-2 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Parathion | 56-38-2 | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| Pirimphos-ethyl | 23505-41-1 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Chlorfenvinphos | 470-90-6 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Bromophos-ethyl | 4824-78-6 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Fenamiphos | 22224-92-6 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Prothiofos | 34643-46-4 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Ethion | 563-12-2 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Carbophenothion | 786-19-6 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| Azinphos Methyl | 86-50-0 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons** | | | | | | | | | |
| Naphthalene | 91-20-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Client sample ID | QAQC2 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | Client sampling date / time | [03-Nov-2016] | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | ES1625137-001 | -------- | -------- | -------- | -------- |
| | | | | Result | ---- | ---- | ---- | ---- |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued** | | | | | | | | |
| Fluorene | 86-73-7 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Anthracene | 120-12-7 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Pyrene | 129-00-0 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Chrysene | 218-01-9 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(b+j)fluoranthene | 205-99-2 205-82-3 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(k)fluoranthene | 207-08-9 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| ^ Sum of polycyclic aromatic hydrocarbons | ---- | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (zero) | ---- | 0.5 | mg/kg | <0.5 | ---- | ---- | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (half LOR) | ---- | 0.5 | mg/kg | **0.6** | ---- | ---- | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (LOR) | ---- | 0.5 | mg/kg | **1.2** | ---- | ---- | ---- | ---- |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | |
| C6 - C9 Fraction | ---- | 10 | mg/kg | <10 | ---- | ---- | ---- | ---- |
| C10 - C14 Fraction | ---- | 50 | mg/kg | <50 | ---- | ---- | ---- | ---- |
| C15 - C28 Fraction | ---- | 100 | mg/kg | <100 | ---- | ---- | ---- | ---- |
| C29 - C36 Fraction | ---- | 100 | mg/kg | <100 | ---- | ---- | ---- | ---- |
| ^ C10 - C36 Fraction (sum) | ---- | 50 | mg/kg | <50 | ---- | ---- | ---- | ---- |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions** | | | | | | | | |
| C6 - C10 Fraction | C6_C10 | 10 | mg/kg | <10 | ---- | ---- | ---- | ---- |
| ^ C6 - C10 Fraction minus BTEX (F1) | C6_C10-BTEX | 10 | mg/kg | <10 | ---- | ---- | ---- | ---- |
| >C10 - C16 Fraction | ---- | 50 | mg/kg | <50 | ---- | ---- | ---- | ---- |
| >C16 - C34 Fraction | ---- | 100 | mg/kg | <100 | ---- | ---- | ---- | ---- |
| >C34 - C40 Fraction | ---- | 100 | mg/kg | <100 | ---- | ---- | ---- | ---- |
| ^ >C10 - C40 Fraction (sum) | ---- | 50 | mg/kg | <50 | ---- | ---- | ---- | ---- |
| ^ >C10 - C16 Fraction minus Naphthalene (F2) | ---- | 50 | mg/kg | <50 | ---- | ---- | ---- | ---- |
| **EP080: BTEXN** | | | | | | | | |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Client sample ID | QAQC2 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Client sampling date / time | [03-Nov-2016] | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES1625137-001 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EP080: BTEXN - Continued** | | | | | | | | | |
| **Benzene** | 71-43-2 | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| **Toluene** | 108-88-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| **Ethylbenzene** | 100-41-4 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| **meta- & para-Xylene** | 108-38-3 106-42-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| **ortho-Xylene** | 95-47-6 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ^ **Sum of BTEX** | ---- | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| ^ **Total Xylenes** | 1330-20-7 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| **Naphthalene** | 91-20-3 | 1 | mg/kg | | <1 | ---- | ---- | ---- | ---- |
| **EP066S: PCB Surrogate** | | | | | | | | | |
| **Decachlorobiphenyl** | 2051-24-3 | 0.1 | % | | **91.2** | ---- | ---- | ---- | ---- |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | | |
| **Dibromo-DDE** | 21655-73-2 | 0.05 | % | | **109** | ---- | ---- | ---- | ---- |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | | |
| **DEF** | 78-48-8 | 0.05 | % | | **87.0** | ---- | ---- | ---- | ---- |
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | | | | | | | |
| **Phenol-d6** | 13127-88-3 | 0.5 | % | | **103** | ---- | ---- | ---- | ---- |
| **2-Chlorophenol-D4** | 93951-73-6 | 0.5 | % | | **96.2** | ---- | ---- | ---- | ---- |
| **2.4.6-Tribromophenol** | 118-79-6 | 0.5 | % | | **93.3** | ---- | ---- | ---- | ---- |
| **EP075(SIM)T: PAH Surrogates** | | | | | | | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 0.5 | % | | **94.9** | ---- | ---- | ---- | ---- |
| **Anthracene-d10** | 1719-06-8 | 0.5 | % | | **112** | ---- | ---- | ---- | ---- |
| **4-Terphenyl-d14** | 1718-51-0 | 0.5 | % | | **88.1** | ---- | ---- | ---- | ---- |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | | |
| **1.2-Dichloroethane-D4** | 17060-07-0 | 0.2 | % | | **77.0** | ---- | ---- | ---- | ---- |
| **Toluene-D8** | 2037-26-5 | 0.2 | % | | **89.4** | ---- | ---- | ---- | ---- |
| **4-Bromofluorobenzene** | 460-00-4 | 0.2 | % | | **103** | ---- | ---- | ---- | ---- |

## Analytical Results

### Descriptive Results

Sub-Matrix: **SOIL**

| Method: Compound | Client sample ID - Client sampling date / time | Analytical Results |
|---|---|---|
| **EA200: AS 4964 - 2004 Identification of Asbestos in Soils** | | |
| EA200: Description | QAQC2 - [03-Nov-2016] | Pale brown sandy soil |

## Surrogate Control Limits

Sub-Matrix: **SOIL**

| Compound | CAS Number | Recovery Limits (%) Low | High |
|---|---|---|---|
| **EP066S: PCB Surrogate** | | | |
| **Decachlorobiphenyl** | 2051-24-3 | 39 | 149 |
| **EP068S: Organochlorine Pesticide Surrogate** | | | |
| **Dibromo-DDE** | 21655-73-2 | 49 | 147 |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | |
| **DEF** | 78-48-8 | 35 | 143 |
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | |
| **Phenol-d6** | 13127-88-3 | 63 | 123 |
| **2-Chlorophenol-D4** | 93951-73-6 | 66 | 122 |
| **2.4.6-Tribromophenol** | 118-79-6 | 40 | 138 |
| **EP075(SIM)T: PAH Surrogates** | | | |
| **2-Fluorobiphenyl** | 321-60-8 | 70 | 122 |
| **Anthracene-d10** | 1719-06-8 | 66 | 128 |
| **4-Terphenyl-d14** | 1718-51-0 | 65 | 129 |
| **EP080S: TPH(V)/BTEX Surrogates** | | | |
| **1.2-Dichloroethane-D4** | 17060-07-0 | 73 | 133 |
| **Toluene-D8** | 2037-26-5 | 74 | 132 |
| **4-Bromofluorobenzene** | 460-00-4 | 72 | 130 |