# Preliminary Site Investigation

CSO Engineers

'TAMINDA BUSINESS & LIFESTYLE PARK'

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## EXECUTIVE SUMMARY

CSO Engineers commissioned Moss Environmental Pty Ltd to conduct a Preliminary Site Investigation (PSI, also known as a Phase 1 Environmental Assessment) on Lot 1 and 2 DP1213875 referred to as Site A, and an additional area of concern on Lot 1 DP 233288 referred to as Site B in this report. The site is currently being used as a farm for grazing. The site is proposed to be developed into a residential estate therefore, the investigative levels used in this report are human health based using the low-density residential scenario (HIL-A).

The objectives of this report are to review the site history and to collect limited soil and water samples to create a timeline of the site historical information. This is to identify if there have been historical activities on the site that have the potential to cause contamination, to identify contaminants of potential concern (CoPC) and to inform on the need for additional investigations. In addition to investigating anthropogenic causes of contamination, this investigation assesses the possible extent of salinity occurrence on the site.

The findings of the report are based on a site inspection conducted over two days: 15/11/2022 and 16/11/2022, a review of historical site data, and limited surface soil and water samples collected.

The historical searches and lot searches completed for this report have an adequate buffer in place to cover all lots for the study (Lot 1 and 2 DP1213875 and Lot 1 DP 233288) throughout this report.

The scope of work included the following:

- A site history review and site visit to identify potential Areas of Environmental Concerns (AECs) and chemicals of concern (CoCs) and;
- Assessment of the need for additional investigation based on the site history review and limited surface soil and water sampling consisting of:
    - Twenty (20) topsoil samples and 2 quality control samples collected using a Jarrett auger and analysed at a NATA accredited laboratory for Salinity, pH, Sodium, Heavy Metals, BTEX, TRH, PAHs and OCPs;
    - One (1) surface water sample collected via a grab sample.

Surface soil sampling was designed using a stratified sampling regime with the site divided into two discrete investigation areas, sampling strategies and sampling locations due to different characteristics of the site. Site 1 uses a judgmental sampling strategy located around areas of potential concern based on historical information and Site 2 uses low-density systematic sampling strategy with locations further apart to assess natural soil with no known contaminants (NSW EPA,2022).

Analytical results from the laboratory show that all soil analytes including salinity are below the assessment criteria for a low-density residential land use. However, groundwater was not accessible which presented sampling limitations. Surface water result was also below all assessment criteria for proposed land use.

Based on the site history review and site investigation for Site A, it is considered that;

- The site was used for grazing and farming since the 1960s and it is still being currently used for farming.
- There is evidence of a structured shed and water tank on site from the aerial imagery and was found on site during the site investigation.

- No dangerous goods or explosives were stored or used on the Site.
- A WorkCover Dangerous Goods licence search was conducted and returned no results.
- Surrounding lots have a history of above ground storage tank (AST) locations which poses the likelihood for offsite migration to the subject site of this report. However, the potential is regarded as low.
- Burkes Gully traverses the site boundary and due to the slope of site, will serve as a collection point for sediments.
- Surface soil salinity is recorded to occur over a distance of 500m from the eastern boundary of the site.
- The additional lot (Site B) currently has chemical storage, general waste material debris and abandoned materials on site.
- There are no notices of contamination with the council or the EPA available for the Site or surroundings.
- There is no evidence of oil spills, staining or areas of vegetation die back on the site.
- There is no evidence of old waste disposal or landfilling on site.
- No groundwater investigation has been conducted for the site of the surrounding areas.

Moss Environmental concludes that there is an overall low potential of salinity and other contaminants of concern across site. There is a low risk of further soil and groundwater contamination at the site. Although, groundwater will not be utilised by future residents of the site.

It is therefore recommended that: based on the information obtained through historical searches and the limited sampling strategy, no further investigations for contamination are required for this Site at this time. Should additional historical information become available, there will be a need to reassess this conclusion.

# 1. INTRODUCTION

## 1.1 PROJECT BACKGROUND

Moss Environmental Pty Ltd was commissioned by CSO Engineers to conduct a Preliminary Site Investigation (PSI), also referred to as a Phase 1 Environmental Site Assessment (ESA) of the vacant lots located at Burgmanns Lane Warral - Lot 2 DP1213875, and Bylong Road Hillvue – Lot 1 DP1213875. Both sites will be referred to as 'Site A' in this document. There is an additional lot of concern which will be included in this investigation at Lot 1 DP 233288 and will be referred to as 'Site B'.

The project entails a subdivision of the lots into residential dwellings which will be known as Arcadia Estate. Tamworth Regional Council (TRC) have requested the submission of a PSI with the Development Application. A previous Preliminary Site Investigation was conducted in 2014 for several lots within Duri Road and Bylong Road, which included Site A and Site B. The previous report will be referenced in some sections of this report.

## 1.2 PROJECT OBJECTIVES

The objective of the PSI was to identify potentially contaminating activities that are currently being performed at the Site, and that may have been performed in the past on the Site, with the aim to determine if additional contamination investigations are warranted prior to site development. The PSI also involves testing for salinity on the site as the surrounding area of site within a 1km buffer shows a record of strong salting evidence. This investigative report will determine if additional contamination investigations are warranted prior to site development.

## 1.3 SCOPE OF WORKS

In order to meet the objectives of the PSI, the following scope of works were carried out:

- Review of relevant reports and other historical documentation
- A site history review and site visit to identify potential areas of environmental concern (AECs) and contaminants of concern (CoCs)
- Preparation of a Conceptual Site Model (CSM)
- Collection of surface soil samples, surface water and groundwater if accessible
- Analyse soil and water samples using a NATA accredited laboratory
- Interpretation of laboratory results in accordance with NEPC (2013a) guidelines
- Preparation of recommendations and final conclusions from results analysis.

## 1.4 CONSULTANCY COMPETENCY

Moss Environmental has conducted this PSI in general accordance with the relevant NSW Department of Planning and Environment (DPE formally DPIE) and Environmental Protection Authority (EPA) guidelines such as:

- *Managing Land Contamination – Planning Guidelines,*
- *SEPP (Resilience and Hazards) 2021 (DPIE, 2021)* and
- *Consultants reporting on contaminated land: Contaminated land guidelines (*NSW EPA 2020) respectively.

- *National Environment Protection (Assessment of Site Contamination) Measure 1999. NEPC 2013.*

Moss Environmental is a multidisciplinary firm of environmental consultants with personnel experience and qualifications as described in National Environment Protection Measure 1999 schedule B9. Details of consultant competency can be provided if requested.

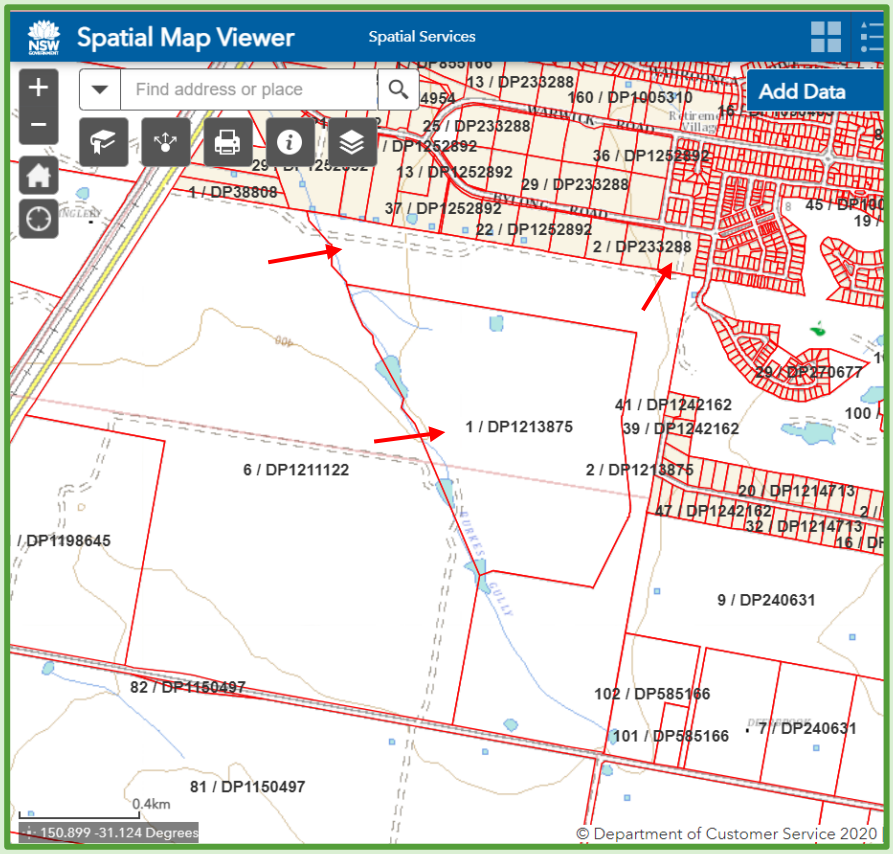
It is understood that the current investigation has been conducted for the purpose of environmental due diligence as part of a development application for the Site.

# 2. SITE CONDITIONS

## 2.1 SITE IDENTIFICATION

The sites can be identified with the following:

**Table 2-1: Site identification details**

| Identifier | Description |
|---|---|
| **Property description (Plan Number)** | Site A: - Lot 1 DP1213875 in Bylong Road, Hillvue<br>Lot 2 DP1213875 in Burgmanns Lane, Warral<br>Site B: - Lot 1 DP 233288<br>  <br>**Figure 2-1: A map showing the Site location** |
| **Local Government Authority** | Tamworth Local government<br>Tamworth Regional Council<br>The lots fall within the locality of Warral and Hillvue. See image below. |

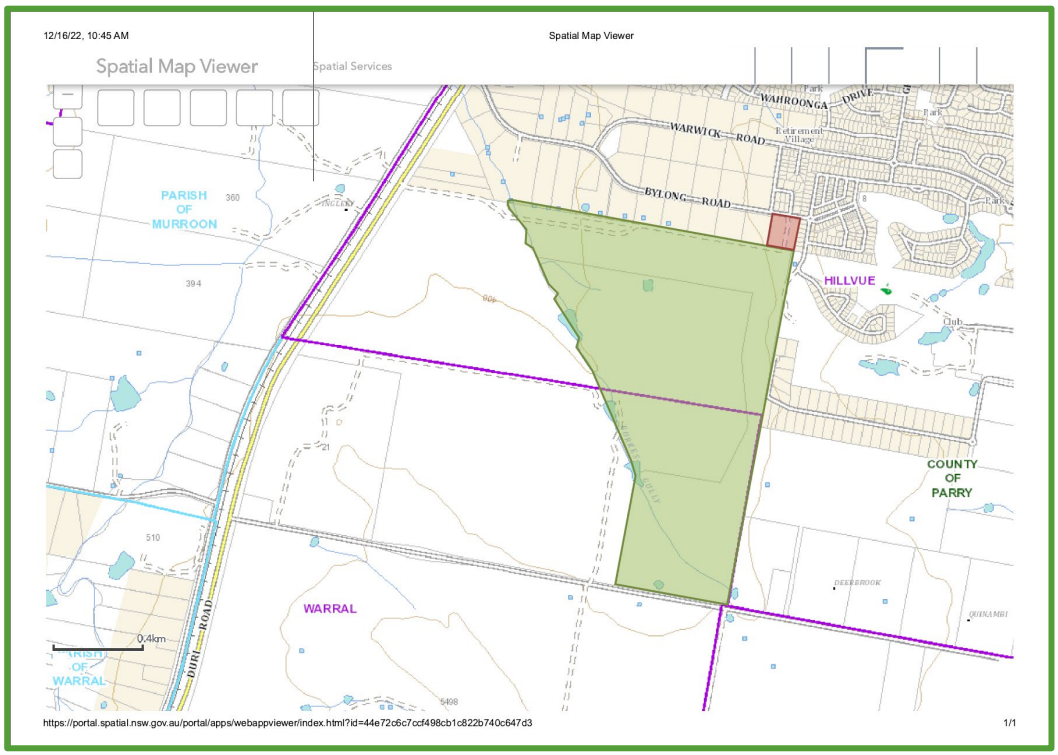
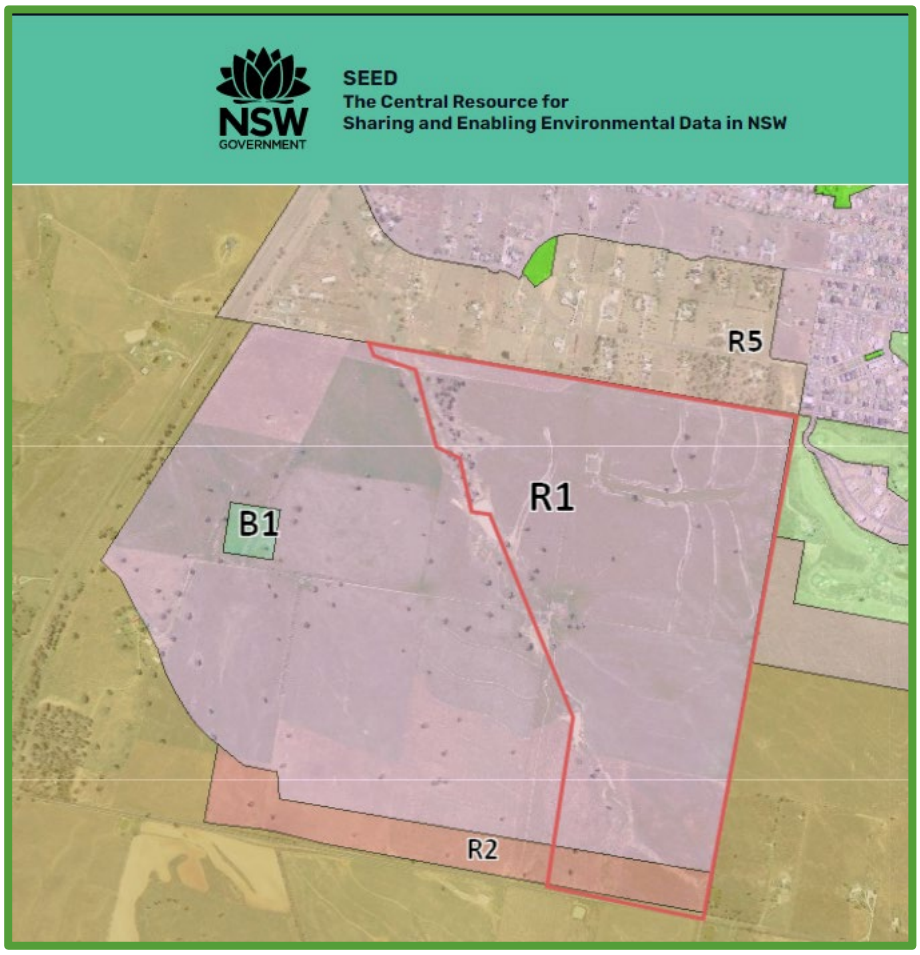
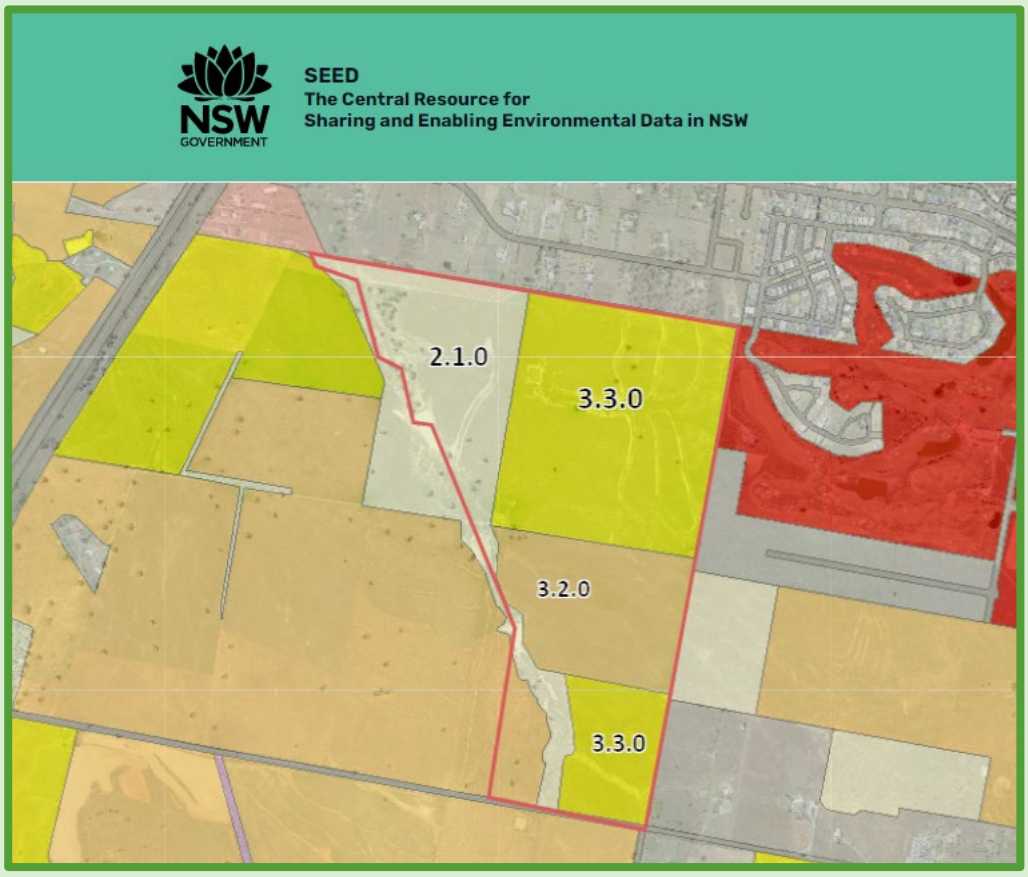



**Figure 2-2: An image showing the suburbs of proposal (Sites A and B in green and red shades respectively )**

| | |
|---|---|
| **Latitude and Longitude** | Centre of site:<br><br>Latitude -31.133213°<br><br>Longitude 150.899816° |
| **Site Area and Dimensions** | Total Site A Area: 1.2km² / 120Ha<br><br>Total Site A Perimeter: 5.22km |
| **Current occupier** | Site A is currently being used as a grazing property. |
| **Current Land zoning** | Site A is currently zoned R1- General residential with less than 10% of the site zoned R2 – Low density Residential.<br><br>Site B is zoned R5- Large Lot Residential.<br><br>See image below. |

| | |
|---|---|
| |  <br>**Figure 2-3: Land zoning map of the site**<br>*Key:*<br>*R1: General Residential*<br>*R2: Low Density Residential*<br>*R5: Large Lot Residential*<br>*B1: Neighbourhood Centre* |
| **Land Use** | See Land Use map below. |

| | |
|---|---|
| |  <br>**Figure 2-4: Land Use map (site in red outline)**<br><br>*Key:*<br>*2.1.0- Grazing native vegetation*<br>*3.3.0- Cropping*<br>*3.2.0- Grazing modified pastures* |
| **Adjoining site uses** | The surrounding sites are for residential and grazing purposes |
| **Trigger for PSI** | Subdivision into residential lots for building Arcadia Estate |

### 2.2 SURROUNDING LAND USE

Based on the observations from Google earth and the site visit, the surrounding land use comprises of the following.

North- The Northern boundary of the site comprises large lot residential fronting Bylong Road. The properties were observed to have horse stables.

South- The southern lot of the Site's boundary leads to Burgmanns Lane. Across Burgmanns Lane are Primary Production small lots and further south are residential homes in the suburb of Kingswood.

East- Half of the Eastern side of the Site are Recreational lots and General residential properties on Rodeo Drive and Peak drive. The remaining half are vacant with isolated residential buildings, zoned Primary production small lots.

West- The western boundary of the site is Burkes Gully which leads to Lot 6 DP 1211122 and is currently a grazing property. Further west is the Duri Road, a rail-line and Warral Road.

### 2.3 TOPOGRAPHY

The Site is gently undulating, sloping from the Eastern boundary towards the Gully area, western boundary with the maximum across site being 5.3% and the minimum being 2.1%. Burkes Gully which is present on site is a first-order tributary of the Timbumburi Creek. Timbumburi Creek is approximately 1.1km from the site's western boundary. Burkes Gully is deemed to be the major surface water discharge point and run off collector for the site and nearby lots due to the topography.

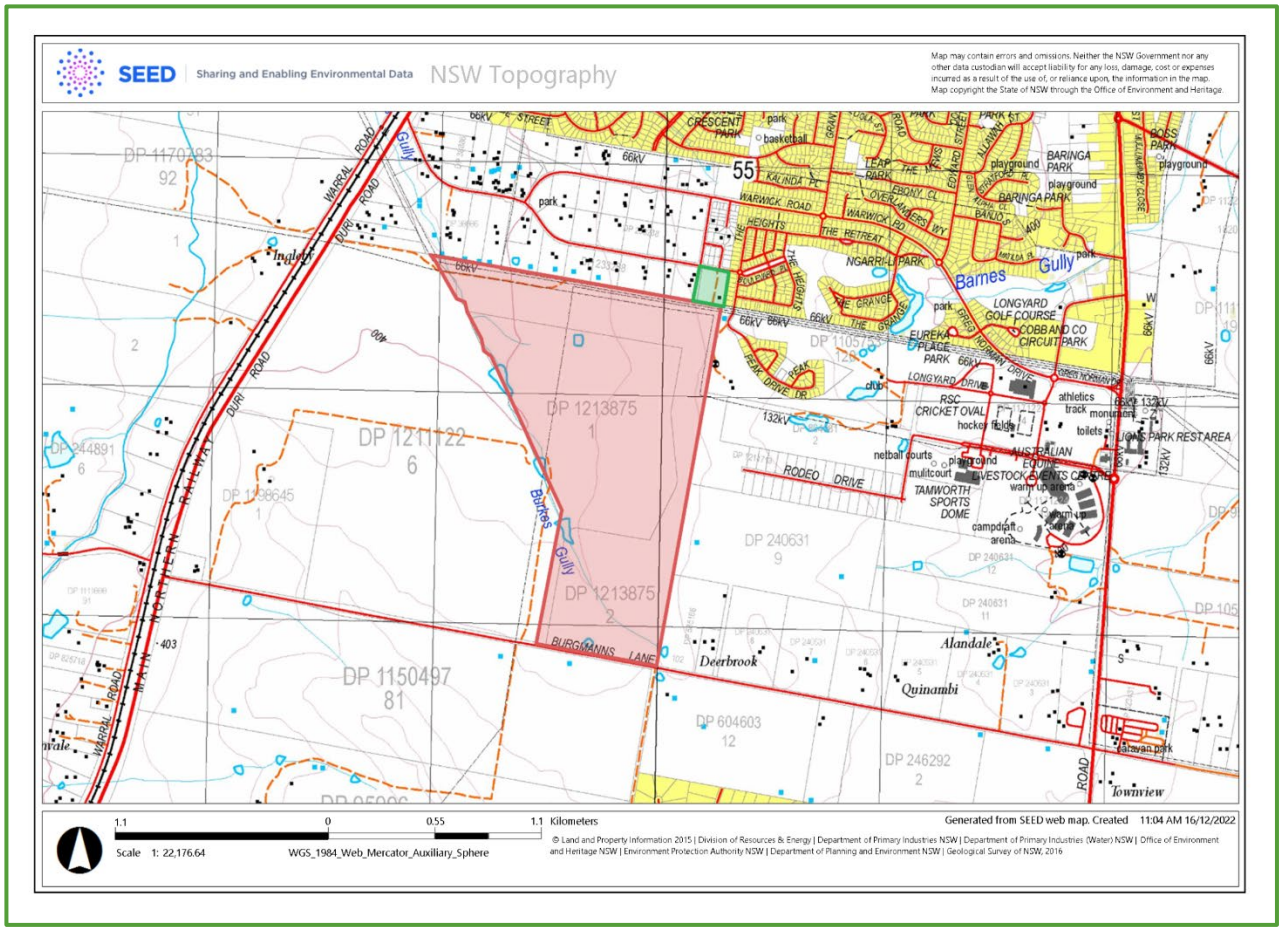



**Figure 2-5: NSW Topography map from NSW SEED. (Site A in red shade, Site B in green shade)**

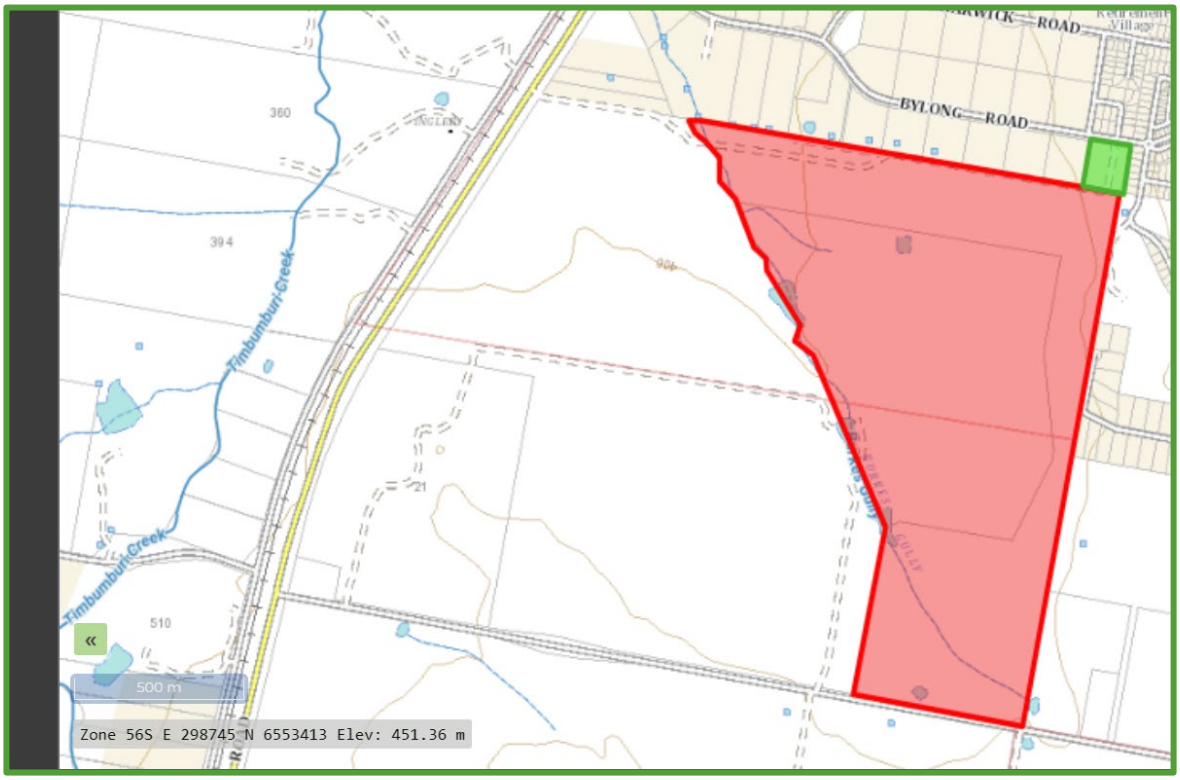



**Figure 2-6: An image showing the Burkes Gully and Timbumburi Creek**

## 2.4 GEOLOGY

Data from the MinView – Regional NSW mapping database, Australian Soil Classification Outcrop map indicates that underlying the topsoil is identified to be Chromosol soils. Chromosols are texture contrast soils between the A-and B-horizons. The B-horizon are not sodic and not strongly acidic and are therefore widely used for Agriculture particularly the red subsoils. The parent material of Chromosols ranges from highly siliceous, siliceous to intermediate in composition. These soils are found in imperfectly drained sites (yellow and grey chromosol) where rainfall is between 250mm and 900mm.[1]

[1] The Australian Soil Classification, 1st ed. Available at: ASC - CHROMOSOLS (csiro.au)

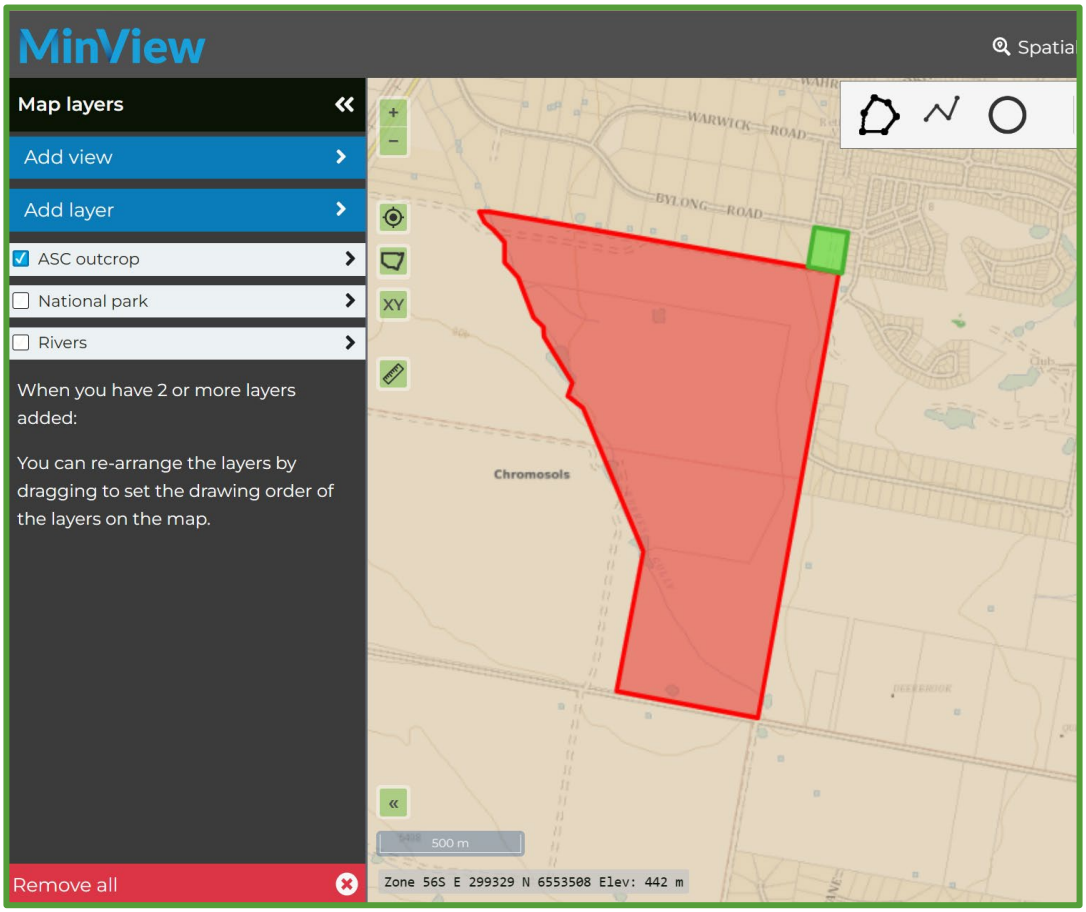



**Figure 2-7: Map showing the Australian Soil Classification of the sites to be Chromosols.**

The original landscape of the site is characterised by the Mitchell Landscapes as Tamworth - Keepit Slopes and Plains (**Figure 2-8**). These landscapes developed on rock types including Silurian-Devonian chert, schist, sandstone and small areas of limestone. These landscapes are characterised by general elevation 500 to 800m. Texture contrast soils on almost all slopes shifting in colour from red brown on upper slopes to yellow with harsh subsoils prone to gully development on lower slopes. There is various dominant vegetation across different areas on the landscape e.g., on the lower slopes, flats, eastern and western regions. For example, White box (*Eucalyptus albens*) grassy woodlands, yellow box (*Eucalyptus melliodora*), River oak (*Casuarina cunninghamiana*), Blakely's red gum (*Eucalyptus blakelyii*) Rough barked apple (*Angophora floribunda*) etc.

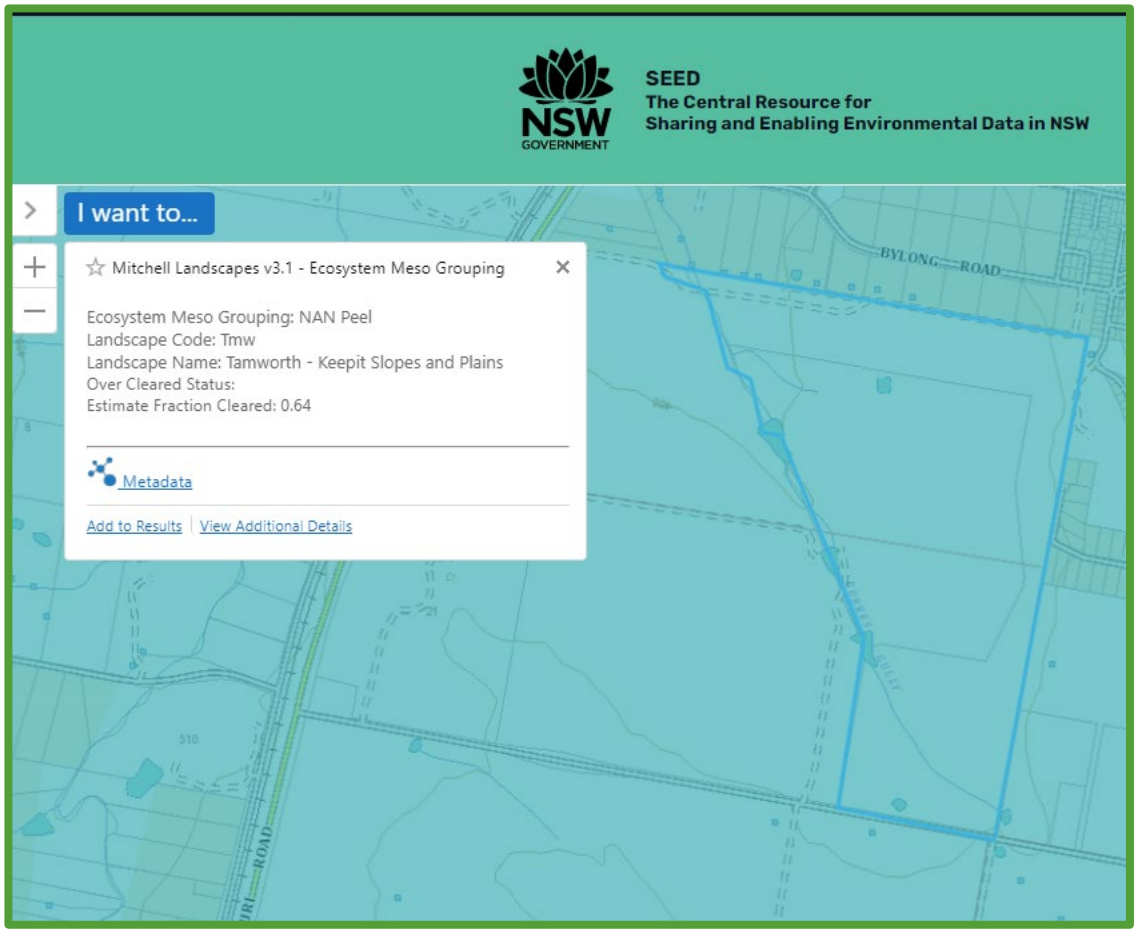



**Figure 2-8: Mitchell landscape grouping for the Site**

## 2.5 HYDROGEOLOGY

The hydrogeology Map of Australia by Geoscience of Australia shows there are two descriptions of aquifers on The Site, and they are:

- Porous and extensive highly productive aquifers
- Fractured or fissured, extensive aquifers of low to moderate productivity.

A search conducted by Lotsearch (**Appendix A**) indicates that there are 190 groundwater bores within a 2km buffer of the site. The Water NSW database- "All Groundwater Sites" details was also checked to identify the groundwater bores closest to the site and the results have been mapped out below. There are no groundwater bores identified on the site, but the shallowest groundwater well (GW003359) has a standing level of 18.60m at coordinates 31°07'59.3"S 150°53'19.1"E. The bore is 750m west of the Site boundary however, the bore was not located at the recorded coordinates during the site visit and may have been decommissioned. Table 2-2 below shows the groundwater bores closest to the site.

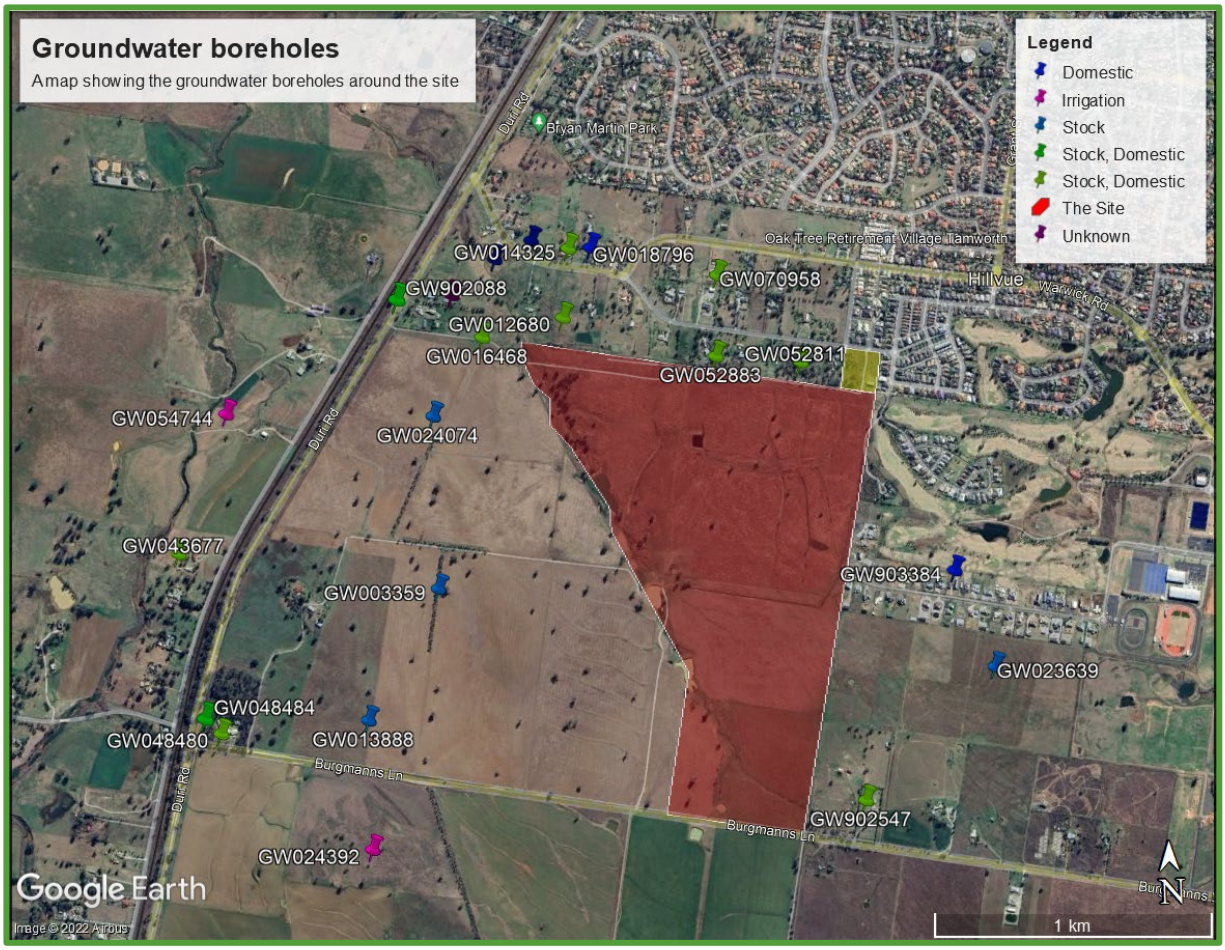



**Figure 2-9: An image showing the closest groundwater boreholes works around the site**

**Table 2-2: Closest groundwater boreholes to site (within 1km)**

| Groundwater id | Coordinates | Purpose | Depth | Distance to the Site |
|---|---|---|---|---|
| GW003359 | 31°07'59.3"S 150°53'19.1"E | Stock | 18.60m | 750m West |
| GW024074 | 31°07'39.3"S 150°53'19.1"E | Stock | 36.6m | 423m West |
| GW016468 | 31°07'30.3"S 150°53'26.1"E | Stock, Domestic | 28.3m | 139m West |
| GW902574 | 31°07'28.3"S 150°53'16.1"E | Stock, Domestic | 34.7m | 207m East |
| GW902088 | 31°07'27.3"S 150°53'13.8"E | Stock, Domestic | 28.0m | 482m Northwest |
| GW013888 | 31°08'14.3"S | Stock | 76.2m | 1103m Southwest |

| | | | | |
|---|---|---|---|---|
| | 150°53'09.1"E | | | |
| GW024392 | 31°08'29.3"S 150°53'09.1"E | Irrigation | 29.3m | 1061m Southwest |
| GW048480 | 31°08'15.3"S 150°52'49.1"E | Stock, Domestic | 33.50m | 1583m West |
| GW048484 | 31°08'15.3"S 150°52'46.1"E | Stock, Domestic | 30.4m | 1654m West |
| GW048456 | 31°08'11.3"S 150°52'39.1"E | Stock, Domestic | 22.3m | 1775m West |

Drillers logs for each groundwater bores describe the dominant soil profile as:

- Topsoil – Sand, Brown topsoil
- Subsoils B - Shale Brown, Shale Yellow,
- Subsoils C - Blue Basalt, Basalt -water bearing, yellow clay, Red clay, Mudstone.

During the site investigation, a hand auger was used to expose the soil profile up to a depth of 150mm and the soil profile was majorly moist brown clay. Gravel and stones were also present at some locations. More details on soil profile during site visit is included in the digital bore log in **Appendix E**.

The southern boundary of Site A showed characteristics of low water-holding capacity soils which was identified to be in proximity to the gully line. The areas around the water tank around the existing farm shed on site also appeared to be waterlogged during the investigation. Although, there was a 51mm rainfall event within the preceding 24 hours of the site visit, and the waterlogging may also be most likely be due to loss of soil structure from hoof compaction. The ground surface was wet during the visit as water was evident on the surface.

**Figure 2-10: Photos showing water logging characteristics on Site A**

Burkes Gully flows across from the boundary of the Site and it is a first order tributary of the Timbumburi Creek. Timbumburi creek is a Laterally Unconfined Continuous River, with a poor stream condition and low recovery potential. See map below showing the hydro lines around the site. During the site investigation, Burkes Gully appeared highly vegetated and dry however, the dams along the gully line were filled with water.

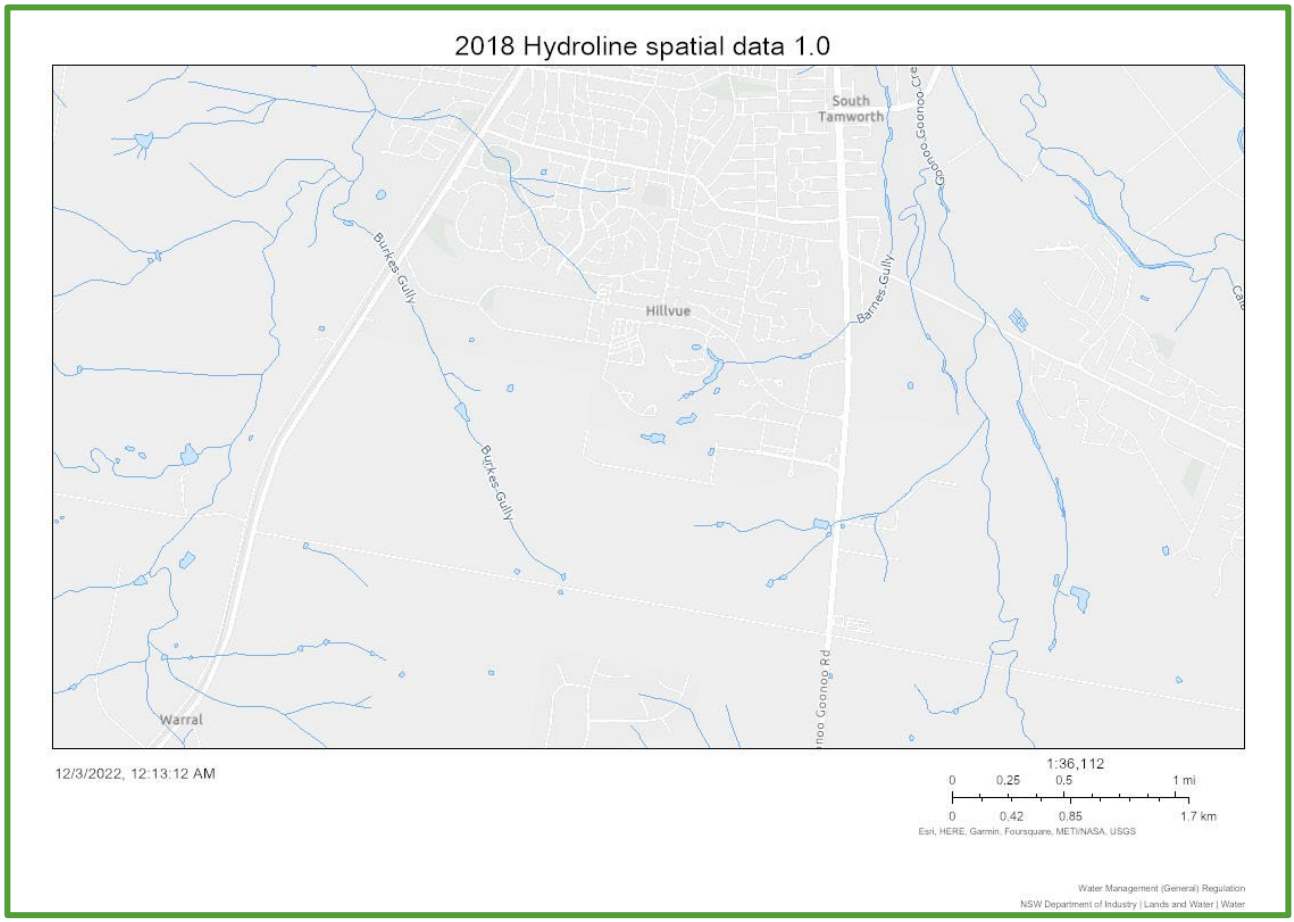



**Figure 2-11: Hydroline data of the site and environs**

## 2.6 FLOOD POTENTIAL

The Tamworth Regional Council (TRC) flood studies and the NSW SEED database was checked for the flood planning areas on or around The Site. The NSW SEED map indicates the Peel River and Timbumburi Creek to be in the flood planning area for Tamworth. See image below identifying the flood planning areas.

The TRC flood studies identifies that the areas affected by depths of flow greater than 100 mm are generally confined to the network of natural gullies and man-made diversion channels which drain to either Goonoo Goonoo Creek or Timbumburi Creek. Burkes Gully falls under this category as it drains into the Timbumburi Creek. According to Tamworth flood studies, Burkes Gully is the largest watercourse in the South Tamworth Rural Lands Area (STRLA), with depths of flow exceeding 1m along most of its length north of Burgmanns Lane which is surcharged at the 20-

year ARI level. While outside the limits of the STRLA, the hydrologic standard of the Werris Creek Road culverts on Burkes Gully are less than 20-year ARI [2].

Several flood studies have been undertaken to define peak flood levels on the floodplains of the Peel River, Goonoo Goonoo Creek and Timbumburi Creek at Tamworth. Depths of overland flow in the highly urbanised parts of Tamworth south of the Peel River and west of Goonoo Goonoo Creek are generally less than 300 mm for storms with ARI's up to 100 years.[3]

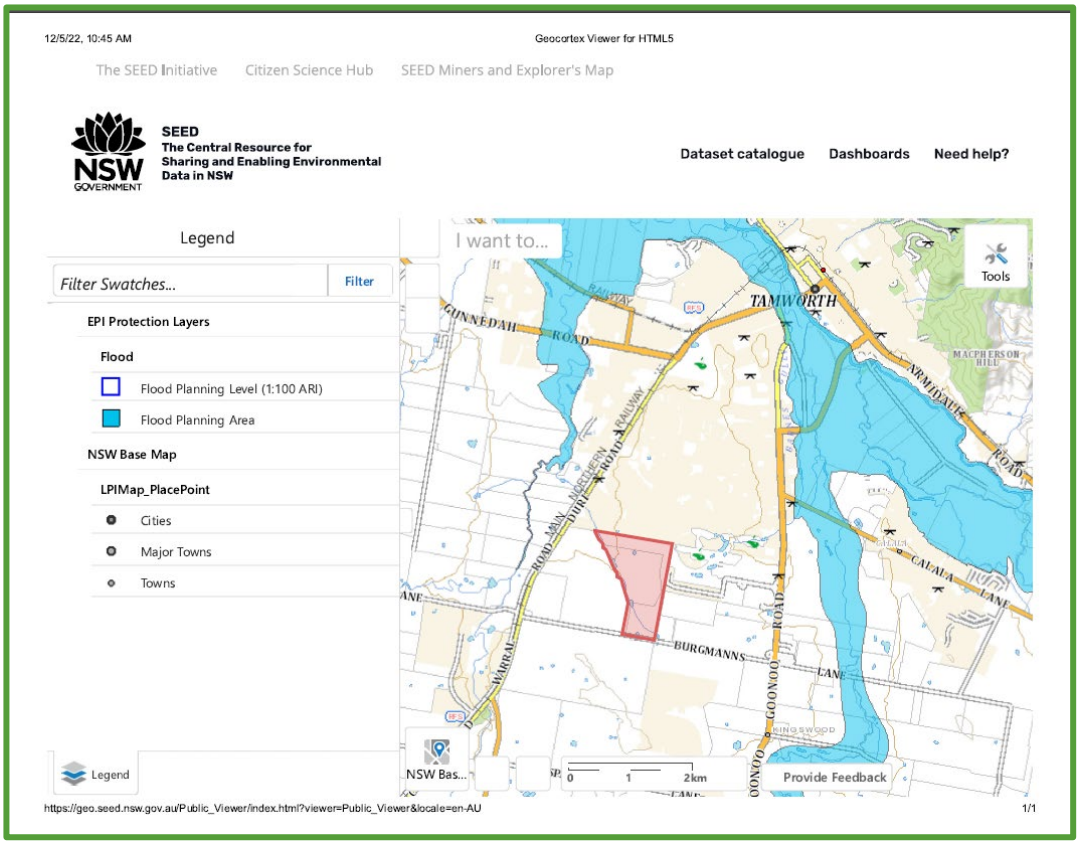



**Figure 2-12: Flood planning Areas around the site**

[2] TRC, *Tamworth City Wide Flooding Investigation – Vol 2 (2019)* Flood Studies | Tamworth Regional Council (nsw.gov.au)
[3] TRC, Tamworth City Wide Flooding Investigation – Vol 1 (2019) Flood Studies | Tamworth Regional Council (nsw.gov.au)

## 2.7 UNDERGROUND UTILITIES

A Before You Dig Australia search (BYDA) formerly known as Dial Before You Dig (DBYD) enquiry was carried out on 6/11/2022 to determine the presence of underground utilities which may act as conduits for contamination migration both onsite and offsite. Five Assets owners were notified of enquiry and plans were received for each asset owners. They are:

- AARNet Pty Ltd NSW
- APA Group Networks NSW Tamworth
- Essential Energy
- NBN Co NswAct
- Telstar NSW North

All BYDA plans received from each asset owners have been collated and included in **Appendix B.** A summary of the plans revealed the presence of Gas pipelines and associated infrastructures, fibre optic asset and other underground cable utilities. Further enquiries will be required in regard to network cables prior to start of works. Although, no Underground Petroleum Systems Services (UPSS) were identified in the searches, the existing utilities will be taken into consideration as potential contamination migration pathways.

A number of overhead poles were identified mostly on lot boundaries during the site visit.

**Figure 2-13: Images showing overhead poles on site**

## 2.8 ACID SULPHATE SOILS AND SALINITY

Acid sulphate soils is the common term for soil which contains chemical compounds known as metal sulphides. Soil containing metal sulphides is usually not a concern when it remains undisturbed or covered by water, but if it is

exposed to air, it can pose a risk to water quality. Acid sulphate soils form when there is a combination of factors, which includes a source of sulphate from seawater or saline groundwater.[4]

The NSW SEED map did not indicate the occurrence of salinity of sulphate soils on site or its surrounding. The NSW eSpade was further checked, and the result shows the occurrence of salinity evidence around site (See figure 2-14 below). The results show salinity occurrence majorly beyond the eastern boundary of the site. There is salting evidence within 500m of the site boundary, while 761m and beyond show a strong salting evidence.

Salinity has been included in the PSI because salinity affects the quality of soils and groundwater which impacts on building material usage and water usage for a residential development.

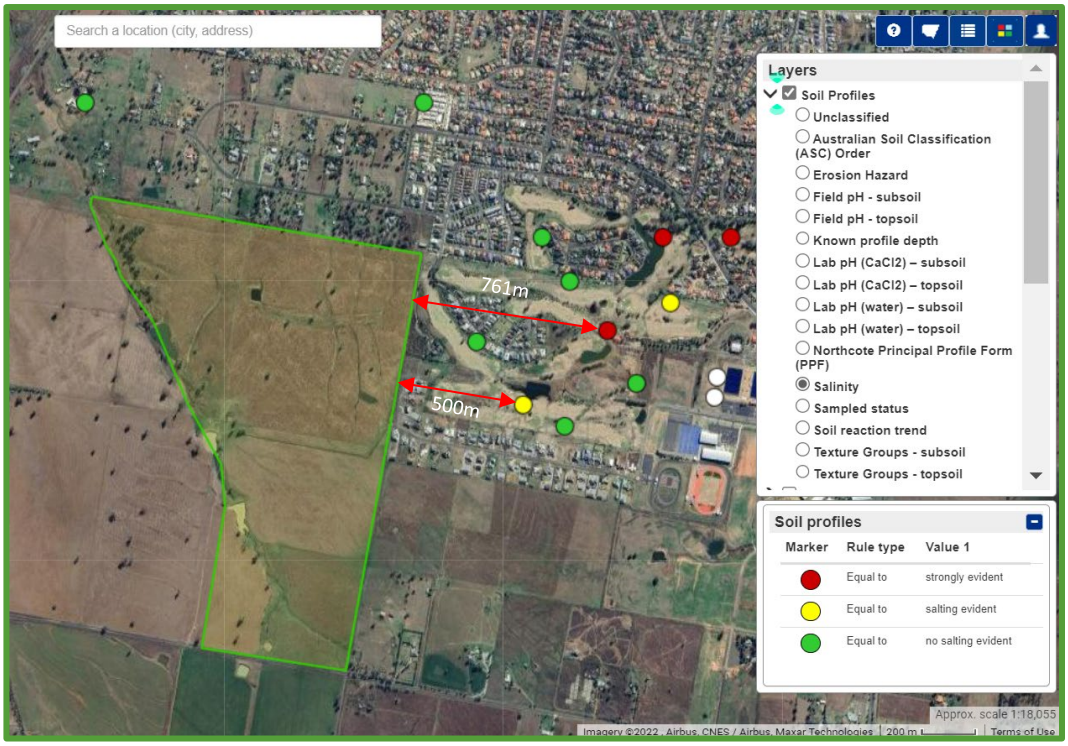



**Figure 2-14: Salinity evidence around the site**

[4] Water Quality Australia, Department of Agriculture, Water, and the Environment. Available at: https://www.waterquality.gov.au/issues

# 3. SITE BACKGROUND

## 3.1 PREVIOUS STUDIES

A Preliminary Site Contamination Investigation has been prepared for TRC in April 2014 by Mitchel Hanlon Consulting Pty Ltd[5]. The PSI was conducted for 36 individual lots which included Lot 6A in DP 161273 and Lot 1 in DP 795331. These Lot numbers were the former identifiers for Site A. The image below has been extracted from the previous PSI study and it shows the previous study areas which includes Site A identified as Lot 6A in DP 161273 and Lot 1 in DP 795331.

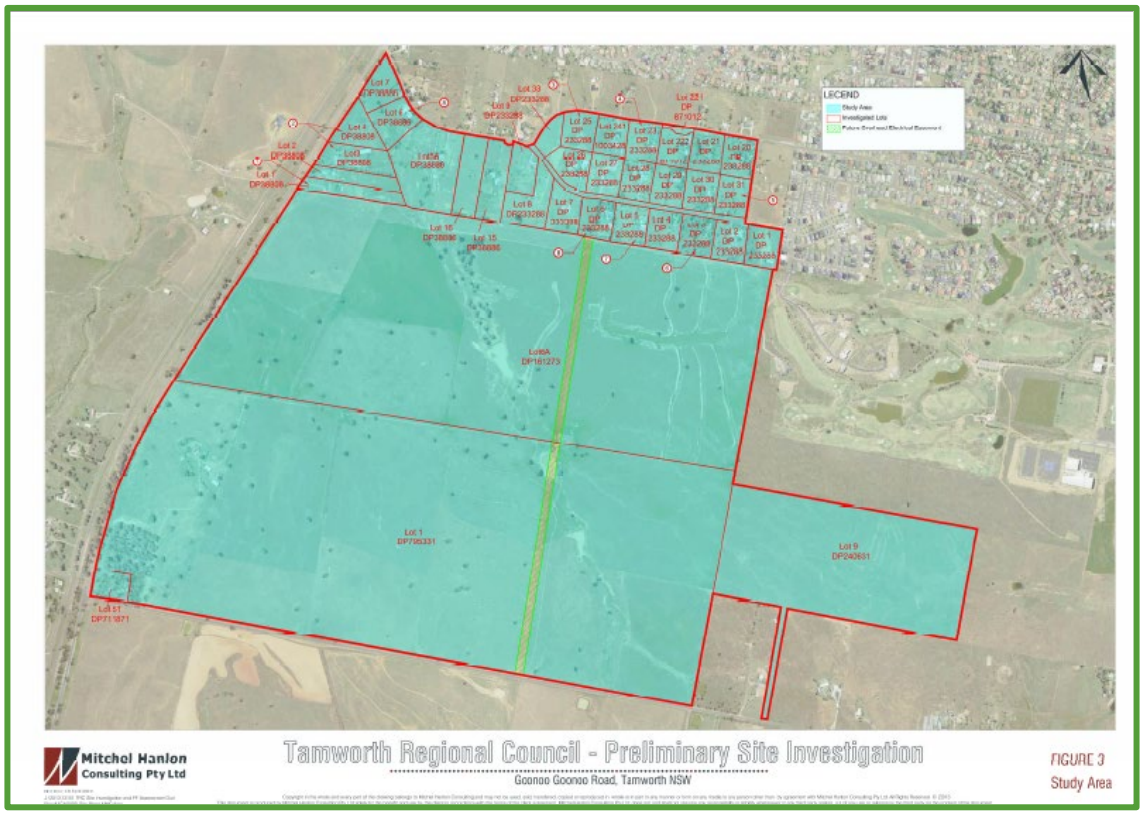



**Figure 3-1: Image showing previous PSI study area[5]**

Based on the previous study, there was no potential contaminants of concern for the site. However, adjoining lots were identified as containing potential contaminants of concerns due to the activities carried out on the lots. The major activities of concerns were the storage of vehicles and heavy equipment and the storage of aboveground fuel storage tanks which have the potential for hydrocarbon contamination via leakages of oil, fuels onto the soil. This has raised the concern for offsite migration of hydrocarbon and has been included in this PSI study.

[5] Preliminary Site Contamination Investigation. South Tamworth Rural Lands Master Plan, 2014. Mitchel Hanlon Consulting Pty Ltd, 2014 Prepared for Tamworth Regional Council.

Landholders of concerned lots interviewed during the PSI stated that there were no major fuel spills which had occurred during their ownership (Mitchel Hanlon, 2014). Therefore the report concluded that, based on the quantities stored, off site migration was considered unlikely as contamination potential would be restricted to the immediate area surrounding the infrastructure or beneath the storage tanks.

The report further concluded that the contamination risk across the site is generally low, although localised areas of concern exist across the site. A range of further investigations will be required to assess the actual degree of contamination present on site[5].

## 3.2 SITE HISTORY

A Lot search (**Appendix A**) was conducted for the site on 3rd November 2022 using the address Burgmanns Lane Warral, Tamworth which is inclusive of both lots for Arcadia Estate development. Buffers were also used for the searches which varies from 150m to 1km depending on the search topic. Based on the buffer range, the lot for concern, Site B was included in the search. The following information has been reviewed from the Lot search results to determine the historical land use and assess the likelihood of potentially contaminating activities that may have occurred on site or adjoining sites.

### 3.2.1 CURRENT AND HISTORICAL TITLE DEEDS

A title search was conducted via New South Wales Land Registry Services Historical Land Records Viewer. The result shows that the certificate of title or folio for Site A were delivered to CARROLL & O'DEA in 2017 and 2019 respectively. There were no records of other title owners on the database. The title search result for Site B also shows that the certificate of title was delivered to CARROLL & O'DEA in 2017.

The Lot search was further checked for mining titles and no results were returned for the Current Mining and Exploration Titles. Historical mining and exploration title shows the title holder to be Petrosearch Pty Ltd, Sion Resources Australia from 01/1981 to 12/1884.

### 3.2.2 HISTORICAL AERIAL PHOTOGRAPHS

Historical aerial photographs were reviewed to determine whether there was an indication of previous land use activities within a buffer of 150m from the site. All images reviewed are included in **Appendix A** from pages 20-28 and are described in the table below.

**Table 3-1: Historical aerial photo description**

| Year | Photo Details | Observation |
|---|---|---|
| **1965** | NSW Department of Customer Service<br><br>GDA 1994 MGA Zone 56 | The photograph is black and white and of poor quality.<br><br>Site appears empty, undeveloped with sparse strands of vegetation. A cluster of vegetation can be identified along the north-western corner of the lot, along Burkes Gully |

| | | |
|---|---|---|
| | | Surrounding lots appear to have some vegetation and a very few structures can be faintly identified outside the north-western boundary of the site. |
| **1976** | NSW Department of Customer Service<br><br>GDA 1994 MGA Zone 56 | The photograph is black and white and of poor quality.<br><br>Site appears empty, undeveloped with sparse strands of vegetation. A cluster of vegetation can be identified along the north-western corner of the lot, along Burkes Gully<br><br>Surrounding lots appear to have some vegetation and more structures can be identified outside the northern boundary and south-eastern corner of the site. |
| **1984** | NSW Department of Customer Service<br><br>GDA 1994 MGA Zone 56 | The photograph is black and white and of clearer visual quality than the previous image.<br><br>Site appears empty, undeveloped with sparse strands of vegetation. A cluster of vegetation can be identified along the north-western corner of the lot, along Burkes Gully.<br><br>A structure/shed with a tank can be seen faintly in the middle of the site which was present on Site A during the site visit.<br><br>Surrounding lots appear to have some vegetation, and more structures can be identified outside the northern boundary and south-eastern corner of the site. |
| **1989** | NSW Department of Customer Service<br><br>GDA 1994 MGA Zone 56 | The photograph is in coloured prints and of clearer visual quality.<br><br>Site appears empty, undeveloped with sparse strands of vegetation. A cluster of vegetation can be identified along the north-western corner of the lot, along Burkes Gully.<br><br>A structure/shed with a tank can be seen clearly in the middle of the site which was present on Site A during the site visit.<br><br>One dam can be identified flowing from Burkes Gully along the southern boundary of the site.<br><br>Surrounding lots appears to have some vegetation, and more structures can be identified outside the northern boundary and south-eastern corner of the site. |
| **1993** | NSW Department of Customer Service<br><br>GDA 1994 MGA Zone 56 | The photograph is in coloured prints and of clearer visual quality.<br><br>Site appears empty, undeveloped with sparse strands of vegetation. A cluster of vegetation can be identified along the north-western corner of the lot, along Burkes Gully<br><br>A structure/shed with a tank can be identified in the middle of the site which was present on Site A during the site visit. |

| | | |
|---|---|---|
| | | One dam can be identified flowing from Burkes Gully along the southern boundary of the site. On the western side of the dam, an unidentifiable object can be seen.<br><br>Surrounding lots appears to have some vegetation, and more structures can be identified outside the northern boundary and south-eastern corner of the site. |
| **1998** | NSW Department of Customer Service<br><br>GDA 1994 MGA Zone 56 | The photograph is in coloured prints and of good visual quality.<br><br>Site appears empty, undeveloped with sparse strands of vegetation. A cluster of vegetation can be identified along the north-western corner of the lot, along Burkes Gully<br><br>A structure/shed with a tank can be identified in the middle of the site which was present on Site A during the site visit.<br><br>Five (5) dams can be identified on site, with two (2) being along Burkes Gully.<br><br>Surrounding lots appears to have some vegetation, and more structures can be identified outside the northern boundary and south-eastern corner of the site. |
| **2012** | 2022 Google Inc<br><br>GDA 1994 MGA Zone 56 | The photograph is in coloured prints and of good visual quality.<br><br>Site appears empty, undeveloped with sparse strands of vegetation. A cluster of vegetation can be identified along the north-western corner of the lot, along Burkes Gully<br><br>A structure/shed with a tank can be identified in the middle of the site which was present on Site A during the site visit.<br><br>Five (5) dams can identified on site, with two (2) being along Burkes Gully.<br><br>Surrounding lots appears to have some vegetation, and more structures can be identified outside the northern boundary and south-eastern corner of the site. |
| **2017** | Aerometrex Pty Ltd<br><br>GDA 1994 MGA Zone 56 | The photograph is in coloured prints and of good visual quality.<br><br>Site appears empty, undeveloped with lesser strands of vegetation. Some vegetation can be identified along the north-western corner of the lot, along Burkes Gully<br><br>A structure/shed with a tank can be identified in the middle of the site.<br><br>Five (5) dams can identified on site, with two (2) being along Burkes Gully. |

| | | |
|---|---|---|
| | | Surrounding lots appears to have some vegetation, and more structures can be identified outside the northern boundary and south-eastern corner of the site. |
| **2022** | Aerometrex Pty Ltd<br><br>GDA 1994 MGA Zone 56 | The photograph is in coloured prints and of good visual quality.<br><br>Site appears empty, undeveloped with lesser strands of vegetation. Some vegetation can be identified along the north-western corner of the lot, along Burkes Gully<br><br>A structure/shed with a tank can be identified in the middle of the site.<br><br>Five (5) dams can identified on site, with two (2) being along Burkes Gully.<br><br>Surrounding lots appears to have some vegetation, and more structures can be identified outside the northern and eastern boundaries, and south-eastern corner of the site. |

### 3.2.3 TAMWORTH HISTORICAL SOCIETY ARCHIVES

A search of the THS archives was conducted on 5/12/2022 and there is no publicly available information for the sites.

### 3.2.4 NSW OEH CONTAMINATED LAND DATABASES

A review of the NSW OEH Contaminated Land Database established under Section 58 of the CLM Act 1997 found no records for the sites. The search result is presented in **Appendix C**. Eleven (11) notices were matched to five (5) sites however, none of them are in the vicinity of the site. The Lot Search indicated no contaminated land records or former gasworks on site or within buffer. There are also no records of contaminated sites notified to NSW OEH.

### 3.2.5 POEO ACT 1997 REGISTER

A search of the public register established under Section 308 of *the Protection of the Environment Operations Act 1997* (POEO Act) identified a licensed activity. The result identifies the railway systems operated by UGL Regional Linx Pty Ltd which is 484m Northwest of the site boundary. The rail line is downhill of Sites A&B and there are no evidences of any storage structures on the rail corridor or within the buffer. Potential for migration of contaminant from the rail line is low.

### 3.2.6 TAMWORTH REGIONAL PLANNING CERTIFICATES

There are no publicly available data for the sites.

### 3.2.7 SITE HISTORY SUMMARY

It was detailed in the previous PSI report that in the past 60years, Site A had only been used for agricultural purposes (cattle grazing and cropping). Residential use of the site commenced in 2002 when the existing shed or homestead was built at the time of investigation. It was further detailed that all chemicals and fuels held onsite were stored inside sheds with sealed concrete floors (Mitchel Hanlon, 2014). The site investigation conducted by Moss Environmental did not identify shed or homesteads with stored chemicals.

## 3.3 SITE DESCRIPTION AND SURROUNDING ENVIRONMENT

The findings of the report are based on a site inspection conducted by Moss Environmental on the 15th and 16th November 2022, with the analysis of twenty-two (22) soil samples, (one) 1 surface water and the review of historical data and previous studies.

The site is currently not occupied by any buildings, farm animals were seen to be grazing on all lots. Each parcel of lot is surrounded by wire fencing. There is an open horse stable built out of wooden and metal materials, round concrete water tank and abandoned metal tank on site. The abandoned tank appears destroyed with lots of metal and wooden refuse.

About 95% of this site appears vegetated except for a few access tracks on the southern boundary of the lot area. The site has scattered strands of Eucalyptus trees and shrubs with an approximate number of 40 throughout the site. They have an average height of 13-15m and an average circumference breast height (cbh) of 2-2.5m. Each tree has a dense canopy cover with one of them observed to have nests indicating a habitat tree.

Major ground cover includes a mixture of grasses species and crops utilized for grazing by livestock. Weeds identified include Slender Vervain, Hare's - foot clover, False oatgrass, Wild Oats, Aaron's rod, Prickly lettuce etc.






Figure 3-2: Images showing site conditions.

Site B (Lot 1 DP 233288) was also assessed, and it contained a shed, plastic rainwater tanks, metal tanks, metal rods, window frames made of glass and metal, window frames, containers containing adhesives, paints etc. Two soil samples were taken from the front of shed and back of shed using judgemental sampling locations based on the presence of above ground storage tanks (ASTs) and used chemical containers.

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**Figure 3-3: Images showing conditions of additional lot**

## 3.4 POTENTIAL AREAS OF ENVIRONMENTAL CONCERN AND CONTAMINANTS OF CONCERN

Based on the available site history, investigations indicated limited potential for any areas of environmental concern (AEC) or contaminants of concern (CoC), with the site being used for farming business over the past years. However, based on the previous study, there are areas of environmental concerns within a 150m buffer of the site which was mentioned in Section 3.1 of this report. Potential contaminants and chemicals of concerns as identified include fuels and oils from the vehicle storage and aboveground fuel tanks.

The previous PSI report (Mitchel Hanlon, 2015) investigated AECs around the site, concluding that the contamination risks across the areas are generally low, although localised areas of concern exist across the site. A range of further investigations will be required to assess the actual degree of contamination present on site.

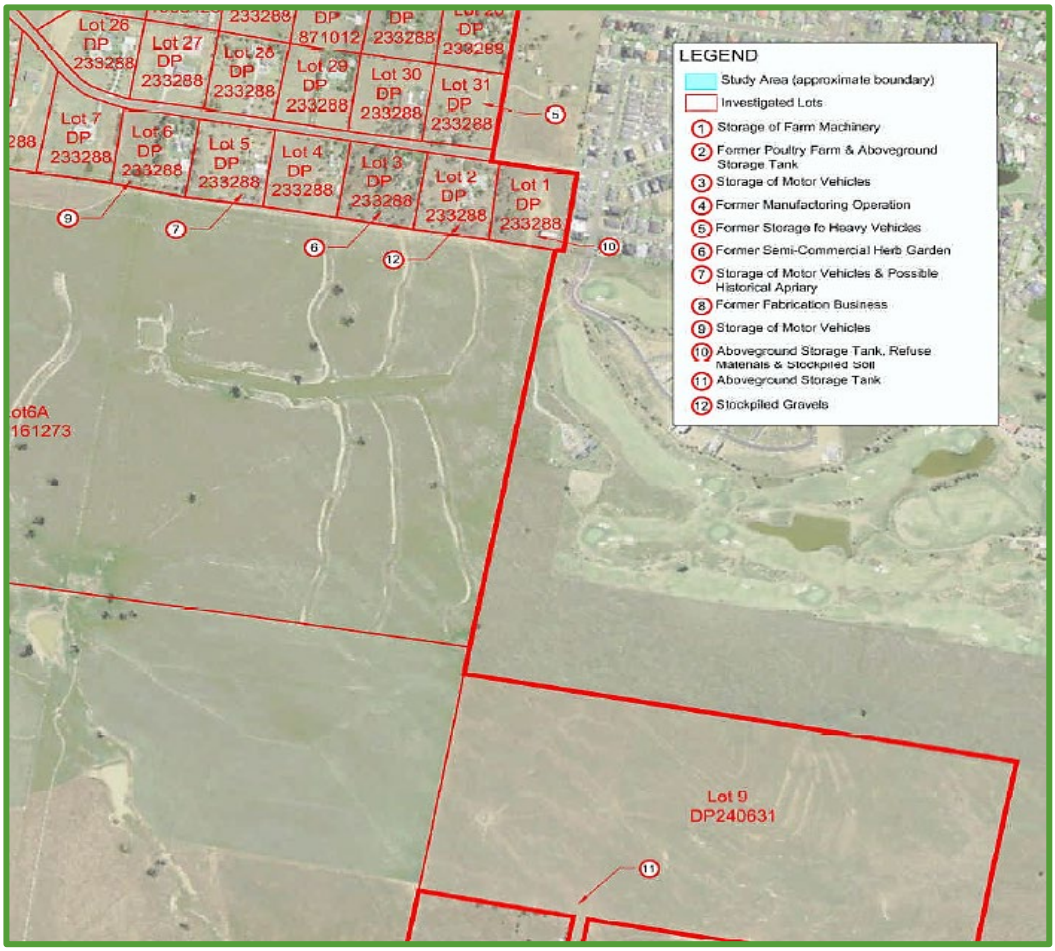


**Figure 3-4: AECs identified from the previous report.**

Based on the above desktop investigation results, this study sought to address migration of contaminants from off-site by reviewing historical photographs and systematic surface soil sampling across the northern boundary.

None of these areas in figure 3-4 above were identified as potential concerns during this study however, Site B – Lot 1 DP 233288 poses as the major AEC for this report. The other AECs identified above were also considered in this report as potential concerns. The AECs identified in this study are summarised in the Table below.

**Table 3-2: Summary of Area of Environmental Concern (AEC)**

| Potential Areas of Environmental Concern | Description of Potentially Contaminating Activity | Contaminants of Concern | Likelihood of Contamination (Based on Site History Review)[A] | Comments |
|---|---|---|---|---|
| **Site B** | Storage of chemicals on site | PAHs<br>BTEX<br>Metals<br>PCBs | Moderate | Contamination, if present, may be limited to surface, near surface and beneath the hardstand areas. |

| | | | | |
|---|---|---|---|---|
| **Site A** | Storage of chemicals in shed on site | PAHs<br>BTEX<br>Metals<br>PCBs | Low | Contamination, if present, may be limited to surface, near surface and beneath the hardstand areas. |
| **Site A** | Cattle yard, possible use of toxic chemicals on dip sites | Arsenic<br>Dieldrin<br>DDT<br>Lindane | Low | No dip sites were identified during investigation. Contamination if present, is low. |

Legend:

A Qualitative assessment of the probability of occurrence of contamination.

### 3.5 CONCEPTUAL SITE MODEL

A site model depicting the historical information can be used to inform the sampling strategy, soil sampling locations, and contamination sources. Major areas of concern for this report are the additional lot and adjoining properties with previous history around site boundaries as seen in **figure 3-4** above.

Possible onsite and off-site migrations, receptor linkages, exposure pathways, transport mechanisms and sources of contamination are the main key points to inform the conceptual site model (CSM).

The CSM for this report is represented in a diagram showing the primary and secondary sources, transport mechanism and exposed populations. See **figure 3-5** below. It is also represented using a table which includes all key points. See **Table 3-3** below.

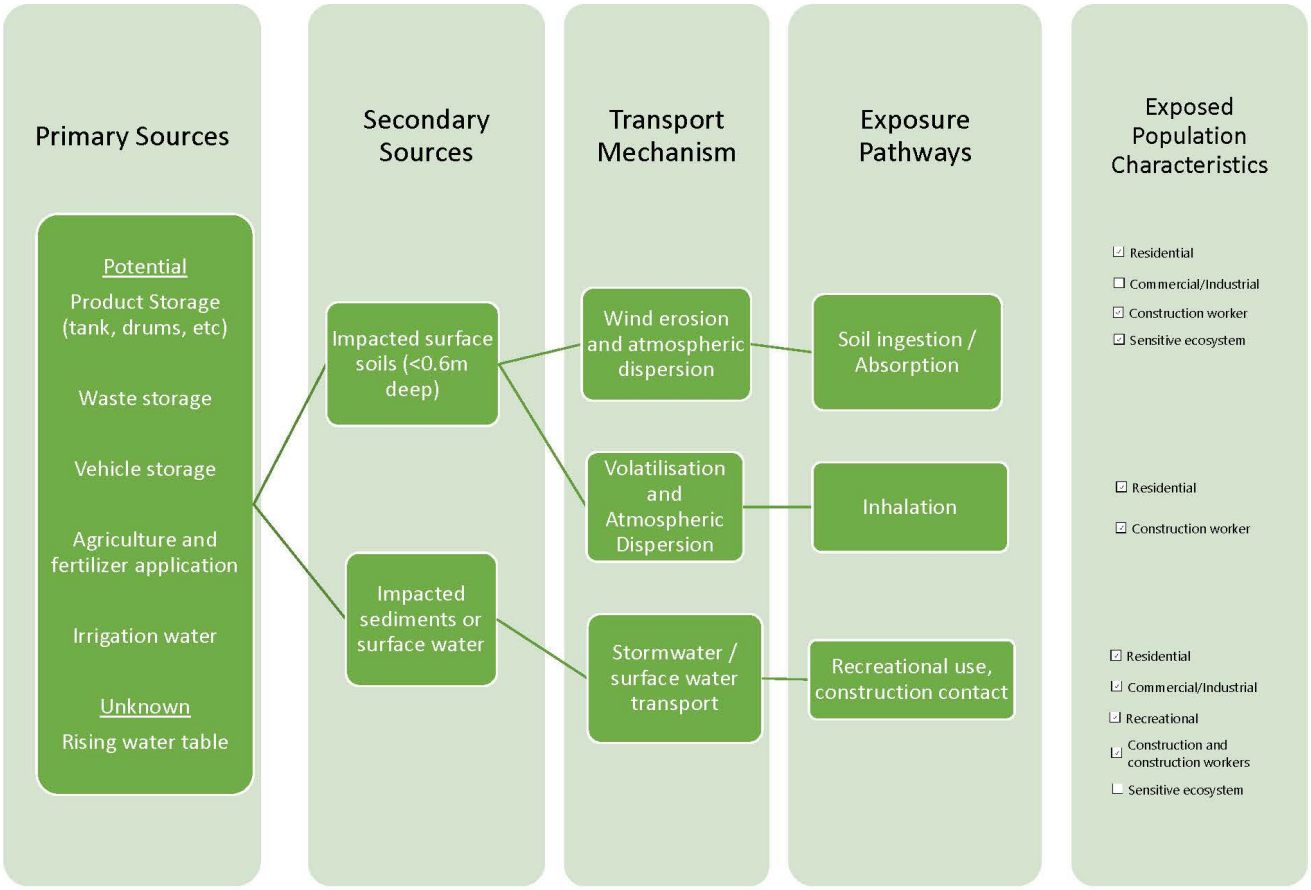


**Figure 3-5: Conceptual Site Model (CSM)**

**Table 3-3: Identification of sources considered to inform the conceptual site model.**

| Possible sources of contaminants | Contaminants of potential concern | Transport mechanism | Exposure pathway | Receptor |
|---|---|---|---|---|
| **Storage of vehicles, heavy vehicles and equipment on adjoining lots within the northern boundary of Site A** | BTEX<br>Metals<br>PAHs<br>PCBs<br>Alkalis (pH) | Groundwater<br>Surface soil erosion<br>Wind blown | Ingestion of contaminated soil and groundwater or borehole water<br>Dermal contact | Humans<br>Animals<br>Construction workers<br>Neighbours |
| **Storage of paints and chemicals on site and on additional lot** | PAHs<br>BTEX<br>Metals<br>PCBs<br>Sodium hydroxide | Groundwater<br>Surface soil erosion<br>Concrete floor runoff | Dermal contact<br>Uptake by garden plants<br>Ingestion of contaminated soil and groundwater or borehole water | Humans<br>Construction workers<br>Neighbours |
| **Storage of scrap metals on additional lot** | Metals | Surface soil erosion<br>Wind blown | Dermal contact<br>Inhalation of particles | Humans<br>Neighbours |
| **Aboveground storage tank on adjoining lot within the eastern boundary of Site A used for storage of diesel** | BTEX<br>Metals<br>OC/OP<br>PAHs | Surface soil erosion<br>Concrete floor runoff | Inhalation of gas vapours<br>Ingestion of contamination soil | Humans<br>Animals<br>Construction workers<br>Neighbours |
| **Intensive agriculture and fertilizer application** | Metals<br>OC/OP<br>Nutrients e.g., Sodium | Groundwater<br>Surface soil erosion<br>Migration of farm animals | Ingestion of contamination soil and groundwater<br>Dermal contact<br>Uptake by garden plants | Humans<br>Animals<br>Construction workers<br>Neighbours |

# 4. SAMPLING AND ANALYSIS QUALITY PLAN AND SAMPLING METHODOLOGY

## 4.1 DATA QUALITY OBJECTIVES

As stated in Section 4 of Contaminated Land Management Guidelines for the NSW Site Auditor Scheme 3rd ed[6] and ASC NEPM Schedule B2 Appendix B[7], the DQO process is a seven-step planning approach used to define the type, quantity and quality of data needed to support decisions relating to the environmental conditions of a site. The seven-step DQO process that was adopted for this assessment is provided below.

**Step 1: State the problem**.

The major problem identified for this study is the migration of contaminants from off-site and the possible presence of salinity in surface soils.

**Step 2: Identify the decision/goals of study.**

The major goal of this study is to determine the extent of contamination on the site proposed for residential subdivision against the human health investigation levels.

**Step 3: Identify Information inputs.** The primary inputs required for this assessment include:

- A review of the site history information, certificates, and aerial photographs available for the site.
- NATA accredited laboratory to undertake the analysis of soil using appropriate analytical methods.
- Outcome of quality assessment of relevant data.
- Applicable contaminated land guidelines by NSW EPA and other relevant guidelines.

**Step 4: Define the study boundaries**.

The study boundary was limited to Site A (Lots 1&2 DP 1213875) and Site B (Lot 1 DP 233288) due to the physical condition and previous study history. Sampling along the northern and eastern boundaries was targeted to be close to the fence line of the site due to these being identified as the AEC's for migration from offsite sources. One (1) surface water sample was collected from the dam which formed along Burkes gully line.

Limitations occurred for the collection of groundwater samples. There are three boreholes within 500m of the site however, none of them were accessible during the site visit on 15th November 2022.

[6] NSW EPA, 2017. Guidelines for the NSW Site Auditor Scheme 3rd ed. Accessed at: https://www.epa.nsw.gov.au/your-environment/contaminated-land/site-auditor-scheme
[7] ASC NEPM 1999. Schedule B2 Volume 3. Accessed at: https://www.legislation.gov.au/Details/F2013C00288/Html/Volume_3

**Step 5: Develop the decision rule.**

If the concentrations of CoCs are reported to be below the adopted guidelines for residential purposes, no further investigation is warranted for the site. If the concentration of the CoCs is reported to be above the adopted guidelines, further investigation is warranted for the site.

**Step 6: Specify the performance or acceptance criteria.**

Decision errors for this assessment may occur from sample collection methods and sample analysis method. QA/QC samples were collected during the site investigation and were analysed by a second NATA accredited laboratories. Based on the results and the closeness of data to the assessment criteria, management of potential decisions errors will be established.

The null hypothesis for this assessment is that "Occurrence of salinity is higher in low areas which have received drainage waters along the gully than the rest of the site".

**Step 7: Optimise the design for obtaining data**.

Based on the previous steps of the DQO, the optimal sampling and analysis design for obtaining the required data is presented in the following section 4.2 below.

## 4.2 SAMPLING METHODOLOGY

The soil samples and surface water collected by Moss Environmental were submitted to Envirolab, Sydney and ALS Environmental for analysis. Samples collected were tested for the following contaminants:

- Polyaromatic Hydrocarbons (PAHs),
- Organochlorine/Organophosphate (OC/OP) Pesticides
- Polychlorinated Biphenyls (PCBs),
- Metals (As, Be, B, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, Se, Zn)
- Salinity
- Cations (Na)
- Acidity and Alkalinity (pH)
- Benzene, Toluene, Ethylbenzene, Xylene (BTEX)

All samples were logged onto a chain of custody before sending to a NATA-accredited laboratory. Conditions across the site varied between wet, dry gravel, clay and sandy loam material. Samples were collected with a Jarrett auger to a maximum depth of 150mm. The bore logs were digitally logged and are included in **Appendix E**. Bore logs show each soil profile at the collection depth as detailed notes were collected on-site during sampling.

The sampling plan was carried out in accordance with the ASC NEPM 1999 Schedule B2- Site Characterisation[7] and the NSW EPA Sampling design Part 1 Contaminated Land Guidelines[8]. The sampling locations were decided based on historical information, utilising a stratified sampling strategy to account for land use.

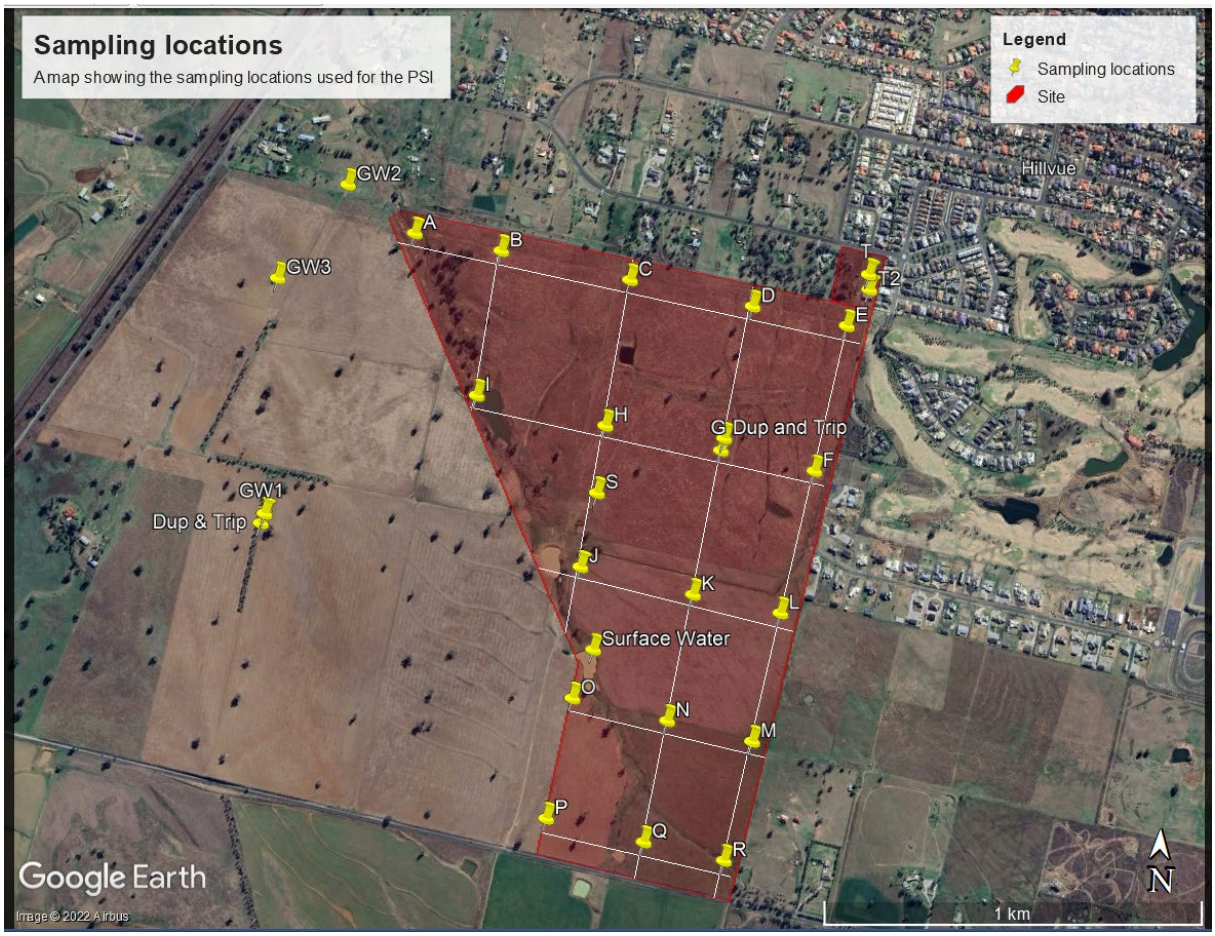


**Figure 4-1: A map showing the sampling locations used during the site investigation.**

The table shows the coordinates of the bore location which were obtained from the GPS used on the site. There is a possibility of inaccuracy due to unstable local mobile network connection on site, however, these locations are representative of bore logs.

[8] NSW EPA, 2020. Sampling Design Part 1 – Application. Contaminated Land Guidelines, Draft for Consultation. https://yoursay.epa.nsw.gov.au/sampling-design-guidelines

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**Table 4-1: Sampling Locations**

| DESCRIPTION_ | LATITUDE | LONGITUDE |
|---|---|---|
| **SP-A** | -31.1258 | 150.8921 |
| **SP-B** | -31.1263 | 150.8945 |
| **SP-C** | -31.1272 | 150.8984 |
| **SP-D** | -31.1277 | 150.9013 |
| **SP-E** | -31.128 | 150.9046 |
| **SP-F** | -31.1315 | 150.9039 |
| **SP-G** | -31.1312 | 150.9011 |
| **SP-1 & SP-2** | -31.1312 | 150.9011 |
| **SP-H** | -31.127 | 150.8986 |
| **SP-I** | -31.1339 | 150.8952 |
| **SP-J** | -31.1356 | 150.8969 |
| **SP-L** | -31.1349 | 150.9029 |
| **SP-M** | -31.138 | 150.9025 |
| **SP-N** | -31.1376 | 150.9 |
| **SP-O** | -31.1372 | 150.8973 |
| **SP-P** | -31.1402 | 150.8969 |
| **SP-Q** | -31.1407 | 150.899 |
| **SP-R** | -31.1408 | 150.9019 |
| **SP-S** | -31.1322 | 150.8978 |
| **SP-T** | -31.1272 | 150.9051 |
| **SP-T2** | -31.1258 | 150.9053 |
| **SW-1** | -31.1360 | 150.8979 |

## 4.3 QUALITY ASSURANCE/QUALITY CONTROL DATA EVALUATION

The Data Quality Indicators (DQIs) established for the standard contamination assessments are discussed below in relation to precision, accuracy, representativeness, comparability and completeness (PARCC parameters), and are shown in Table 4-2 below.

- **Precision** – measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percentage Difference (RPD) of duplicate samples.
- **Accuracy** – measures the bias in a measurement system. The accuracy of the laboratory data that is generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analysed against reference standards.
- **Representativeness** – expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterize the site to the required accuracy.
- **Comparability** – expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.

Due to the low risk and the preliminary nature of this assessment, the parameters have been simplified for this project.

### 4.3.1 FIELD QA/QC

A summary of the Data Quality Indicator (DQI) is shown in table 4-2 below.

**Table 4-2: Summary of Data Quality Indicators for Example Contamination Assessment**

| Data Quality Objective | Frequency | Data Quality Indicator |
|---|---|---|
| **Precision** | | |
| Blind duplicates (intra laboratory) | 1 / 20 samples | Refer to Table 4-3, RPD[8] |
| Split duplicates (inter laboratory) | 1/20 samples | Refer to Table 4-3, RPD[Error! Bookmark not defined.] |
| **Accuracy** | | |
| Surrogate spikes | All organic analytes | 70-130% |
| Matrix Spikes | All organic analytes | 70-130% |
| **Representativeness** | | |
| Sampling appropriate for media and analytes | All media / analytes | |
| Samples extracted and analysed within holding times | All samples | 14 days for organics, 28 days for mercury, metals 6 months |
| **Comparability** | | |

| | | |
|---|---|---|
| Standard operating procedures for sample collection & handling | All Samples | All samples |
| Standard analytical methods used for all analytes | All Samples | All samples |
| Consistent field conditions, sampling staff and laboratory analysis | All Samples | All samples |
| Limits of reporting appropriate and consistent | All Samples | All samples |
| **Completeness** | | |
| Sample description and CoCs completed and appropriate | All Samples | All samples |
| Appropriate documentation | All Samples | All samples |
| Satisfactory frequency and result for QC samples | All QA/QC samples | 95% |
| Data from critical samples is considered valid. | All Samples | Critical samples valid |

[8] $RPD(\%) = \frac{Co-Cd}{Co+Cd}\ x\ 100$

Where $C_o$ is the analyte concentration of the original sample

$C_d$ is the analyte concentration of the duplicate sample

If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgement will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

The quality assurance / quality control (QA/QC) procedures adopted during this assessment included accurate labelling and recording of all samples collected, and accurate chain of custody records. All sampling equipment was washed down between sampling locations to ensure that there was no cross contamination between samples. The field QA/QC also included preparation of blank samples such as Rinsate, blind samples, trip spikes and blanks.

### 4.3.2 LABORATORY QA/QC

The laboratories used for the QA/QC analysis are Envirolab (primary laboratory) and ALS Environmental (secondary laboratory). The samples were analysed and extracted within the recommended holding times. The analytical laboratories conducted a QA/QC program which included the analysis of a duplicate, triplicate, surrogate, spike and blanks for the analytes.

### 4.3.3 DATA EVALUATION

The data precision proposed for this assessment are an acceptable range for Relative Percent Difference (RPD) for duplicate samples. The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. These have been set as follows:

- Result >10 times Practical quantitation limits (PQL) = RPD value <= 50% are acceptable
- Result >5 times PQL = RPD value <= 75% are acceptable
- Result >2 times PQL = RPD value <= 100% are acceptable
- Result <2 times PQL then acceptable difference 2.5 times.

- The acceptable accuracy for laboratory prepared spikes is 70%-130%.

Results of analysis of duplicate samples (SP-1) was used to calculate the RPD for quality evaluation. Results of these calculations are summarized in the table below.

**Table 4-3: RPD Calculations**

| Contaminants | RPD Soil Samples SP-1 | Comment |
|---|---|---|
| Benzene | 0% | Accept |
| Toluene | 0% | Accept |
| Ethyl benzene | 0% | Accept |
| Xylene | 0% | Accept |
| TRH F1(C6-C10) | 0% | Accept |
| TRH F2(C10-C16_ | 0% | Accept |
| TRH F3 (C16-C34) | 0% | Accept |
| TRH F4(>C34) | 0% | Accept |
| PAHs (Benzo(a)pyrene) | 0% | Accept |
| OC/OP (HCB) | 0% | Accept |
| PCB | 0% | Accept |
| Heavy metals | | |
| Arsenic | 4 | Accept |
| Cadmium | 0.4 | Accept |
| Chromium | 1 | Accept |
| Copper | 1 | Accept |
| Lead | 1 | Accept |
| Mercury | 0.1 | Accept |
| Nickel | 1 | Accept |
| Zinc | 1 | Accept |

Notes: 0% represents no difference in results, both results less than level of reporting (LOR).

# 5. RESULTS

## 5.1 ASSESSMENT CRITERIA

The assessment criteria for soil at the site were adopted from the ASC NEPM, 2013 Volume 2[9], Health Investigation Levels (*HLs*) A (Low density Residential). As this is a preliminary site investigation, analytical results are indicative of potential contaminants within Sites A and B. HILs apply generally to the top 3m of the soil for residential use. Analytical results have not been used to determine the suitability of the site for its intended use, but as an indicator for the need for further investigation along with the site history.

**Table 5-1: HILs and HSLs for low density residential soil**

| Analysis | Envirolab PQL (mg/kg) | Health based Investigation Levels (HIL A)[1] (mg/kg) |
|---|---|---|
| Benzene | 0.2 | 100 |
| Toluene | 0.5 | 14000 |
| Ethylbenzene | 1 | 4500 |
| Total Xylenes | 1 | 12000 |
| PAHs | 0.05 | 300 |
| PCBs | 0.1 | 1 |
| Arsenic[2] | 4 | 100 |
| Cadmium | 0.4 | 20 |
| Chromium | 1 | 100 |
| Copper | 1 | 7000 |
| Lead[4] | 1 | 300 |
| Mercury[3] | 0.1 | 7 |
| Nickel | 1 | 400 |
| Zinc | 1 | 8000 |
| | | Ecological Investigation Level (EIL) (mg/kg) Interim Urban[5] |
| pH | | NA |
| Salinity (Sulphate)[6] | 5 | 2000 |
| Sodium | 10 | 150000 |

*Notes:*

1. *HIL A Standard residential with garden/accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry), includes children's day care centres, preschools and primary schools.*
2. *HIL for arsenic assumes 70% oral bioavailability. Site-specific bioavailability may be important and should be considered where appropriate*
3. *Elemental mercury: HIL does not address elemental mercury. A site-specific assessment should be considered if elemental mercury is present, or suspected to be present*
4. *Lead: HIL is based on blood lead models (IEUBK for HILs A, B and C and adult lead model for HIL D where 50% oral bioavailability has been considered. Site-specific bioavailability may be important and should be considered where appropriate.*
5. *Interim EILs for the urban setting are based on considerations of phytotoxicity, ANZECC B levels, and soil survey data from urban residential properties in four Australian capital cities.*
6. *For protection of built structures.*

[9] NEPC, 2013 National Environment Protection (Assessment of Site Contamination) Measure 1999 (legislation.gov.au)

## 5.2 REVIEW OF ANALYTICAL DATA

The laboratory analytical results from Envirolab and ALS Environmental have been included in **Appendix D** with a total of 22 soil samples and one surface water sample. Table 5-2 below shows the analytical results for locations which were sampled for all analytes (Heavy metals, BTEX, PAHs, PCBs, pH, Salinity and Sodium). Some of them are above the laboratory Limit of Reporting (LOR), however, they are below the investigative levels for low density residential use. Results above the LOR are in bold letters in the table below.

**Table 5-2: Analytes above the laboratory Limit of Reporting**

*NT- analysis not done

| Analyte (mg/kg) | LOR | SP-A | SP-B | SP-C | SP-D | SP-E | SP-F | SP-G | SP-H | SP-I | SP-J | SP-L | SP-M | SP-N | SP-O | SP-P | SP-Q | SP-R | SP-S | SP-T | SP-T2 | SP-1 | SP-2 | SW-1 | HIL-A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Depth (m)** | - | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | - | |
| **Benzene** | 0.2 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | <0.2 | NT | NT | NT | <0.2 | NT | NT | <0.2 | NT | NT | NT | NT | 100 |
| **Toluene** | 0.5 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | <0.5 | NT | NT | NT | <0.5 | NT | NT | <0.5 | NT | NT | NT | NT | 14000 |
| **Ethylbenzene** | 1 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | <1 | NT | NT | NT | <1 | NT | NT | <1 | NT | NT | NT | NT | 4500 |
| **Xylene** | 1 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | <1 | NT | NT | NT | <1 | NT | NT | <1 | NT | NT | NT | NT | 12000 |
| **Arsenic** | 4 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | 5 | NT | NT | NT | <4 | NT | NT | <4 | NT | NT | NT | NT | 100 |
| **Cadmium** | 0.4 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | <0.4 | NT | NT | NT | <0.4 | NT | NT | <0.4 | NT | NT | NT | NT | 20 |
| **Chromium** | 1 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | **14** | NT | NT | NT | **15** | NT | NT | **13** | NT | NT | NT | NT | 100 |
| **Copper** | 1 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | **29** | NT | NT | NT | **28** | NT | NT | **33** | NT | NT | NT | NT | 7000 |
| **Lead** | 1 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | **13** | NT | NT | NT | **9** | NT | NT | **9** | NT | NT | NT | NT | 300 |
| **Mercury** | 0.1 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | **<0.1** | NT | NT | NT | **<0.1** | NT | NT | **<0.1** | NT | NT | NT | NT | 7 |
| **Nickel** | 1 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | **15** | NT | NT | NT | **9** | NT | NT | **11** | NT | NT | NT | NT | 400 |
| **Zinc** | 1 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | **49** | NT | NT | NT | **33** | NT | NT | **44** | NT | NT | NT | NT | 8000 |
| **PAHs** | 0.05 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | <0.05 | NT | NT | NT | <0.05 | NT | NT | <0.05 | NT | NT | NT | NT | 300 |
| **PCBs** | 0.1 | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | NT | <0.1 | NT | NT | NT | <0.1 | | | <0.1 | NT | NT | NT | NT | 1 |
| **pH** | - | 7.8 | 6.7 | 6.7 | 6.0 | 6.5 | 6.9 | 6.6 | 6.5 | 6.3 | 6.2 | 6.0 | 6.2 | 6.2 | 6.5 | 6.5 | 7.1 | 7.0 | 7.3 | 7.0 | 6.2 | 6.3 | 6.3 | NT | NA |
| **Salinity** | 5 | **150** | **74** | **100** | **1300** | **71** | **150** | **85** | **71** | **71** | **260** | **130** | **110** | **110** | **170** | **290** | **100** | **76** | **250** | **100** | **120** | **95** | **47** | 0.08 | 2000 |
| **Sodium** | 10 | **180** | **60** | **80** | **100** | **60** | **100** | **90** | **60** | **100** | **110** | **70** | **110** | **70** | **70** | **90** | **90** | **110** | **80** | **90** | **60** | **80** | <10 | NT | 150000 |

As seen in table 5-2 above, three locations exceeded the laboratory Limit of Reporting of some heavy metals at SP-M, SP-Q and SP-T. However, they are well below the HILs for human health for a low residential use and are of no concern for this investigation.

The lowest pH level across the site is 6.8 pH units with the highest level being 7.8 pH units at SP-A location. The lowest sodium level across site is 60mg/kg while the highest is 180mg/kg at the same location SP-A. A low pH (less than 5) is detrimental to plant growth, not because of the acidity itself, but because of imbalances in nutrient levels. A pH greater than 8 indicates possible high levels of exchangeable sodium or magnesium, and therefore a tendency for the clay to disperse (producing poor soil structure).

Due to the spike in sodium and pH levels for location SP-A at the north-western corner of site along the gully line, the soils can be described as sodic however, according to Bui 2017[10], sodic soils refer to the presence of sodium in a soil and they have a pH higher than 8.5 and an exchangeable sodium percentage of higher than 15% (150000mg/kg). This is because sodic soils are alkaline soils and may be caused by seasonal and structural stability, as a result of leaching with dilute rain, irrigation or weathering. The sample collection was carried out a day after heavy rainfall of 51mm as mentioned in Section 2.5 of this report, hence, the slightly raised levels of sodium and pH along the location of the gully line. pH levels between 5-8 are considered normal for a low-density residential scenario including plant growth.[12]

Salinity was higher at the SP-D location with a value of 1300mg/kg. Other locations are between 47-290mg/kg. All salinity values are reportedly below the HIL salinity criteria for human health of 2000mg/kg in a low residential density scenario.

As with human health, high salinity affects plant growth as it causes the plants to dry up due to the high salt content. To calculate the trigger value for salinity in plants, the estimated salinity from the laboratory result is converted to ECe. ECe is the estimated electrical conductivity of the extract from a saturated soil paste, derived from the EC 1:5 measure and adjusted for the soil texture class. EC 1:5 is the electrical conductivity of a suspension of one part air-dry soil by weight to five parts water by weight, as for pH (water). ECe is the preferred method of estimating soil salinity because it best reflects how salinity will affect plant growth. This will help identify the salinity class of the site for revegetation or gardening purposes.[11]

Table 5-4 below was derived by converting estimated salinity (mg/kg) to ECe using the process below[12]:

- Converting the laboratory estimated salinity mg/kg result to EC 1:5 dS/m, by multiplying the values by 0.00031.
- EC 1:5 was then converted to ECe by multiplying with a conversion factor of 9 based on the dominant soil type of Clay Loam.

[10] Bui, E. Causes of Soil Salinization, Sodification, and Alkalinization. *Oxford Research Encyclopedia of Environmental Science.* Retrieved 11 Dec. 2022, from https://oxfordre.com/environmentalscience/view/10.1093/acrefore/9780199389414.001.0001/acrefore-9780199389414-e-264.
[11] Measuring soil salinity, DPI Western Australia, 2022. Accessed at Measuring soil salinity | Agriculture and Food
[12] Chemical tests, Chapter D3, NSW DPI. Chemical tests (nsw.gov.au)

- The result in ds/m unit was multiplied by 100 which equals values in mS/m to enable proper interpretation of results.

The salinity classes and trigger value used to interpret the results are as follows:

**Table 5-3: Salinity classes and trigger value for plant absorption**

| Salinity classes | ECe for all soil type (mS/m) |
|---|---|
| **Non-saline** | <200 |
| **Slightly saline** | 200-400 |
| **Moderately** | 400-800 |
| **Highly** | 800-1600 |
| **Severely** | 1600-3200 |
| **Extremely** | >3200 |

Using the above information, table 5-4 shows the salinity classes for each location across the site. Location SP-D falls under a slightly saline class. The health criteria for salinity in a low residential density scenario is 2000mg/kg which equals 558mS/m.

**Table 5-4: Estimated salinity conversion to calculate plant absorption values**

| Sampling location | Estimated Salinity (mg/kg) | ECe (mS/m) | Salinity classes |
|---|---|---|---|
| **SP-A** | 150 | 41.85 | Non- Saline |
| **SP-B** | 74 | 20.646 | Non- Saline |
| **SP-C** | 100 | 27.9 | Non- Saline |
| **SP-D** | 1300 | **362.7** | **Slightly saline** |
| **SP-E** | 71 | 19.809 | Non- Saline |
| **SP-F** | 150 | 41.85 | Non- Saline |
| **SP-G** | 85 | 23.715 | Non- Saline |
| **SP-H** | 71 | 19.809 | Non- Saline |
| **SP-I** | 71 | 19.809 | Non- Saline |
| **SP-J** | 260 | 72.54 | Non- Saline |

| | | | |
|---|---|---|---|
| **SP-L** | 130 | 36.27 | Non- Saline |
| **SP-M** | 110 | 30.69 | Non- Saline |
| **SP-N** | 110 | 30.69 | Non- Saline |
| **SP-O** | 170 | 47.43 | Non- Saline |
| **SP-P** | 290 | 80.91 | Non- Saline |
| **SP-Q** | 100 | 27.9 | Non- Saline |
| **SP-R** | 76 | 21.204 | Non- Saline |
| **SP-S** | 250 | 69.75 | Non- Saline |
| **SP-T** | 100 | 27.9 | Non- Saline |
| **SP-T2** | 120 | 33.48 | Non- Saline |
| **SP-1** | 95 | 26.505 | Non- Saline |
| **SP-2** | 47 | 13.113 | Non- Saline |

Salinity also has effects on building materials e.g. concrete because the salt crystals will exert physical pressure on building materials surrounding it.[13] The slightly saline level seems to be localised to SP-D along the northern boundary and is not a cause for concern as this may be attributed to soil erosion from the rainfall event.

There were no exceedances of criteria for contaminants from a human health perspective for the specific proposed land use (low density residential) of 558mS/m. It can be concluded that there is no occurrence of salinity or acid sulphate soil from the topsoil sampling on the Site. Contamination potential is therefore described as low for the site.

[13] Al-Adili, A. and Sabs, M., 2019. Effect of salty soil on subsurface concrete strength. *International Journal of Civil Engineering and Technology (IJCIET*, *10*(1), pp.2556-2565.

# 6. CONCLUSIONS

## 6.1 CONCLUSION

The results of the PSI indicate that the surroundings of the site have a mixed history of residential use, farming, heavy and light vehicle storage and workshops, while Site A has only an history of farming and grazing. Surrounding lots also have a history of above tank storage locations which poses the likelihood of offsite migration to Site A.

Based on the site history review, surrounding site history and visual observation carried out for this report, Moss Environmental concludes the following for this PSI report:

- The site was used for grazing and farming since the 1960s and it is still being currently used for farming.
- There is evidence of a structured shed and water tank on site from the aerial imagery and was found on site during the site investigation.
- Surrounding lots have a history of above tank storage locations which poses the likelihood of offsite migration to the subject site of this report. However, the potential is regarded as low.
- There is Burkes Gully across the site boundary and due to the slope of site, will serve as a collection point for sediments.
- Salinity is recorded to occur over a distance of 500m from the eastern boundary of the site.
- The additional lot currently has chemical storage, lot of scraps and abandoned materials on site.
- There are no notices of contamination with the council or the EPA available for the Site or surroundings.
- There is no evidence of oil spills or stains on the site as site is highly vegetated.
- There is no evidence of old rubbish tips on site.
- No groundwater investigation has been conducted for the site of the surrounding areas.

Based on the limited soil and surface water assessment and laboratory analytical results, the following conclusions are drawn:

- The site does not currently require the remediation of the identified CoCs, and no further investigation is required at this time.
- The topsoils of all locations around the site are below the assessment criteria and are therefore at low risk of contamination to human health.
- All analytes (BTEX, PAHs, PCB, OC/OP, Salinity, pH, Sodium) are below the health investigative levels for topsoils.
- Slightly elevated sodium and pH levels at SP-A sample location do not present issues with soil suitability. This is attributed to the rainy event before soil sampling and possible topsoil erosion from neighbouring lots where irrigation may have taken place.
- There is a very low risk of further soil and groundwater contamination at the site.

### 6.2 RECOMMENDATIONS

Based on the above conclusions, Moss Environmental recommends the following to ensure complete suitability for the proposed land use:

- Any soils requiring removal from the site, as part of future site works, should be classified in accordance with the "Waste Classification Guidelines, Part 1: Classifying Waste" NSW EPA (2014).
- A site specific 'Unexpected Finds Protocol' is to be made available for reference for all occupants and/or site workers in the event unanticipated contamination is discovered.

### 6.3 LIMITATIONS

This report sets out the findings of a Preliminary Site Investigation by Moss Environmental. A detailed site assessment is not warranted at this stage.

This report should be read in full, and no executive summary, conclusion or other section of the report may be used or relied on in isolation or taken as representative of the report as a whole. No responsibility is accepted by Moss Environmental, and any duty of care that would or may arise but for this statement is excluded, in relation to any use of any part of this report other than on this basis.

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The works undertaken by Moss Environmental are based solely on the scope of works, as agreed by the Client (Scope of Works). No other investigations, sampling, monitoring works or reporting will be carried out other than as expressly provided in the Scope of Works. A COPY OF THE SCOPE OF WORKS IS AVAILABLE ON REQUEST.

The conclusions stated in this report are based solely on the information, Scope of Works, analysis and data that are stated or expressly referred to in this report.

To the extent that the information and data relied upon to prepare this report have been conveyed to Moss Environmental by the Client or third parties orally or in the form of documents, Moss Environmental has assumed that the information and data are completely accurate and has not sought independently to verify the accuracy of the information or data. Moss Environmental assumes no responsibility or duty of care in respect of any errors or omissions in the information or data provided to it.

Moss Environmental assumes no responsibility in respect of any changes in the condition of the Site which have occurred since the time when Moss Environmental gathered data and/or took samples from the Site on its site inspections dated 15/11/2022 and 16/11/2022.

Moss Environmental has not investigated any off-site conditions, including the extent if any to which substances in the Site may be emanating off Site, and if so whether any adjoining sites have been or may be impacted by contamination originating from the Site.

Moss Environmental has prepared this report with the diligence, care and skill which a reasonable person would expect from a reputable environmental consultancy and in accordance with environmental regulatory authority and industry standards, guidelines and assessment criteria applicable as at the date of this report. Industry standards and environmental criteria change frequently and may change at any time after the date of this report.

## 7. REFERENCE LIST

Al-Adili, A. and Sabs, M., 2019. Effect of salty soil on subsurface concrete strength. *International Journal of Civil Engineering and Technology (IJCIET*, *10*(1), pp.2556-2565.

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## 8. APPENDICES

# APPENDIX A – LOT SEARCH RESULT

# LOTSEARCH

## LOTSEARCH ENVIRO PROFESSIONAL

**Date: 03 Nov 2022 14:09:01**

**Reference: LS037612 EP**

**Address: Burgmanns Lane Warral, Tamworth, NSW 2340**

# Dataset Listing

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

| Dataset Name | Custodian | Supply Date | Currency Date | Update Frequency | Dataset Buffer (m) | No. Features On-site | No. Features within 100m | No. Features within Buffer |
|---|---|---|---|---|---|---|---|---|
| Cadastre Boundaries | NSW Department of Customer Service - Spatial Services | 05/10/2022 | 05/10/2022 | Quarterly | - | - | - | - |
| Topographic Data | NSW Department of Customer Service - Spatial Services | 22/08/2022 | 22/08/2022 | Annually | - | - | - | - |
| List of NSW contaminated sites notified to EPA | Environment Protection Authority | 04/10/2022 | 12/09/2022 | Monthly | 1000m | 0 | 0 | 0 |
| Contaminated Land Records of Notice | Environment Protection Authority | 31/10/2022 | 31/10/2022 | Monthly | 1000m | 0 | 0 | 0 |
| Former Gasworks | Environment Protection Authority | 02/09/2022 | 14/07/2021 | Quarterly | 1000m | 0 | 0 | 0 |
| National Waste Management Facilities Database | Geoscience Australia | 26/05/2022 | 07/03/2017 | Annually | 1000m | 0 | 0 | 0 |
| National Liquid Fuel Facilities | Geoscience Australia | 23/08/2022 | 13/07/2012 | Annually | 1000m | 0 | 0 | 0 |
| EPA PFAS Investigation Program | Environment Protection Authority | 04/10/2022 | 23/09/2021 | Monthly | 2000m | 0 | 0 | 0 |
| Defence PFAS Investigation & Management Program - Investigation Sites | Department of Defence | 06/10/2022 | 06/10/2022 | Monthly | 2000m | 0 | 0 | 0 |
| Defence PFAS Investigation & Management Program - Management Sites | Department of Defence | 06/10/2022 | 06/10/2022 | Monthly | 2000m | 0 | 0 | 0 |
| Airservices Australia National PFAS Management Program | Airservices Australia | 06/10/2022 | 06/10/2022 | Monthly | 2000m | 0 | 0 | 0 |
| Defence 3 Year Regional Contamination Investigation Program | Department of Defence | 02/09/2022 | 02/09/2022 | Quarterly | 2000m | 0 | 0 | 0 |
| EPA Other Sites with Contamination Issues | Environment Protection Authority | 16/02/2022 | 13/12/2018 | Annually | 1000m | 0 | 0 | 0 |
| Licensed Activities under the POEO Act 1997 | Environment Protection Authority | 31/10/2022 | 31/10/2022 | Monthly | 1000m | 0 | 0 | 1 |
| Delicensed POEO Activities still regulated by the EPA | Environment Protection Authority | 31/10/2022 | 31/10/2022 | Monthly | 1000m | 0 | 0 | 0 |
| Former POEO Licensed Activities now revoked or surrendered | Environment Protection Authority | 31/10/2022 | 31/10/2022 | Monthly | 1000m | 3 | 3 | 3 |
| UBD Business Directories (Premise & Intersection Matches) | Hardie Grant | | | Not required | 150m | 0 | 0 | 0 |
| UBD Business Directories (Road & Area Matches) | Hardie Grant | | | Not required | 150m | - | 0 | 1 |
| UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches) | Hardie Grant | | | Not required | 500m | 0 | 0 | 0 |
| UBD Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches) | Hardie Grant | | | Not required | 500m | - | 0 | 0 |
| Points of Interest | NSW Department of Customer Service - Spatial Services | 19/10/2022 | 19/10/2022 | Quarterly | 1000m | 0 | 0 | 15 |
| Tanks (Areas) | NSW Department of Customer Service - Spatial Services | 19/10/2022 | 19/10/2022 | Quarterly | 1000m | 0 | 0 | 0 |
| Tanks (Points) | NSW Department of Customer Service - Spatial Services | 19/10/2022 | 19/10/2022 | Quarterly | 1000m | 1 | 1 | 1 |
| Major Easements | NSW Department of Customer Service - Spatial Services | 29/08/2022 | 29/08/2022 | Quarterly | 1000m | 5 | 6 | 22 |
| State Forest | Forestry Corporation of NSW | 16/08/2022 | 14/08/2022 | Annually | 1000m | 0 | 0 | 0 |
| NSW National Parks and Wildlife Service Reserves | NSW Office of Environment & Heritage | 10/02/2022 | 31/12/2021 | Annually | 1000m | 0 | 0 | 0 |
| Hydrogeology Map of Australia | Commonwealth of Australia (Geoscience Australia) | 29/08/2022 | 19/08/2019 | Annually | 1000m | 2 | 2 | 2 |
| Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018 | NSW Department of Planning, Industry and Environment | 28/03/2022 | 23/02/2018 | Annually | 1000m | 0 | 0 | 0 |
| National Groundwater Information System (NGIS) Boreholes | Bureau of Meteorology; Water NSW | 24/01/2022 | 24/01/2022 | Annually | 2000m | 0 | 5 | 192 |

| Dataset Name | Custodian | Supply Date | Currency Date | Update Frequency | Dataset Buffer (m) | No. Features On-site | No. Features within 100m | No. Features within Buffer |
|---|---|---|---|---|---|---|---|---|
| NSW Seamless Geology Single Layer: Rock Units | Department of Regional NSW | 17/02/2022 | 01/05/2021 | Annually | 1000m | 1 | 1 | 3 |
| NSW Seamless Geology – Single Layer: Trendlines | Department of Regional NSW | 17/02/2022 | 01/05/2021 | Annually | 1000m | 0 | 0 | 0 |
| NSW Seamless Geology – Single Layer: Geological Boundaries and Faults | Department of Regional NSW | 17/02/2022 | 01/05/2021 | Annually | 1000m | 0 | 0 | 0 |
| Naturally Occurring Asbestos Potential | NSW Dept. of Industry, Resources & Energy | 04/12/2015 | 24/09/2015 | Unknown | 1000m | 0 | 0 | 0 |
| Atlas of Australian Soils | Australian Bureau of Agriculture and Resource Economics and Sciences (ABARES) | 19/05/2017 | 17/02/2011 | As required | 1000m | 1 | 1 | 2 |
| Soil Landscapes of Central and Eastern NSW | NSW Department of Planning, Industry and Environment | 18/08/2022 | 27/07/2020 | Annually | 1000m | 1 | 1 | 3 |
| Environmental Planning Instrument Acid Sulfate Soils | NSW Department of Planning, Industry and Environment | 11/10/2022 | 02/09/2022 | Monthly | 500m | 0 | - | - |
| Atlas of Australian Acid Sulfate Soils | CSIRO | 19/01/2017 | 21/02/2013 | As required | 1000m | 1 | 1 | 1 |
| Dryland Salinity - National Assessment | National Land and Water Resources Audit | 18/07/2014 | 12/05/2013 | None planned | 1000m | 0 | 0 | 0 |
| Mining Subsidence Districts | NSW Department of Customer Service - Subsidence Advisory NSW | 19/08/2021 | 05/08/2021 | Quarterly | 1000m | 0 | 0 | 0 |
| Current Mining Titles | NSW Department of Industry | 06/10/2022 | 06/10/2022 | Monthly | 1000m | 0 | 0 | 0 |
| Mining Title Applications | NSW Department of Industry | 06/10/2022 | 06/10/2022 | Monthly | 1000m | 0 | 0 | 0 |
| Historic Mining Titles | NSW Department of Industry | 06/10/2022 | 06/10/2022 | Monthly | 1000m | 2 | 2 | 2 |
| Environmental Planning Instrument SEPP State Significant Precincts | NSW Department of Planning, Industry and Environment | 15/11/2021 | 07/12/2018 | Monthly | 1000m | 0 | 0 | 0 |
| Environmental Planning Instrument Land Zoning | NSW Department of Planning, Industry and Environment | 15/11/2021 | 05/11/2021 | Monthly | 1000m | 2 | 7 | 21 |
| Commonwealth Heritage List | Australian Government Department of the Agriculture, Water and the Environment | 03/06/2022 | 13/04/2022 | Annually | 1000m | 0 | 0 | 0 |
| National Heritage List | Australian Government Department of the Agriculture, Water and the Environment | 03/06/2022 | 13/04/2022 | Annually | 1000m | 0 | 0 | 0 |
| State Heritage Register - Curtilages | NSW Department of Planning, Industry and Environment | 18/10/2022 | 01/07/2022 | Quarterly | 1000m | 0 | 0 | 0 |
| Environmental Planning Instrument Local Heritage | NSW Department of Planning, Industry and Environment | 11/10/2022 | 30/09/2022 | Monthly | 1000m | 0 | 0 | 0 |
| Bush Fire Prone Land | NSW Rural Fire Service | 01/11/2022 | 19/09/2022 | Weekly | 1000m | 2 | 2 | 2 |
| Ramsar Wetlands of Australia | Australian Government Department of Agriculture, Water and the Environment | 28/03/2022 | 19/03/2020 | Annually | 1000m | 0 | 0 | 0 |
| Groundwater Dependent Ecosystems | Bureau of Meteorology | 28/10/2022 | 26/10/2022 | Annually | 1000m | 0 | 0 | 0 |
| Inflow Dependent Ecosystems Likelihood | Bureau of Meteorology | 28/10/2022 | 26/10/2022 | Annually | 1000m | 0 | 0 | 0 |
| NSW BioNet Species Sightings | NSW Office of Environment & Heritage | 24/10/2022 | 24/10/2022 | Weekly | 10000m | - | - | - |

# Site Diagram

**Burgmanns Lane Warral, Tamworth, NSW 2340**


**Legend**

- Site Boundary
- Internal Parcel Boundaries

**Total Area:** 1.2km²

**Total Perimeter:** 5.22km

Disclaimers:

Measurements are approximate only and may have been simplified or smaller lengths removed for readability.

Parcels that make up a small percentage of the total site area have not been labelled for increased legibility.

Scale:

0 25 50 100 150 200 250
Meters

Data Source Aerial Imagery:
© Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 03 November 2022

# Contaminated Land

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## List of NSW contaminated sites notified to EPA

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

| Map Id | Site | Address | Suburb | Activity | Management Class | Status | Location Confidence | Dist | Direction |
|---|---|---|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | | | | |

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

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

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

Contaminated Land Records of Notice Data Source: Environment Protection Authority

Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm

## Former Gasworks

Former Gasworks within the dataset buffer:

| Map Id | Location | Council | Further Info | Location Confidence | Distance | Direction |
|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | |

Former Gasworks Data Source: Environment Protection Authority

# Waste Management & Liquid Fuel Facilities

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## National Waste Management Site Database

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

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



## National Liquid Fuel Facilities

National Liquid Fuel Facilties within the dataset buffer:

| Map Id | Owner | Name | Address | Suburb | Class | Operational Status | Operator | Revision Date | Loc Conf | Dist | Direction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | | | | | | |

# PFAS Investigation & Management Programs

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## EPA PFAS Investigation Program

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

| Map ID | Site | Address | Loc Conf | Dist | Dir |
|---|---|---|---|---|---|
| N/A | No records in buffer | | | | |

EPA PFAS Investigation Program: Environment Protection Authority


## Defence PFAS Investigation Program

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

| Map ID | Base Name | Address | Loc Conf | Dist | Dir |
|---|---|---|---|---|---|
| N/A | No records in buffer | | | | |

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

## Defence PFAS Management Program

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

| Map ID | Base Name | Address | Loc Conf | Dist | Dir |
|---|---|---|---|---|---|
| N/A | No records in buffer | | | | |

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

## Airservices Australia National PFAS Management Program

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

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

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

# Defence Sites

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Defence 3 Year Regional Contamination Investigation Program

Sites which have been assessed as part of the Defence 3 Year Regional Contamination Investigation Program within the dataset buffer:

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

Defence 3 Year Regional Contamination Investigation Program, Data Custodian: Department of Defence, Australian Government

# EPA Other Sites with Contamination Issues

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## EPA Other Sites with Contamination Issues

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

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

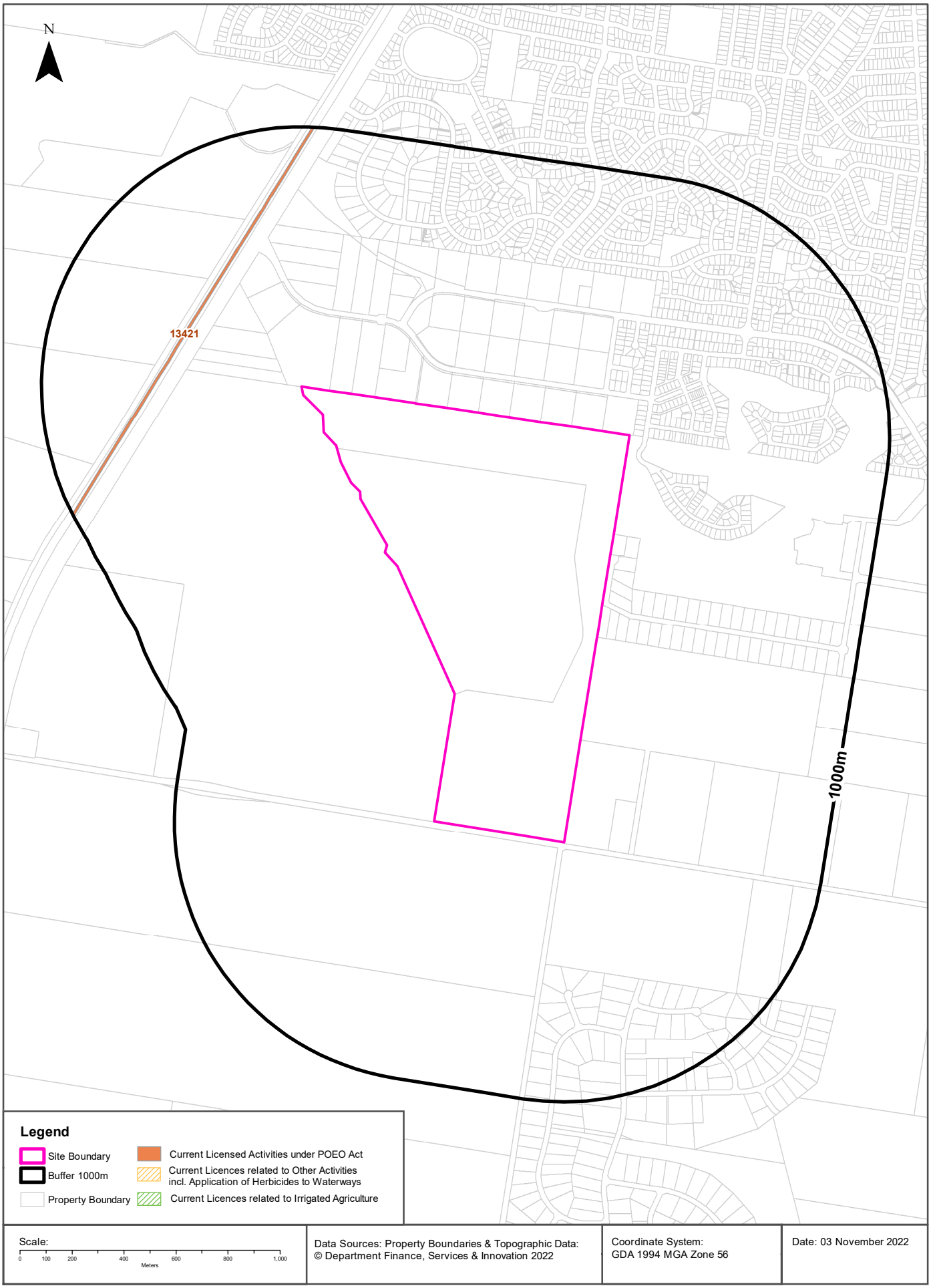
Sites within the dataset buffer:

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

EPA Other Sites with Contamination Issues: Environment Protection Authority

# Current EPA Licensed Activities

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# EPA Activities

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Licensed Activities under the POEO Act 1997

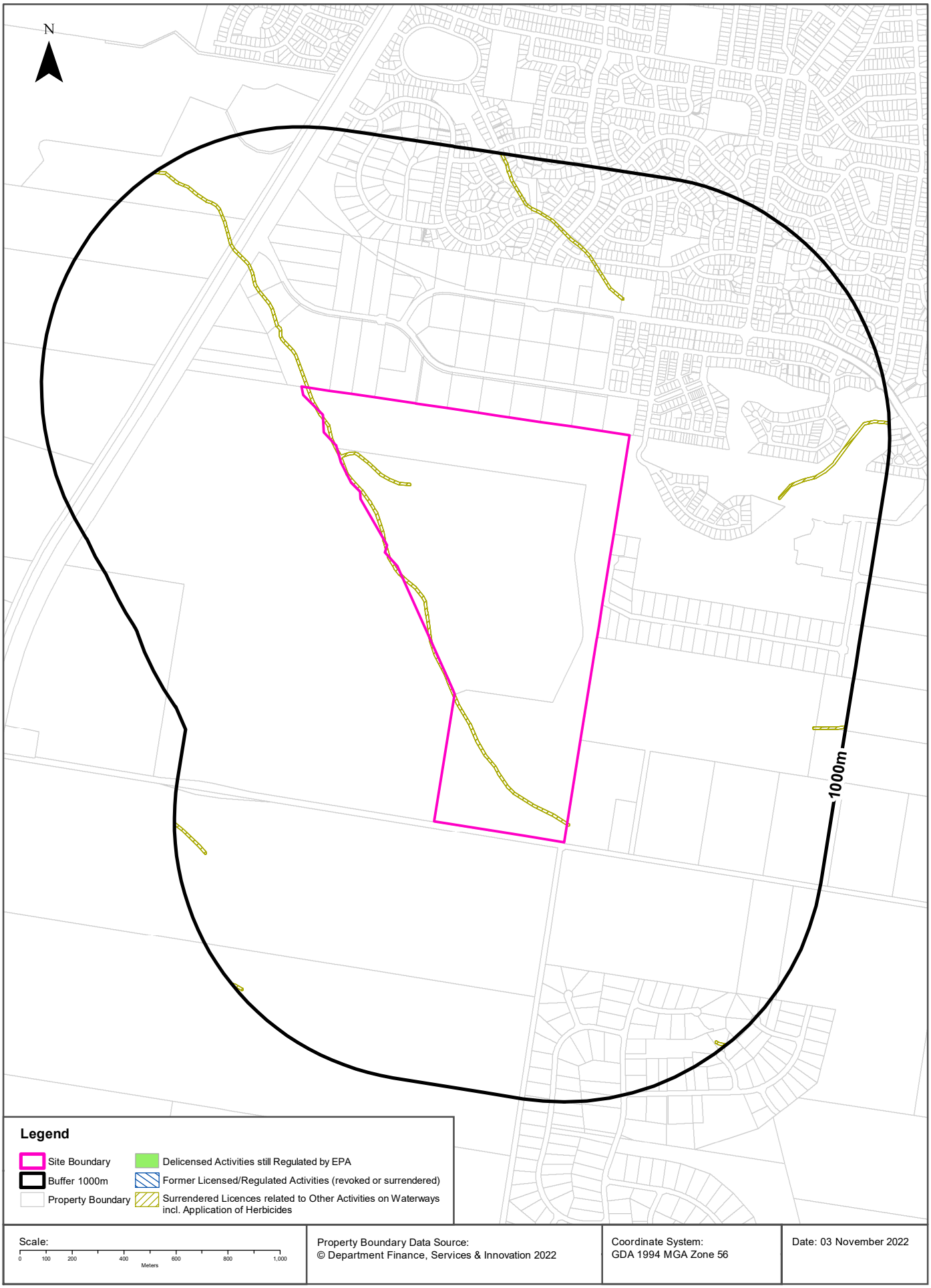
Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

| EPL | Organisation | Name | Address | Suburb | Activity | Loc Conf | Distance | Direction |
|---|---|---|---|---|---|---|---|---|
| 13421 | UGL REGIONAL LINX PTY LTD | | COUNTRY REGIONAL NETWORK, ORANGE, NSW 2800 | | Railway systems activities | Network of Features | 484m | North West |

POEO Licence Data Source: Environment Protection Authority

# Delicensed & Former Licensed EPA Activities

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# EPA Activities

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Delicensed Activities still regulated by the EPA

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

| Licence No | Organisation | Name | Address | Suburb | Activity | Loc Conf | Distance | Direction |
|---|---|---|---|---|---|---|---|---|
| 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

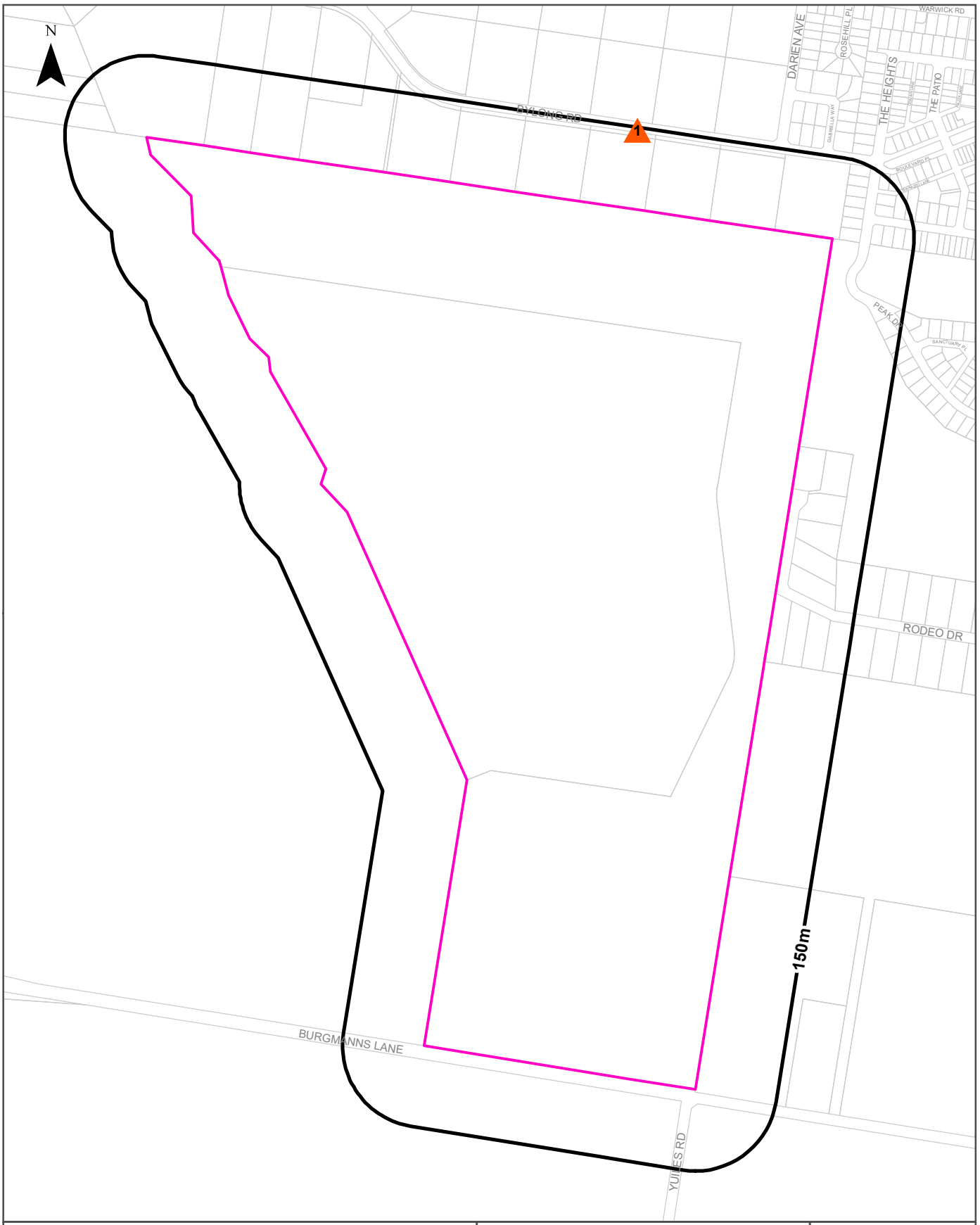
Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

| Licence No | Organisation | Location | Status | Issued Date | Activity | Loc Conf | Distance | Direction |
|---|---|---|---|---|---|---|---|---|
| 4653 | LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD | WATERWAYS THROUGHOUT NSW | Surrendered | 06/09/2000 | Other Activities / Non Scheduled Activity - Application of Herbicides | Network of Features | 0m | On-site |
| 4838 | Robert Orchard | Various Waterways throughout New South Wales - SYDNEY NSW 2000 | Surrendered | 07/09/2000 | Other Activities / Non Scheduled Activity - Application of Herbicides | Network of Features | 0m | On-site |
| 6630 | SYDNEY WEED & PEST MANAGEMENT PTY LTD | WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148 | Surrendered | 09/11/2000 | Other Activities / Non Scheduled Activity - Application of Herbicides | Network of Features | 0m | On-site |

Former Licensed Activities Data Source: Environment Protection Authority

# Historical Business Directories

**Burgmanns Lane Warral, Tamworth, NSW 2340**




**Legend**

- Site Boundary
- Buffer 150m
- Property Boundary
- Business directory records mapped to a specific premise
- Business directory records mapped to a road intersection
- Business directory records mapped to a road corridor
- Business directory records mapped to a general area

Scale: 0 130 260 390 520 Meters

Coordinate System: GDA 1994 MGA Zone 56

Date: 03 November 2022

Data Sources: Reproduced with permission of UBD and Hardie Grant Media Pty Ltd DD 01/08/2018

# Historical Business Directories

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Business Directory Records 1950-1991
## Premise or Road Intersection Matches

Universal Business Directory records from years 1991, 1982, 1970, 1961 & 1950, mapped to a premise or road intersection within the dataset buffer:

| Map Id | Business Activity | Premise | Ref No. | Year | Location Confidence | Distance to Property Boundary or Road Intersection | Direction |
|---|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | | |

## Business Directory Records 1950-1991
## Road or Area Matches

Universal Business Directory records from years 1991, 1982, 1970, 1961 & 1950, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

| Map Id | Business Activity | Premise | Ref No. | Year | Location Confidence | Distance to Road Corridor or Area |
|---|---|---|---|---|---|---|
| 1 | CARRIERS &/OR CARTAGE CONTRACTORS. | Hook J., Bylong Rd, Tamworth | 211259 | 1991 | Road Match | 140m |

# Historical Business Directories

**Burgmanns Lane Warral, Tamworth, NSW 2340**

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

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

| Map Id | Business Activity | Premise | Ref No. | Year | Location Confidence | Distance to Property Boundary or Road Intersection | Direction |
|---|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | | |

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

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

| Map Id | Business Activity | Premise | Ref No. | Year | Location Confidence | Distance to Road Corridor or Area |
|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | |

# Aerial Imagery 2022

**Burgmanns Lane Warral, Tamworth, NSW 2340**


| Scale: | Data Source Aerial Imagery: | Coordinate System: | Date: 03 November 2022 |
|---|---|---|---|
| 0 110 220 330 440 Meters | © Aerometrex Pty Ltd | GDA 1994 MGA Zone 56 | |

# Aerial Imagery 2017

**Burgmanns Lane Warral, Tamworth, NSW 2340**


| Scale: | Data Source Aerial Imagery: | Coordinate System: | Date: 03 November 2022 |
|---|---|---|---|
| 0 110 220 330 440 Meters | © Aerometrex Pty Ltd | GDA 1994 MGA Zone 56 | |

# Aerial Imagery 2012

**Burgmanns Lane Warral, Tamworth, NSW 2340**


Scale:
0 110 220 330 440
Meters

Data Source Aerial Imagery: © 2022 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.

Coordinate System:
GDA 1994 MGA Zone 56

Date: 03 November 2022

# Aerial Imagery 1998

**Burgmanns Lane Warral, Tamworth, NSW 2340**

# Aerial Imagery 1993

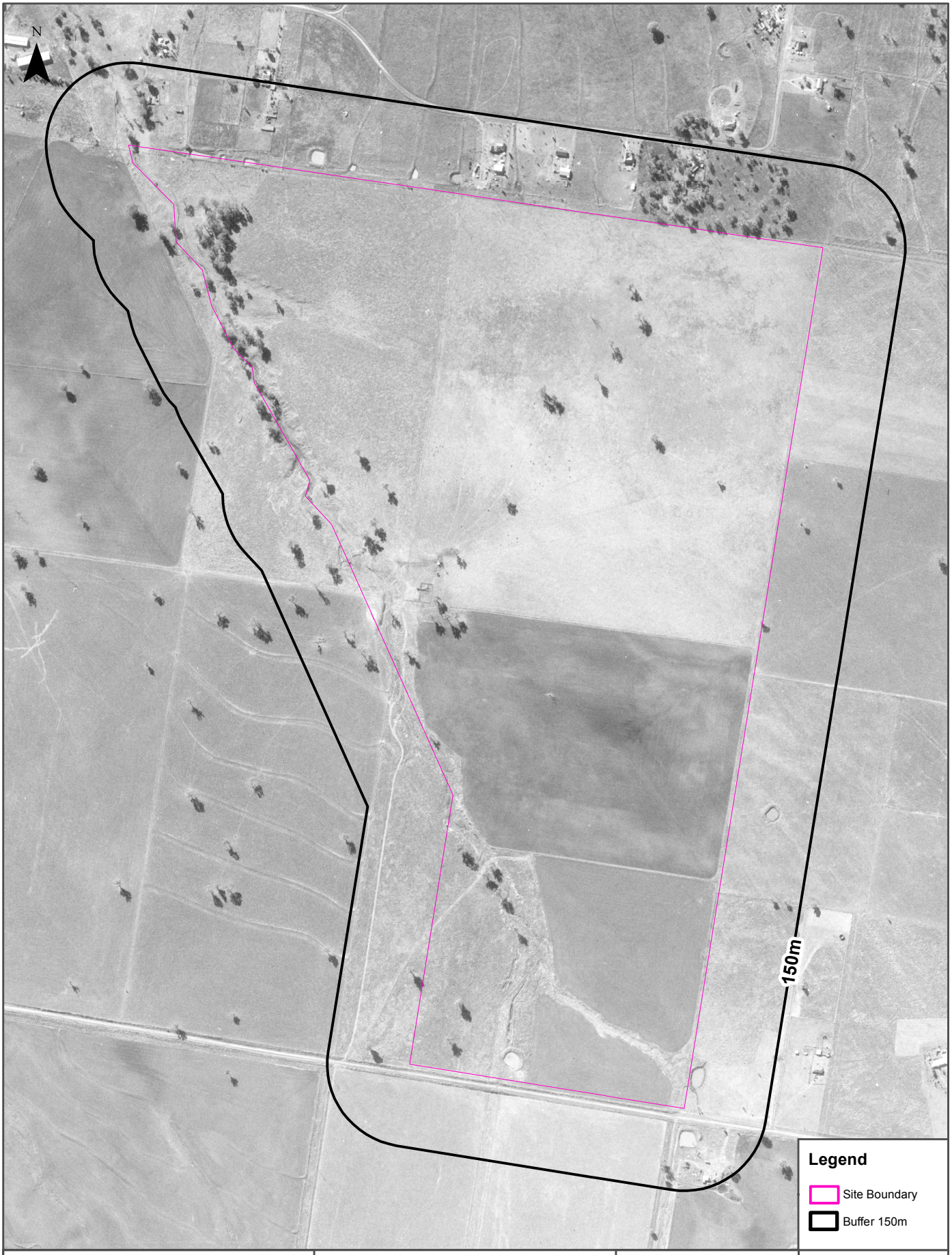
**Burgmanns Lane Warral, Tamworth, NSW 2340**

# Aerial Imagery 1989

**Burgmanns Lane Warral, Tamworth, NSW 2340**

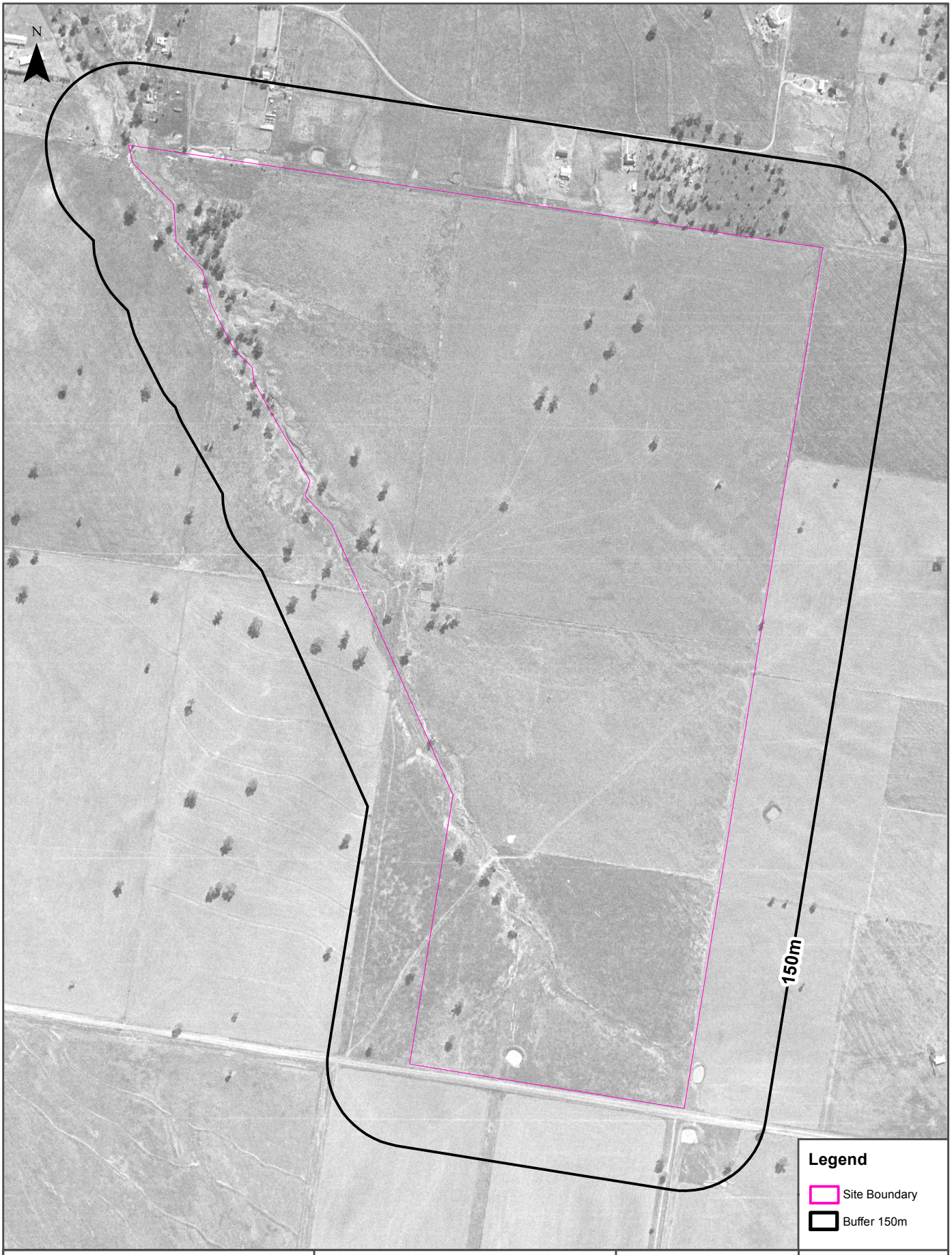
# Aerial Imagery 1984

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# Aerial Imagery 1976

**Burgmanns Lane Warral, Tamworth, NSW 2340**



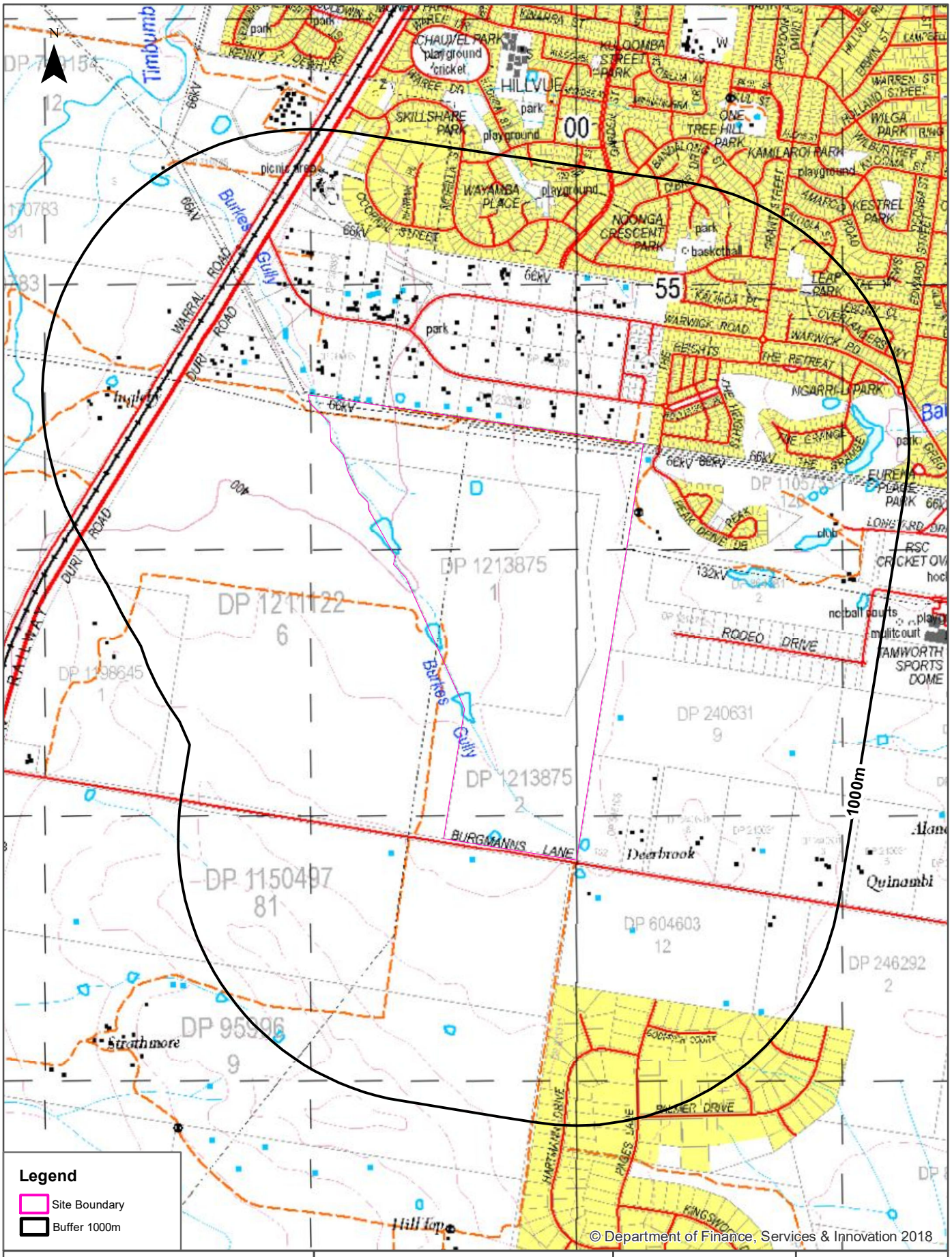
# Aerial Imagery 1965

**Burgmanns Lane Warral, Tamworth, NSW 2340**


| Scale: | Data Source Aerial Imagery: | Coordinate System: | Date: 03 November, 2022 |
|---|---|---|---|
| 0 110 220 330 440 Meters | © NSW Department of Customer Service | GDA 1994 MGA Zone 56 | |

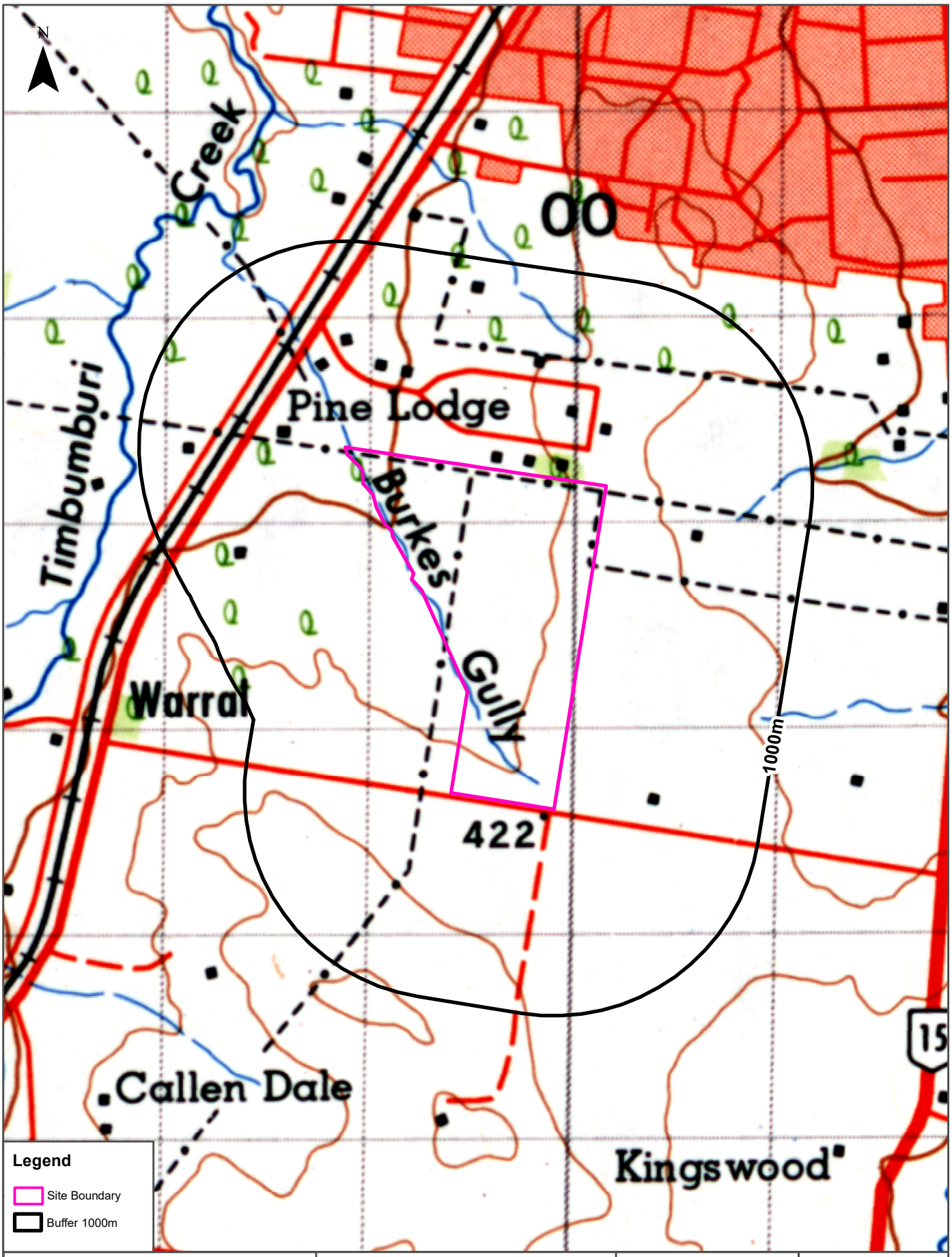
# Topographic Map 2015

**Burgmanns Lane Warral, Tamworth, NSW 2340**



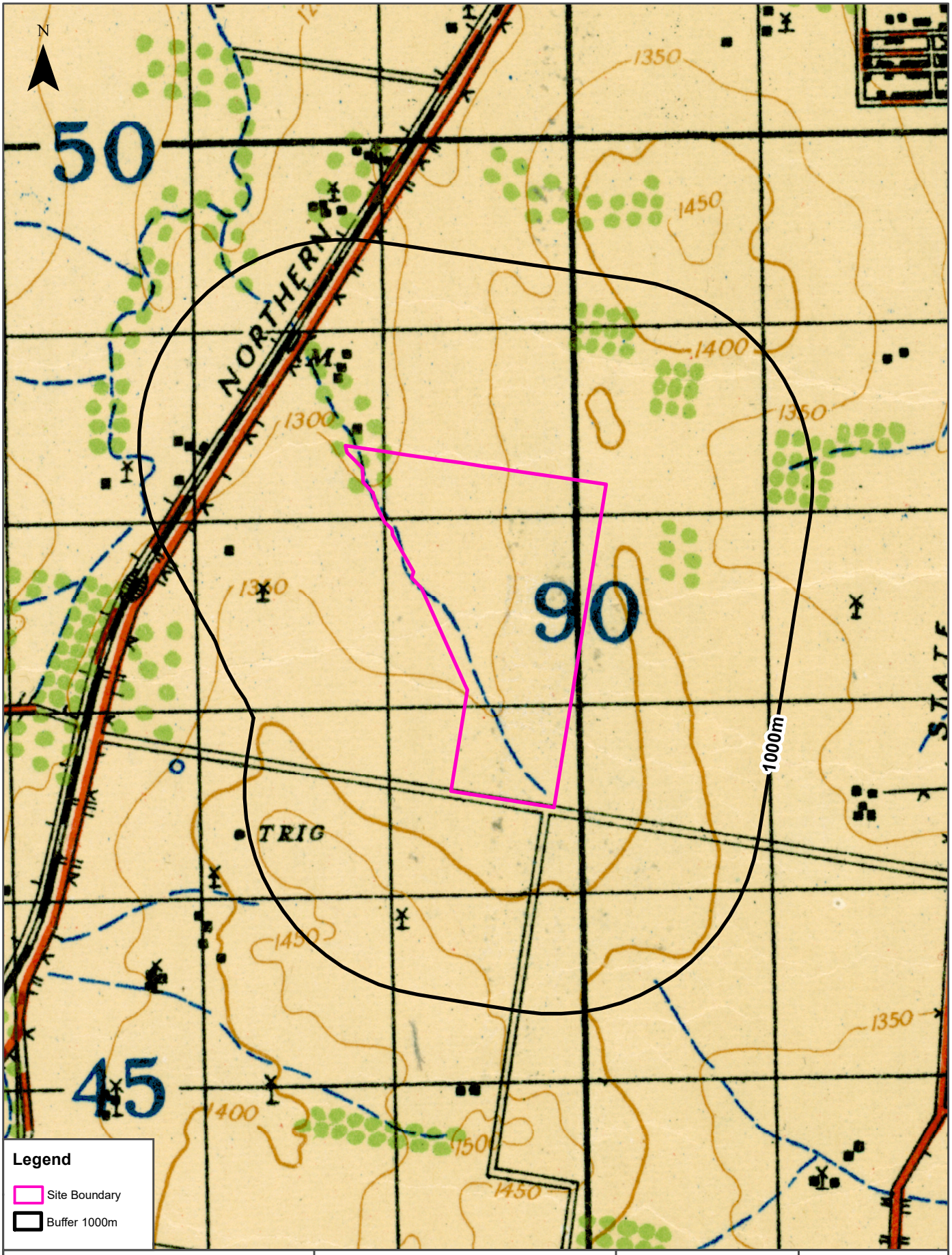
# Historical Map 1975

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# Historical Map c.1942

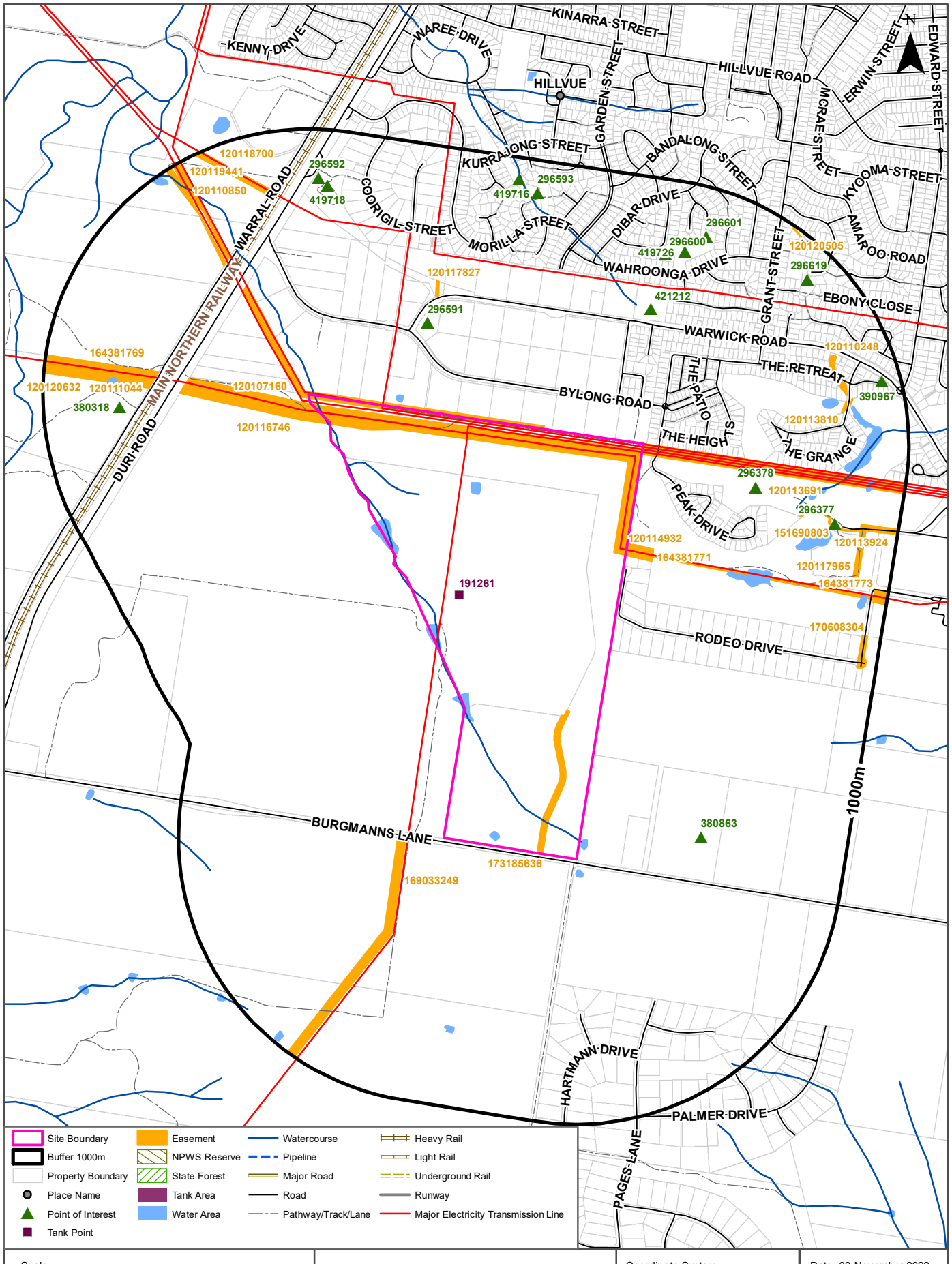
**Burgmanns Lane Warral, Tamworth, NSW 2340**




| | | | |
|---|---|---|---|
| Scale: 0 200 400 800 Meters | Data Sources: Australia 1:63360<br>Produced by Australian Section Imperial General Staff | Coordinate System:<br>GDA 1994 MGA Zone 56 | Date: 03 November 2022 |

# Topographic Features

**Burgmanns Lane Warral, Tamworth, NSW 2340**




Scale: 0 100 200 400 600 800 1,000 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 03 November 2022

# Topographic Features

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Points of Interest

What Points of Interest exist within the dataset buffer?

| Map Id | Feature Type | Label | Distance | Direction |
|---|---|---|---|---|
| 296591 | Park | Park | 332m | North |
| 296378 | Golf Course | LONGYARD GOLF COURSE | 444m | North East |
| 380863 | Homestead | DEERBROOK | 450m | South East |
| 421212 | Retirement Village | OAK TREE RETIREMENT VILLAGE TAMWORTH | 507m | North East |
| 380318 | Homestead | INGLEBY | 712m | North West |
| 296600 | Park | NOONGA CRESCENT PARK | 719m | North East |
| 419726 | Sports Court | BASKETBALL | 742m | North East |
| 296377 | Club | LONGYARD GOLF CLUB | 760m | East |
| 419718 | Park | PLAYGROUND | 790m | North West |
| 296601 | Park | Park | 816m | North East |
| 296592 | Picnic Area | TAMWORTH LIONS PARK | 817m | North West |
| 296619 | Park | LEAP PARK | 874m | North East |
| 296593 | Park | PLAYGROUND | 878m | North |
| 419716 | Park | WAYAMBA PLACE | 918m | North |
| 390967 | Park | NGARRI-LI PARK | 929m | North East |

# Topographic Features

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Tanks (Areas)

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

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

## Tanks (Points)

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

| Map Id | Tank Type | Status | Name | Feature Currency | Distance | Direction |
|---|---|---|---|---|---|---|
| 191261 | Water | Operational | | 28/06/2017 | 0m | On-site |



## Major Easements

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

| Map Id | Easement Class | Easement Type | Easement Width | Distance | Direction |
|---|---|---|---|---|---|
| 173185636 | Primary | Right of way | 10m,20m | 0m | On-site |
| 120107160 | Primary | Undefined | | 0m | On-site |
| 164381771 | Primary | Electricity | 45&var | 0m | On-site |
| 120114932 | Primary | Undefined | | 0m | On-site |
| 120116746 | Primary | Undefined | | 0m | On-site |
| 120113691 | Primary | Undefined | | 0m | North East |
| 169033249 | Primary | Electricity | 30m | 144m | South |
| 120117827 | Primary | Undefined | | 436m | North |
| 120111044 | Primary | Undefined | | 571m | North West |
| 164381769 | Primary | Electricity | 45&var | 571m | North West |
| 120110850 | Primary | Undefined | | 580m | North West |
| 120120632 | Primary | Undefined | | 582m | North West |
| 120119441 | Primary | Undefined | | 590m | North West |
| 151690803 | Primary | Right of way | | 627m | East |

| Map Id | Easement Class | Easement Type | Easement Width | Distance | Direction |
|---|---|---|---|---|---|
| 120110248 | Primary | Undefined | | 755m | North East |
| 120113810 | Primary | Undefined | | 757m | North East |
| 120118700 | Primary | Undefined | | 766m | North West |
| 120117965 | Primary | Undefined | | 860m | East |
| 120113924 | Primary | Undefined | | 880m | East |
| 170608304 | Primary | Right of way | 20m and VAR | 929m | East |
| 164381773 | Primary | Electricity | 45&var | 949m | East |
| 120120505 | Primary | Undefined | | 981m | North East |

# Topographic Features

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## State Forest

What State Forest exist within the dataset buffer?

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



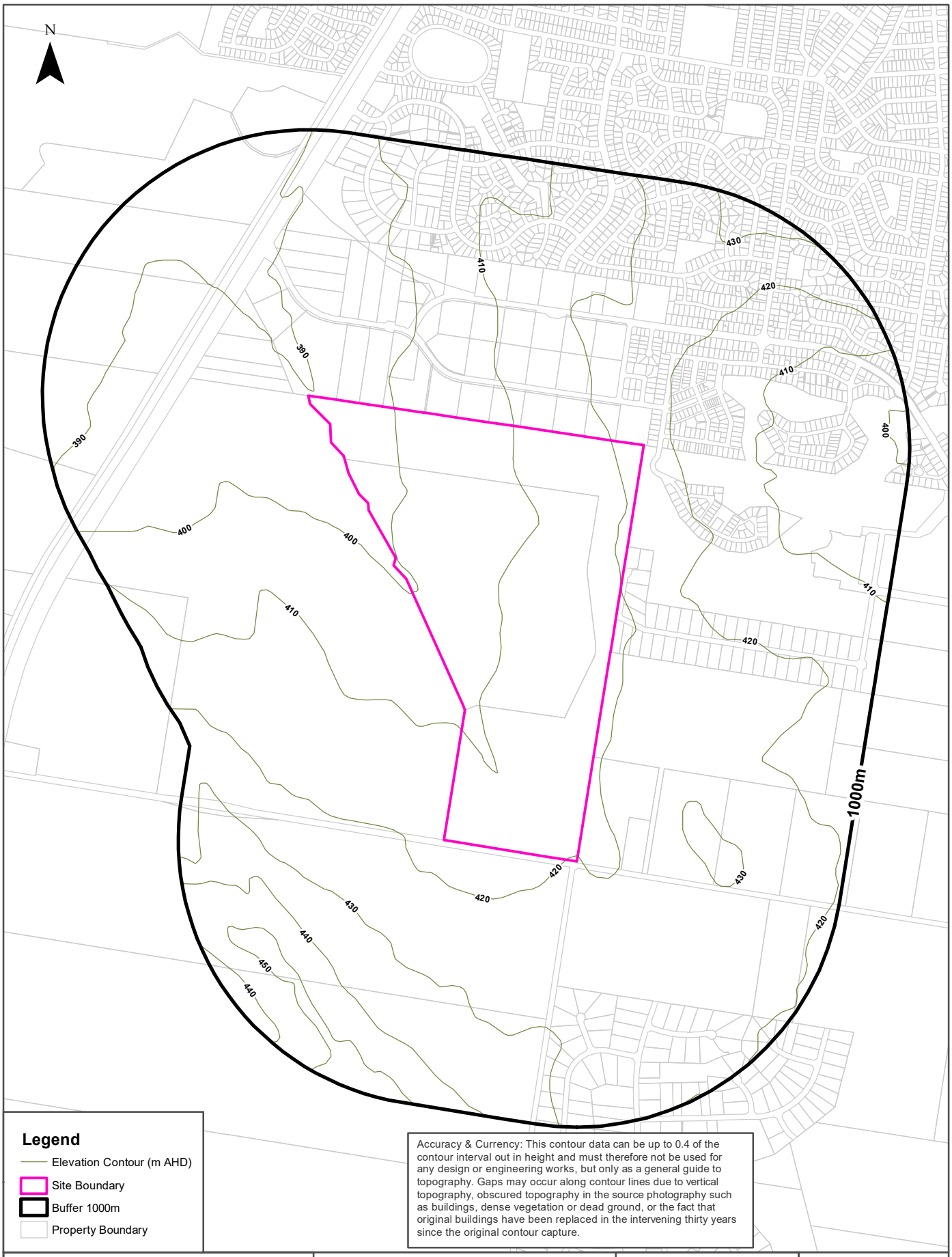
## National Parks and Wildlife Service Reserves

What NPWS Reserves exist within the dataset buffer?

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

# Elevation Contours (m AHD)

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# Hydrogeology & Groundwater

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Hydrogeology

Description of aquifers within the dataset buffer:

| Description | Distance | Direction |
|---|---|---|
| Porous, extensive highly productive aquifers | 0m | On-site |
| Fractured or fissured, extensive aquifers of low to moderate productivity | 0m | On-site |

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


## Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018

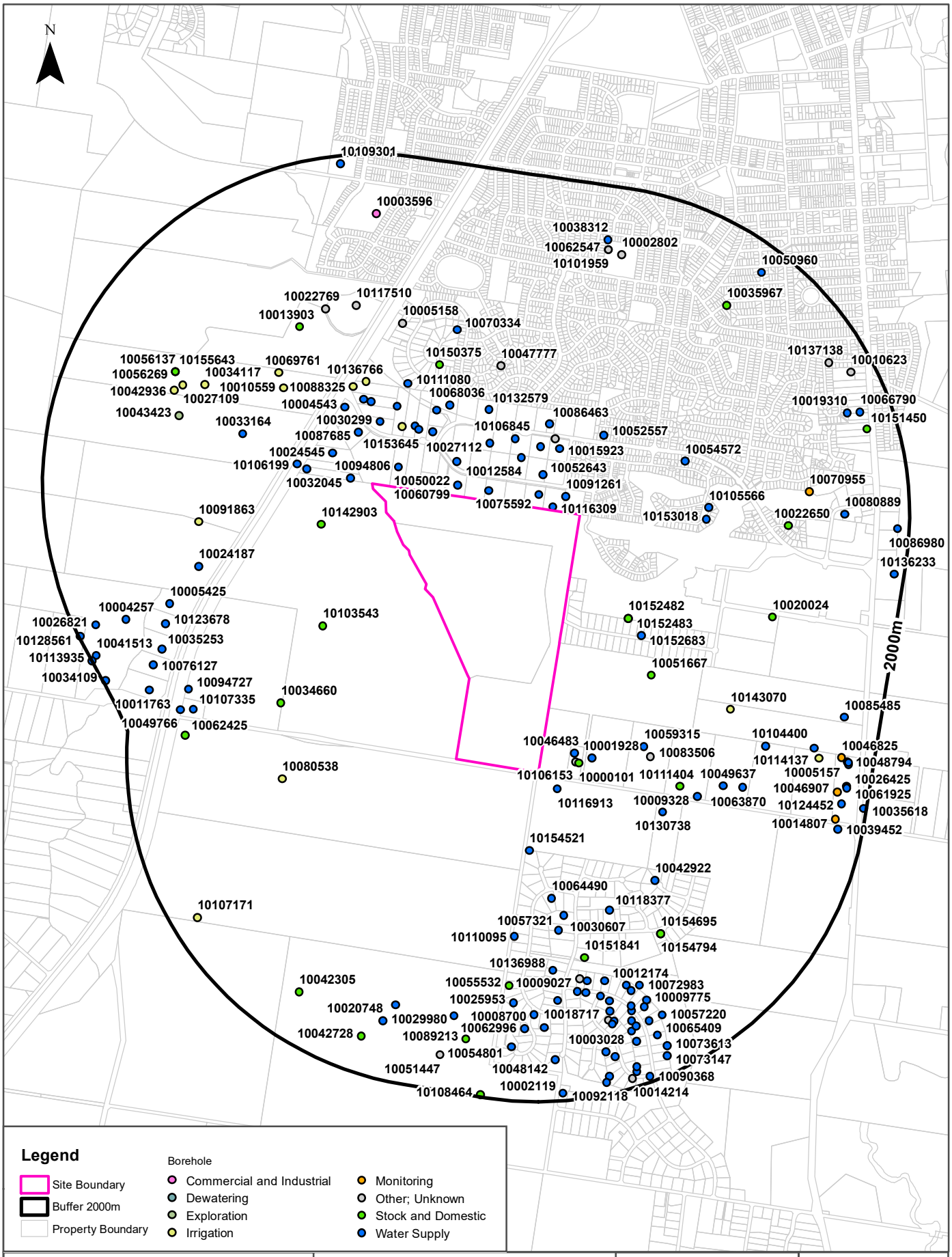
Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

| Prohibition Area No. | Prohibition | Distance | Direction |
|---|---|---|---|
| N/A | No records in buffer | | |

Temporary Water Restriction (Botany Sands Groundwater Source) Order 2018 Data Source : NSW Department of Primary Industries

# Groundwater Boreholes

**Burgmanns Lane Warral, Tamworth, NSW 2340**




**Legend**

Site Boundary
Buffer 2000m
Property Boundary

Borehole

- Commercial and Industrial
- Dewatering
- Exploration
- Irrigation
- Monitoring
- Other; Unknown
- Stock and Domestic
- Water Supply

Scale: 0 100 200 400 600 800 1,000 1,200 1,400 1,600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 03 November 2022

# Hydrogeology & Groundwater

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Groundwater Boreholes

Boreholes within the dataset buffer:

| NGIS Bore ID | NSW Bore ID | Bore Type | Status | Drill Date | Bore Depth (m) | Reference Elevation | Height Datum | Salinity (mg/L) | Yield (L/s) | SWL (mbgl) | Distance | Direction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10116309 | GW969695 | Water Supply | Functioning | 07/07/1991 | 48.70 | | AHD | | 0.600 | | 19m | North East |
| 10095536 | GW052883 | Water Supply | Unknown | 01/03/1980 | 24.30 | | AHD | | | | 60m | North |
| 10060799 | GW965284 | Water Supply | Unknown | 05/10/2001 | 61.00 | | AHD | | 0.640 | 7.00 | 65m | North |
| 10075592 | GW052811 | Water Supply | Unknown | 01/01/1981 | 68.30 | | AHD | | | | 80m | North |
| 10091261 | GW900606 | Water Supply | Unknown | 06/02/1996 | 79.20 | | AHD | | | | 93m | North East |
| 10050022 | GW012680 | Water Supply | Unknown | 01/10/1955 | 30.48 | | AHD | | | | 122m | North West |
| 10094806 | GW016468 | Water Supply | Unknown | 01/01/1955 | 28.30 | | AHD | Good | | | 132m | North West |
| 10116913 | GW056032 | Water Supply | Unknown | 01/09/1982 | 28.00 | | AHD | | | | 154m | South |
| 10046483 | GW902547 | Water Supply | Unknown | 01/06/1998 | 97.56 | | AHD | | 0.180 | 19.00 | 197m | South East |
| 10052643 | GW070730 | Water Supply | Unknown | 04/12/1992 | 56.40 | 420.00 | AHD | | | | 206m | North |
| 10087651 | GW966018 | Water Supply | Unknown | 09/09/2003 | 73.10 | | AHD | | 0.500 | 16.70 | 208m | North |
| 10106153 | GW070613 | Unknown | Abandoned | 15/03/1993 | 71.00 | | AHD | | | | 215m | South East |
| 10000101 | GW045909 | Stock and Domestic | Functioning | 01/03/1977 | 23.00 | | AHD | Good | | | 234m | South East |
| 10012584 | GW969497 | Water Supply | Functioning | 11/10/2007 | 42.70 | | AHD | | 0.380 | 7.00 | 288m | North |
| 10024545 | GW014235 | Water Supply | Unknown | 01/08/1958 | 21.00 | | AHD | Good Stock | | | 300m | North West |
| 10001928 | GW035223 | Water Supply | Unknown | 01/01/1972 | | | AHD | | | | 307m | South East |
| 10087685 | GW035323 | Water Supply | Unknown | 01/04/1973 | 27.70 | | AHD | Hard | | | 320m | North West |
| 10027112 | GW070958 | Water Supply | Unknown | 09/09/1993 | 50.30 | | AHD | | | | 346m | North |
| 10153645 | GW971373 | Water Supply | Functioning | 30/11/2015 | 121.00 | | AHD | | | | 364m | North West |
| 10113206 | GW902287 | Water Supply | Unknown | 12/02/2000 | 61.00 | | AHD | Potable | 0.500 | 12.20 | 365m | North |
| 10134316 | GW014325 | Irrigation | Unknown | 01/09/1959 | 34.10 | | AHD | 1001-3000 ppm | | | 369m | North West |
| 10096529 | GW900254 | Water Supply | Unknown | 18/11/1991 | 27.40 | | AHD | | | | 370m | North |
| 10015923 | GW056193 | Water Supply | Unknown | 01/01/1982 | 30.00 | | AHD | | | | 375m | North |
| 10030299 | GW056834 | Water Supply | Unknown | 01/01/1983 | 60.90 | | AHD | | | | 378m | North West |
| 10054643 | GW018796 | Water Supply | Unknown | 01/10/1960 | 27.40 | | AHD | | | | 382m | North West |
| 10142903 | GW024074 | Stock and Domestic | Functioning | 01/08/1965 | 36.60 | | AHD | 501-1000 ppm | | | 382m | North West |
| 10152482 | GW903384 | Stock and Domestic | Functioning | 09/08/2019 | 78.00 | | AHD | | | | 391m | East |
| 10152483 | GW903384 | Stock and Domestic | Functioning | 09/08/2019 | 78.00 | | AHD | | | | 391m | East |
| 10106845 | GW072006 | Water Supply | Unknown | 15/06/1994 | 44.20 | | AHD | | | | 395m | North |

| NGIS Bore ID | NSW Bore ID | Bore Type | Status | Drill Date | Bore Depth (m) | Reference Elevation | Height Datum | Salinity (mg/L) | Yield (L/s) | SWL (mbgl) | Distance | Direction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10032045 | GW902574 | Water Supply | Unknown | 10/06/2000 | 34.70 | | AHD | | | | 404m | North West |
| 10036215 | GW070951 | Unknown | Unknown | 15/09/1993 | | 420.00 | AHD | | | | 431m | North |
| 10106199 | GW902088 | Water Supply | Unknown | 23/12/1999 | 28.00 | | AHD | | | | 469m | North West |
| 10154521 | GW971592 | Water Supply | Functioning | 26/04/2016 | 58.50 | | AHD | | | | 479m | South |
| 10152683 | GW903693 | Water Supply | Functioning | 20/02/2020 | 96.00 | | AHD | | | | 485m | East |
| 10008562 | GW058334 | Water Supply | Unknown | 01/02/1984 | 36.50 | | AHD | | | | 486m | North West |
| 10004543 | GW043963 | Water Supply | Unknown | 01/06/1975 | 52.40 | | AHD | | | | 490m | North West |
| 10108029 | GW052043 | Water Supply | Unknown | 01/10/1980 | 54.80 | | AHD | | | | 495m | North |
| 10141884 | GW019308 | Water Supply | Unknown | 01/05/1962 | 47.90 | | AHD | 1001-3000 ppm | | | 497m | North West |
| 10052557 | GW968174 | Water Supply | Functioning | 17/04/2007 | 79.20 | | AHD | | 0.080 | 16.10 | 500m | North East |
| 10037706 | GW067688 | Water Supply | Unknown | 29/05/1989 | 79.50 | | AHD | Good | | | 511m | North West |
| 10086463 | GW068999 | Water Supply | Unknown | 26/10/1992 | 58.50 | | AHD | Good | | | 516m | North |
| 10068036 | GW965111 | Water Supply | Unknown | 11/07/2001 | 65.24 | | AHD | | 0.280 | 15.24 | 539m | North |
| 10132579 | GW902795 | Water Supply | Unknown | 24/10/1993 | 58.80 | | AHD | 500 | | 13.00 | 548m | North |
| 10051667 | GW023639 | Stock and Domestic | Unknown | 01/11/1965 | 18.30 | | AHD | Hard | | | 585m | South East |
| 10088325 | GW011439 | Irrigation | Unknown | 01/09/1955 | 68.90 | | AHD | | | | 597m | North West |
| 10059315 | GW044970 | Water Supply | Unknown | 01/06/1976 | 26.00 | | AHD | Good | | | 609m | South East |
| 10136766 | GW013794 | Irrigation | Unknown | 01/07/1957 | 30.50 | | AHD | 501-1000 ppm | | | 620m | North West |
| 10111080 | GW966730 | Water Supply | Unknown | 14/11/2003 | 220.00 | | AHD | | | 150.00 | 630m | North |
| 10103543 | GW003359 | Stock and Domestic | Unknown | 01/08/1935 | 18.60 | | AHD | Good | | | 657m | West |
| 10083506 | GW070735 | Unknown | Unknown | 25/02/1993 | 93.00 | | AHD | | | | 659m | South East |
| 10054572 | GW968128 | Water Supply | Functioning | 07/12/2006 | 47.80 | | AHD | | 16.000 | 6.00 | 716m | North East |
| 10064490 | GW966327 | Water Supply | Unknown | 10/12/2003 | 48.70 | | AHD | | 0.250 | 19.80 | 769m | South |
| 10153018 | GW903625 | Water Supply | Functioning | 10/01/2020 | 48.00 | | AHD | | | | 769m | North East |
| 10150375 | GW904193 | Stock and Domestic | Functioning | 19/02/2020 | 68.00 | | AHD | | | | 773m | North |
| 10105566 | GW968448 | Water Supply | Functioning | 05/05/2008 | 36.00 | | AHD | | 0.600 | 5.00 | 783m | North East |
| 10010559 | GW047276 | Irrigation | Removed | 01/01/1974 | 6.70 | | AHD | | | | 789m | North West |
| 10130738 | GW049802 | Water Supply | Unknown | 01/08/1979 | 27.40 | | AHD | | | | 793m | South East |
| 10047777 | GW010559 | Unknown | Unknown | 01/01/1953 | 24.40 | | AHD | | | | 822m | North |
| 10033164 | GW969397 | Water Supply | Functioning | 03/03/2010 | 25.00 | | AHD | | 0.900 | 4.80 | 838m | North West |
| 10111404 | GW070059 | Stock and Domestic | Unknown | 01/01/1992 | | | AHD | | | | 861m | South East |
| 10069761 | GW047275 | Irrigation | Removed | 01/01/1974 | 6.70 | | AHD | | | | 876m | North West |
| 10030607 | GW068848 | Water Supply | Unknown | 08/12/1990 | 50.00 | | AHD | Good | | | 882m | South |
| 10118377 | GW970815 | Water Supply | Functioning | 09/03/2014 | 41.00 | | AHD | 680 | 0.440 | 7.00 | 941m | South |
| 10042922 | GW969435 | Water Supply | Removed | 19/04/2007 | 97.50 | | AHD | | | | 965m | South East |

| NGIS Bore ID | NSW Bore ID | Bore Type | Status | Drill Date | Bore Depth (m) | Reference Elevation | Height Datum | Salinity (mg/L) | Yield (L/s) | SWL (mbgl) | Distance | Direction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10057321 | GW971048 | Water Supply | Functioning | 06/09/2014 | 70.00 | | AHD | Potable | 0.310 | 16.00 | 968m | South |
| 10009328 | GW037657 | Water Supply | Unknown | 01/08/1973 | 42.60 | | AHD | | | | 977m | South East |
| 10005158 | GW068498 | Unknown | Unknown | 01/06/1990 | 64.00 | | AHD | Good | 0.200 | 17.00 | 988m | North |
| 10070334 | GW970137 | Water Supply | Functioning | 04/11/2011 | 172.00 | | AHD | potable | 0.510 | 19.80 | 997m | North |
| 10110095 | GW971291 | Water Supply | Functioning | 02/12/2014 | 49.50 | | AHD | | 1.625 | 25.00 | 1006m | South |
| 10013903 | GW902776 | Stock and Domestic | Unknown | 29/09/1995 | 36.60 | | AHD | | 0.370 | | 1046m | North West |
| 10080538 | GW024392 | Irrigation | Unknown | 01/09/1965 | 29.30 | | AHD | | | | 1061m | South West |
| 10091863 | GW054744 | Irrigation | Proposed | 01/08/1981 | 18.20 | | AHD | | | | 1076m | West |
| 10117510 | GW059228 | Other | Unknown | 01/04/1982 | 34.70 | | AHD | 1001-3000 ppm | | | 1084m | North West |
| 10143070 | GW042841 | Irrigation | Unknown | | 17.70 | | AHD | 1001-3000 ppm | | | 1092m | South East |
| 10022769 | GW900118 | Unknown | Unknown | 29/09/1995 | 42.70 | | AHD | | 0.880 | | 1096m | North West |
| 10034660 | GW013888 | Stock and Domestic | Unknown | 01/05/1958 | 76.20 | | AHD | Stock | | | 1103m | South West |
| 10049637 | GW035739 | Water Supply | Unknown | 01/02/1973 | 36.80 | | AHD | | | | 1122m | South East |
| 10024187 | GW966256 | Water Supply | Unknown | 10/02/2004 | 16.80 | | AHD | | 2.520 | 4.00 | 1158m | West |
| 10151841 | GW904268 | Stock and Domestic | Functioning | 30/05/2019 | 30.50 | | AHD | | | | 1160m | South |
| 10034117 | GW054746 | Irrigation | Proposed | 01/08/1981 | 15.20 | | AHD | | | | 1178m | North West |
| 10136988 | GW968819 | Water Supply | Functioning | 21/09/2004 | 43.20 | | AHD | 1447 | 0.500 | 17.90 | 1206m | South |
| 10154695 | GW904014 | Stock and Domestic | Functioning | 21/03/2019 | 110.00 | | AHD | | | | 1230m | South East |
| 10154794 | GW904014 | Stock and Domestic | Functioning | 21/03/2019 | 110.00 | | AHD | | | | 1230m | South East |
| 10043423 | GW047835 | Exploration | Unknown | 01/09/1980 | 30.40 | | AHD | | | | 1239m | North West |
| 10063870 | GW967466 | Water Supply | Unknown | | | | AHD | | | | 1240m | South East |
| 10020024 | GW003362 | Stock and Domestic | Unknown | 01/08/1935 | 20.10 | | AHD | Good | | | 1254m | East |
| 10022650 | GW013346 | Stock and Domestic | Functioning | 01/01/1956 | | | AHD | | | | 1267m | East |
| 10009027 | GW067568 | Unknown | Unknown | 06/11/1989 | 48.70 | | AHD | | 0.450 | | 1278m | South |
| 10027109 | GW047836 | Irrigation | Unknown | 01/09/1980 | 30.40 | | AHD | | | | 1292m | North West |
| 10096997 | GW071940 | Water Supply | Unknown | 01/01/1982 | 27.40 | | AHD | | 0.500 | | 1303m | South |
| 10055532 | GW902819 | Stock and Domestic | Unknown | 03/04/2017 | 109.00 | | AHD | | | 0.00 | 1308m | South |
| 10042936 | GW054745 | Irrigation | Proposed | 01/08/1981 | 18.20 | | AHD | | | | 1325m | North West |
| 10018025 | GW061087 | Water Supply | Unknown | 01/05/1985 | 23.40 | | AHD | | | | 1329m | South |
| 10104400 | GW965359 | Water Supply | Unknown | 06/03/2002 | 13.70 | | AHD | | | 4.50 | 1338m | South East |
| 10061943 | GW968122 | Water Supply | Functioning | 08/03/2007 | 30.50 | | AHD | | 0.630 | 20.40 | 1352m | South |
| 10056137 | GW902873 | Stock and Domestic | Unknown | 26/05/2017 | 16.00 | | AHD | | | 0.00 | 1369m | North West |
| 10056269 | GW902884 | Stock and Domestic | Unknown | 26/05/2017 | 16.00 | | AHD | | | 0.00 | 1369m | North West |
| 10155643 | GW903873 | Stock and Domestic | Unknown | 26/05/2017 | 16.00 | | AHD | | | | 1369m | North West |
| 10071720 | GW068116 | Water Supply | Unknown | 15/01/1987 | 24.30 | | AHD | | 0.750 | 8.20 | 1370m | South |

| NGIS Bore ID | NSW Bore ID | Bore Type | Status | Drill Date | Bore Depth (m) | Reference Elevation | Height Datum | Salinity (mg/L) | Yield (L/s) | SWL (mbgl) | Distance | Direction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10018717 | GW069089 | Water Supply | Unknown | 15/02/1991 | 34.00 | | AHD | Good | | | 1392m | South |
| 10070955 | GW068658 | Monitoring | Proposed | 22/11/1991 | 44.00 | | AHD | Good | | | 1400m | East |
| 10012174 | GW063973 | Water Supply | Unknown | 01/05/1987 | 37.50 | | AHD | | | | 1401m | South |
| 10025953 | GW965102 | Water Supply | Unknown | 24/06/2000 | 114.30 | | AHD | | | | 1408m | South |
| 10018998 | GW056558 | Water Supply | Unknown | 01/11/1982 | 28.90 | | AHD | | | | 1411m | South |
| 10005425 | GW043677 | Water Supply | Unknown | 01/12/1973 | 18.90 | | AHD | | | | 1416m | West |
| 10072983 | GW062538 | Water Supply | Unknown | 01/03/1984 | 21.30 | | AHD | | | | 1432m | South |
| 10019225 | GW054888 | Water Supply | Unknown | 01/01/1981 | 34.70 | | AHD | | | | 1440m | South |
| 10126884 | GW056774 | Water Supply | Unknown | 01/11/1982 | 33.50 | | AHD | | | | 1455m | South |
| 10008700 | GW968043 | Water Supply | Functioning | 01/02/2007 | 79.20 | | AHD | | 0.220 | 27.00 | 1472m | South |
| 10123678 | GW045421 | Water Supply | Unknown | 01/12/1976 | 15.80 | | AHD | 1001-3000 ppm | | | 1498m | West |
| 10033611 | GW071956 | Water Supply | Unknown | 01/12/1990 | 53.00 | | AHD | | 0.900 | | 1514m | South |
| 10105571 | GW065553 | Water Supply | Unknown | 09/11/1988 | 49.60 | | AHD | | | | 1526m | South |
| 10009775 | GW068114 | Water Supply | Unknown | 01/01/1985 | 26.00 | | AHD | | | 19.50 | 1532m | South |
| 10029980 | GW056105 | Water Supply | Unknown | 01/05/1980 | 79.80 | | AHD | | | | 1538m | South |
| 10115997 | GW901276 | Water Supply | Unknown | 06/04/1994 | 93.00 | | AHD | | | | 1541m | South |
| 10035967 | GW011061 | Stock and Domestic | Unknown | 01/01/1954 | 46.00 | | AHD | 501-1000 ppm | | | 1549m | North East |
| 10034375 | GW966243 | Water Supply | Unknown | 09/02/2004 | 67.00 | | AHD | | 0.750 | 42.60 | 1553m | South |
| 10101681 | GW064231 | Water Supply | Unknown | 01/05/1987 | 18.90 | | AHD | | | | 1555m | South |
| 10094727 | GW902677 | Water Supply | Unknown | 28/04/1999 | 79.20 | | AHD | | | | 1556m | West |
| 10062996 | GW969222 | Water Supply | Functioning | 01/11/2006 | 90.00 | | AHD | | 0.150 | 50.00 | 1558m | South |
| 10089538 | GW901473 | Water Supply | Unknown | 01/01/1989 | 27.00 | | AHD | | | | 1563m | South |
| 10023929 | GW067555 | Unknown | Unknown | 03/05/1989 | 36.50 | | AHD | | 0.020 | 10.60 | 1565m | South |
| 10017271 | GW070035 | Water Supply | Unknown | 30/06/1988 | 23.00 | | AHD | Good | | | 1580m | South |
| 10107335 | GW048480 | Water Supply | Unknown | 01/07/1978 | 33.50 | | AHD | | | | 1583m | West |
| 10035253 | GW048398 | Water Supply | Unknown | 01/02/1978 | 15.30 | | AHD | | | | 1594m | West |
| 10002802 | GW060277 | Other | Unknown | 01/09/1985 | | | AHD | | | | 1595m | North |
| 10084195 | GW902122 | Water Supply | Unknown | 04/05/1994 | 44.00 | | AHD | | | | 1595m | South |
| 10080889 | GW013345 | Water Supply | Functioning | 01/01/1956 | | | AHD | | | | 1608m | East |
| 10062547 | GW065955 | Other | Unknown | 30/11/1989 | 101.00 | | AHD | | | | 1612m | North |
| 10101959 | GW065954 | Other | Unknown | 21/10/1991 | 95.00 | | AHD | Good | | | 1612m | North |
| 10018191 | GW056489 | Water Supply | Unknown | 01/09/1982 | 48.70 | | AHD | | | | 1613m | South |
| 10114137 | GW055344 | Water Supply | Unknown | 01/05/1981 | 22.60 | | AHD | | | | 1631m | South East |
| 10003596 | GW021645 | Commercial and Industrial | Unknown | 01/06/1964 | 22.60 | | AHD | Stock | | | 1637m | North |
| 10020748 | GW052943 | Water Supply | Unknown | 01/05/1980 | 79.80 | | AHD | | | | 1649m | South |
| 10062425 | GW043096 | Stock and Domestic | Unknown | 01/06/1974 | 26.20 | | AHD | | | | 1649m | West |
| 10072151 | GW055611 | Water Supply | Unknown | 01/10/1981 | 40.80 | | AHD | | | | 1651m | South |

| NGIS Bore ID | NSW Bore ID | Bore Type | Status | Drill Date | Bore Depth (m) | Reference Elevation | Height Datum | Salinity (mg/L) | Yield (L/s) | SWL (mbgl) | Distance | Direction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10099885 | GW056831 | Water Supply | Unknown | 01/01/1983 | 28.30 | | AHD | | | | 1651m | South |
| 10049766 | GW048484 | Water Supply | Unknown | 01/08/1978 | 30.40 | | AHD | | | | 1654m | West |
| 10057220 | GW063923 | Water Supply | Unknown | 01/01/1987 | 24.30 | | AHD | | | | 1656m | South |
| 10005157 | GW037812 | Irrigation | Unknown | | 36.20 | | AHD | | | | 1668m | South East |
| 10089213 | GW024401 | Stock and Domestic | Unknown | 01/11/1965 | 30.50 | | AHD | | | | 1670m | South |
| 10003028 | GW071934 | Water Supply | Unknown | 01/01/1985 | 39.50 | | AHD | | | | 1671m | South |
| 10038312 | GW902185 | Water Supply | Unknown | 21/10/1991 | 95.00 | | AHD | | | | 1673m | North |
| 10054801 | GW967990 | Water Supply | Abandoned | 26/02/2007 | 91.40 | | AHD | | | | 1677m | South |
| 10076127 | GW049805 | Water Supply | Unknown | 01/02/1978 | 12.80 | | AHD | | | | 1682m | West |
| 10004257 | GW043678 | Water Supply | Proposed | 01/12/1973 | 12.50 | | AHD | | | | 1694m | West |
| 10042305 | GW043097 | Stock and Domestic | Unknown | 01/06/1974 | 29.20 | | AHD | | | | 1703m | South West |
| 10019310 | GW034588 | Water Supply | Unknown | 01/01/1972 | 22.20 | | AHD | | | | 1736m | North East |
| 10071674 | GW063979 | Water Supply | Unknown | 01/05/1987 | 31.30 | | AHD | | | | 1738m | South |
| 10070538 | GW902451 | Water Supply | Unknown | | 22.50 | | AHD | | | 6.50 | 1747m | South |
| 10048142 | GW968017 | Water Supply | Functioning | 27/02/2007 | 48.80 | | AHD | | 0.500 | 33.20 | 1748m | South |
| 10065409 | GW063930 | Water Supply | Functioning | 01/01/1987 | 22.80 | | AHD | | | | 1753m | South |
| 10137138 | GW015487 | Unknown | Unknown | 01/09/1951 | 26.80 | | AHD | 501-1000 ppm | | | 1770m | North East |
| 10011763 | GW048456 | Water Supply | Unknown | 01/07/1977 | 22.30 | | AHD | 1001-3000 ppm | | | 1775m | West |
| 10042728 | GW024399 | Stock and Domestic | Unknown | 01/11/1965 | 22.90 | | AHD | | | | 1778m | South |
| 10085485 | GW037695 | Water Supply | Unknown | 01/12/1974 | 31.30 | | AHD | | | | 1781m | East |
| 10051447 | GW031642 | Unknown | Unknown | 01/02/1967 | 70.10 | | AHD | | | | 1789m | South |
| 10084378 | GW071960 | Water Supply | Functioning | 01/01/1989 | 24.00 | | AHD | | | 24.00 | 1789m | South |
| 10046825 | GW900737 | Monitoring | Abandoned | 10/06/1997 | 54.90 | | AHD | | | | 1803m | South East |
| 10046907 | GW900738 | Monitoring | Abandoned | 12/06/1997 | 97.50 | | AHD | | | | 1810m | South East |
| 10066790 | GW966714 | Water Supply | Unknown | 01/05/1992 | 36.00 | | AHD | | 16.000 | | 1810m | North East |
| 10151450 | GW904273 | Stock and Domestic | Functioning | 16/01/2019 | 33.00 | | AHD | | | | 1819m | North East |
| 10014807 | GW900739 | Monitoring | Unknown | 16/06/1997 | 91.40 | | AHD | | | | 1826m | South East |
| 10073613 | GW071977 | Water Supply | Unknown | 16/05/2000 | | | AHD | | | | 1835m | South |
| 10050960 | GW007701 | Water Supply | Unknown | 01/08/1948 | 55.80 | | AHD | 1001-3000 ppm | | | 1836m | North East |
| 10107171 | GW024034 | Irrigation | Unknown | 01/09/1965 | 14.60 | | AHD | | | | 1840m | South West |
| 10048794 | GW901196 | Water Supply | Removed | 12/06/1997 | 97.50 | | AHD | | | | 1843m | South East |
| 10124452 | GW037718 | Water Supply | Unknown | 01/09/1974 | 33.50 | | AHD | | | | 1848m | South East |
| 10039452 | GW054976 | Water Supply | Unknown | | 22.90 | | AHD | Domestic | | | 1850m | South East |
| 10103609 | GW901194 | Water Supply | Unknown | 17/07/1997 | 61.00 | | AHD | | | | 1850m | South East |
| 10085893 | GW901197 | Water Supply | Removed | 16/06/1997 | 91.40 | | AHD | | | | 1851m | South East |

| NGIS Bore ID | NSW Bore ID | Bore Type | Status | Drill Date | Bore Depth (m) | Reference Elevation | Height Datum | Salinity (mg/L) | Yield (L/s) | SWL (mbgl) | Distance | Direction |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10010623 | GW013886 | Unknown | Unknown | 01/01/1948 | 21.30 | | AHD | Hard | | | 1857m | North East |
| 10026425 | GW902179 | Water Supply | Unknown | 17/07/1997 | 61.00 | | AHD | | | | 1861m | South East |
| 10061925 | GW901195 | Water Supply | Removed | 10/06/1997 | 54.90 | | AHD | | | | 1864m | South East |
| 10026821 | GW043680 | Water Supply | Unknown | 01/12/1973 | 22.90 | | AHD | | | | 1874m | West |
| 10095444 | GW063922 | Water Supply | Unknown | 01/01/1987 | 24.30 | | AHD | | | | 1884m | South |
| 10073147 | GW071942 | Water Supply | Unknown | | 26.00 | | AHD | | 2.200 | 24.50 | 1891m | South |
| 10055418 | GW902892 | Water Supply | Functioning | 16/05/2018 | 33.50 | | AHD | | | 17.00 | 1896m | South |
| 10015883 | GW056731 | Water Supply | Unknown | 01/10/1982 | 40.20 | | AHD | | | | 1913m | South |
| 10092118 | GW902274 | Water Supply | Unknown | 01/11/1988 | 25.00 | | AHD | | 1.500 | | 1927m | South |
| 10086980 | GW015466 | Water Supply | Unknown | 01/02/1958 | 19.50 | | AHD | | | | 1930m | East |
| 10136233 | GW019318 | Water Supply | Unknown | 01/06/1962 | 25.90 | | AHD | 1001-3000 ppm | | | 1941m | East |
| 10014214 | GW068082 | Unknown | Unknown | 04/08/1989 | 36.50 | | AHD | | 0.500 | 11.50 | 1945m | South |
| 10109301 | GW049638 | Water Supply | Unknown | 01/08/1978 | 15.20 | | AHD | | | | 1950m | North |
| 10002119 | GW059771 | Water Supply | Unknown | 01/06/1984 | 27.00 | | AHD | | | | 1955m | South |
| 10041513 | GW043679 | Water Supply | Unknown | 01/12/1973 | 17.70 | | AHD | | | | 1960m | West |
| 10090368 | GW071959 | Water Supply | Unknown | 01/01/1980 | 12.00 | | AHD | Good | | 9.75 | 1967m | South |
| 10034109 | GW043681 | Water Supply | Unknown | 01/12/1973 | 24.40 | | AHD | | | | 1984m | West |
| 10035618 | GW046726 | Water Supply | Unknown | 01/04/1977 | 53.00 | | AHD | | | | 1984m | South East |
| 10108464 | GW031643 | Stock and Domestic | Unknown | 01/02/1967 | 57.90 | | AHD | | | | 1989m | South |
| 10128561 | GW062122 | Water Supply | Functioning | 01/01/1970 | 2.50 | | AHD | | | 2.50 | 1989m | West |
| 10113935 | GW072015 | Water Supply | Unknown | 03/03/1994 | 19.50 | | AHD | | | | 1997m | West |

# Hydrogeology & Groundwater

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Driller's Logs

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

| NGIS Bore ID | Drillers Log | Distance | Direction |
|---|---|---|---|
| 10116309 | 0.00m-0.60m Soil<br>0.60m-1.30m Clay, ridge<br>1.30m-6.70m Shale, yellow<br>6.70m-18.30m Shale, brown<br>18.30m-43.60m Basalt, blue<br>43.60m-43.90m Basalt, blue, water bearing<br>43.90m-48.70m Basalt, blue | 19m | North East |
| 10095536 | 0.00m-0.60m Topsoil<br>0.60m-3.60m Shale Yellow<br>3.60m-14.60m Shale<br>14.60m-24.30m Shale Water Supply | 60m | North |
| 10060799 | 0.00m-1.50m topsoil<br>1.50m-1.76m red clay<br>1.76m-28.96m blue shale<br>28.96m-61.00m basalt | 65m | North |
| 10075592 | 0.00m-0.91m Soil<br>0.91m-1.52m Shale<br>1.52m-13.72m Shale<br>1.52m-13.72m Seams<br>13.72m-14.63m Shale Water Supply<br>14.63m-67.06m Shale Very Hard<br>14.63m-67.06m Basalt Seams<br>67.06m-67.67m Basalt Broken Water Supply<br>67.67m-68.28m Basalt Water Supply | 80m | North |
| 10091261 | 0.00m-0.90m TOP SOIL<br>0.90m-14.00m BROWN SHALE<br>14.00m-16.70m BASALT<br>16.70m-17.00m WATER BEARING BASALT<br>17.00m-27.40m BASALT<br>27.40m-27.70m WATER BEARING BASALT<br>27.70m-73.10m BASALT<br>73.10m-73.40m WATER BEARING BASALT<br>73.40m-79.20m BASALT | 93m | North East |
| 10050022 | 0.00m-4.57m Subsoil Clay<br>4.57m-30.48m Shale Water Supply | 122m | North West |
| 10094806 | 0.00m-0.91m Clay<br>0.91m-28.35m Shale Water Supply | 132m | North West |
| 10116913 | 0.00m-1.50m Soil<br>1.50m-19.00m Shale Grey<br>19.00m-28.00m Mudstone Grey Water Supply | 154m | South |
| 10046483 | 0.00m-0.30m loamy clay<br>0.30m-67.07m shale<br>67.07m-89.63m basalt<br>89.63m-97.56m basalt | 197m | South East |
| 10052643 | 0.00m-0.90m Soil<br>0.90m-12.20m shale brown<br>12.20m-54.90m Basalt - blue<br>54.90m-55.20m Basalt w.b<br>55.20m-56.40m Basalt - blue | 206m | North |
| 10087651 | 0.00m-0.30m topsoil<br>0.30m-1.20m clay<br>1.20m-7.30m shale<br>7.30m-18.30m basalt<br>18.30m-18.60m water bearing basalt<br>18.60m-54.80m basalt<br>54.80m-55.00m water bearing basalt<br>55.00m-70.00m basalt<br>70.00m-70.30m water bearing basalt<br>70.30m-73.10m basalt | 208m | North |
| 10106153 | 0.00m-4.00m CLAY<br>4.00m-21.00m BROWN SHALE<br>21.00m-71.00m GREY SHALE | 215m | South East |

| NGIS Bore ID | Drillers Log | Distance | Direction |
|---|---|---|---|
| 10000101 | 0.00m-0.50m Topsoil Black<br>0.50m-1.00m Clay<br>1.00m-10.00m Shale Soak<br>10.00m-22.00m Basalt Hard Shale Water Supply<br>22.00m-23.00m Basalt Black | 234m | South East |
| 10012584 | 0.00m-0.30m Topsoil<br>0.30m-23.80m Shale, brown<br>23.80m-24.10m Basalt, water bearing<br>24.10m-33.50m Basalt<br>33.50m-33.80m Basalt, water bearing<br>33.80m-39.60m Basalt<br>39.60m-39.90m Basalt, water bearing<br>39.90m-42.70m Basalt | 288m | North |
| 10024545 | 0.00m-0.61m Soil Red<br>0.61m-9.14m Shale<br>9.14m-13.72m Shale Black<br>13.72m-20.42m Water Supply<br>20.42m-21.03m Basalt | 300m | North West |
| 10087685 | 0.00m-0.61m Soil<br>0.61m-3.96m Clay Yellow<br>3.96m-10.67m Shale<br>10.67m-15.24m Basalt<br>15.24m-16.76m Shale<br>16.76m-26.82m Shale Grey Water Supply<br>26.82m-27.74m Shale | 320m | North West |
| 10027112 | 0.00m-0.60m SOIL<br>0.60m-14.30m BROWN SHALE<br>14.30m-15.50m CLAY<br>15.50m-16.50m BROWN SHALE<br>16.50m-16.80m W.B. BROWN SHALE<br>16.80m-27.50m BROWN SHALE<br>27.50m-27.80m W.B. BROWN SHALE<br>27.80m-45.50m BROWN SHALE<br>45.50m-45.80m W.B. BROWN SHALE<br>45.80m-46.10m BLUE SHALE<br>46.10m-50.30m BLUE BASALT | 346m | North |
| 10113206 | 0.00m-0.30m topsoil<br>0.30m-6.10m shale<br>6.10m-61.00m shale | 365m | North |
| 10134316 | 0.00m-0.30m Soil<br>0.30m-2.74m Clay<br>2.74m-5.49m Shale<br>5.49m-34.14m Shale | 369m | North West |
| 10096529 | 0.00m-0.90m SURFACE SOIL<br>0.90m-6.30m YELLOW SHALE<br>6.30m-21.30m BROWN SHALE<br>21.30m-21.60m WATER BEARING BROWN SHALE<br>21.60m-22.20m BLUE SHALE<br>22.20m-25.20m BROWN SHALE<br>25.20m-25.50m WATER BEARING BROWN SHALE<br>25.50m-26.70m BROWN SHALE<br>26.70m-27.40m BLUE BASALT | 370m | North |
| 10015923 | 0.00m-0.30m Surface Red Soil<br>0.30m-2.00m Clay Red<br>2.00m-10.00m Shale<br>10.00m-22.00m Shale Water Supply<br>22.00m-24.00m Basalt Broken<br>24.00m-26.00m Basalt Water Supply<br>26.00m-30.00m Basalt | 375m | North |
| 10030299 | 0.00m-1.00m Topsoil<br>1.00m-2.80m Shale Yellow<br>2.80m-23.40m Shale<br>23.40m-60.90m Basalt Water Supply | 378m | North West |
| 10054643 | 0.00m-0.61m Topsoil<br>0.61m-4.27m Clay<br>4.27m-18.90m Shale<br>18.90m-19.20m Shale Soft Water Supply<br>19.20m-27.43m Shale | 382m | North West |
| 10142903 | 0.00m-36.58m Shale | 382m | North West |
| 10106845 | 0.00m-0.30m Soil<br>0.30m-24.70m Shale brown<br>24.70m-26.50m Basalt blue<br>26.50m-27.50m Shale brown<br>27.50m-27.80m Shale brown w.b<br>27.80m-38.20m Shale brown<br>38.20m-38.50m Shale brwon w.b<br>38.50m-41.20m Shale brown<br>41.20m-44.20m Basalt blue | 395m | North |

| NGIS Bore ID | Drillers Log | Distance | Direction |
|---|---|---|---|
| 10032045 | 0.00m-1.00m topsoil<br>1.00m-34.70m shale | 404m | North West |
| 10036215 | 0.00m-0.30m topsoil<br>0.30m-14.90m shale<br>14.90m-15.40m shale<br>15.40m-15.70m water bearing shale<br>15.70m-17.80m shale<br>17.80m-18.10m shale<br>18.10m-21.40m shale<br>21.40m-21.70m water bearing shale<br>21.70m-24.40m shale<br>24.40m-25.90m basalt | 431m | North |
| 10106199 | 0.00m-1.00m topsoil<br>1.00m-18.00m shale<br>18.00m-20.00m shale<br>20.00m-25.00m shale<br>25.00m-26.00m shale<br>26.00m-28.00m shale | 469m | North West |
| 10008562 | 0.00m-0.60m Topsoil<br>0.60m-16.70m Shale Yellow<br>16.70m-17.00m Shale Water Bearing<br>17.00m-33.40m Basalt<br>33.40m-33.70m Shale Water Supply<br>33.70m-36.50m Basalt | 486m | North West |
| 10004543 | 0.00m-0.30m Topsoil<br>0.30m-2.74m Clay<br>2.74m-3.35m Clay Broken Shale<br>3.35m-15.85m Shale Water Supply<br>15.85m-18.29m Shale Grey<br>18.29m-23.16m Rock Light Grey Hard<br>23.16m-34.14m Shale Grey<br>34.14m-44.81m Shale Water Supply<br>44.81m-45.72m Rock Light Grey Green<br>45.72m-52.43m Slate Water Supply | 490m | North West |
| 10108029 | 0.00m-0.60m Soil Surface<br>0.60m-15.20m Shale Yellow<br>15.20m-15.50m Shale<br>15.50m-54.80m Shale | 495m | North |
| 10141884 | 0.00m-1.52m Topsoil<br>1.52m-4.57m Clay Red<br>4.57m-7.62m Clay Shale<br>7.62m-15.24m Shale Black Grey<br>15.24m-47.85m Shale Black Water Supply<br>47.85m-47.87m Slate | 497m | North West |
| 10052557 | 0.00m-0.30m Topsoil<br>0.30m-0.90m Clay<br>0.90m-16.40m Shale, brown (Seepage)<br>16.40m-22.40m Basalt<br>22.40m-33.70m Basalt, water bearing<br>33.70m-62.30m Basalt<br>62.30m-62.60m Basalt, water bearing<br>62.60m-79.20m Basalt | 500m | North East |
| 10037706 | 0.00m-0.30m Brown Surface Soil<br>0.30m-5.00m Brown Clay<br>5.00m-79.50m Blue Shales | 511m | North West |
| 10086463 | 0.00m-0.30m BROWN TOPSOIL<br>0.30m-3.00m BROWN CLAY<br>3.00m-21.00m BROWN SHALE<br>21.00m-30.00m BLUE SHALE<br>30.00m-58.50m BLUE BASALT | 516m | North |
| 10068036 | 0.00m-1.22m topsoil<br>1.22m-13.72m shale<br>13.72m-15.24m mudstone<br>15.24m-17.07m shale<br>17.07m-26.83m shale<br>26.83m-27.44m shale<br>27.44m-65.24m shale | 539m | North |
| 10132579 | 0.00m-0.90m Loamy clay brown<br>0.90m-4.20m L/Brown Fractured Shale<br>4.20m-7.20m Brown Frac. Shale<br>7.20m-24.00m Hard dark and grey shale<br>24.00m-26.10m Decomposed Shale<br>26.10m-28.50m Soild Dark Grey Shale<br>28.50m-46.80m Light Grey Shale<br>46.80m-58.80m Fractured Grey Shale | 548m | North |
| 10051667 | 0.00m-0.91m Topsoil<br>0.91m-2.74m Clay<br>2.74m-18.29m Shale Water Supply | 585m | South East |

| NGIS Bore ID | Drillers Log | Distance | Direction |
|---|---|---|---|
| 10088325 | 0.00m-2.44m Clay<br>2.44m-17.68m Shale<br>17.68m-37.49m Slate Black<br>37.49m-38.40m Slate Black Calcite<br>38.40m-43.59m Slate Black Grey Some Calcite<br>43.59m-63.70m Slate Black<br>63.70m-68.88m Basalt Water Supply | 597m | North West |
| 10059315 | 0.00m-0.50m Topsoil<br>0.50m-24.00m Shale Hard Clay<br>24.00m-26.00m Basalt Black | 609m | South East |
| 10136766 | 0.00m-0.61m Topsoil<br>0.61m-3.66m Clay Red<br>3.66m-12.19m Shale<br>12.19m-12.50m Shale Yellow Water Bearing<br>12.50m-24.38m Shale<br>24.38m-28.04m Sandstone Or Water Bearing Tuff<br>28.04m-28.96m Shale Black<br>28.96m-30.48m Shale Soft Water Bearing<br>28.96m-30.48m Mud Layers | 620m | North West |
| 10103543 | 0.00m-9.14m Shale Hard<br>9.14m-17.07m Shale Water Supply<br>17.07m-18.59m Rock Hard | 657m | West |
| 10083506 | 0.00m-0.60m SOIL<br>0.60m-18.30m YELLOW SHALE<br>18.30m-26.30m BNLUE SHALE<br>26.30m-26.80m W.B. SHALE (.25L/S)<br>26.80m-93.00m BLUE BASALT | 659m | South East |
| 10064490 | 0.00m-0.30m topsoil<br>0.30m-21.30m shale/brown<br>21.30m-21.60m basalt/water bearing<br>21.60m-30.40m basalt<br>30.40m-30.70m basalt/water bearing<br>30.70m-48.70m basalt | 769m | South |
| 10105566 | 0.00m-1.00m Topsoil<br>1.00m-4.50m Clay<br>4.50m-12.00m Shale, weathered<br>12.00m-36.00m Shale | 783m | North East |
| 10130738 | 0.00m-0.61m Soil Surface<br>0.00m-0.61m Shale Weathered<br>0.61m-5.49m Shale<br>5.49m-10.36m Basalt Grey<br>10.36m-22.25m Slate<br>10.36m-22.25m Basalt Seams<br>22.25m-22.56m Slate Green Water Supply<br>22.56m-25.30m Basalt<br>25.30m-25.91m Slate Green Broken Water Supply<br>25.91m-26.52m Basalt Some Water Supply<br>26.52m-27.43m Basalt | 793m | South East |
| 10047777 | 0.00m-0.91m Subsoil<br>0.91m-15.24m Shale<br>15.24m-24.38m Shale Water Supply | 822m | North |
| 10033164 | 0.00m-6.00m Clay, brown, loamy<br>6.00m-16.80m Shale, brown<br>16.80m-25.00m Shale, blue, fractured | 838m | North West |
| 10030607 | 0.00m-0.90m Brown Clay<br>0.90m-50.00m Blue Shale | 882m | South |
| 10118377 | 0.00m-0.30m Sand/Topsoil<br>0.30m-41.00m Shale; very hard, grey | 941m | South |
| 10042922 | 0.00m-0.30m Topsoil<br>0.30m-18.30m Shale, brown<br>18.30m-97.50m Basalt, blue | 965m | South East |
| 10057321 | 0.00m-1.00m Clay; red<br>1.00m-2.00m Shale; fractured<br>2.00m-20.00m Shale; grey<br>20.00m-23.00m Shale; black<br>23.00m-33.00m Shale; grey<br>33.00m-40.00m Shale; black<br>40.00m-70.00m Shale; grey | 968m | South |
| 10009328 | 0.00m-0.30m Soil<br>0.30m-4.57m Shale<br>4.57m-5.48m Shale<br>5.48m-11.58m Slate<br>11.58m-12.80m Slate Broken<br>12.80m-29.26m Slate<br>29.26m-29.87m Shale Water Supply<br>29.87m-35.66m Slate<br>35.66m-35.96m Shale Water Supply<br>35.96m-41.14m Slate<br>41.14m-42.67m Basalt | 977m | South East |

| NGIS Bore ID | Drillers Log | Distance | Direction |
|---|---|---|---|
| 10005158 | 0.00m-1.20m BROWN SHALE<br>1.20m-2.10m BROWN CLAY<br>2.10m-9.00m BLUE SHALE<br>9.00m-64.00m BLUE BASALT | 988m | North |
| 10070334 | 0.00m-0.15m Topsoil<br>0.15m-1.20m Clay, red<br>1.20m-18.30m Clay, brown/Shale<br>18.30m-19.80m Shale, brown<br>19.80m-82.30m Shale, blue<br>82.30m-97.60m Shale, blue, broken, hard<br>97.60m-103.70m Basalt, hard<br>103.70m-118.30m Shale, grey<br>118.30m-128.10m Shale, blue/black/grey<br>128.10m-172.00m Basalt, hard | 997m | North |
| 10110095 | 0.00m-0.30m Topsoil<br>0.30m-2.00m Clay<br>2.00m-49.50m Basalt; blue, fractured | 1006m | South |
| 10013903 | 0.00m-0.60m Soil<br>0.60m-5.50m Ridge clay<br>5.50m-14.60m Brown shale<br>14.60m-18.20m Blue basalt<br>18.20m-18.50m w.b. basalt<br>18.50m-30.40m Blue basalt<br>30.40m-30.70m w.b. basalt<br>30.70m-36.60m Blue basalt | 1046m | North West |
| 10080538 | 0.00m-1.22m Topsoil<br>1.22m-10.67m Shale<br>10.67m-29.26m Basalt Hard Water Supply | 1061m | South West |
| 10091863 | 0.00m-1.20m Topsoil<br>1.20m-5.10m Clay<br>5.10m-13.60m Shale Yellow<br>13.60m-14.20m Shale Water Supply<br>14.20m-18.20m Shale | 1076m | West |
| 10117510 | 0.00m-1.00m Topsoil Red<br>1.00m-4.00m Clay Red<br>4.00m-8.00m Shale Grey<br>8.00m-12.00m Shale<br>12.00m-15.00m Shale Some Clay Bands Water Supply<br>15.00m-30.00m Shale Water Supply<br>30.00m-34.70m Basalt | 1084m | North West |
| 10022769 | 0.00m-0.60m SOIL<br>0.60m-1.80m RIDGE CLAY<br>1.80m-15.20m BROWN SHALE<br>15.20m-19.80m BLUE SHALE<br>19.80m-20.10m W.B. BLUE SHALE<br>20.10m-36.60m BLUE SHALE<br>36.60m-36.90m W.B. BLUE SHALE<br>36.90m-42.70m BLUE BASALT | 1096m | North West |
| 10034660 | 0.00m-2.74m Clay Soft Shale<br>2.74m-9.14m Shale<br>9.14m-14.63m Shale<br>14.63m-18.29m Basalt Water Supply<br>18.29m-76.20m Diorite | 1103m | South West |
| 10049637 | 0.00m-0.91m Soil Red Volcanic<br>0.91m-3.04m Clay<br>3.04m-13.71m Shale Rock Water Supply<br>13.71m-18.28m Rock Volcanic<br>18.28m-36.88m Basalt Black Water Supply | 1122m | South East |
| 10024187 | 0.00m-1.00m topsoil<br>1.00m-5.80m clay<br>5.80m-7.60m brown shale<br>7.60m-8.20m water bearing brown shale<br>8.20m-14.30m brown shale<br>14.30m-15.30m water bearing shale<br>15.30m-16.80m basalt | 1158m | West |
| 10034117 | 0.00m-6.00m Clay<br>6.00m-12.10m Shale Yellow<br>12.10m-12.70m Shale Water Supply<br>12.70m-15.20m Shale | 1178m | North West |
| 10136988 | 0.00m-0.30m Topsoil, Loam<br>0.30m-1.20m Clay, brown<br>1.20m-2.40m Clay, loamy<br>2.40m-43.20m Shale, blue | 1206m | South |
| 10043423 | 0.00m-6.00m Soil<br>6.00m-6.40m Shale Yellow Water Bearing<br>6.40m-24.40m Shale Yellow<br>24.40m-27.40m Shale Water Supply<br>27.40m-30.40m Shale | 1239m | North West |

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|---|---|---|---|
| 10020024 | 0.00m-5.79m Shale<br>5.79m-12.50m Rock<br>12.50m-19.20m Rock Hard Water Supply<br>19.20m-20.12m Rock Grey | 1254m | East |
| 10009027 | 0.00m-0.30m Soil<br>0.30m-3.90m Clay<br>3.90m-15.40m Yellow Shale<br>15.40m-31.90m Blue Shale<br>31.90m-32.20m Water Bearing Shale<br>32.20m-48.70m Blue Basalt | 1278m | South |
| 10027109 | 0.00m-4.50m Soil<br>4.50m-7.50m Shale Yellow<br>7.50m-7.80m Shale Water Bearing<br>7.80m-18.20m Shale<br>18.20m-21.20m Shale Water Supply<br>21.20m-30.40m Shale | 1292m | North West |
| 10042936 | 0.00m-1.00m Topsoil<br>1.00m-6.20m Clay Yellow<br>6.20m-7.70m Shale Yellow Fractured Water Supply<br>7.70m-13.70m Shale Yellow<br>13.70m-18.20m Shale | 1325m | North West |
| 10018025 | 0.00m-0.60m Soil<br>0.60m-3.90m Clay<br>3.90m-4.80m Shale<br>4.80m-13.90m Shale Hard<br>13.90m-23.40m Shale Water Supply | 1329m | South |
| 10061943 | 0.00m-0.60m Topsoil<br>0.60m-2.70m Clay<br>2.70m-14.30m Shale, brown<br>14.30m-27.40m Basalt<br>27.40m-28.00m Basalt, water bearing<br>28.00m-30.50m Basalt | 1352m | South |
| 10071720 | 0.00m-0.60m Surface Soil<br>0.60m-5.20m Ridge Clay<br>5.20m-20.70m Yellow Shale<br>20.70m-21.00m Water Bearing Shale<br>21.00m-24.30m Yellow Shale | 1370m | South |
| 10018717 | 0.00m-0.50m<br>0.50m-6.00m Brown Shale<br>6.00m-7.00m Red Clay<br>7.00m-30.00m Black Shale<br>30.00m-34.00m | 1392m | South |
| 10070955 | 0.00m-3.00m Brown Clay<br>3.00m-20.00m Shales.<br>20.00m-44.00m | 1400m | East |
| 10012174 | 0.00m-0.60m Soil Surface<br>0.60m-5.50m Clay Ridge<br>5.50m-18.30m Shale Yellow<br>18.30m-35.10m Basalt<br>35.10m-35.40m Basalt Water Bearing Water Supply<br>35.40m-37.50m Basalt | 1401m | South |
| 10025953 | 0.00m-0.30m topsoil<br>0.30m-5.50m brown shale<br>5.50m-18.30m shale<br>18.30m-85.30m basalt<br>85.30m-85.60m water bearing basalt<br>85.60m-111.50m basalt<br>111.50m-111.80m water bearing basalt<br>111.80m-114.30m basalt | 1408m | South |
| 10018998 | 0.00m-0.60m Soil<br>0.60m-3.60m Clay<br>3.60m-28.90m Shale Water Supply | 1411m | South |
| 10005425 | 0.00m-0.61m Soil<br>0.61m-2.74m Clay Gravel<br>2.74m-6.71m Shale<br>6.71m-18.90m Basalt Water Supply | 1416m | West |
| 10072983 | 0.00m-0.60m Soil Surface<br>0.60m-18.20m Shale Yellow<br>18.20m-21.30m Shale Water Supply | 1432m | South |
| 10019225 | 0.00m-0.61m Topsoil<br>0.61m-3.66m Clay Red<br>3.66m-5.18m Shale Soft<br>5.18m-14.63m Shale<br>14.63m-15.24m Shale Weathered<br>15.24m-19.51m Shale<br>19.51m-20.73m Shale Broken Water Supply<br>20.73m-29.87m Shale<br>29.87m-31.70m Shale Green Broken Water Supply<br>31.70m-34.75m Shale | 1440m | South |

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|---|---|---|---|
| 10126884 | 0.00m-0.60m Soil<br>0.60m-3.60m Shale Yellow<br>3.60m-21.20m Shale<br>21.20m-33.50m Shale Water Supply | 1455m | South |
| 10008700 | 0.00m-3.30m Clay, brown<br>3.30m-27.40m Shale, brown<br>27.40m-79.20m Fractured Shale, blue | 1472m | South |
| 10123678 | 0.00m-0.30m Soil<br>0.30m-2.74m Clay Red<br>2.74m-3.66m Clay Red Shale<br>3.66m-12.80m Clay Shale Water Supply<br>12.80m-15.85m Basalt Water Supply<br>12.80m-15.85m Shale Seams | 1498m | West |
| 10029980 | 0.00m-0.60m Surface Soil<br>0.60m-4.50m Shale Yellow<br>4.50m-79.80m Shale | 1538m | South |
| 10115997 | 0.00m-0.60m SOIL<br>0.60m-1.20m RIDGE CLAY<br>1.20m-19.50m BROWN SHALE<br>19.50m-48.80m BLUE BASALT<br>48.80m-49.10m W.B. BASALT<br>49.10m-85.40m BLUE BASALT<br>85.40m-85.70m W.B. BASALT<br>85.70m-88.40m BLUE BASALT<br>88.40m-88.70m W.B. BASALT<br>88.70m-93.00m BLUE BASALT | 1541m | South |
| 10035967 | 0.00m-22.86m Shale<br>22.86m-46.02m Rock Water Supply | 1549m | North East |
| 10034375 | 0.00m-0.30m topsoil<br>0.30m-1.50m clay<br>1.50m-19.80m shale<br>19.80m-57.90m basalt<br>57.90m-58.20m water bearing basalt<br>58.20m-64.00m basalt<br>64.00m-64.30m water bearing basalt<br>64.30m-67.00m basalt | 1553m | South |
| 10101681 | 0.00m-0.60m Soil<br>0.60m-5.40m Clay Ridge<br>5.40m-12.80m Shale Yellow<br>12.80m-17.10m Shale<br>17.10m-17.40m Shale Water Bearing Water Supply<br>17.40m-18.90m Shale | 1555m | South |
| 10094727 | 0.00m-0.60m TOPSOIL<br>0.60m-2.40m shale<br>2.40m-14.60m shale<br>14.60m-24.30m shale<br>24.30m-24.60m water bearing brown shale<br>24.60m-76.10m basalt<br>76.10m-76.40m water bearing basalt<br>76.40m-79.20m basalt | 1556m | West |
| 10089538 | 0.00m-27.00m ( | 1563m | South |
| 10023929 | 0.00m-1.20m Soil<br>1.20m-2.20m Yellow Clay<br>2.20m-12.20m Yellow Shale<br>12.20m-27.40m Blue Basalt<br>27.40m-27.70m Water Bearing Basalt<br>27.70m-33.50m Basalt<br>33.50m-33.80m Water Bearing Basalt<br>33.80m-36.50m Basalt | 1565m | South |
| 10017271 | 0.00m-1.00m topsoil<br>1.00m-9.00m shale<br>9.00m-17.00m shale<br>17.00m-23.00m red clay | 1580m | South |
| 10107335 | 0.00m-0.60m Topsoil<br>0.60m-3.00m Shale Yellow<br>3.00m-9.00m Shale Hard<br>9.00m-25.70m Basalt Hard<br>25.70m-26.00m Basalt Water Bearing Water Supply<br>26.00m-33.50m Basalt Hard | 1583m | West |
| 10035253 | 0.00m-0.60m Topsoil<br>0.60m-8.00m Clay Sandy<br>8.00m-8.40m Clay Some Gravel Water Supply<br>8.40m-11.50m Shale Water Supply<br>11.50m-15.30m Basalt Black Water Supply | 1594m | West |
| 10002802 | 0.00m-1.00m Soil Surface<br>1.00m-6.00m Shale<br>6.00m-60.00m Shale Grey<br>60.00m-71.00m Basalt | 1595m | North |

| NGIS Bore ID | Drillers Log | Distance | Direction |
|---|---|---|---|
| 10084195 | 21.30m-24.00m basalt<br>24.00m-24.30m water bearing basalt<br>24.30m-34.30m basalt<br>34.30m-34.60m water bearing basalt<br>34.60m-44.00m basalt | 1595m | South |
| 10018191 | 0.00m-0.30m Topsoil<br>0.30m-6.30m Shale Yellow<br>6.30m-15.10m Shale Hard<br>15.10m-15.40m Shale Water Bearing<br>15.40m-21.20m Shale Hard<br>21.20m-48.70m Shale Water Supply | 1613m | South |
| 10114137 | 0.00m-0.91m Topsoil<br>0.91m-3.96m Clay Red<br>3.96m-10.36m Shale<br>10.36m-16.46m Slate<br>16.46m-21.34m Slate Some Large Fractured<br>21.34m-22.56m Basalt Black | 1631m | South East |
| 10003596 | 0.00m-3.05m Clay<br>3.05m-18.90m Shale Soak<br>18.90m-22.56m Shale Black Water Supply<br>22.56m-22.57m Basalt | 1637m | North |
| 10020748 | 0.00m-0.60m Topsoil<br>0.60m-4.50m Shale Yellow<br>4.50m-75.30m Shale<br>75.30m-79.80m Driller | 1649m | South |
| 10062425 | 0.00m-2.43m Soil<br>2.43m-5.48m Clay Stones<br>5.48m-10.97m Shale<br>10.97m-17.67m Slate Hard<br>17.67m-19.81m Shale Water Supply<br>19.81m-23.77m Shale<br>23.77m-25.60m Slate Grey Water Supply<br>25.60m-26.21m Basalt | 1649m | West |
| 10072151 | 0.00m-0.10m Topsoil<br>0.10m-3.50m Clay<br>3.50m-24.00m Shale Grey Water Supply<br>24.00m-25.00m Mudstone Grey<br>25.00m-40.80m Shale Water Supply | 1651m | South |
| 10099885 | 0.00m-1.00m Topsoil Red<br>1.00m-5.00m Clay Red<br>5.00m-15.00m Shale Grey<br>15.00m-16.00m Shale<br>16.00m-26.00m Shale Water Supply<br>26.00m-28.30m Basalt | 1651m | South |
| 10049766 | 0.00m-0.60m Soil Surface<br>0.60m-3.00m Shale Yellow<br>3.00m-9.00m Shale<br>9.00m-25.70m Basalt<br>25.70m-26.30m Basalt Water Supply<br>26.30m-30.40m Basalt | 1654m | West |
| 10057220 | 0.00m-0.60m Soil<br>0.60m-20.40m Shale Yellow<br>20.40m-20.70m Shale Water Bearing Water Supply<br>20.70m-21.30m Shale Yellow Water Supply<br>21.30m-21.60m Shale Water Bearing Water Supply<br>21.60m-24.30m Shale | 1656m | South |
| 10005157 | 0.00m-1.52m Soil<br>1.52m-5.48m Shale<br>5.48m-13.10m Shale Dark Brown<br>13.10m-24.38m Slate Water Supply<br>24.38m-25.90m Shale Dark Brown<br>25.90m-36.27m Basalt Water Supply | 1668m | South East |
| 10089213 | 0.00m-0.91m Topsoil<br>0.91m-4.57m Shale Broken<br>4.57m-30.48m Basalt | 1670m | South |
| 10038312 | 0.00m-2.00m clay<br>2.00m-19.00m Shale brown<br>19.00m-85.00m Basalt black<br>85.00m-90.00m Shale black<br>90.00m-95.00m Basalt grey | 1673m | North |
| 10054801 | 0.00m-0.30m Topsoil<br>0.30m-18.30m Shale, yellow<br>18.30m-91.40m Basalt, blue | 1677m | South |
| 10076127 | 0.00m-0.91m Soil Surface<br>0.91m-8.23m Clay Large Stones<br>8.23m-9.14m Gravel<br>9.14m-12.80m Boulders Large Water Supply<br>9.14m-12.80m Slate | 1682m | West |

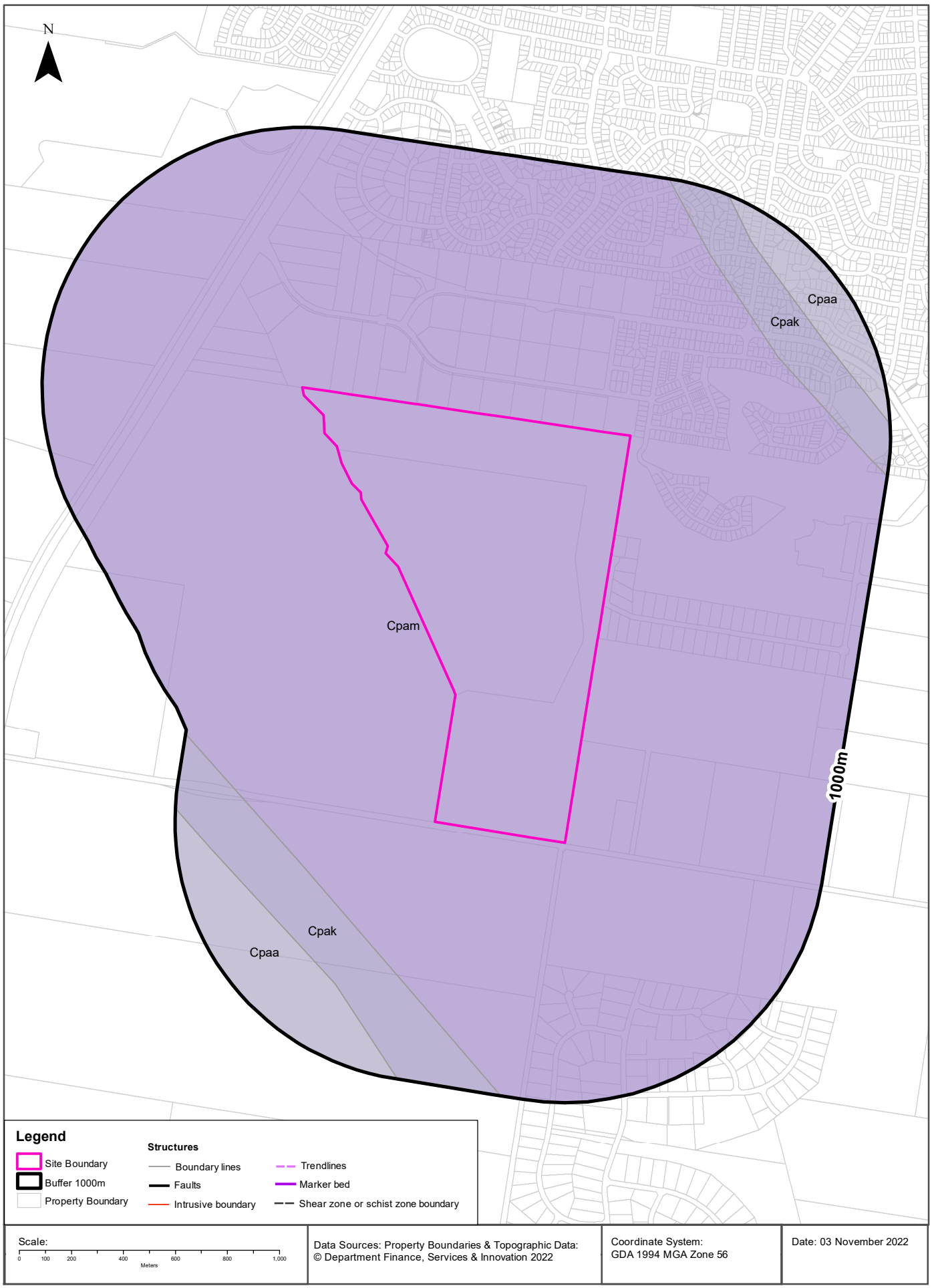
| NGIS Bore ID | Drillers Log | Distance | Direction |
|---|---|---|---|
| 10004257 | 0.00m-0.91m Soil<br>0.91m-5.79m Clay<br>5.79m-12.50m Gravel Dry Dirty | 1694m | West |
| 10042305 | 0.00m-1.21m Soil<br>1.21m-3.04m Clay Stones<br>3.04m-14.63m Shale Hard<br>14.63m-25.60m Shale Water Supply<br>25.60m-28.95m Slate Grey Water Supply<br>28.95m-29.26m Basalt Water Supply | 1703m | South West |
| 10019310 | 0.00m-0.61m Topsoil Red<br>0.61m-1.52m Clay Stoney<br>1.52m-21.95m Shale Rock Water Supply<br>21.95m-22.25m Basalt Black | 1736m | North East |
| 10071674 | 0.00m-0.60m Soil Surface<br>0.60m-2.70m Clay Ridge<br>2.70m-16.70m Shale Yellow<br>16.70m-24.30m Shale Hard<br>24.30m-24.60m Shale Water Bearing Water Supply<br>24.60m-28.20m Shale Hard<br>28.20m-28.50m Shale Water Bearing Water Supply<br>28.50m-31.30m Shale Hard | 1738m | South |
| 10048142 | 0.00m-0.30m Topsoil<br>0.30m-15.30m Shale, brown<br>15.30m-45.80m Basalt<br>45.80m-46.40m Basalt, water bearing<br>46.40m-48.80m Basalt | 1748m | South |
| 10065409 | 0.00m-0.60m Soil<br>0.60m-4.90m Clay Yellow<br>4.90m-18.30m Shale Yellow<br>18.30m-18.60m Shale Water Bearing Water Supply<br>18.60m-19.80m Shale<br>19.80m-20.10m Shale Water Bearing Water Supply<br>20.10m-22.80m Shale | 1753m | South |
| 10011763 | 0.00m-0.91m Soil Surface<br>0.91m-4.57m Clay Red<br>4.57m-5.79m Mudstone<br>4.57m-5.79m Clay Seams<br>5.79m-9.14m Sand Yellow Bright<br>9.14m-10.36m Clay Mixed<br>10.36m-18.29m Shale<br>18.29m-22.25m Basalt Some Weathered Seams | 1775m | West |
| 10042728 | 0.00m-1.22m Topsoil<br>1.22m-5.49m Shale<br>5.49m-22.86m Shale | 1778m | South |
| 10085485 | 0.00m-0.91m Soil<br>0.91m-4.57m Clay Sandy<br>4.57m-9.44m Shale Water Supply<br>9.44m-14.63m Shale Water Supply<br>14.63m-24.99m Slate<br>24.99m-31.39m Basalt Water Supply | 1781m | East |
| 10046825 | 0.00m-1.50m soil<br>1.50m-10.60m ridge clay<br>10.60m-22.80m brown shale<br>22.80m-32.00m blue shale<br>32.00m-54.90m basalt | 1803m | South East |
| 10046907 | 0.00m-0.30m soil<br>0.30m-12.50m brown shale<br>12.50m-97.50m blue basalt | 1810m | South East |
| 10014807 | 0.00m-0.30m soil<br>0.30m-15.50m brown shale<br>15.50m-91.40m blue basalt | 1826m | South East |
| 10050960 | 0.00m-12.19m Slate Yellow Hard<br>12.19m-21.34m Slate Black Hard Water Bearing<br>21.34m-35.05m Slate Grey Water Supply | 1836m | North East |
| 10107171 | 0.00m-1.22m Topsoil<br>1.22m-10.67m Shale Broken<br>10.67m-14.63m Basalt | 1840m | South West |
| 10048794 | 0.00m-0.30m soil<br>0.30m-12.50m brown shale<br>12.50m-97.50m blue basalt | 1843m | South East |
| 10124452 | 0.00m-0.30m Soil<br>0.30m-0.91m Clay<br>0.91m-13.41m Shale Water Supply<br>13.41m-33.53m Shale Grey Water Supply | 1848m | South East |

| NGIS Bore ID | Drillers Log | Distance | Direction |
|---|---|---|---|
| 10103609 | 0.00m-0.30m soil<br>0.30m-1.50m red clay<br>1.50m-21.50m brown shale<br>21.50m-21.80m water bearing brown shale<br>21.80m-34.90m blue basalt<br>34.90m-35.20m water bearing blue basalt<br>35.20m-51.70m blue basalt<br>51.70m-52.00m water bearing blue basalt<br>52.00m-61.00m blue basalt | 1850m | South East |
| 10085893 | 0.00m-0.30m soil<br>0.30m-15.50m brown shale<br>15.50m-91.40m blue basalt | 1851m | South East |
| 10026425 | 0.00m-0.30m topsoil<br>0.30m-1.50m red clay<br>1.50m-21.50m shale<br>21.50m-21.80m water bearing brown shale<br>21.80m-34.90m basalt<br>34.90m-35.20m water bearing blue basalt<br>35.20m-51.70m basalt<br>51.70m-52.00m water bearing blue basalt<br>52.00m-61.00m basalt | 1861m | South East |
| 10061925 | 0.00m-1.50m soil<br>1.50m-10.60m ridge clay<br>10.60m-22.80m brown shale<br>22.80m-32.00m blue shale<br>32.00m-54.90m basalt | 1864m | South East |
| 10026821 | 0.00m-1.52m Soil<br>1.52m-3.66m Clay Gravel<br>3.66m-6.10m Shale Yellow<br>6.10m-21.34m Shale Water Supply<br>21.34m-22.86m Rock Basalt | 1874m | West |
| 10095444 | 0.00m-0.60m Soil<br>0.60m-2.70m Clay Ridge<br>2.70m-19.80m Shale Yellow<br>19.80m-20.10m Shale Water Bearing Water Supply<br>20.10m-21.30m Shale Yellow<br>21.30m-21.60m Shale Water Bearing Water Supply<br>21.60m-22.80m Shale Yellow<br>22.80m-23.10m Shale Water Bearing Water Supply<br>23.10m-24.30m Shale Yellow | 1884m | South |
| 10015883 | 0.00m-1.20m Topsoil<br>1.20m-19.40m Clay<br>19.40m-21.80m Gravel Water Supply<br>21.80m-38.20m Clay<br>38.20m-40.20m Gravel Water Supply | 1913m | South |
| 10086980 | 0.00m-19.51m Shale Water Supply | 1930m | East |
| 10136233 | 0.00m-0.61m Topsoil<br>0.61m-2.13m Clay<br>2.13m-9.14m Shale Yellow<br>9.14m-14.33m Rock Volcanic<br>14.33m-15.54m Rock Soft Seam Water Supply<br>15.54m-17.68m Rock Volcanic<br>17.68m-18.59m Rock Soft Seam<br>18.59m-25.91m Rock Volcanic | 1941m | East |
| 10014214 | 0.00m-0.60m Soil<br>0.60m-1.20m Yellow Shale<br>1.20m-15.80m Brown Shale<br>15.80m-18.20m Blue Shale<br>18.20m-18.50m W.b Basalt<br>18.50m-25.80m Basalt<br>25.80m-26.10m W.b Basalt<br>26.10m-36.50m Basalt | 1945m | South |
| 10109301 | 0.00m-0.60m Soil Surface<br>0.60m-10.70m Shale Hard<br>10.70m-12.20m Shale Water Supply<br>12.20m-13.70m Shale Hard<br>13.70m-15.20m Shale Water Supply | 1950m | North |
| 10002119 | 0.00m-1.00m Soil Red Surface<br>1.00m-10.00m Shale<br>10.00m-26.00m Shale Water Supply<br>26.00m-27.00m Shale Grey | 1955m | South |
| 10041513 | 0.00m-1.22m Soil<br>1.22m-4.88m Clay<br>4.88m-17.68m Shale Water Supply | 1960m | West |

| NGIS Bore ID | Drillers Log | Distance | Direction |
|---|---|---|---|
| 10034109 | 0.00m-1.22m Soil Red<br>1.22m-3.05m Clay Gravel<br>3.05m-7.01m Shale Water Supply<br>7.01m-11.58m Sandstone Water Supply<br>11.58m-12.80m Shale Seams<br>12.80m-13.72m Sandstone Water Supply<br>13.72m-15.85m Shale Water Supply<br>15.85m-23.16m Sandstone Water Supply<br>23.16m-24.38m Rock Basalt Hard | 1984m | West |
| 10035618 | 0.00m-1.52m Soil<br>1.52m-2.74m Basalt<br>2.74m-8.23m Shale Hard<br>8.23m-14.63m Slate<br>14.63m-17.37m Basalt Black<br>17.37m-24.38m Shale Hard Broken<br>24.38m-24.99m Basalt Black<br>24.99m-25.60m Shale Hard<br>25.60m-32.00m Basalt Black<br>32.00m-34.14m Shale Broken Water Supply<br>34.14m-48.77m Slate<br>48.77m-51.51m Slate Water Supply<br>48.77m-51.51m Shale Seams<br>51.51m-53.04m Basalt Black Very Hard | 1984m | South East |
| 10108464 | 0.00m-0.91m Clay Sandy<br>0.91m-12.19m Clay Broken Rock<br>12.19m-57.91m Shale Hard Water Supply Quartz Limestone | 1989m | South |
| 10113935 | 0.00m-0.60m Soil<br>0.60m-7.90m Ridge Clay<br>7.90m-12.20m Shale Brown<br>12.20m-12.50m Shale w.b brown<br>12.50m-17.10m Shale brown<br>17.10m-18.30m Shale w.b brown<br>18.30m-19.50m Basalt | 1997m | West |

# Geology

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# Geology

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Geological Units

What are the Geological Units within the dataset buffer?

| Unit Code | Unit Name | Description | Unit Stratigraphy | Age | Dominant Lithology | Distance |
|---|---|---|---|---|---|---|
| Cpam | Mandowa Mudstone | Grey, thin-bedded, laminated and massive mudstone with subordinate, thin siltstone and fine sandstone. | /Parry Group//Mandowa Mudstone// | Famennian (base) to Famennian (top) | Mudstone | 0m |
| Cpak | Keepit Conglomerate | Boulder to pebble conglomerate, mudstone and thinly bedded sandstone. | /Parry Group//Keepit Conglomerate// | Famennian (base) to Famennian (top) | Conglomerate | 495m |
| Cpaa | Noumea beds | Interbedded massive- and andesitic-lithic wacke, pebbly wacke, laminated siltstone and mudstone. | /Parry Group//Noumea beds// | Frasnian (base) to Famennian (top) | Sandstone | 705m |

## Linear Geological Structures

What are the Dyke, Sill, Fracture, Lineament and Vein trendlines within the dataset buffer?

| Map ID | Feature Description | Map Sheet Name | Distance |
|---|---|---|---|
| No Features | | | |

What are the Faults, Shear zones or Schist zones, Intrusive boundaries & Marker beds within the dataset buffer?

| Map ID | Boundary Type | Description | Map Sheet Name | Distance |
|---|---|---|---|---|
| No Features | | | | |

# Naturally Occurring Asbestos Potential

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Naturally Occurring Asbestos Potential

Naturally Occurring Asbestos Potential within the dataset buffer:

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

# Atlas of Australian Soils

**Burgmanns Lane Warral, Tamworth, NSW 2340**

# Soils

**Burgmanns Lane Warral, Tamworth, NSW 2340**

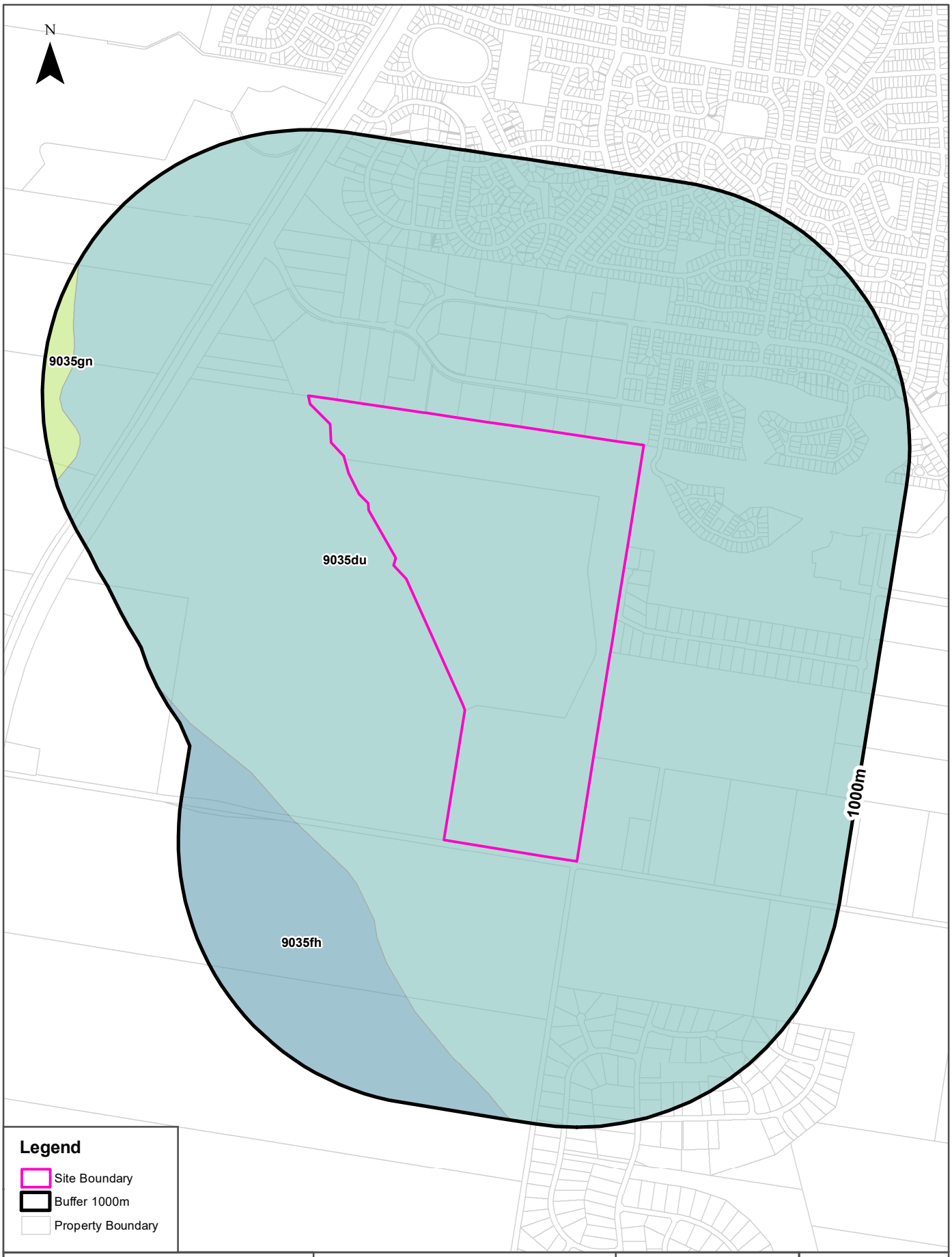
## Atlas of Australian Soils

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

| Map Unit Code | Soil Order | Map Unit Description | Distance | Direction |
|---|---|---|---|---|
| Ob14 | Dermosol | Almost flat to strongly undulating terrain with long gentle slopes sometimes broken by ridges: chief soils are hard alkaline red soils (Dr2.23). Associated are relatively small occurrences of many soils, including: dark cracking clays, such as (Ug5. 13 and Ug5 . 15), usually on slopes and in valleys; (Dr2.22) and shallow loams such as (Um4.1), usually on ridges; (Dy2.43) and (Dy3.43) soils, usually in flat areas and valleys. As mapped, small areas of units Gb12, Qb19, and Ra4 are included. Erosion has exposed subsoils in many places. | 0m | On-site |
| Gb12 | Dermosol | River flood-plains, terraces, and levees: chief soils are probably dark porous loamy soils (Um6.11 and Um6.12) with other (Um) and (Uc) soils. Associated are, locally, fairly large areas of dark cracking clays such as (Ug5.16); areas of (Dy3.4) soils; and sometimes areas of gravelly (Gn2) soils. Soils data are limited. | 160m | North West |

# Soil Landscapes of Central and Eastern NSW

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# Soils

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Soil Landscapes of Central and Eastern NSW

Soil Landscapes of Central and Eastern NSW within the dataset buffer:

| Soil Code | Name | Distance | Direction |
|---|---|---|---|
| 9035du | Duri | 0m | On-site |
| 9035fh | Fullwoods Hill | 369m | South West |
| 9035gn | Goonoo Goonoo | 874m | North West |

# Acid Sulfate Soils

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Environmental Planning Instrument - Acid Sulfate Soils

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

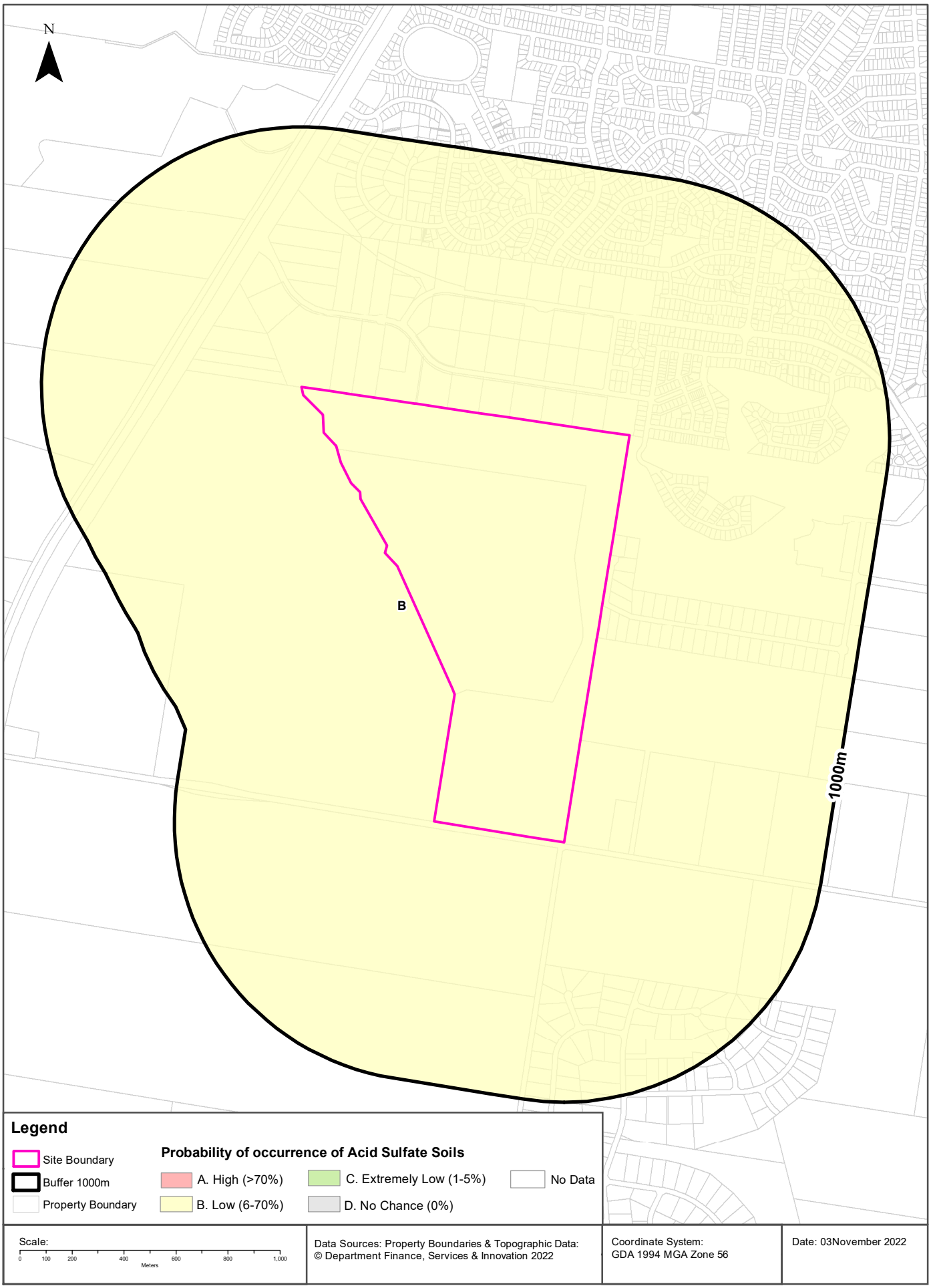
| Soil Class | Description | EPI Name |
|---|---|---|
| N/A | | |

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

| Soil Class | Description | EPI Name | Distance | Direction |
|---|---|---|---|---|
| N/A | | | | |

# Atlas of Australian Acid Sulfate Soils

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# Acid Sulfate Soils

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Atlas of Australian Acid Sulfate Soils

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

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

# Dryland Salinity

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

**No**

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

**No**

What Dryland Salinity assessments are given?

| Assessment 2000 | Assessment 2020 | Assessment 2050 | Distance | Direction |
|---|---|---|---|---|
| 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

**Burgmanns Lane Warral, Tamworth, NSW 2340**

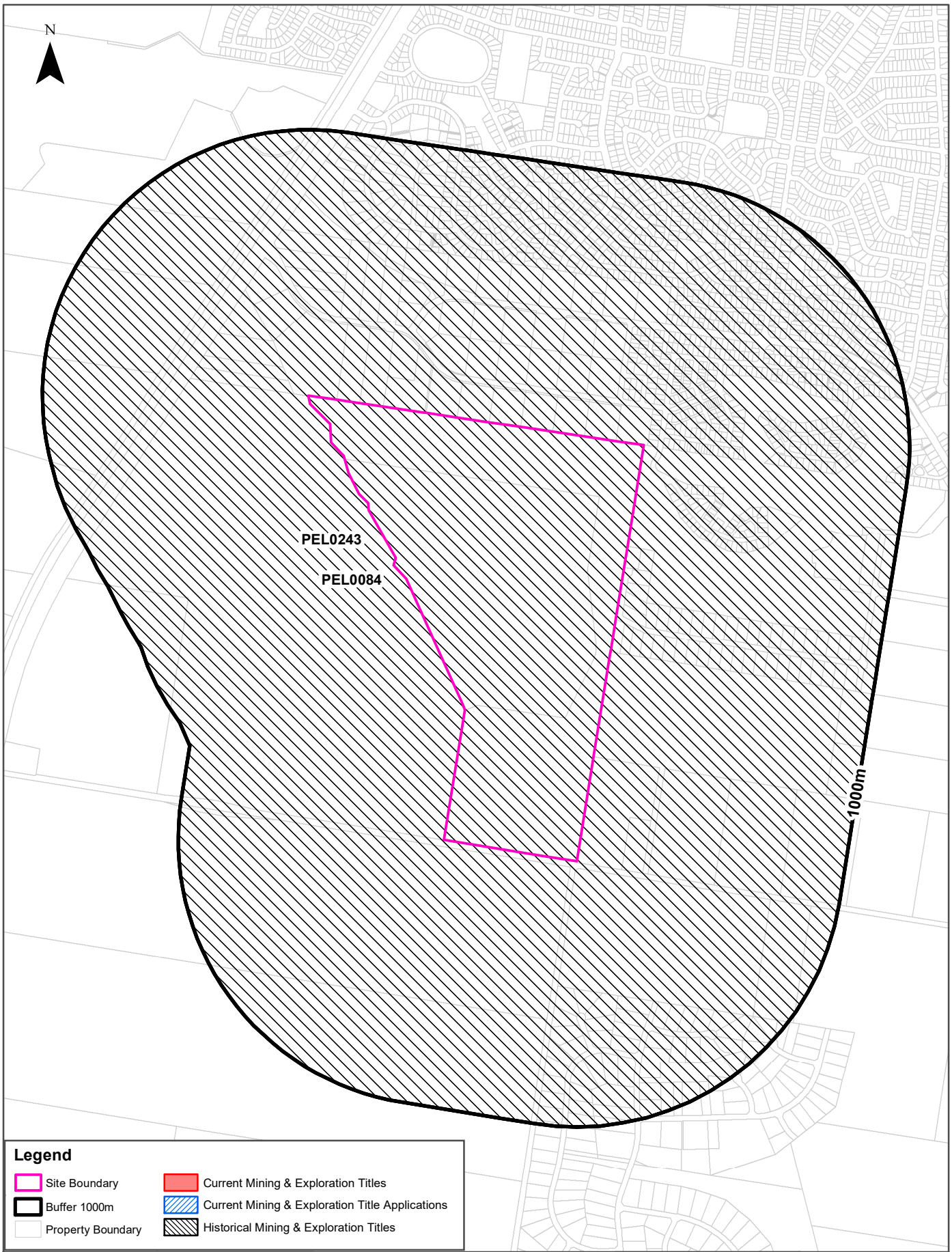
## Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

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

# Mining & Exploration Titles

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# Mining

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Current Mining & Exploration Titles

Current Mining & Exploration Titles within the dataset buffer:

| Title Ref | Holder | Grant Date | Expiry Date | Last Renewed | Operation | Resource | Minerals | Dist | Dir |
|---|---|---|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | | | | |

Current Mining & Exploration Titles Data Source: © State of New South Wales through NSW Department of Industry

## Current Mining & Exploration Title Applications

Current Mining & Exploration Title Applications within the dataset buffer:

| Application Ref | Applicant | Application Date | Operation | Resource | Minerals | Dist | Dir |
|---|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | | |

Current Mining & Exploration Title Applications Data Source: © State of New South Wales through NSW Department of Industry

# Mining

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Historical Mining & Exploration Titles

Historical Mining & Exploration Titles within the dataset buffer:

| Title Ref | Holder | Start Date | End Date | Resource | Minerals | Dist | Dir |
|---|---|---|---|---|---|---|---|
| PEL0243 | PETROSEARCH PTY LTD, SION RESOURCES AUSTRALIA LTD | 19810110 | 19841210 | PETROLEUM | Petroleum | 0m | On-site |
| PEL0084 | | | | PETROLEUM | Petroleum | 0m | On-site |

# State Environmental Planning Policy

**Burgmanns Lane Warral, Tamworth, NSW 2340**

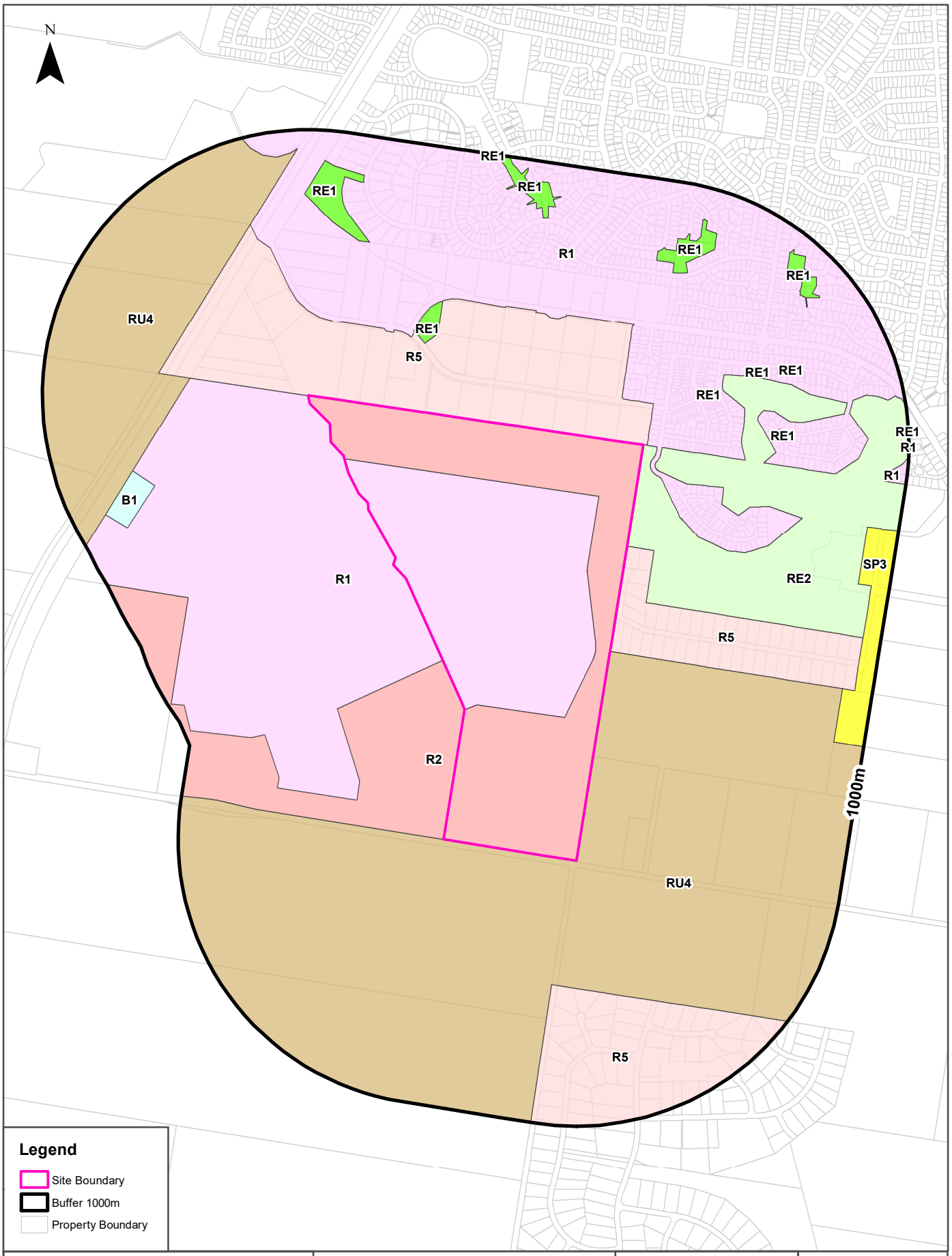
## State Significant Precincts

What SEPP State Significant Precincts exist within the dataset buffer?

| Map Id | Precinct | EPI Name | Published Date | Commenced Date | Currency Date | Amendment | Distance | Direction |
|---|---|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | | | |

# EPI Planning Zones

**Burgmanns Lane Warral, Tamworth, NSW 2340**



# Environmental Planning Instrument

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Land Zoning

What EPI Land Zones exist within the dataset buffer?

| Zone | Description | Purpose | EPI Name | Published Date | Commenced Date | Currency Date | Amendment | Distance | Direction |
|---|---|---|---|---|---|---|---|---|---|
| R2 | Low Density Residential | | Tamworth Regional Local Environmental Plan 2010 | 27/10/2017 | 27/10/2017 | 06/11/2020 | Amendment No 12 | 0m | On-site |
| R1 | General Residential | | Tamworth Regional Local Environmental Plan 2010 | 27/10/2017 | 27/10/2017 | 06/11/2020 | Amendment No 12 | 0m | On-site |
| RE2 | Private Recreation | | Tamworth Regional Local Environmental Plan 2010 | 06/11/2020 | 06/11/2020 | 06/11/2020 | Amendment No 20 | 0m | East |
| R5 | Large Lot Residential | | Tamworth Regional Local Environmental Plan 2010 | 15/02/2013 | 15/02/2013 | 06/11/2020 | Amendment No 2 | 0m | East |
| RU4 | Primary Production Small Lots | | Tamworth Regional Local Environmental Plan 2010 | 13/09/2019 | 13/09/2019 | 06/11/2020 | Amendment No 16 | 0m | South |
| R5 | Large Lot Residential | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 0m | North |
| R1 | General Residential | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 12m | North |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 257m | North |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 280m | North East |
| R5 | Large Lot Residential | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 475m | South |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 492m | North East |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 509m | North East |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 603m | North West |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 608m | North East |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 658m | North East |
| B1 | Neighbourhood Centre | | Tamworth Regional Local Environmental Plan 2010 | 27/10/2017 | 27/10/2017 | 06/11/2020 | Amendment No 12 | 661m | West |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 789m | North |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 804m | North East |
| SP3 | Tourist | | Tamworth Regional Local Environmental Plan 2010 | 06/11/2020 | 06/11/2020 | 06/11/2020 | Amendment No 20 | 880m | East |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 986m | East |
| RE1 | Public Recreation | | Tamworth Regional Local Environmental Plan 2010 | 21/01/2011 | 21/01/2011 | 06/11/2020 | | 987m | North |

# Heritage

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Commonwealth Heritage List

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

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

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


## National Heritage List

What are the National Heritage List Items located within the dataset buffer?
Note. Please click on Place Id to activate a hyperlink to online website.

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

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


## State Heritage Register - Curtilages

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

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

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


## Environmental Planning Instrument - Heritage

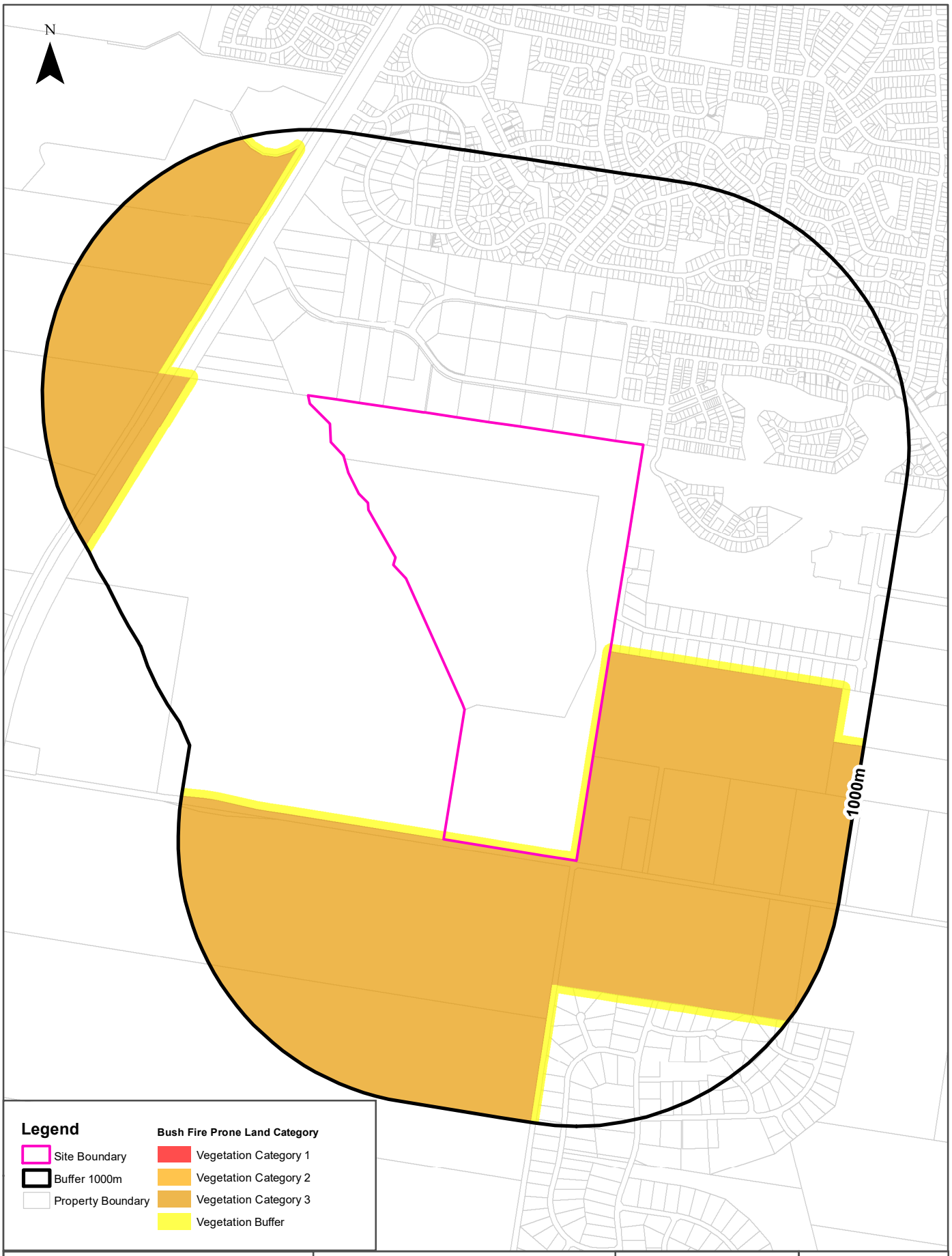
What are the EPI Heritage Items located within the dataset buffer?

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

Heritage Data Source: NSW Crown Copyright - Planning & Environment

# Natural Hazards - Bush Fire Prone Land

**Burgmanns Lane Warral, Tamworth, NSW 2340**




Data Sources: Bush Fire Prone Land: © NSW Rural Fire Service 2022. Property Boundaries: © Department Finance, Services & Innovation 2022

Coordinate System: GDA 1994 MGA Zone 56

Date: 03 November 2022

# Natural Hazards

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Bush Fire Prone Land

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

| Bush Fire Prone Land Category | Distance | Direction |
|---|---|---|
| Vegetation Category 3 | 0m | On-site |
| Vegetation Buffer | 0m | On-site |

# Ecological Constraints

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Ramsar Wetlands

What Ramsar Wetland areas exist within the dataset buffer?

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

Ramsar Wetlands Data Source: © Commonwealth of Australia - Department of Agriculture, Water and the Environment

# Ecological Constraints

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Groundwater Dependent Ecosystems Atlas

| Type | GDE Potential | Geomorphology | Ecosystem Type | Aquifer Geology | Distance | Direction |
|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | |

# Ecological Constraints

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## Inflow Dependent Ecosystems Likelihood

| Type | IDE Likelihood | Geomorphology | Ecosystem Type | Aquifer Geology | Distance | Direction |
|---|---|---|---|---|---|---|
| N/A | No records in buffer | | | | | |

# Ecological Constraints

**Burgmanns Lane Warral, Tamworth, NSW 2340**

## NSW BioNet Atlas

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

| Kingdom | Class | Scientific | Common | NSW Conservation Status | NSW Sensitivity Class | Federal Conservation Status | Migratory Species Agreements |
|---|---|---|---|---|---|---|---|
| Animalia | Amphibia | Litoria booroolongensis | Booroolong Frog | Endangered | Not Sensitive | Endangered | |
| Animalia | Aves | Alectura lathami | Australian Brush-turkey | Endangered Population | Not Sensitive | Not Listed | |
| Animalia | Aves | Apus pacificus | Fork-tailed Swift | Not Listed | Not Sensitive | Not Listed | ROKAMBA;CAMBA; JAMBA |
| Animalia | Aves | Artamus cyanopterus cyanopterus | Dusky Woodswallow | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Calyptorhynchus banksii samueli | Red-tailed Black-Cockatoo (inland subspecies) | Vulnerable | Category 2 | Not Listed | |
| Animalia | Aves | Chthonicola sagittata | Speckled Warbler | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Circus assimilis | Spotted Harrier | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Climacteris picumnus victoriae | Brown Treecreeper (eastern subspecies) | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Falco subniger | Black Falcon | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Gallinago hardwickii | Latham's Snipe | Not Listed | Not Sensitive | Not Listed | ROKAMBA;JAMBA |
| Animalia | Aves | Glossopsitta porphyrocephala | Purple-crowned Lorikeet | Vulnerable | Category 3 | Not Listed | |
| Animalia | Aves | Glossopsitta pusilla | Little Lorikeet | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Hieraaetus morphnoides | Little Eagle | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Hirundapus caudacutus | White-throated Needletail | Not Listed | Not Sensitive | Vulnerable | ROKAMBA;CAMBA; JAMBA |
| Animalia | Aves | Lathamus discolor | Swift Parrot | Endangered | Category 3 | Critically Endangered | |
| Animalia | Aves | Lophoictinia isura | Square-tailed Kite | Vulnerable | Category 3 | Not Listed | |
| Animalia | Aves | Melithreptus gularis gularis | Black-chinned Honeyeater (eastern subspecies) | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Neophema pulchella | Turquoise Parrot | Vulnerable | Category 3 | Not Listed | |
| Animalia | Aves | Ninox strenua | Powerful Owl | Vulnerable | Category 3 | Not Listed | |
| Animalia | Aves | Pachycephala inornata | Gilbert's Whistler | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Petroica boodang | Scarlet Robin | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Pezoporus wallicus wallicus | Eastern Ground Parrot | Vulnerable | Category 3 | Not Listed | |
| Animalia | Aves | Polytelis swainsonii | Superb Parrot | Vulnerable | Category 3 | Vulnerable | |
| Animalia | Aves | Stagonopleura guttata | Diamond Firetail | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Aves | Thinornis cucullatus cucullatus | Eastern Hooded Dotterel | Critically Endangered | Not Sensitive | Vulnerable | |

| Kingdom | Class | Scientific | Common | NSW Conservation Status | NSW Sensitivity Class | Federal Conservation Status | Migratory Species Agreements |
|---|---|---|---|---|---|---|---|
| Animalia | Mammalia | Chalinolobus dwyeri | Large-eared Pied Bat | Vulnerable | Not Sensitive | Vulnerable | |
| Animalia | Mammalia | Dasyurus maculatus | Spotted-tailed Quoll | Vulnerable | Not Sensitive | Endangered | |
| Animalia | Mammalia | Falsistrellus tasmaniensis | Eastern False Pipistrelle | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Mammalia | Micronomus norfolkensis | Eastern Coastal Free-tailed Bat | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Mammalia | Miniopterus orianae oceanensis | Large Bent-winged Bat | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Mammalia | Petaurus norfolcensis | Squirrel Glider | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Mammalia | Phascolarctos cinereus | Koala | Endangered | Not Sensitive | Endangered | |
| Animalia | Mammalia | Pteropus poliocephalus | Grey-headed Flying-fox | Vulnerable | Not Sensitive | Vulnerable | |
| Animalia | Reptilia | Aprasia parapulchella | Pink-tailed Legless Lizard | Vulnerable | Not Sensitive | Vulnerable | |
| Animalia | Reptilia | Chelonia mydas | Green Turtle | Vulnerable | Not Sensitive | Vulnerable | |
| Animalia | Reptilia | Simoselaps fasciolatus | Narrow-banded Snake | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Reptilia | Suta flagellum | Little Whip Snake | Vulnerable | Not Sensitive | Not Listed | |
| Animalia | Reptilia | Uvidicolus sphyrurus | Border Thick-tailed Gecko | Vulnerable | Not Sensitive | Vulnerable | |
| Plantae | Flora | Dichanthium setosum | Bluegrass | Vulnerable | Not Sensitive | Vulnerable | |
| Plantae | Flora | Eucalyptus nicholii | Narrow-leaved Black Peppermint | Vulnerable | Not Sensitive | Vulnerable | |
| Plantae | Flora | Euphrasia ruptura | | Extinct | Not Sensitive | Extinct | |
| Plantae | Flora | Syzygium paniculatum | Magenta Lilly Pilly | Endangered | Not Sensitive | Vulnerable | |

Data does not include NSW category 1 sensitive species.

# Location Confidences

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

| LC Code | Location Confidence |
|---|---|
| Premise Match | Georeferenced to the site location / premise or part of site |
| Area Match | Georeferenced to an approximate or general area |
| Road Match | Georeferenced to a road or rail corridor |
| Road Intersection | Georeferenced to a road intersection |
| Buffered Point | A point feature buffered to x metres |
| Adjacent Match | Land adjacent to a georeferenced feature |
| Network of Features | Georeferenced to a network of features |
| Suburb Match | Georeferenced to a suburb boundary |
| As Supplied | Spatial data supplied by provider |

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admin@mossenviro.com
ABN 53 126 494 776
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PO Box 390, Tamworth NSW 2340

# APPENDIX B – BYDA SEARCHES

aarnet
Australia's Academic and Research Network

GPO Box 5519
Chatswood
NSW, 1515

06/11/2022

To:
Elizabeth Ogunsote
Not Supplied
24, Fitzroy Street
Tamworth, 2340

Sequence No: 217880833

Job No: 33051649

Location: 43 Rodeo Drive
Hillvue, NSW, 2340

Commencement Date: 01/12/2022

**Dial Before You Dig Response – Underground Fibre Assets**

Dear Elizabeth Ogunsote

This letter is in relation to the proposed work at location detailed above is in the vicinity and may impact AARNet fibre optic cable assets.

Attached is a map indicating the approximate location of the AARNet assets in relation to your enquiry area. A detailed Plan is normally attached to this response. There may be additional AARNet assets in this area contained within Telstra duct. No work is to take place until plans have been obtained from Telstra and reviewed as necessary

Any information provided is valid for 28 days from the date of issue of this document.

Please review the map and if you have any further concerns, contact the AARNet NOC on 1300 APL NOC (1300 275 662).

If you are proposing to carry out digging in the vicinity of AARNet underground infrastructure you will need to carry out these works in accordance with the guidelines below.

**WARNING**

Where AARNet plans have been attached, they are indicative of the position of AARNet Pty Ltd's (AARNet) fibre optic installation/s only. Services belonging to other third parties are not included on these plans.

These plans have been prepared solely for the use of AARNet and any reliance placed on these plans by you is entirely at your own risk. The plans may show the position of our assets relative to fences, buildings etc., as they existed at the time the fibre etc. was installed. The plans may not have been updated to take account of any subsequent change in the location or style of those features since the time at which the plans were initially prepared.

GPO Box 5519
Chatswood
NSW, 1515

AARNet makes no warranty as to the accuracy or completeness of the enclosed plans and does not assume any duty of care to you nor any responsibility for the accuracy, adequacy, suitability or completeness of the plans or for any error, omission, lack of detail, transmission failure or corruption in the information provided. AARNet does not accept any responsibility for any loss that you or anyone else may suffer in connection with the provision of these plans, however that loss may arise (including whether or not arising from the negligence of AARNet, its employees, agents, officers or contractors).

The recipient of these plans must use their own care and diligence in carrying out their works and must carry out further surveys to locate services at their work site. Persons excavating or carrying out other earthworks will be held responsible for any damage caused to AARNet's fibre optic installations.

While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither AARNet or PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

**All Areas**

Under no circumstances shall construction, digging or excavating work entailing crossing AARNet plant be carried out without first exposing or locating the AARNet asset by an accredited locator and under the supervision of an accredited plant location contractor.

Manual pot-holing needs to be undertaken with extreme care, common-sense and employing techniques least likely to damage cables. For example, orientate shovel blades and trowels parallel to the cable rather than digging across the cable.

Visual location of asset must be carried out by hand digging or using non-destructive water jet method (pot holing) where construction activities may damage or interfere with AARNet assets.

The following minimum clearances must be maintained between mechanical construction activity and the located AARNet asset.

| | |
|---|---|
| **Jackhammers / Pneumatic Breakers** | Not within 1.0m of actual location |
| **Vibrating Plate or Wacker Packer Compactor** | Not within 0.5m of actual location 300mm compact clearance before compactor can be used over AARNet conduits. 750mm compact clearance cover before compactor can be used Over AARNet Direct Buried cable |
| **Boring Equipment (in-line, horizontal and vertical)** | Not within 5.0m of actual location without supervision of accredited plant location contractor onsite<br>OR<br>AARNet asset must exposed via hand dig or nondestructive water jet method (pot holing).<br>AND<br>AARNet asset must not be crossed without first exposing the asset at the crossing point and not without an accredited plant location contractor representative onsite |

GPO Box 5519
Chatswood
NSW, 1515

| | |
|---|---|
| **Heavy vehicle Traffic (over 3 tonnes)** | Not to be driven over AARNet conduits or assets with less than 600mm of cover.<br>Depth to be verified via hand digging |
| **Mechanical Excavators, Farm ploughing, Boring, Tree removal, fencing** | Not within 1.0m of actual location. Constructor to hand dig or use non-destructive water jet method (pot holing) and expose asset |

**Urban Areas**

Under no circumstances shall construction, digging or excavating work be carried out: within 1.5m of AARNet assets without first locating and identifying the AARNet asset by an accredited locator and under the supervision of an accredited plant location contractor.

**Rural Areas**

Under no circumstances shall construction, digging or excavating work be carried out within 10m of AARNet plant be carried out without first locating and identifying the AARNet asset by an accredited locator and under the supervision of an accredited plant location contractor.

ASSET RELOCATIONS

**You are not permitted to relocate, modify or alter any AARNet assets under any circumstances. Please** contact AARNet Infrastructure Development Group via email apl-dig@aarnet.edu.au for all enquiries relating to the relocation of AARNet assets.

**DAMAGE**

AARNet will seek Compensation for any loss caused by damage to its assets. Damage to any AARNet asset must be immediately reported to AARNet NOC on 1300 APL NOC (1300 275 662).

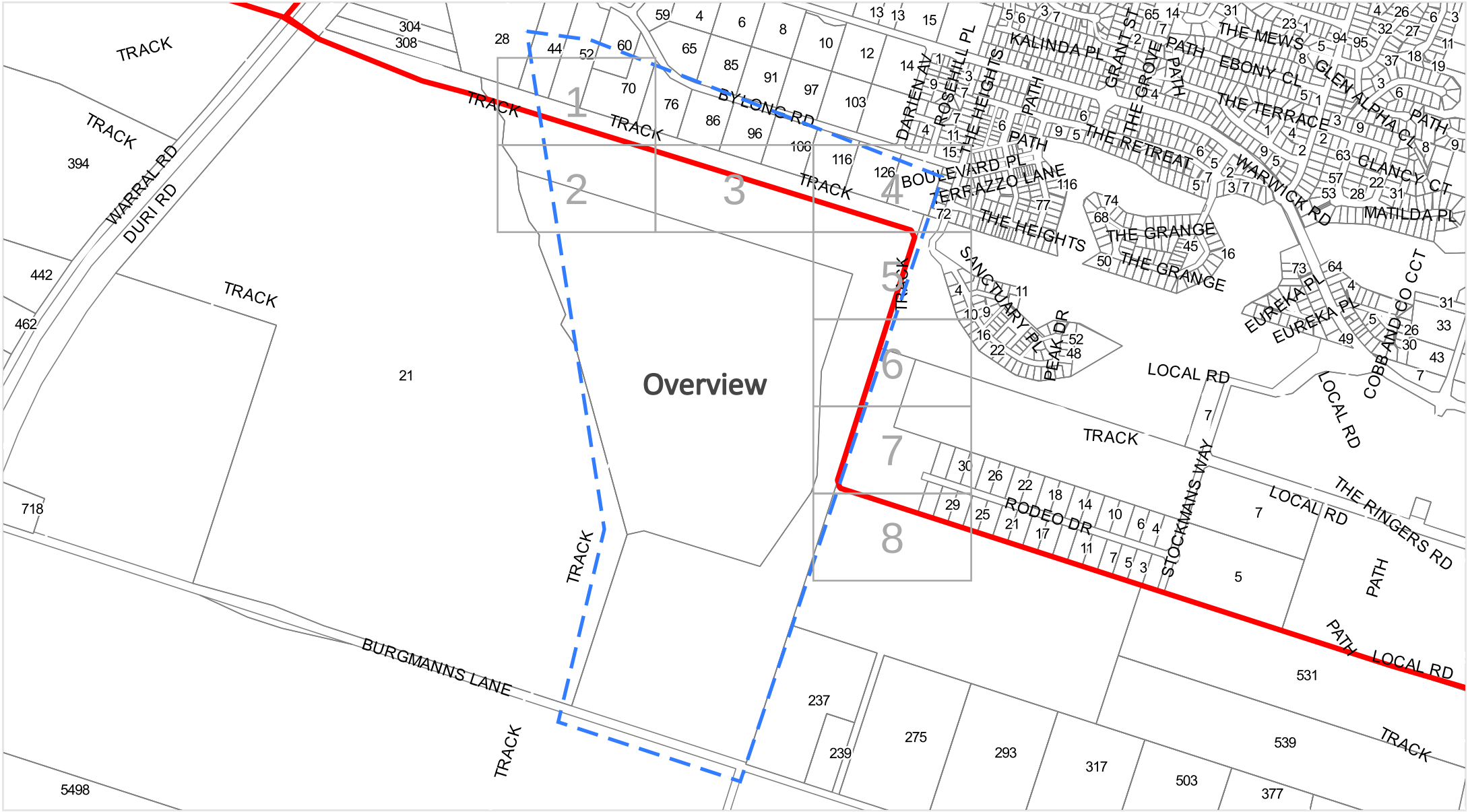
**FURTHER ASSISTANCE**

Assistance can be obtained by contacting AARNet NOC on 1300 APL NOC (1300 275 662) Where an on-site location is provided by an accredited locator, the owner is responsible for all costs associated with hand digging or use of non-destructive water jet method (pot holing) to visually locate AARNet assets. If plant location drawings or visual location of AARNet assets by digging reveals that the location of AARNet plant is situated wholly or partly within the owner work area, then AARNet Infrastructure Development Group **apl-dig@aarnet.edu.au must be contacted to discuss possible engineering solutions**.

aarnet
Australia's Academic and Research Network

**Sequence No:** 217880833
**Job No:** 33051649
**Location:** 43 Rodeo Drive, Hillvue, NSW 2340

DIAL BEFORE YOU DIG www.1100.com.au
*The Essential First Step.*

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- Enquiry Area
- AARNet Fibre Optic Assets
- AARNet Power Assets
- Cadastre

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aarnet
Australia's Academic and Research Network

**Sequence No:** 217880833
**Job No:** 33051649
**Location:** 43 Rodeo Drive, Hillvue, NSW 2340

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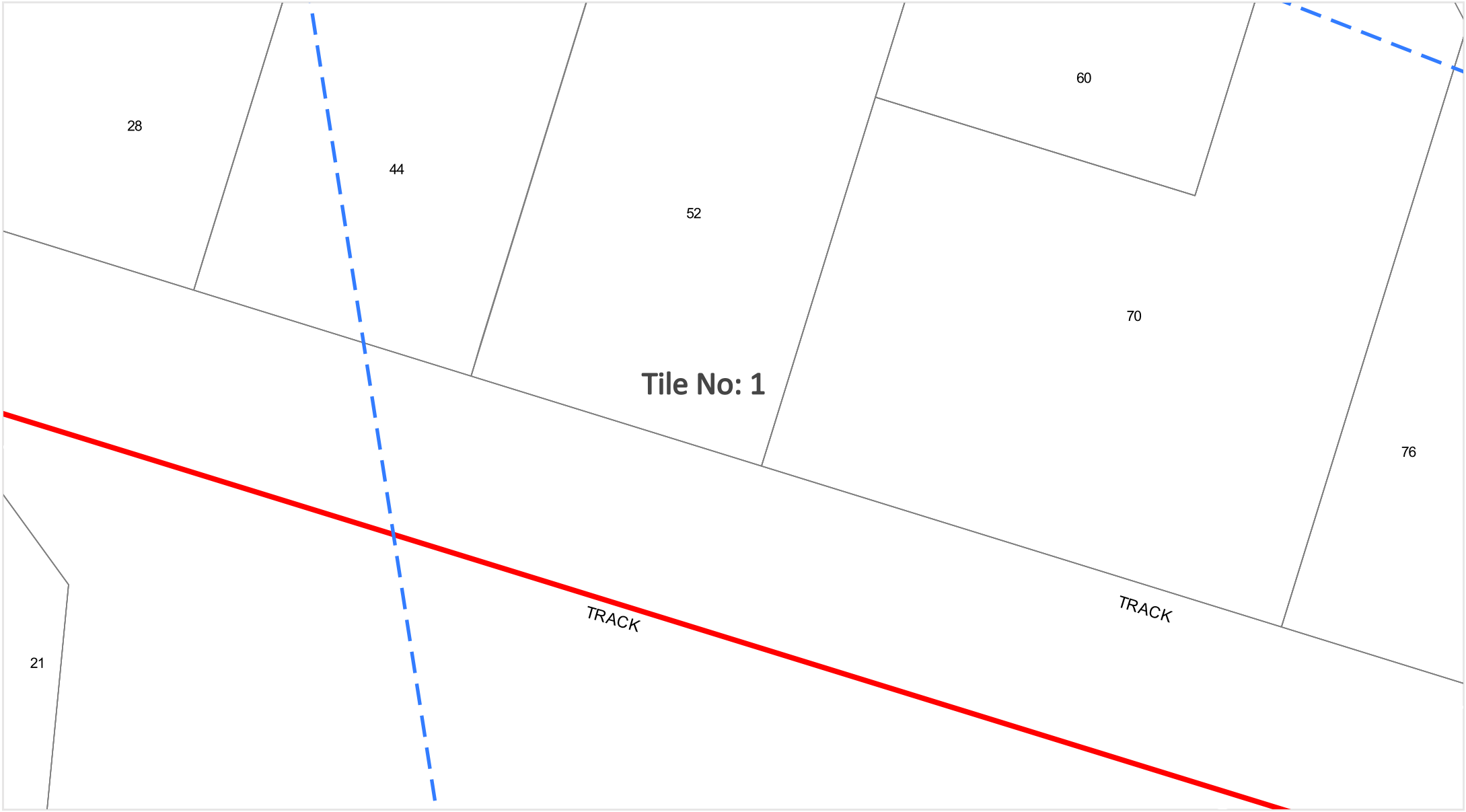


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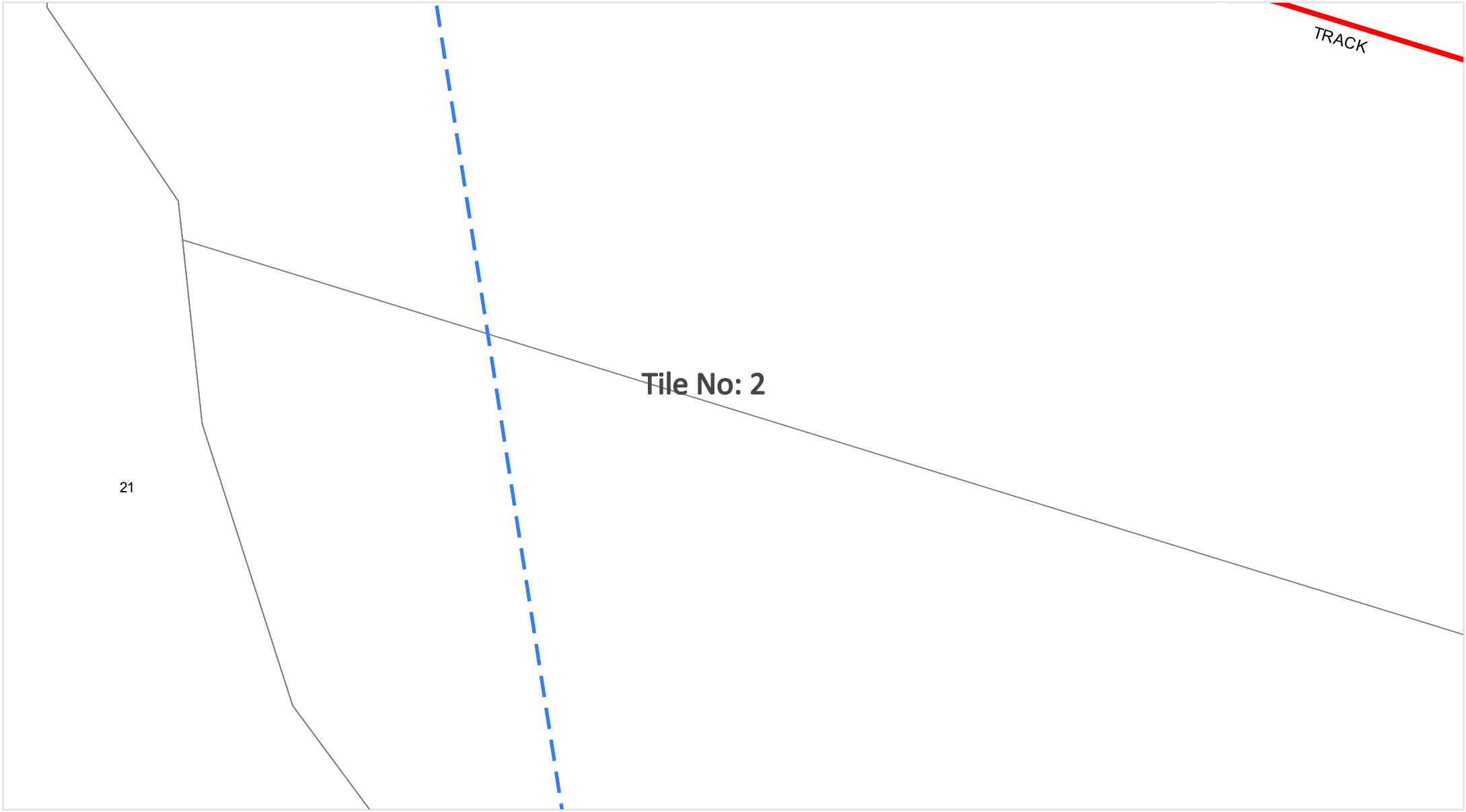


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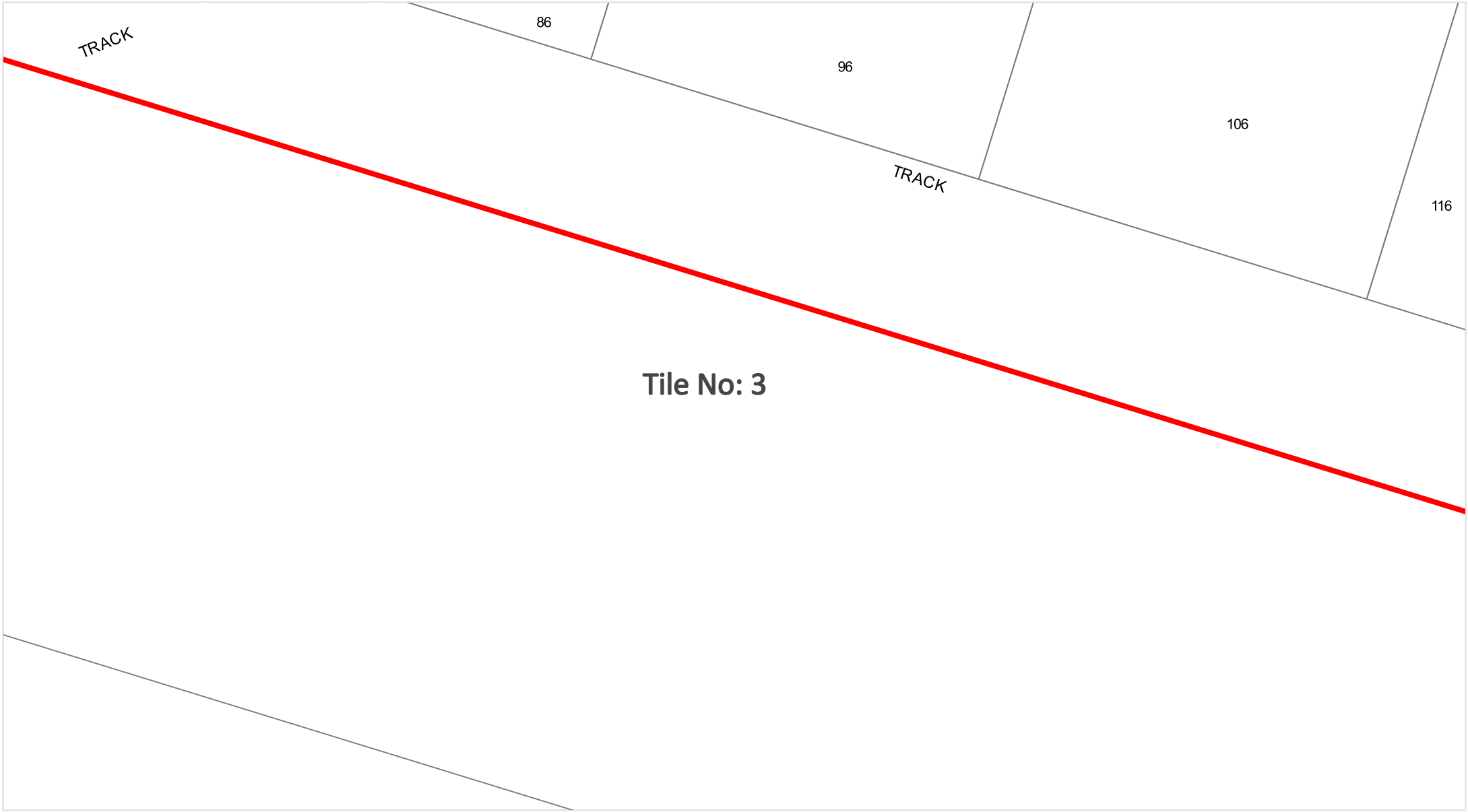


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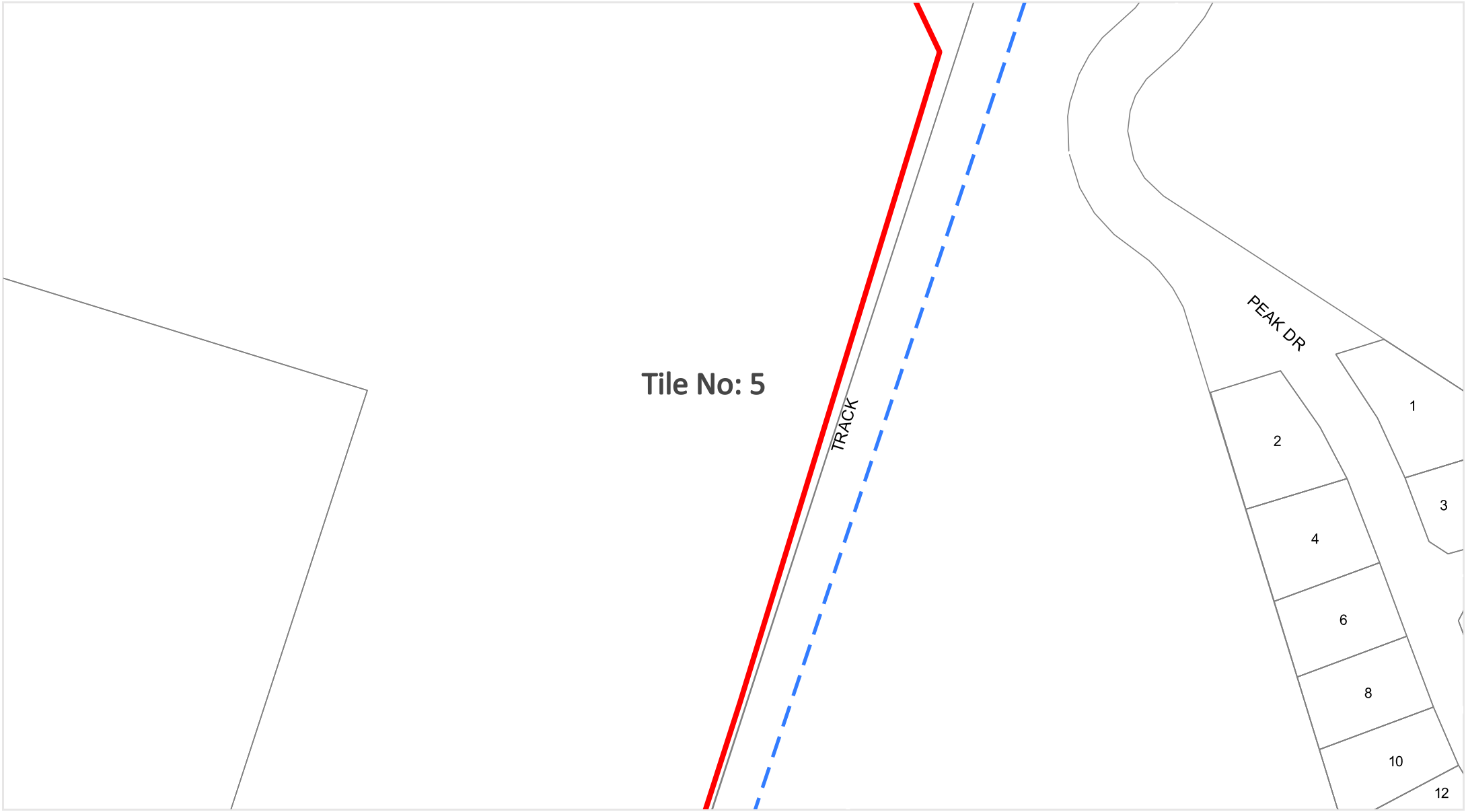


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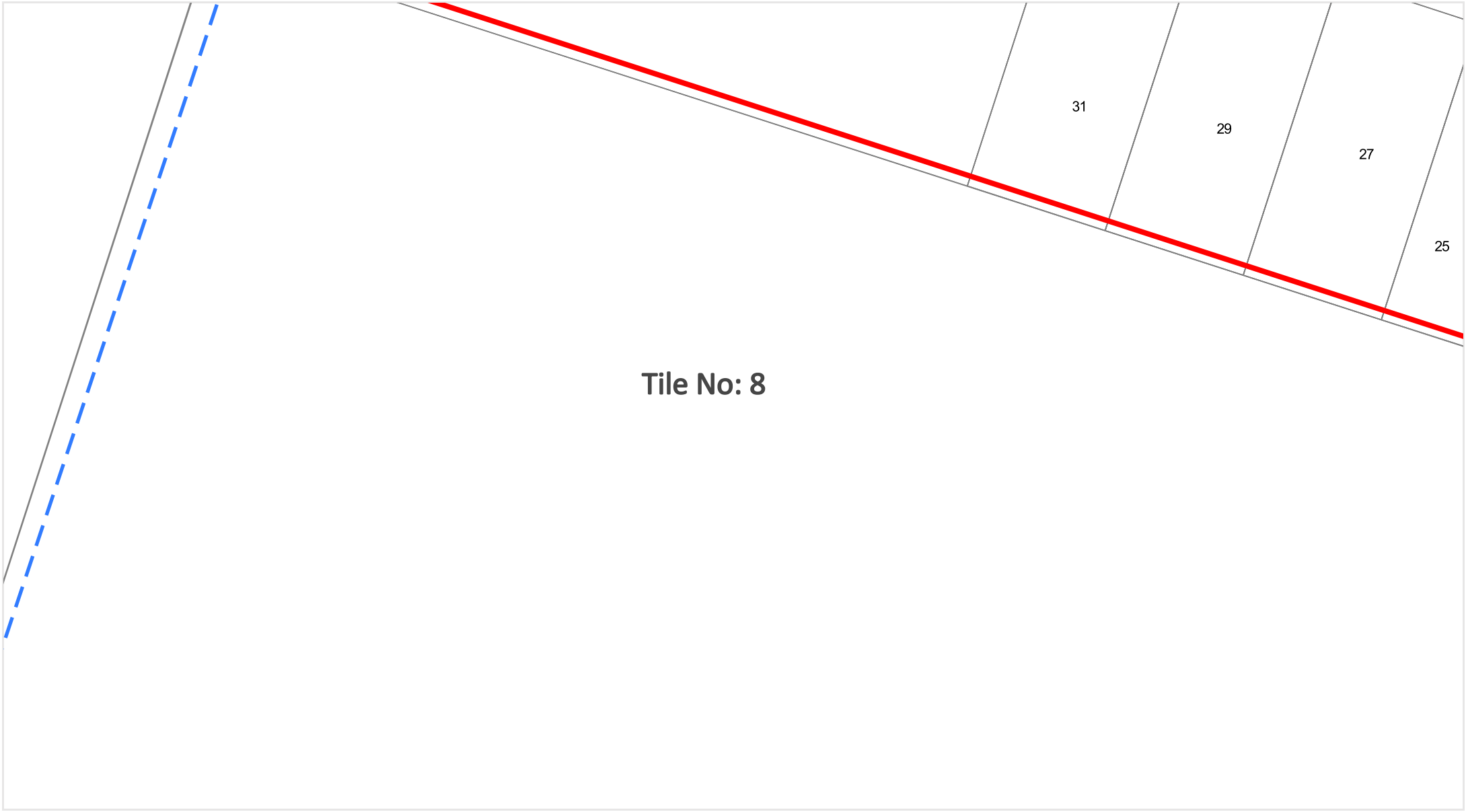


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- AARNet Power Assets
- Cadastre

Date: Sunday, 6 November 2022

To: Elizabeth Ogunsote

Company: Not supplied

Address: 24, Fitzroy Street Tamworth NSW 2340

## ELECTRICAL CABLE / WATER PIPE LOCATION

Dear Elizabeth Ogunsote

With reference to your enquiry:

- **Location:** 43 Rodeo Drive Hillvue NSW 2340
- **Sequence No:** 217880832
- **Dial Before You Dig Job No:** 33051649
- **Dial Before You Dig Customer No:** 3249927

Your specified area of interest is too large for automatic response. Please consider whether you need the full area and submit smaller request(s), each no longer than 1.6 km or contact Technical Enquiries on 13 23 91 for locations longer than 10 km only.

Note: the excavator must not assume that there may not be assets owned by other network operators in the area of interest.



www.essentialenergy.com.au
ABN 37 428 185 226
PO Box 5730 Port Macquarie NSW 2444
Telephone: 13 23 91 Facsimile: 1800 354 636

Essential Energy Network Information Portal

# ELECTRICITY SAFETY WHILE EXCAVATING

## When working near underground electrical infrastructure

NSW legislation requires people who are planning to do excavation work to obtain copies of underground electricity cable plans through Dial Before you Dig (Phone 1100) and to make sure that the plans are no more than 30 days old when excavation commences.

The aim of the legislation is to ensure that when workers dig or drive items near underground electricity cables, ducting, and pipes, they will establish the exact location of the cables and thus avoid coming into contact with them or damaging them. These items carry vital services such as electricity, water, gas and communications, and establishing their location before digging will help ensure worker safety and prevent damage to the network which may cause disruption of essential services to local communities.

### Excavate safely and protect underground assets

Dial Before You Dig (DBYD) is the first step to excavating safely. You should use DBYD when you will be undertaking (but not restricted to) the following:

- Any excavation using machinery digging deeper than 150mm. This includes but is not restricted to back hoes, excavators, borers & kanger hammers (ploughing or ripping activities)
- Any excavation using hand tools deeper than 300mm which includes shovels, spades and crow bars
- Any vertical or horizontal boring.

**Note:** The above examples are general and may not cover all situations in the regulations where a DBYD would be required e.g. driving metal posts in the ground.

Regardless of the size of your project you should lodge an enquiry with DBYD before commencing work. This applies to small tasks like backyard landscaping, driving items into the ground as well as heavy work such as directional boring or directional drilling. DBYD strive to respond to enquiries within two business days.

**Dial Before You Dig**

- Phone 1100
- Web www.1100.com.au
- Download the DBYD iPhone app

DIAL BEFORE YOU DIG
www.1100.com.au
The Essential First Step

When a DBYD has been obtained, contact Essential Energy on **13 23 91** to identify any underground pipes and/or cables in the vicinity of excavation works to be carried out. Allow at least **two weeks or 10 working days advance notice** in your construction program to permit Essential Energy time to allocate the necessary field resources to carry out an onsite inspection if required. This service may incur a fee & should be stated at the time of making the appointment.

In the event the excavation does not commence within 28 days of receipt of a plan, a new plan should be obtained. The excavator **must** retain the plans on site for the duration of the excavation works.

### Your responsibility

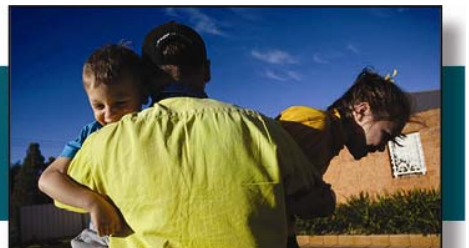
All individuals have a duty of care they must observe when working in the vicinity of underground cables, ducts and pipes. Be aware of the requirement set out in the latest WorkCover Codes of Practice 'Work near Underground Assets Guideline' and 'Work near Overhead Powerlines' which can be viewed at **www.workcover.nsw.gov.au** or you can purchase a copy of the Code of Practice by contacting WorkCover on 1300 799 003.

You should also be familiar with Essential Energy's operational procedures 'Work near Essential Energy's underground assets' CEOP8041 and 'Construction work near electricity network' CEOP1116, which can be found at essentialenergy.com.au/construction

- Employers: If you're an employer or employing someone to excavate, complete construction or drive items into the ground even at home you have a legal obligation to ensure their safety
- Excavators: It is the excavator's responsibility to visually expose the underground pipes and cables manually before any construction begins.

**Note** – when excavating involving high pressure water or compressed air to break up the ground, which is then removed by a powerful vacuum unit to expose critical utilities after they have been electronically located to confirm identity, size, number of services and depth, checks should be carried out to ensure the pressure is acceptable for all cables and other assets which may be found prior to commencing pot holing by this method. Warning: CONSAC cables shouldn't be potholed by this method and must be de-energised before any work carried out near them. It's recommended to only use air/vacuum equipment to pot hole that operates at or less than 13,790Kpa (2000psi).

Be safe, because they need you



## No Go Zone for powered excavation

Extract from WorkCover "**Work near Underground Assets**"

**TABLE 1:** Types of assets and limits of underground approach

| Assets | Clearances | No Go Zone for Powered Excavation | Controls | Typical Depths |
|---|---|---|---|---|
| Low voltage electricity cables – voltages less than or equal to 1000V (1kV) | Close proximity with the use of hand tools | 300 mm | Must contact asset owner for specific conditions | 450 – 750 mm |
| Electricity conductors from 11,000V (11kV) up to 33,000V (33 kV) | Close proximity with the use of hand tools | 600 mm | Must contact asset owner for specific conditions | 900 mm |
| Underground sub-transmission cables 33,000V up to 132,000V (132 kV) | Must contact asset owner | Must contact asset owner | Must be carried out under the supervision of the asset owner | 900 mm |
| High Voltage Electricity cables – voltages from 1000V (1kV) up to (33 kV) | Close proximity with the use of hand tools | Must contact asset owner | Must contact asset owner for specific conditions | 600 – 1000 mm |
| Extra High Voltage Electricity Transmission cables – voltages above (132 kV) and 330,000V (330 kV) | Must contact asset owner | Must contact asset owner | Work must be carried out under the supervision of the asset owner | 800 – 1200 mm |

### How to expose cables or pipes

Location plans provide an indication of the presence of underground assets only; they do not pinpoint the exact location. This is why manual exposure is required, which can be done by potholing. Underground assets must first be exposed by pot-holing with non-conductive tools to identify their location. Excavation with hand tools shall be carried out carefully up to, but not closer than, the minimum distances specified in Table 1. Several potholes may need to be dug manually to determine and satisfy yourself of the exact locations of cables or pipes to avoid any mishaps. Manual pot-holing needs to be undertaken with extreme care, common sense and while employing techniques least likely to damage cables. For example, orientate shovel blades and trowels parallel to the cable rather than digging across the cable. Look out for sand, plastic strips or specially marked bricks when excavating, which signal the presence of underground cables.

Only once all underground assets have been located, marked and protected against damage can the excavation proceed with caution.

### No Go Zone for powered excavation

Directional boring is powered excavation and contact with the asset owner must be made before excavation takes place. For directional boring across the line of an asset a minimum clearance of **300 mm** from the asset shall be maintained. When boring across the line of an underground asset, the location of the asset/s shall be positively proven by hand digging (pot-holing) or by another approved method and a safety observer appointed.

Note: Where the risk assessment identifies a potential risk of making contact with either underground assets, safety observer/s would be required. The safety observer's responsibility is to ensure that approach distances from underground and overhead assets are maintained.

For boring under electricity cables, the only true way of knowing where the directional drill is, is to "see" it. It is necessary to excavate a slit trench at right angles to the approaching drill and 500mm deeper than the asset being protected and beside the cables to confirm the depth of the cables and ensure the drill is not within the minimum approach distance of the cable (specified in Table 1).

For directional boring parallel to the asset and at the level of the asset, a clearance of **500 mm** shall be maintained from the edge of the nearest asset and pot holed at 10m intervals to ensure clearances are maintained with a safety observer appointed.

### The four Ps of safe excavation

1. **Plan** – Plan your job. Use the Dial Before You Dig service before your job is due to begin to help keep your project safe. Contact Essential Energy on 13 23 91 to identify any underground pipes and/or cables in the vicinity
2. **Pothole** – Potholing (digging by hand) is a method to assist in establishing the exact location of all underground infrastructure. Only use air/vacuum equipment to pot hole that operates at or less than 13,790Kpa (2000psi)
3. **Protect - Protecting and supporting exposed infrastructure is the** excavator's responsibility. Always erect safety barriers in areas at risk to protect underground networks
4. **Proceed** – But ONLY when you have planned, potholed and put the protective measures in place.

## Digging safely

You cannot be too careful when it comes to safe excavation. Avoiding underground ducting pipe and cable damage is as simple as having the right tools, the right skills and the right information.

- Study the plans you receive from asset owners thoroughly
- Check to see if they relate to the area you requested and make sure you understand them. If you are unclear about what the symbols mean or how to proceed, contact the relevant network owner
- Check the work area for other forms of electrical equipment, including street lights, ground substations, phone boxes or traffic lights – all good indicators that underground cables will be present
- Remember underground cables can also be present even if overhead powerlines have been identified
- Never assume the depth or alignment of pipes and cables. Installed networks assets may not have been installed in a straight line
- Always observe any instructions stated on the plans provided by the asset owner
- Remember, plans and maps identifying the location of underground cables and depths can alter after road upgrades or developments and underground assets may be as little as a few millimetres below the surface
- Other service lines (for example gas mains (pipes) and communication cables) can also be present. Shared trenches are frequently used on underground runs to premises
- New electrical cables are sometimes laid using existing old conduits
- Various methods of protecting underground cables may be utilised (for example electrical bricks, conduits, concrete or flat PVC barriers) or may be direct buried or installed by under-boring methods which may have no visual disturbance of the ground
- Ensure overhead & electrical structures aren't undermined during excavation.

## Earth cables

Earth cables are an important part of all electrical installations and have two main purposes:

- To safeguard against the possibility of danger to life
- To maintain the good working order of the electrical network.

They can have potentially dangerous electrical current flowing through them. Usually they have a green and yellow covering but could be a bare cable buried directly in the ground.

Even if the map provided does not show underground cables, earth cables may be present. These earth cables are usually associated with electrical equipment located on the pole such as transformers, switching equipment, permanent earthing points or Padmount / kiosk subs.

It's recommended that if any excavation is to take place within **10m** of a power pole with a cable running down it into the ground, contact is made with Essential Energy on **13 23 91** to have the earthing system located. While an effort is made to install the earthing under the powerline and guy if installed, sometimes circumstances may require a variation to this, so done assume where they are installed. The distance and configuration that the earthing cable is installed varies due to the soil conditions and system type (e.g. Single wire earth return (SWER)).

Additional earthing electrodes stakes may be installed to ensure the required earthing reading is obtained.

**WARNING:SWER installations**

- Contacting SWER earthing can be deadly
- Voltage is present on SWER transformer earthing systems either at 12.7 kV or 19.1kV
- NO excavation is allowed within 10 metres of a SWER transformer pole.

## Excavating around electrical poles

Anyone intending to excavate around any electrical item risks serious injury or death as a result of contact with underground cables or the earthing system.

## Assets around poles

For excavation depths greater than 250mm near power poles and stays you must arrange for an Essential Energy representative to attend the worksite 2 weeks prior to work commencing. Call Essential Energy on 13 23 91. More information is available in Essential Energy's operational procedure, 'Work near Essential Energy's underground assets: CEOP8041' which can be found at essentialenergy.com.au/construction

Unless otherwise agreed, underground assets and other obstructions around poles are to be kept a minimum distance of 300mm from the periphery of the pole, to allow inspections by the asset owner employees.

No excavation within 10 metres of a SWER transformer pole is to occur without the approval of the local electricity asset owner. It should be noted that the NSW Service and Installation Rules require a sketch of the underground service/consumers mains to be marked inside the switchboard.

The risks are higher for those earthing systems of the SWER constructions as the earthing is utilised as the return path.

Be safe, because they need you

Typically any electrical item installed on a pole will have an earth wire running down the pole into the ground, which includes:

- Transformers in urban and rural situations
- Isolation, protection and regulation items.

Transformers located on the ground (padmount and kiosk), besides having underground electrical cables, will have an earthing system installed around them.

## Damaged earthing

If an earth cable has been damaged, maintain a clearance of eight (8) meters and contact Essential Energy on 13 23 91. **DONT ATTEMPT** to re-join the cable - this will place you at serious risk.

## Operating near underground cables and earths

- Underground cables should never be moved or relocated unless under the express authority of the organisation or person responsible for the powerlines
- The excavator shall report all damage made to Essential Energy assets immediately. Damage includes: gouges, dents, holes and gas escapes
- Never undermine poles, cables, earthing cable, pad-mount and kiosk substations.

**Above:** Poles with become unstable if undermined

## Make sure it can't go wrong

You should ensure that people at work, their equipment (tools and plant) or materials do not come within close proximity to underground powerlines unless:

- A written risk assessment has been completed and a safe system of work implemented
- The relevant safety precautions and worker training requirements, including WorkCover Codes of Practice and Essential Energy's requirements, have been implemented and complied with.

If working in close proximity to underground cables is unavoidable and the risk assessment has been completed, the following should be considered to control the risks and ensure work safety:

- Have the power switched off by Essential Energy
- Consider all conductors as live unless it is positively known they have been de-energised
- Where appropriate, provide ground markings to identify location and warn workers of the presence of underground power and other assets.

## Emergency situations

In the event that contact with an underground powerline occurs or cables are exposed or damaged, remembering the following points could help save a life:

- If the situation is at all life threatening, immediately contact the Emergency Services on 000 (triple zero)
- Call Essential Energy's 24-hour supply interruptions line – **13 20 80** to switch off the power if required or report damage or exposure cables / conduits

- If any other underground assets are damaged you should contact the affected asset owners immediately
- Treat underground cables as alive, even if they appear to be dead
- Keep everyone at least eight metres away from the incident site, the person or any machinery making contact with underground cable

- Don't panic or touch the person receiving the electric shock – this could place you at risk
- Untrained, unequipped persons should not attempt to rescue a person receiving an electric shock. All too often secondary deaths occur when others go to the aid of earlier victims
- Remain on/inside the machinery until the supply is disconnected
- If possible, break contact between the machinery and underground cable.

## For more information

Essential Energy's Public Safety team is available to facilitate Electrical Awareness sessions and discuss any questions relating to electrical safety. For more information on electrical safety please call

- Essential Energy General Enquiries 13 23 91
- Essential Energy Supply Interruptions 13 20 80
- WorkCover NSW 13 10 50
- Dial Before You Dig www.1100.com.au 1100
- Follow us
- or visit essentialenergy.com.au/safety

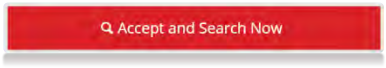
**Safety first:** Before you dig or drive items into the ground

1. Contact DBYD
2. DO NOT attempt to excavate with in 10m of any power pole or electrical item
3. Contact Essential Energy on 13 23 91 for assistance to locate cables and earthing
4. Locate asset: Pot-hole
5. Proceed only if you have satisfied yourself it is safe.

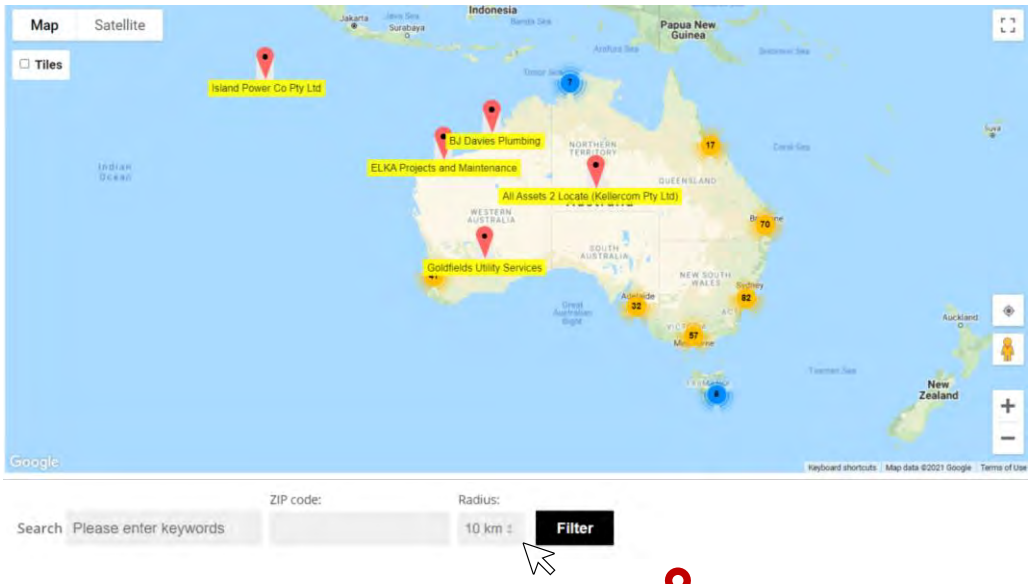
*Be safe, because they need you*

# Certified Locating Organisations (CLO)

**Find the closest CLO to your worksite on:** https://dbydlocator.com/certified-locating-organisation/

Read the disclaimer and click: 


A national map and an A-Z list of Certified Locating Organisations is displayed.




Use the map to zoom to your work area and choose the closest Locator indicated.

OR search by entering the **postcode** of your work area.

1. **Enter the post/zip code**
2. **Choose your search radius**
3. **Click filter** (If there is no result, you may have to increase the search radius)
4. **Click on the closest for CLO details or view the results displayed below the map**


Locator skills have been tested, and the Organisation has calibrated location and safety equipment.

Telstra is aware of each Certified Locating Organisation and their employee locators.

**Only a DBYD Certified Locator registered with a Certified Locating Organisation is authorised to access Telstra network for locating purposes.**

Each Certified Locator working for a CLO is issued with a photo ID Card, authorising them to access Telstra pits and manholes for the purpose of cable and plant locations.

Please ask to see your Locators' CLO ID Card.

# Before You Dig Australia

## Think before you dig

This document has been sent to you because you requested plans of the Telstra network through Before You Dig Australia (BYDA).

**If you are working or excavating near telecommunications cables, or there is a chance that cables are located near your site, you are responsible to avoid causing damage to the Telstra network.**

Please read this document carefully. Taking your time now and following the steps below can help you avoid damaging our network, interrupting services, and potentially incurring civil and criminal penalties.

Our network is complex and working near it requires expert knowledge. Do not attempt these activities if you are not qualified to do so.

# Your checklist

## 1. Plan

Plan your work with the latest plans of our network.

Plans provided through the BYDA process are indicative only*.

**This means the actual location of our asset may differ substantially from that shown on the plans.**

Refer to steps 2 and 3 to determine actual location prior to proceeding with construction.

## 2. Prepare

Engage a DBYD Certified Locating Organisation (CLO) via dbydlocator.com to identify, validate and protect Telstra assets before you commence work.

## 3. Pothole

Validate underground assets by potholing by hand or using non-destructive vacuum extraction methods.

Electronic detection alone (step 2) is not deemed to validate underground assets and must not be used for construction purposes.

If you cannot validate the Telstra network, you must not proceed with construction.

## 4. Protect

Protect our network by maintaining the following distances from our assets:

- 1.0m Mechanical Excavators, Farm Ploughing, Tree Removal
- 500mm Vibrating Plate or Wacker Packer Compactor
- 600mm Heavy Vehicle Traffic (over 3 tonnes) not to be driven across Telstra ducts or plant
- 1.0m Jackhammers/Pneumatic Breakers
- 2.0m Boring Equipment (in-line, horizontal and vertical)

## 5. Proceed

You can proceed with your work only once you have completed all the appropriate preparation, potholing and protection.

# Useful information

## Report any damage immediately

https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-equipment

**13 22 03**

If you receive a message asking for an account or phone number say "I Don't have one" Then say "Report Damage" then press 1 to speak to an operator.

## Relocating assets

If your project requires the relocation of a Telstra asset, please contact the Telstra Network Integrity Group:

Request Asset Relocation Or Commercial Works (telstra.com.au)

NetworkIntegrity@team.telstra.com

**1800 810 443 (AEST business hours only)**

Never try to move or alter our network infrastructure without authorisation. By law, only authorised people can work on our assets or enter a facility owned or operated by us. Any interference, including unauthorised entry or tampering, may result in legal action.

## Further information

Plan enquiries

**1800 653 935 (AEST business hours only)**

Telstra.Plans@team.telstra.com

**Information on how to find cables and request asset relocations:**

https://www.telstra.com.au/consumer-advice/digging-construction

**Asset Plan Readers**

**PDF** Adobe Acrobat Reader DC Install for all versions
**DWF** Download Design Review | DWF Viewer | Autodesk

# Disclaimer and legal details

*Telstra advises that the accuracy of the information provided by Telstra conforms to Quality Level D as defined in AS5488-2013.

It is a criminal offence under the Criminal Code Act 1995 (Cth) to tamper or interfere with telecommunications infrastructure.

Telstra will also take action to recover costs and damages from persons who damage assets or interfere with the operation of Telstra's networks.

By receiving this information including the indicative plans that are provided as part of this information package you confirm that you understand and accept the risks of working near Telstra's network and the importance of taking all of the necessary steps to confirm the presence, alignments and various depths of Telstra's network. This in addition to, and not in replacement of, any duties and obligations you have under applicable law.

When working in the vicinity of a telecommunications plant you have a "Duty of Care" that must be observed. Please read and understand all the information and disclaimers provided below.

The Telstra network is complex and requires expert knowledge to interpret information, to identify and locate components, to pothole underground assets for validation and to safely work around assets without causing damage. If you are not an expert and/or qualified in these areas, then you must not attempt these activities. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers. The 5 P's to prevent damage to Telstra assets are listed above. Construction activities and/or any activities that potentially may impact on Telstra's assets must not commence without first undertaking these steps. Construction activities can include anything that involves breaking ground, potentially affecting Telstra assets.

If you are designing a project, it is recommended that you also undertake these steps to validate underground assets prior to committing to your design.

This Notice has been provided as a guide only and may not provide you with all the information that is required for you to determine what assets are on or near your site of interest. You will also need to collate and understand all of the information received from other Utilities and understand that some Utilities are not a part of the BYDA program and make your own enquiries as appropriate. It is the responsibility of the entities undertaking the works to protect Telstra's network during excavation / construction works.

Telstra owns and retains the copyright in all plans and details provided in conjunction with the applicant's request. The applicant is authorised to use the plans and details only for the purpose indicated in the applicant's request. The applicant must not use the plans or details for any other purpose.

Telstra plans or other details are provided only for the use of the applicant, its servants, agents, or Certified Locating Organisation. The applicant must not give the plans or details to any parties other than these and must not generate profit from commercialising the plans or details.

Telstra, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Telstra against any claim or demand for any such loss or damage.

Please ensure Telstra plans and information provided always remains on-site throughout the inspection, location, and construction phase of any works.

Telstra plans are valid for 60 days after issue and must be replaced if required after the 60 days.

### Data Extraction Fees

In some instances, a data extraction fee may be applicable for the supply of Telstra information. Typically, a data extraction fee may apply to large projects, planning and design requests or requests to be supplied in non-standard formats. For further details contact Telstra Planned Services.

Telstra does not accept any liability or responsibility for the performance of or advice given by a Certified Locating Organisation. Certification is an initiative taken by Telstra towards the establishment and maintenance of competency standards. However, performance and the advice given will always depend on the nature of the individual engagement.

Neither the Certified Locating Organisation nor any of its employees are an employee or agent for Telstra. Telstra is not liable for any damage or loss caused by the Certified Locating Organisation or its employees.

Once all work is completed, the excavation should be reinstated with the same type of excavated material unless specified by Telstra

The information contained within this pamphlet must be used in conjunction with other material supplied as part of this request for information to adequately control the risk of potential asset damage.

When using excavators and other machinery, also check the location of overhead power lines.

Workers and equipment must maintain safety exclusion zones around power lines

**WARNING:** Telstra plans and location information conform to Quality Level 'D' of the Australian Standard AS 5488 - Classification of Subsurface Utility Information. As such, Telstra supplied location information is indicative only. Spatial accuracy is not applicable to Quality Level D. Refer to AS 5488 for further details. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans. FURTHER ON SITE INVESTIGATION IS REQUIRED TO VALIDATE THE EXACT LOCATION OF TELSTRA PLANT PRIOR TO COMMENCING CONSTRUCTION WORK. A plant location service is an essential part of the process to validate the exact location of Telstra assets and to ensure the assets are protected during construction works. The exact position of Telstra assets can only be validated by physically exposing them. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.

### Privacy Note

Your information has been provided to Telstra by BYDA to enable Telstra to respond to your BYDA request. Telstra keeps your information in accordance with its privacy statement. You can obtain a copy at www.telstra.com.au/privacy or by calling us at 1800 039 059 (business hours only).

217880830 (1).dwf

AUTODESK Viewer

AUTODESK

IT'S HOW WE CONNECT

## OPENING ELECTRONIC MAP ATTACHMENTS -

Telstra Cable Plans are generated automatically in either PDF or DWF file types dependant on the site address and the size of area selected. You may need to download and install free viewing software from the internet e.g.


**PDF Map Files (max size A3)**

Adobe Acrobat Reader ( http://get.adobe.com/reader/ ),

**DWF Map Files (all sizes over A3)**


Autodesk A360 (https://360.autodesk.com/viewer) or

Autodesk Design Review ( http://usa.autodesk.com/design-review/ ) for DWF files. (Windows)

**Telstra DBYD map related enquiries**

email - Telstra.Plans@team.telstra.com

1800 653 935 (AEST Business Hours only)

**REPORT ANY DAMAGE TO THE TELSTRA NETWORK IMMEDIATELY**

Report online - https://service.telstra.com.au/customer/general/forms/report-damage-to-telstra-equipment

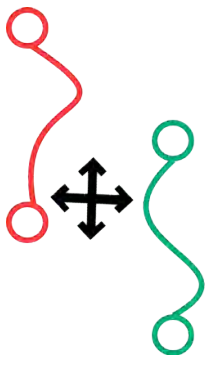
Ph: **13 22 03**

If you receive a message asking for a phone or account number say:

"I don't have one" then say "Report Damage" then press 1 to speak to an operator.

**Telstra New Connections / Disconnections**

**13 22 00**



**Telstra asset relocation enquiries:** 1800 810 443 (AEST business hours only).

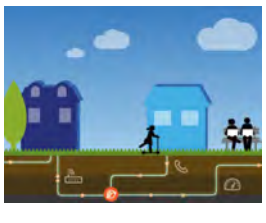
NetworkIntegrity@team.telstra.com

https://www.telstra.com.au/consumer-advice/digging-construction

Certified Locating Organisation (CLO)

https://dbydlocator.com/certified-locating-organisation/

Please refer to attached Accredited Plant Locator.pdf



Telstra Smart Communities
Information for new developments (developers, builders, homeowners)
https://www.telstra.com.au/smart-community

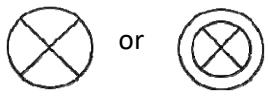
# LEGEND

IT'S HOW WE CONNECT

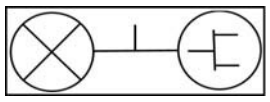
**For more info contact a Certified Locating Organisation or Telstra Plan Services 1800 653 935**

Exchange
(Major Cable Present)

Footway Access Chamber
(can vary from 1-lid to 12-lid)




Pillar / Cabinet
(above ground / free standing)



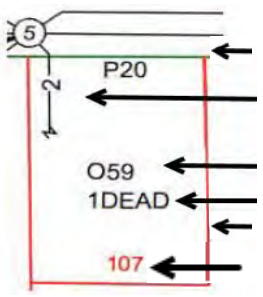
Above ground complex equipment housing (eg RIM)
Please Note: This equipment is powered by 240V Electricity

OC — Other Carrier Telecommunications Cable/Asset

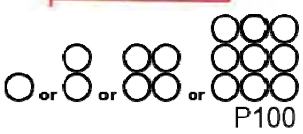
Dist — Distribution cables in Main Cable ducts

MC — Main Cable ducts on a Distribution plan

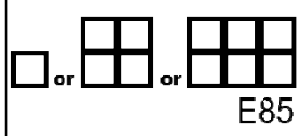
▲ — Blocked or damaged duct.



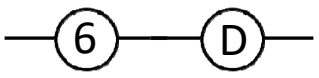

Roadside / Front Boundary
2 pair lead-in to property from pit in street 1
pair working (pair ID 059)
1 pair dead (i.e. spare, not connected)
Side / Rear Property Boundary
Property Number




Single to multiple round conduit
Configurations 1.2.4.9 respectively
(attached text denotes conduit type and size)




Multiple square conduit
Configurations 2, 4, 6 respectively
(attached text denotes conduit type and size)




Cable Jointing Pit
(number / Letter indicating Pit Type)

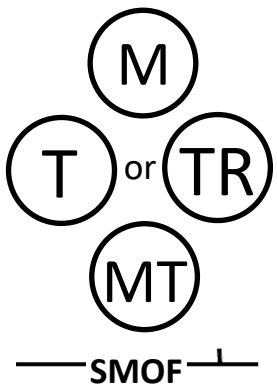

Elevated Joint
(above ground joint on buried cable)

Telstra Plant in shared Utility trench

Aerial Cable

Aerial Cable
(attached to joint Use Pole eg. Power)

Direct Buried Cable




Marker Post Installed

Buried Transponder

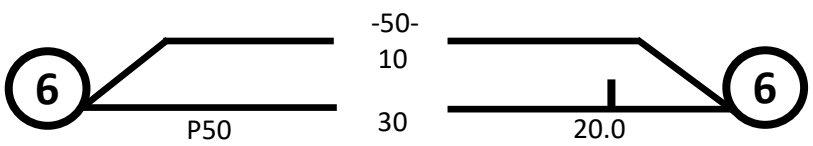
Marker Post, Transponder

Optical Fibre cable direct buried

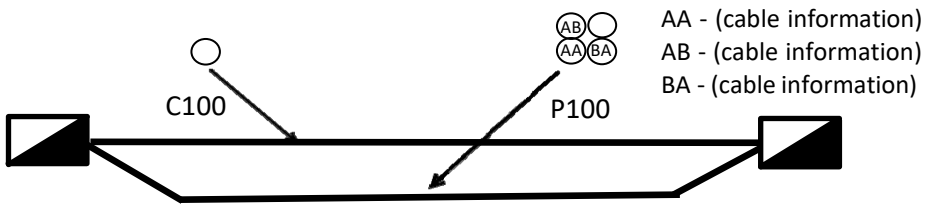
**Some examples of conduit type and size:**

A - Asbestos cement, P - PVC / Plastic, C - Concrete,
GI - Galanised iron, E - Earthenware
Conduit sizes *nominally* range from 20mm to 100mm
P50 50mm PVC conduit
P100 100mm PVC conduit
A100 100mm asbestos cement conduit

Some Examples of how to read Telstra Plans




One 50mm PVC conduit (P50) containing a 50-pair and a 10-pair cable between two 6-pits. approximately 20.0m apart, with a direct buried 30-pair cable along the same route




Two separate conduit runs between two footway access chambers (manholes) approximately 245m apart A nest of four 100mm PVC conduits (P100) containing assorted cables in three ducts (one being empty) and one empty 100mm concrete duct (C100) along

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APA Group
PO Box 6014 Halifax Street
South Australia 5000

**For your immediate information THERE IS A CRITICAL GAS PIPELINE AND/OR ASSOCIATED INFRASTRUCTURE in the area of your works.**

06/11/2022

Company:
Elizabeth Ogunsote
24, Fitzroy Street
Tamworth
NSW 2340
e.ogunsote@mossenviro.com.au

Dear Elizabeth Ogunsote

**Sequence Number:** 217880834
**Worksite Address:** 43 Rodeo Drive
Hillvue
NSW 2340

Thank you for your Dial Before You Dig enquiry regarding the location of Gas Assets. We can confirm that the APA Group has **Critical Gas Assets** in the vicinity of the above location.

You are hereby notified that **before you commence any works** you are required to complete the attached '**Work In The Vicinity Of Critical Gas Assets**' request form and forward this to APA as soon as practicable.

As laid out in the **Duty of Care** requirements supplied, any activity in the vicinity of Critical Gas Assets operated by APA requires an Authority to Work Permit and potentially attendance on site by an APA representative during any work. Please ensure you read and comply with all the relevant requirements. Should you have any questions with regards to the attached information please contact our Qld Planning & Scheduling Officer - (07) 3215 6644.

**Caution - Damage to gas assets could result in possible explosion and fire with the risk of personal injury.**
**For Gas Emergencies please call 1800 GAS LEAK (1800 427 532)**

Please find enclosed the following information:-

- APA's Duty of Care, If you are unclear of your obligations under these requirements please contact the APA Representative listed above immediately
- An overview map with your requested area highlighted to assist in locating APA's Gas Assets
- A map(s) showing APA's Gas Assets in the requested area, this information is valid for 30 days from the date of this response, **please check this represents the area you requested**, if it does not, please contact the APA Representative listed above immediately
- A 'Work In The Vicinity Of Critical Gas Assets' request form, please complete and forward to APA as soon as practicable via PermitsQld@apa.com.au, or the address above. *A minimum of **5 business days** advance notification is required to process Authority To Work Request applications*

The outcome of this request may be that a qualified APA Group Representative will be required on site when you undertake your proposed works, if this is the case, this will need to be arranged dependent on their availability. Whilst we will aim to facilitate this within 5 business days from a decision, **this cannot be guaranteed.**

**Please Note:** For some DBYD enquiries, you might receive 2 responses from the APA Group. Please read both responses carefully as they will relate to different assets. It is your responsibility to action all requirements set out in APA Group responses.

Please take some time to review the entire response document and check the information supplied and please let us have any feedback by sending an email to DBYDNetworksAPA@apa.com.au or contacting us direct on 1800 085 628.

## Duty of Care - Working Around Gas Assets

## General Conditions

- This location enquiry is valid for 30 days from the enquiry date
- Expired locations, i.e., over 30 days from the date of this response, require a new Dial Before You Dig request to validate location information
- The location information supplied in this document shall be used as a guide only. APA Group shall not be liable or responsible for the accuracy of any such information supplied pursuant to this request
- It is the responsibility of the excavator to expose all Gas Assets, including Gas Service pipes (see below), **by hand**. Gas Asset depths may vary according to ground conditions
- Gas Services (inlet service) connecting Gas Assets in the street to the gas meter on the property are typically **not** marked on the map
- Some Gas Assets are installed inside of a casing. The locations where a Gas Asset changes from inserted to direct burial are not marked on the map unless otherwise stated
- This information has been generated by an automated system based on the area highlighted in your DBYD request and has not been independently verified. It is your responsibility to ensure that the information supplied in this response matches the dig site you defined when submitting your Dial Before You Dig enquiry. If the information does not match the dig site or you have any question, please contact APA immediately using the details listed on the first page and / or please resubmit your enquiry
- For **Gas Emergencies** please call **1800 GAS LEAK (1800 427 532)**

## Critical Gas Assets - Conditions

It is your responsibility to follow these important conditions when working in the vicinity of Critical Gas Assets

- A 'Work In The Vicinity Of Critical Gas Assets" request form must be submitted to APA Group PRIOR to any work commencing, a minimum of **5 business days** are required to arrange attendance by an APA Group representative
- Whilst we will aim to facilitate this within **5 business days** from a decision, **this cannot be guaranteed**. Charges for APA Group supervision may apply
- Any works in the vicinity of Critical Gas Assets requires approval from APA via **APA's 'Authority to work" permit** and supervision by an APA Group representative unless expressed otherwise on the "Authority to work" permit.
- Penalties apply to excavators commencing work in the vicinity of Critical Gas Assets **prior to receiving an APA Group 'Authority to Work' permit and an APA Group representative is present**

**Rates applicable to APA on-site representation for supervision or location**

| Item | Rate |
|---|---|
| Site Watch - Normal Hours | $143.42 (hr) |
| Site Watch - After Hours | $175.06 (hr) |
| Electronic Locate – Normal Hours | $143.42 (hr) |
| Electronic Locate – After Hours | $175.06 (hr) |
| Cancellation | 2 hrs (where less than 1 business day notice is provided) |
| Mains Proving | As quoted by APA |

Notes:

- All prices are exclusive of GST
- All partial hours will be charged at a full hour rate for the first hour, 1hr minimum charge.
- Cancellations must be received 1 business day prior to the booked supervision otherwise a 2hr charge will be incurred.
- Contact us for State specific hours of business.

## APA CHANGE NOTIFICATION

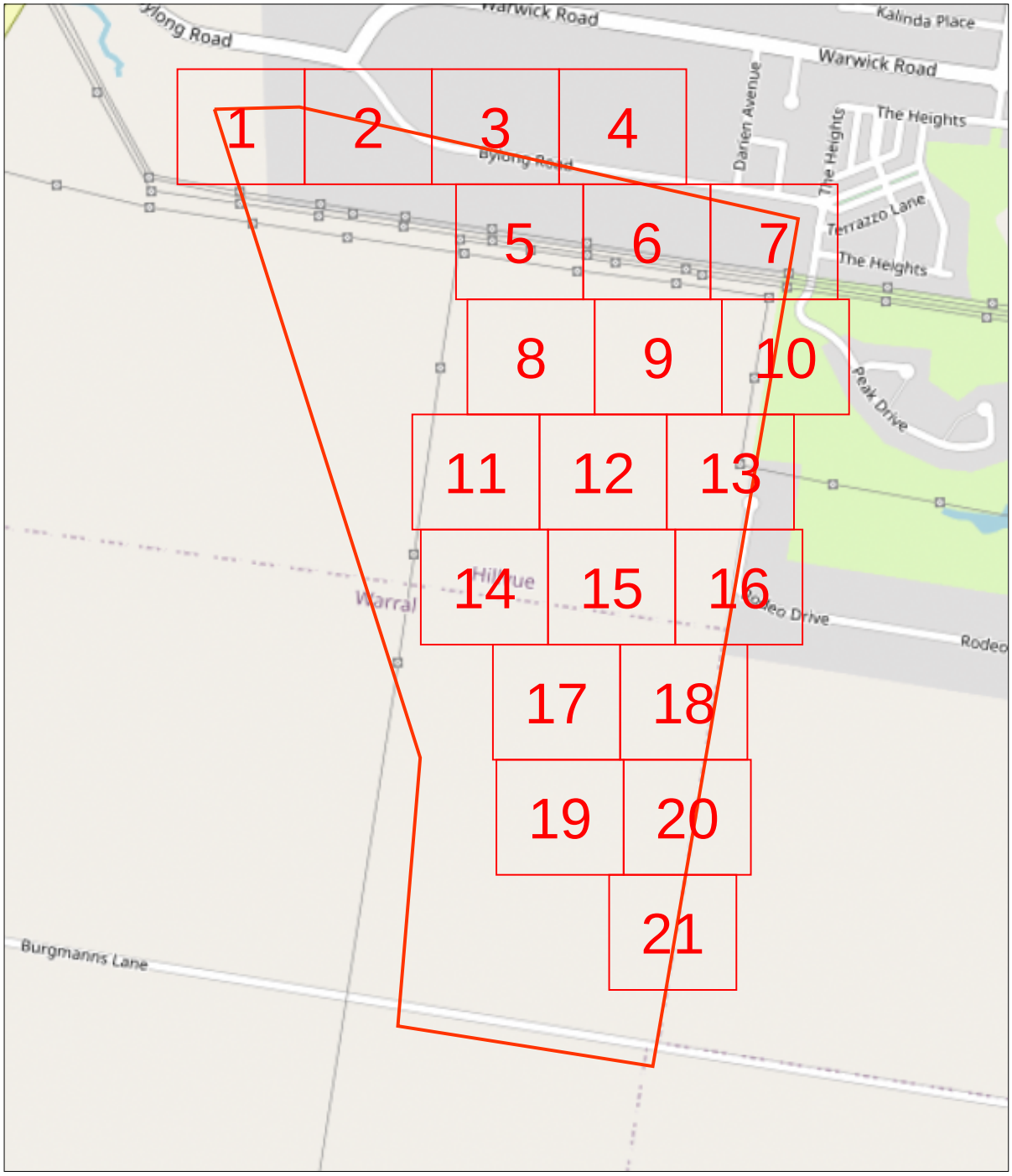
**The map below may have different symbols to those you are familiar with.**

APA recently upgraded the asset mapping software utilised for Dial Before You Dig requests.

To avoid confusion, please carefully review the legend along with the map.

Please direct any questions to DBYDNetworksAPA@apa.com.au

| | | | |
|---|---|---|---|
| **Site Address** | 43 Rodeo Drive<br>Hillvue<br>2340 | **Sequence No** | 217880834 |
| **Name** | Elizabeth Ogunsote | | |
| **Email** | e.ogunsote@mossenviro.com.au | | |




| | | |
|---|---|---|
| Scale 1: 9500 | N | Enquiry Area / Map Key Area |

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

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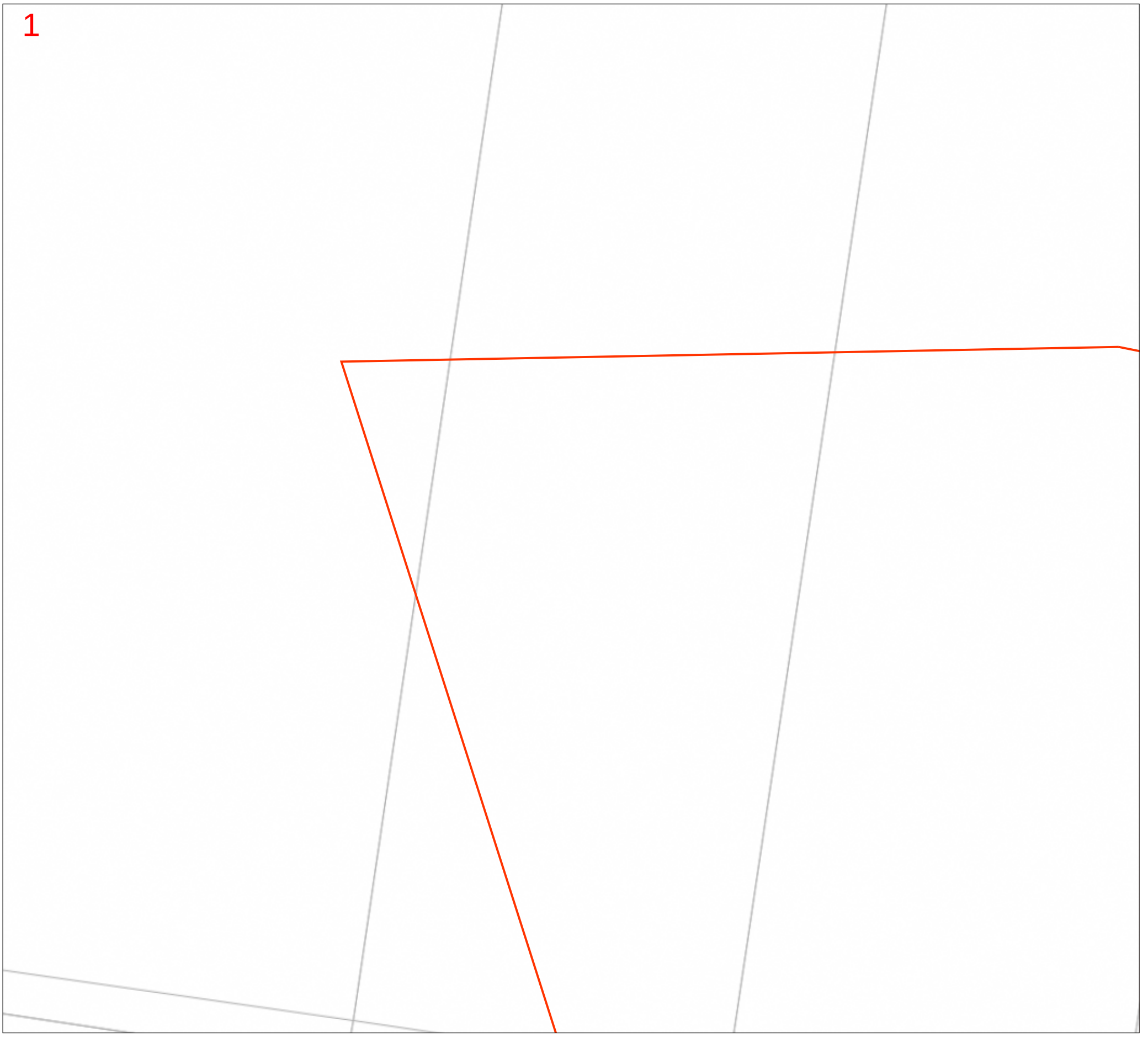



| PIPE AND BOUNDARIES | | PIPE CODE / MATERIALS | | OBJECTS or TERMS | |
|---|---|---|---|---|---|
| SERVICE (COLOUR BY PRESSURE) | | C2, CI | Cast Iron | VALVES | |
| LOW PRESSURES | | CU | Copper | BURIED VALVES | |
| MEDIUM PRESSURES | | N2, NY, NY11 | Nylon | GATE / REGULATORS | |
| HIGH PRESSURES | | P# *(e.g. P6)* | Polyethylene (PE) | GAS SUPPLIED = YES | |
| TRANSMISSION PRESSURES | | P6,P7,P9-P12 | Medium Density PE | CP RECTIFIER UNIT | |
| PRIORITY MAIN (BEHIND PIPE) | | P2,P4,P8 | High Density PE | CP TEST POINT/ ANODE | |
| PROPOSED (COLOUR BY PRESSURE) | | ST or S# | Steel | SYPHON | |
| LPG (COLOUR BY PRESSURE) | | *S6# (e.g. S61)* | Steel Class 600 | TRACE WIRE POINT | |
| ABANDONED | | *S3# (e.g. S33)* | Steel Class 300 | PIPELINE MARKER | |
| IDLE | | W2 or GAL | Wrought Galv. Iron | NOT TIED IN | N.T.I. |
| SLEEVE | | W3 or PGAL | Poly Coat Wrought Galv. Iron | COUPLING & END CAP | or |
| CASING / SPLIT (BEHIND PIPE) | | *Pipe diameter in millimetres is shown before pipe code*<br>*e.g. 40P6 = 40mm nominal diameter* | | DEPTH OF COVER | C |
| UNKNOWN | | | | | |
| EASEMENT/ JURISDICTION | | | | | |

**EXAMPLES**

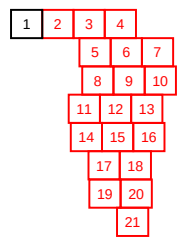
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

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**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
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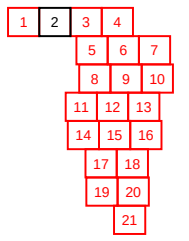


Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

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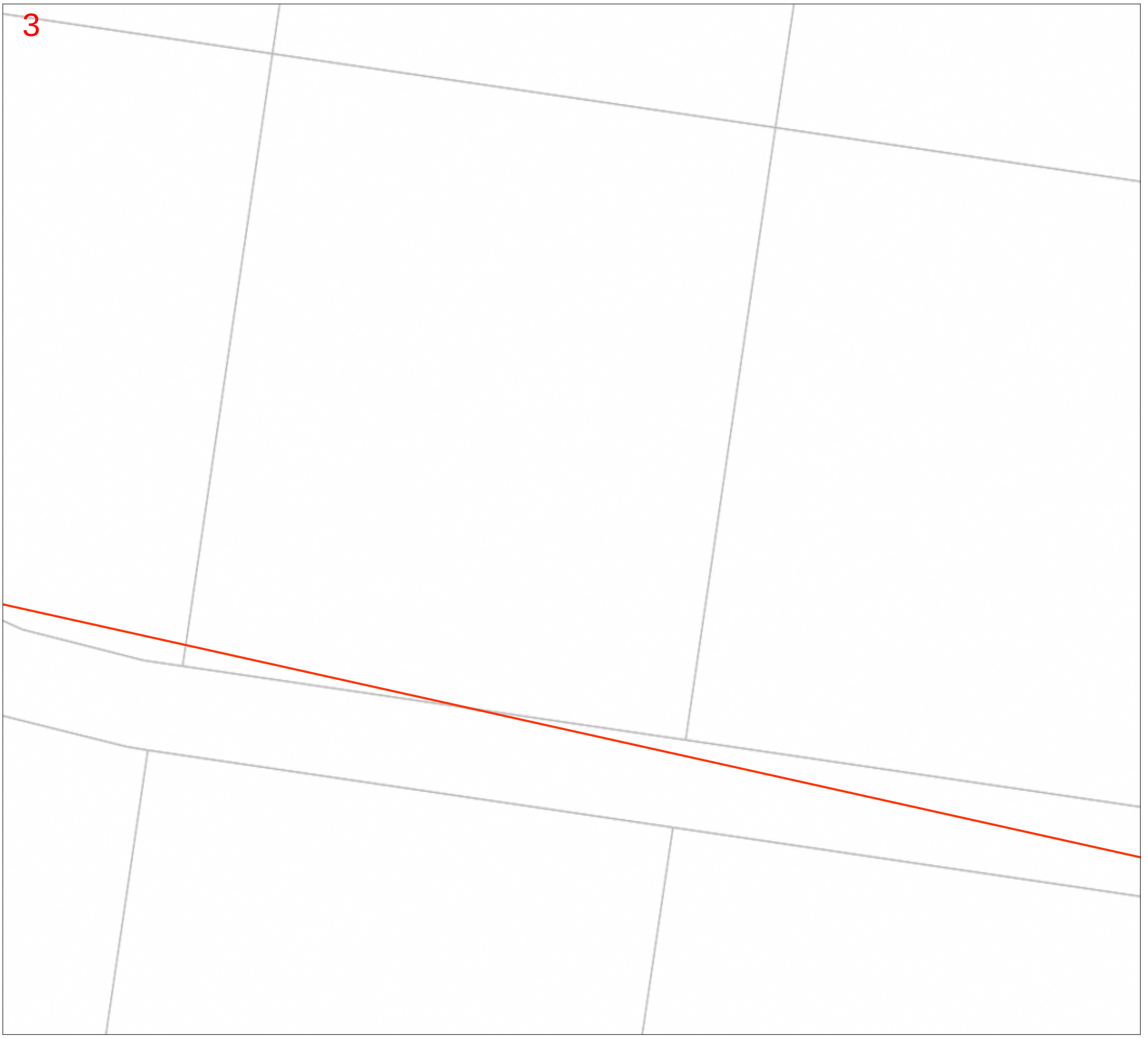


**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

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| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
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| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

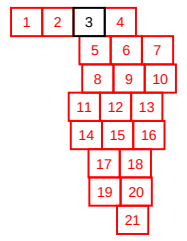
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key



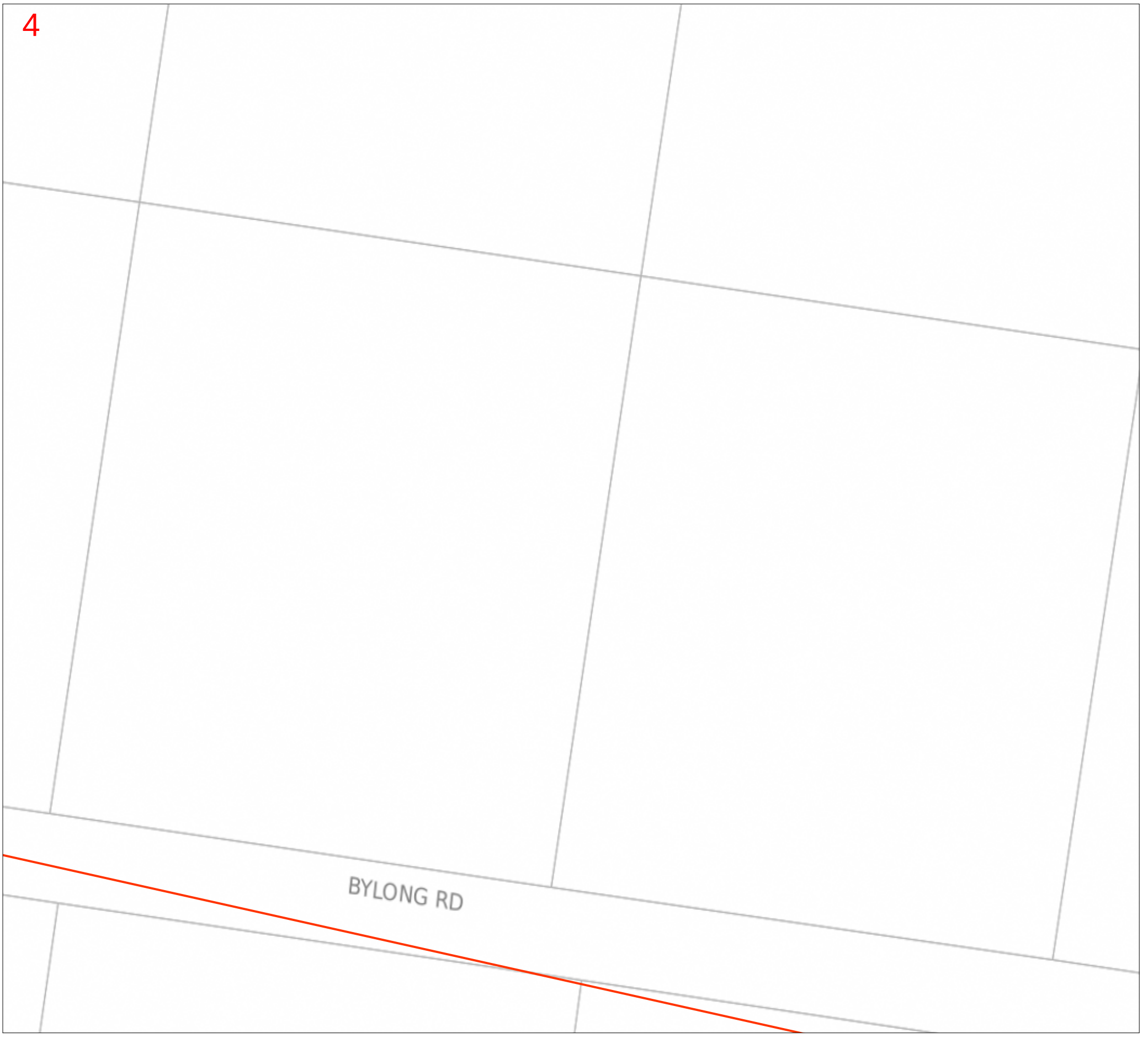

Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.




**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

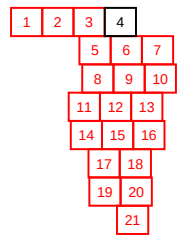
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key



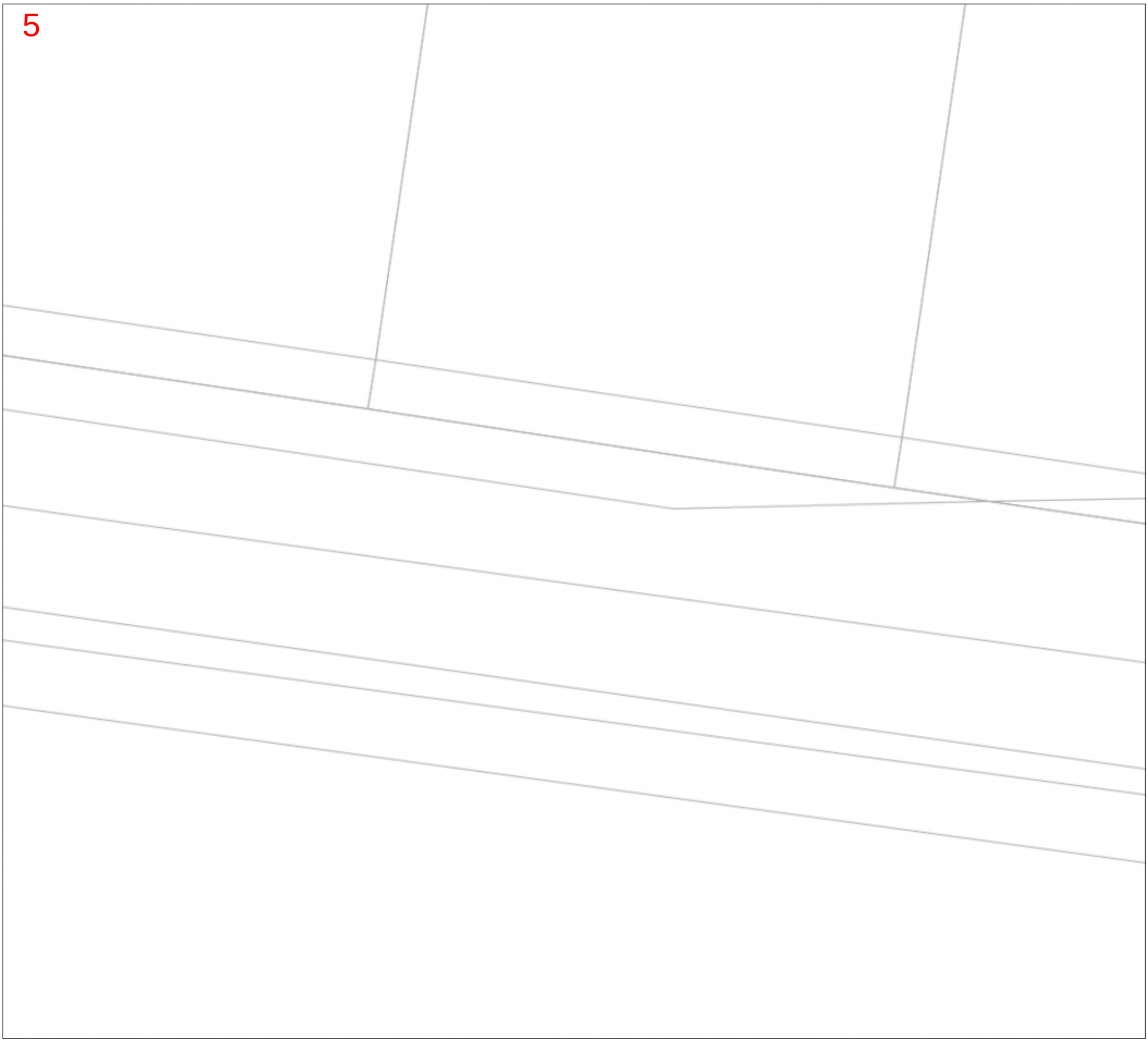

Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.




**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

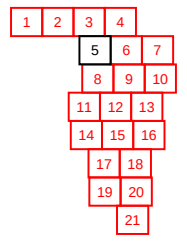
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key



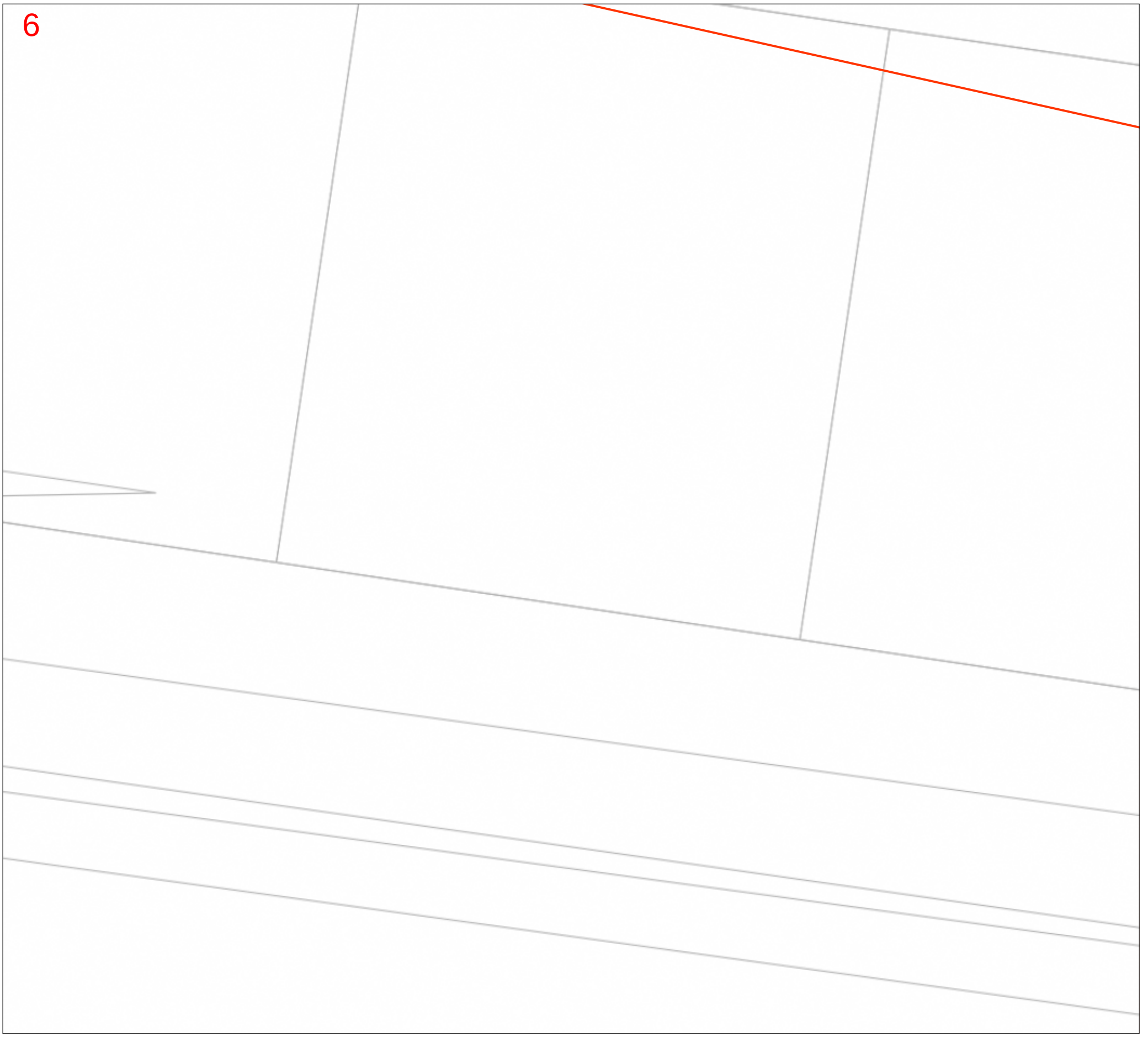

Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.




| PIPE AND BOUNDARIES | | PIPE CODE / MATERIALS | | OBJECTS or TERMS | |
|---|---|---|---|---|---|
| SERVICE (COLOUR BY PRESSURE) | | C2, CI | Cast Iron | VALVES | |
| LOW PRESSURES | | CU | Copper | BURIED VALVES | |
| MEDIUM PRESSURES | | N2, NY, NY11 | Nylon | GATE / REGULATORS | |
| HIGH PRESSURES | | P# *(e.g. P6)* | Polyethylene (PE) | GAS SUPPLIED = YES | |
| TRANSMISSION PRESSURES | | P6,P7,P9-P12 | Medium Density PE | CP RECTIFIER UNIT | |
| PRIORITY MAIN (BEHIND PIPE) | | P2,P4,P8 | High Density PE | CP TEST POINT/ ANODE | |
| PROPOSED (COLOUR BY PRESSURE) | | ST or S# | Steel | SYPHON | |
| LPG (COLOUR BY PRESSURE) | | *S6# (e.g. S61)* | Steel Class 600 | TRACE WIRE POINT | |
| ABANDONED | | *S3# (e.g. S33)* | Steel Class 300 | PIPELINE MARKER | |
| IDLE | | W2 or GAL | Wrought Galv. Iron | NOT TIED IN | N.T.I. |
| SLEEVE | | W3 or PGAL | Poly Coat Wrought Galv. Iron | COUPLING & END CAP | or |
| CASING / SPLIT (BEHIND PIPE) | | *Pipe diameter in millimetres is shown before pipe code e.g. 40P6 = 40mm nominal diameter* | | DEPTH OF COVER | C |
| UNKNOWN | | | | | |
| EASEMENT/ JURISDICTION | | | | | |

**EXAMPLES**

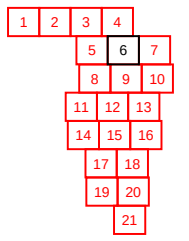
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key



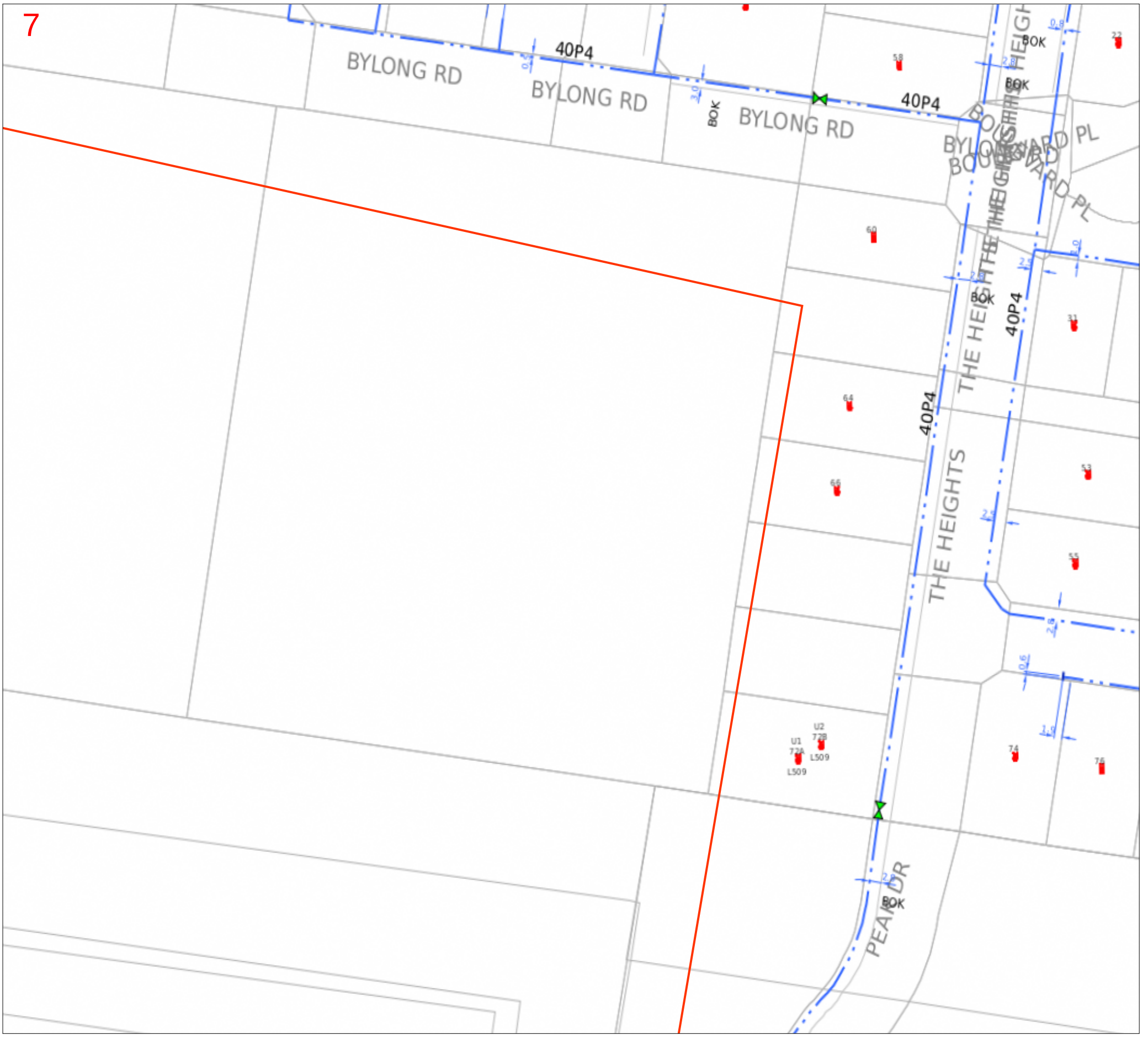

Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.




| PIPE AND BOUNDARIES | | PIPE CODE / MATERIALS | | OBJECTS or TERMS | |
|---|---|---|---|---|---|
| SERVICE (COLOUR BY PRESSURE) | | C2, CI | Cast Iron | VALVES | |
| LOW PRESSURES | | CU | Copper | BURIED VALVES | |
| MEDIUM PRESSURES | | N2, NY, NY11 | Nylon | GATE / REGULATORS | |
| HIGH PRESSURES | | P# *(e.g. P6)* | Polyethylene (PE) | GAS SUPPLIED = YES | |
| TRANSMISSION PRESSURES | | P6,P7,P9-P12 | Medium Density PE | CP RECTIFIER UNIT | |
| PRIORITY MAIN (BEHIND PIPE) | | P2,P4,P8 | High Density PE | CP TEST POINT/ ANODE | |
| PROPOSED (COLOUR BY PRESSURE) | | ST or S# | Steel | SYPHON | |
| LPG (COLOUR BY PRESSURE) | | *S6# (e.g. S61)* | Steel Class 600 | TRACE WIRE POINT | |
| ABANDONED | | *S3# (e.g. S33)* | Steel Class 300 | PIPELINE MARKER | |
| IDLE | | W2 or GAL | Wrought Galv. Iron | NOT TIED IN | N.T.I. |
| SLEEVE | | W3 or PGAL | Poly Coat Wrought Galv. Iron | COUPLING & END CAP | or |
| CASING / SPLIT (BEHIND PIPE) | | *Pipe diameter in millimetres is shown before pipe code e.g. 40P6 = 40mm nominal diameter* | | DEPTH OF COVER | C |
| UNKNOWN | | | | | |
| EASEMENT/ JURISDICTION | | | | | |

**EXAMPLES**

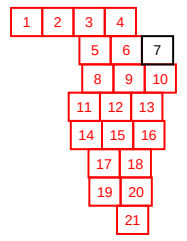
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key

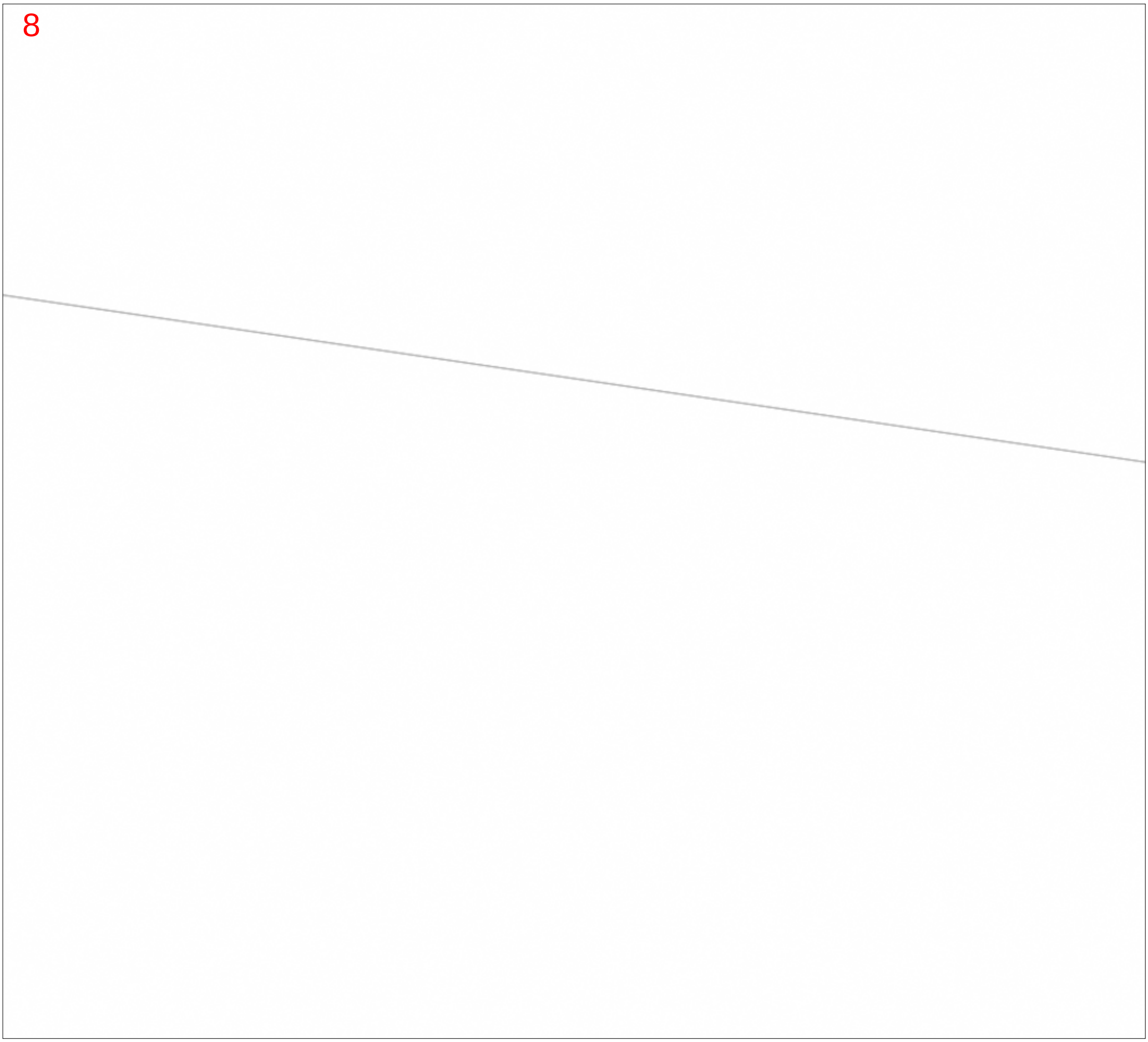



Scale 1:700

0 0.008km

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.




**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

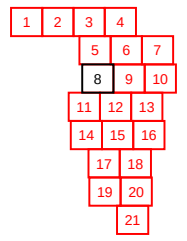
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

N

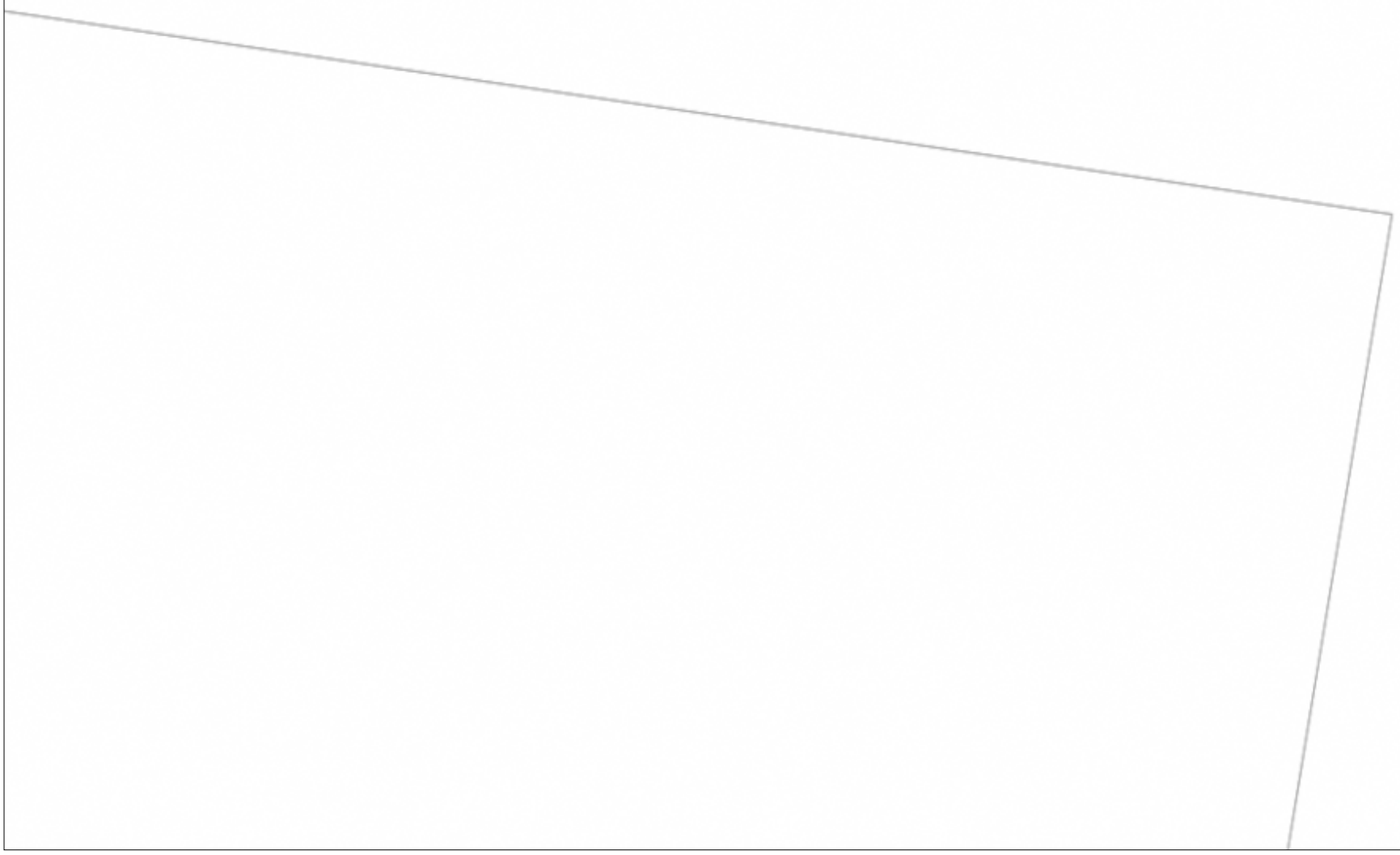


**Mapping information is provided as AS5488-2013 Quality Level D**

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.

9



**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | / |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | / |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

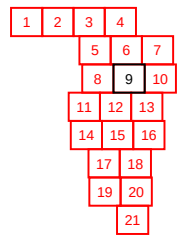
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

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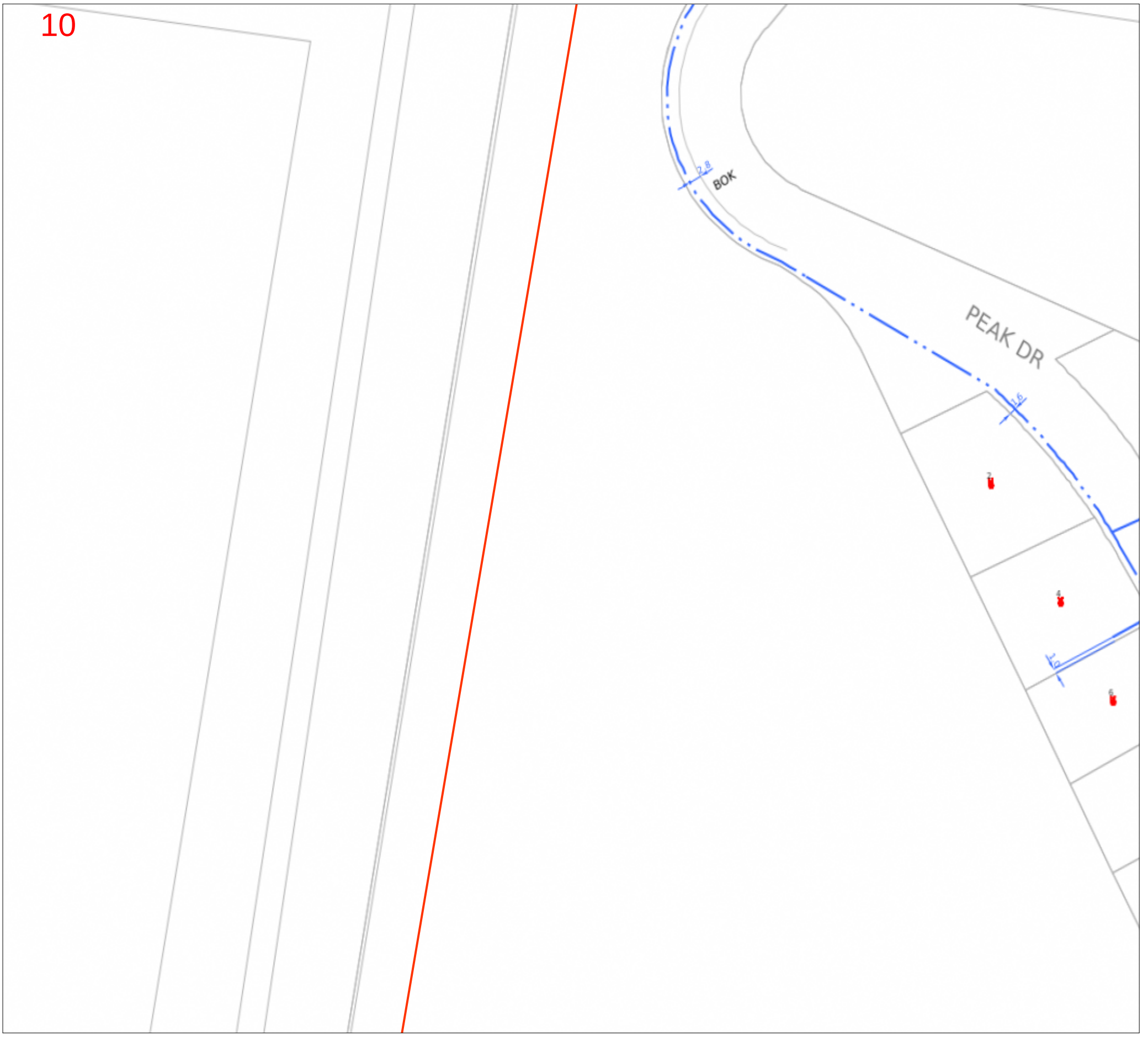



| PIPE AND BOUNDARIES | | PIPE CODE / MATERIALS | | OBJECTS or TERMS | |
|---|---|---|---|---|---|
| SERVICE (COLOUR BY PRESSURE) | | C2, CI | Cast Iron | VALVES | |
| LOW PRESSURES | | CU | Copper | BURIED VALVES | |
| MEDIUM PRESSURES | | N2, NY, NY11 | Nylon | GATE / REGULATORS | |
| HIGH PRESSURES | | P# *(e.g. P6)* | Polyethylene (PE) | GAS SUPPLIED = YES | |
| TRANSMISSION PRESSURES | | P6,P7,P9-P12 | Medium Density PE | CP RECTIFIER UNIT | |
| PRIORITY MAIN (BEHIND PIPE) | | P2,P4,P8 | High Density PE | CP TEST POINT/ ANODE | |
| PROPOSED (COLOUR BY PRESSURE) | | ST or S# | Steel | SYPHON | |
| LPG (COLOUR BY PRESSURE) | | *S6# (e.g. S61)* | Steel Class 600 | TRACE WIRE POINT | |
| ABANDONED | | *S3# (e.g. S33)* | Steel Class 300 | PIPELINE MARKER | |
| IDLE | | W2 or GAL | Wrought Galv. Iron | NOT TIED IN | N.T.I. |
| SLEEVE | | W3 or PGAL | Poly Coat Wrought Galv. Iron | COUPLING & END CAP | or |
| CASING / SPLIT (BEHIND PIPE) | | *Pipe diameter in millimetres is shown before pipe code*<br>*e.g. 40P6 = 40mm nominal diameter* | | DEPTH OF COVER | C |
| UNKNOWN | | | | | |
| EASEMENT/ JURISDICTION | | | | | |

**EXAMPLES**

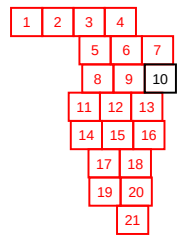
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

N



**Mapping information is provided as AS5488-2013 Quality Level D**

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.

11

**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

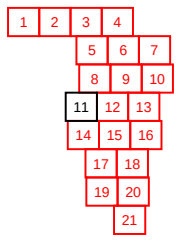
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.

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| PIPE AND BOUNDARIES | | PIPE CODE / MATERIALS | | OBJECTS or TERMS | |
|---|---|---|---|---|---|
| SERVICE (COLOUR BY PRESSURE) | | C2, CI | Cast Iron | VALVES | |
| LOW PRESSURES | | CU | Copper | BURIED VALVES | |
| MEDIUM PRESSURES | | N2, NY, NY11 | Nylon | GATE / REGULATORS | |
| HIGH PRESSURES | | P# *(e.g. P6)* | Polyethylene (PE) | GAS SUPPLIED = YES | |
| TRANSMISSION PRESSURES | | P6,P7,P9-P12 | Medium Density PE | CP RECTIFIER UNIT | |
| PRIORITY MAIN (BEHIND PIPE) | | P2,P4,P8 | High Density PE | CP TEST POINT/ ANODE | |
| PROPOSED (COLOUR BY PRESSURE) | | ST or S# | Steel | SYPHON | |
| LPG (COLOUR BY PRESSURE) | | *S6# (e.g. S61)* | Steel Class 600 | TRACE WIRE POINT | |
| ABANDONED | | *S3# (e.g. S33)* | Steel Class 300 | PIPELINE MARKER | |
| IDLE | | W2 or GAL | Wrought Galv. Iron | NOT TIED IN | N.T.I. |
| SLEEVE | | W3 or PGAL | Poly Coat Wrought Galv. Iron | COUPLING & END CAP | or |
| CASING / SPLIT (BEHIND PIPE) | | *Pipe diameter in millimetres is shown before pipe code*<br>*e.g. 40P6 = 40mm nominal diameter* | | DEPTH OF COVER | C |
| UNKNOWN | | | | | |
| EASEMENT/ JURISDICTION | | | | | |

**EXAMPLES**

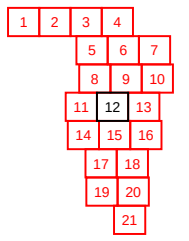
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.


| PIPE AND BOUNDARIES | | PIPE CODE / MATERIALS | | OBJECTS or TERMS | |
|---|---|---|---|---|---|
| SERVICE (COLOUR BY PRESSURE) | | C2, CI | Cast Iron | VALVES | |
| LOW PRESSURES | | CU | Copper | BURIED VALVES | |
| MEDIUM PRESSURES | | N2, NY, NY11 | Nylon | GATE / REGULATORS | |
| HIGH PRESSURES | | P# *(e.g. P6)* | Polyethylene (PE) | GAS SUPPLIED = YES | |
| TRANSMISSION PRESSURES | | P6,P7,P9-P12 | Medium Density PE | CP RECTIFIER UNIT | |
| PRIORITY MAIN (BEHIND PIPE) | | P2,P4,P8 | High Density PE | CP TEST POINT/ ANODE | |
| PROPOSED (COLOUR BY PRESSURE) | | ST or S# | Steel | SYPHON | |
| LPG (COLOUR BY PRESSURE) | | *S6# (e.g. S61)* | Steel Class 600 | TRACE WIRE POINT | |
| ABANDONED | | *S3# (e.g. S33)* | Steel Class 300 | PIPELINE MARKER | |
| IDLE | | W2 or GAL | Wrought Galv. Iron | NOT TIED IN | N.T.I. |
| SLEEVE | | W3 or PGAL | Poly Coat Wrought Galv. Iron | COUPLING & END CAP | or |
| CASING / SPLIT (BEHIND PIPE) | | *Pipe diameter in millimetres is shown before pipe code e.g. 40P6 = 40mm nominal diameter* | | DEPTH OF COVER | C |
| UNKNOWN | | | | | |
| EASEMENT/ JURISDICTION | | | | | |

**EXAMPLES**

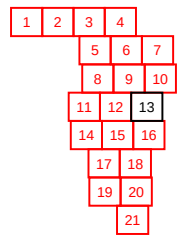
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

N



**Mapping information is provided as AS5488-2013 Quality Level D**

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.

14

**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

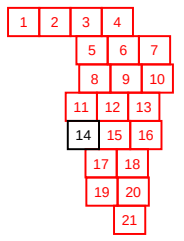
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.

15

**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

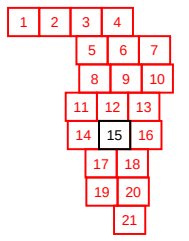
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key



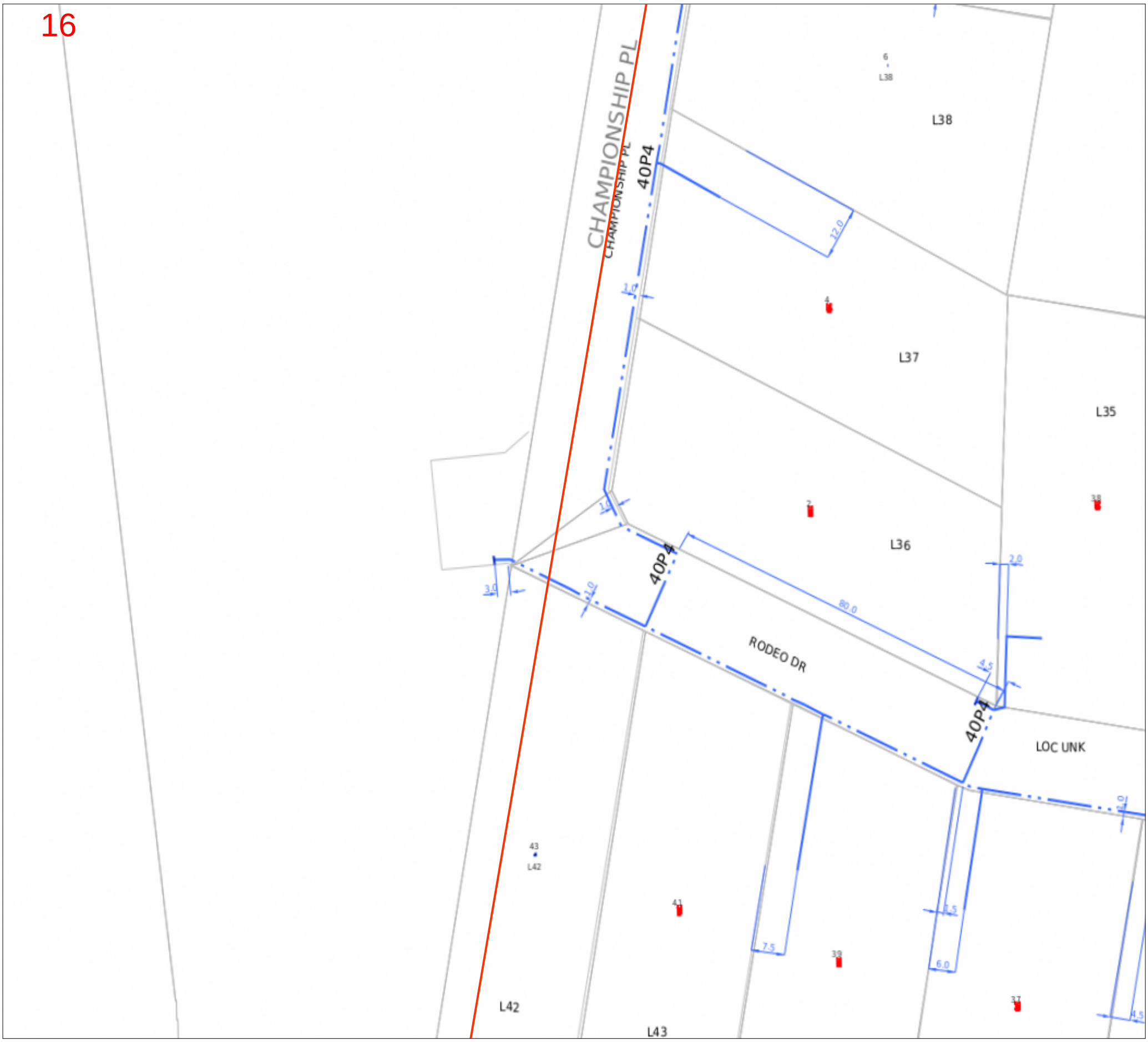

Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.




| PIPE AND BOUNDARIES | | PIPE CODE / MATERIALS | | OBJECTS or TERMS | |
|---|---|---|---|---|---|
| SERVICE (COLOUR BY PRESSURE) | | C2, CI | Cast Iron | VALVES | |
| LOW PRESSURES | | CU | Copper | BURIED VALVES | |
| MEDIUM PRESSURES | | N2, NY, NY11 | Nylon | GATE / REGULATORS | |
| HIGH PRESSURES | | P# *(e.g. P6)* | Polyethylene (PE) | GAS SUPPLIED = YES | |
| TRANSMISSION PRESSURES | | P6,P7,P9-P12 | Medium Density PE | CP RECTIFIER UNIT | |
| PRIORITY MAIN (BEHIND PIPE) | | P2,P4,P8 | High Density PE | CP TEST POINT/ ANODE | |
| PROPOSED (COLOUR BY PRESSURE) | | ST or S# | Steel | SYPHON | |
| LPG (COLOUR BY PRESSURE) | | *S6# (e.g. S61)* | Steel Class 600 | TRACE WIRE POINT | |
| ABANDONED | | *S3# (e.g. S33)* | Steel Class 300 | PIPELINE MARKER | |
| IDLE | | W2 or GAL | Wrought Galv. Iron | NOT TIED IN | N.T.I. |
| SLEEVE | | W3 or PGAL | Poly Coat Wrought Galv. Iron | COUPLING & END CAP | or |
| CASING / SPLIT (BEHIND PIPE) | | *Pipe diameter in millimetres is shown before pipe code e.g. 40P6 = 40mm nominal diameter* | | DEPTH OF COVER | C |
| UNKNOWN | | | | | |
| EASEMENT/ JURISDICTION | | | | | |

**EXAMPLES**

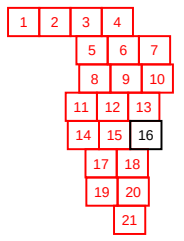
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.

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**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

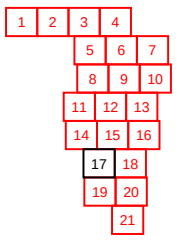
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

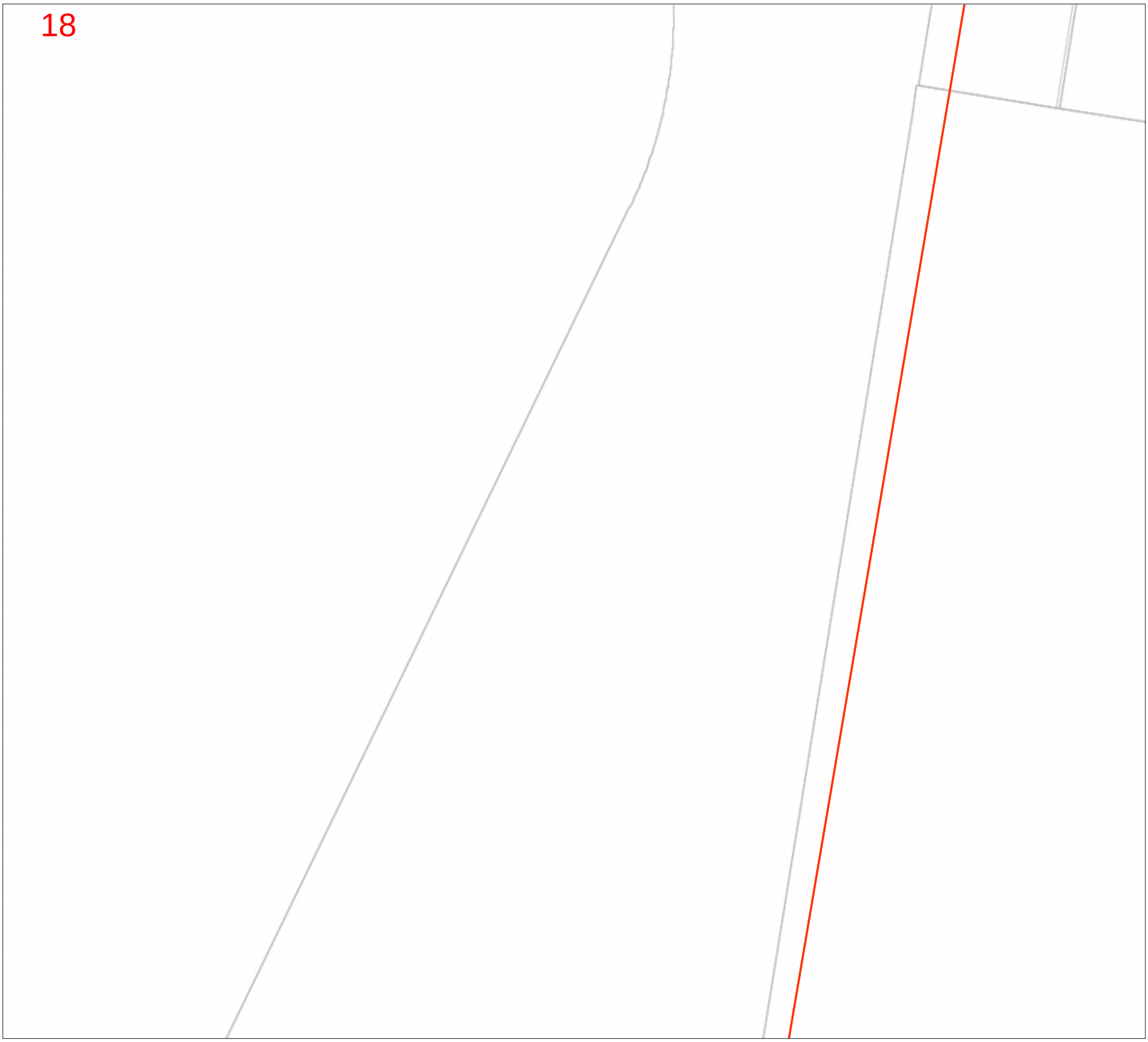
N



**Mapping information is provided as AS5488-2013 Quality Level D**

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.




**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

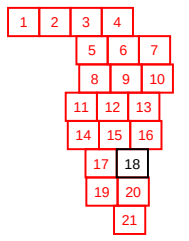
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

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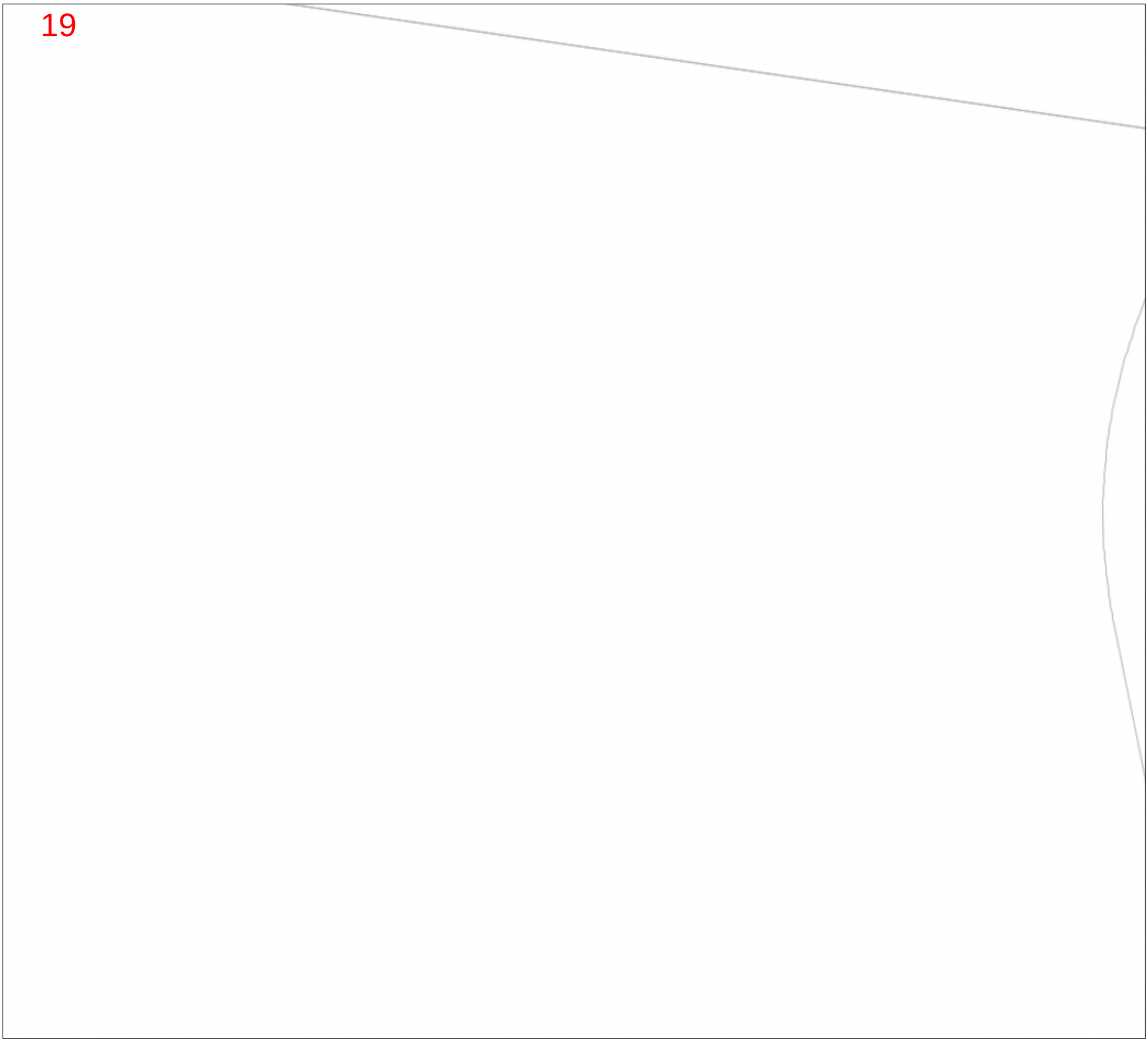



**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

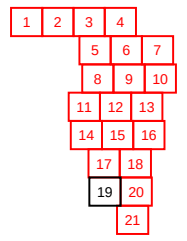
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

N



**Mapping information is provided as AS5488-2013 Quality Level D**

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

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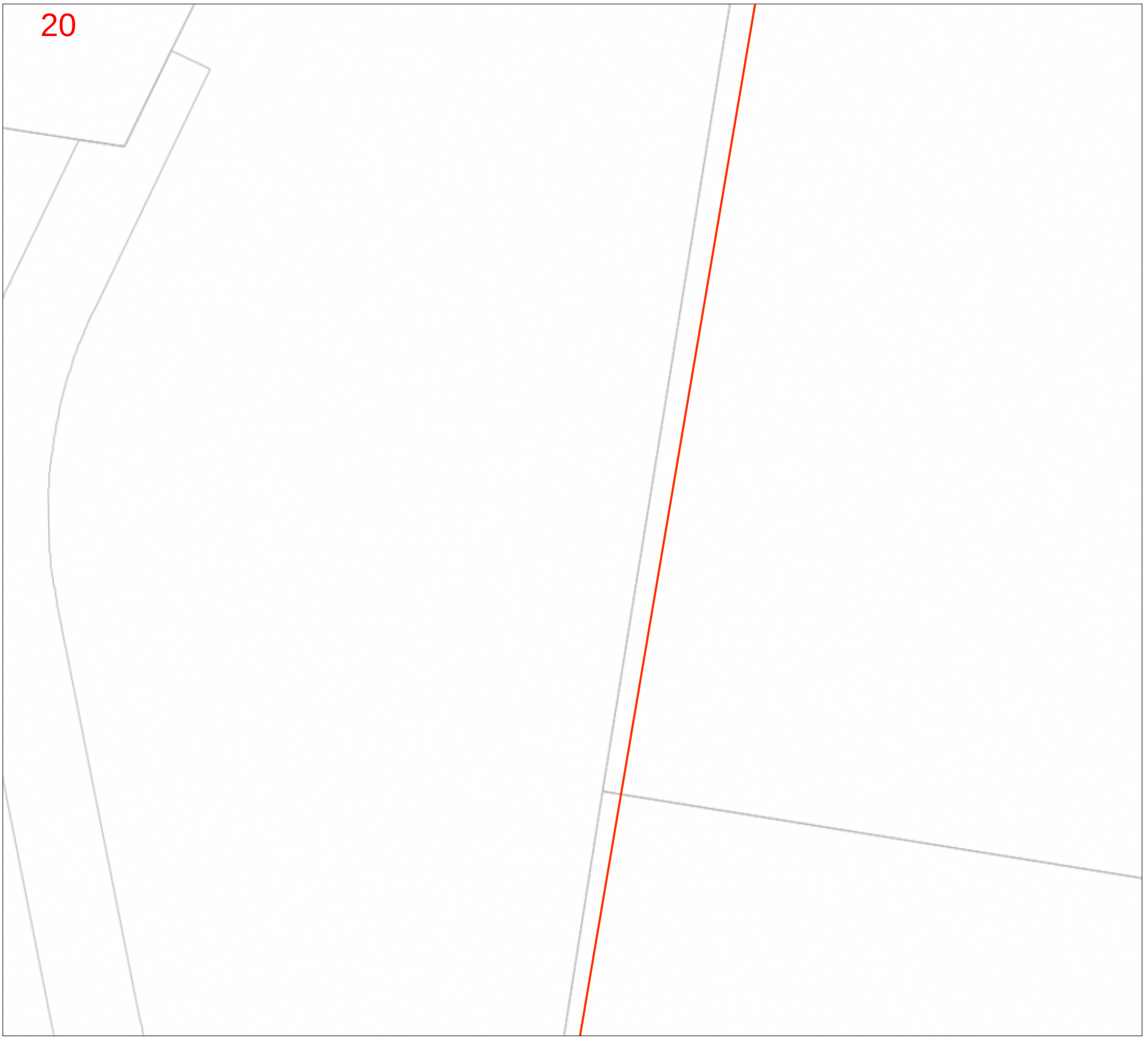



**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

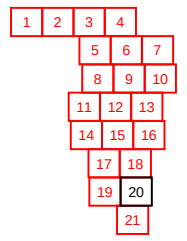
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key



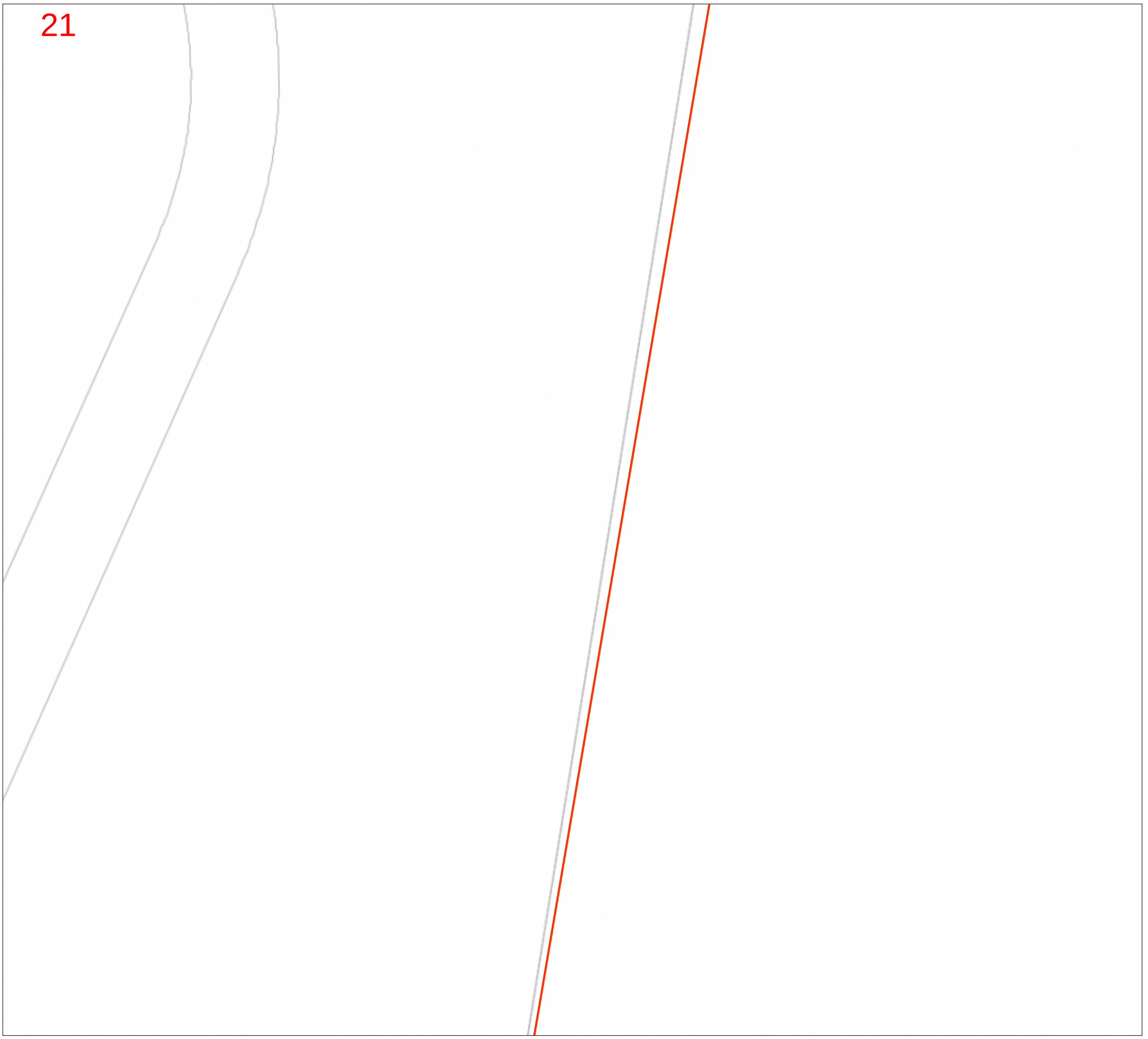

Scale 1:700

0 0.008km

N

| Site Address | 43 Rodeo Drive<br>Hillvue 2340 | Sequence No | 217880834 |
|---|---|---|---|

**Before you commence any works** you are required to complete the attached 'Work In The Vicinity Of Critical Gas Assets' request form and forward this to APA as soon as practicable.




**PIPE AND BOUNDARIES**

| | |
|---|---|
| SERVICE (COLOUR BY PRESSURE) | |
| LOW PRESSURES | |
| MEDIUM PRESSURES | |
| HIGH PRESSURES | |
| TRANSMISSION PRESSURES | |
| PRIORITY MAIN (BEHIND PIPE) | |
| PROPOSED (COLOUR BY PRESSURE) | |
| LPG (COLOUR BY PRESSURE) | |
| ABANDONED | |
| IDLE | |
| SLEEVE | |
| CASING / SPLIT (BEHIND PIPE) | |
| UNKNOWN | |
| EASEMENT/ JURISDICTION | |

**PIPE CODE / MATERIALS**

| | |
|---|---|
| C2, CI | Cast Iron |
| CU | Copper |
| N2, NY, NY11 | Nylon |
| P# *(e.g. P6)* | Polyethylene (PE) |
| P6,P7,P9-P12 | Medium Density PE |
| P2,P4,P8 | High Density PE |
| ST or S# | Steel |
| *S6# (e.g. S61)* | Steel Class 600 |
| *S3# (e.g. S33)* | Steel Class 300 |
| W2 or GAL | Wrought Galv. Iron |
| W3 or PGAL | Poly Coat Wrought Galv. Iron |

*Pipe diameter in millimetres is shown before pipe code*
*e.g. 40P6 = 40mm nominal diameter*

**OBJECTS or TERMS**

| | |
|---|---|
| VALVES | |
| BURIED VALVES | |
| GATE / REGULATORS | |
| GAS SUPPLIED = YES | |
| CP RECTIFIER UNIT | |
| CP TEST POINT/ ANODE | T / A |
| SYPHON | |
| TRACE WIRE POINT | |
| PIPELINE MARKER | |
| NOT TIED IN | N.T.I. |
| COUPLING & END CAP | or |
| DEPTH OF COVER | C |

**EXAMPLES**

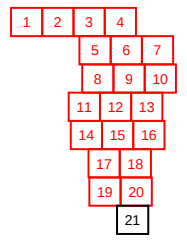
40P6 in 80C2 — 40mm High Pressure Medium Density Polyethylene in an 80mm Cast Iron Casing

63S8 — 63mm Medium Pressure Steel

Line / Polygon Request

This map is created in colour and shall be printed in colour

Map Key




Scale 1:700

0 0.008km

N

WORK IN THE VICINITY OF CRITICAL GAS ASSETS

It is your responsibility to read and complete this request form

1. This request form must be received by the APA Group via the options below at least **5 business days prior to excavation or site location work commencement**
2. Excavation / works must not commence on site until you have received a 'Authority to Work Permit' from the APA Group
3. This request form must be accompanied by a detailed schedule of works
4. Penalties apply to excavators commencing work in the vicinity of Critical Gas Assets **prior to receiving an APA Group 'Authority to Work Permit'**

   For further information refer to:-

   - NSW Gas Supply Act 1996 – Sec 64 C, Requirements in relation to carrying out of certain excavation work
   - Victoria: Pipelines Act 2005 – Section 118, Digging near pipelines and Section 119, Interference with pipeline
   - South Australia: Gas Industry Act 1997 – Section 83, Notice of work that may affect gas infrastructure.
   - Northern Territory: Energy Pipelines Act as in force at 8 March 2007 – Section 66, Threat to pipeline.

---

**Return to:** PermitsQld@apa.com.au

**Enquiries:**

Should you have any questions with regards to the attached information please contact our Qld Planning & Scheduling Officer - (07) 3215 6644.

---

**Work / Excavation Site Details:**

| | |
|---|---|
| Number: | Street: |
| Suburb: | State: |
| Sequence Number: 217880834 | |
| Requestors Name: | |
| Company Name: | |
| Name of Authorised Company Site Representative: | |
| Email: | |
| Phone: | Mobile: |

| | |
|---|---|
| Signature: | |

## Description of Work / Excavation:

| | | | |
|---|---|---|---|
| *Activity/Excavation Details:* | | | |
| **Tick Applicable Box** | | | |
| Excavation | | Change to surface level | |
| Service crossing | | Boring | |
| Proving | | Other *(provide details)* | |
| Earthworks | | | |
| Excavator Size, Tooth Type & Tooth Size *(provide details)* | | | |

**Work / Excavation Drawings Attached** (circle): Yes No

## Proposed Dates and Times:

| | From | | To | |
|---|---|---|---|---|
| **Excavation** | **Date** | **Time** | **Date** | **Time** |
| | / / | am/pm | / / | am/pm |
| **Backfill** | **Date** | **Time** | **Date** | **Time** |
| | / / | am/pm | / / | am/pm |

| | | | | | |
|---|---|---|---|---|---|
| **Work is assessed as:** | **Class 1** Works crossing a critical gas asset | | **Class 2** Works within 3m of a critical gas asset | | **Class 3** Works involving large excavations, vibrations or blasting beyond 3m of the critical gas asset |

## Insurer and Policy Details

| | | | |
|---|---|---|---|
| **Policy Number** | | **Policy Expiry Date** | |
| **Insurance Cover – Current Level** ($amount) | | | |

## Third Party Works Authorisation requested by (mandatory fields required for invoicing):

| | |
|---|---|
| Company/Biller Name: | |
| Billing Address: | |
| Purchase Order: | Billing Email: |
| Biller Phone: | |
| Requestors Name: | Requesters Signature: |

NOTES

5. This Authority to Work applies only to work in the vicinity of the Gas Mains. It does not authorise work near or on the Gas Mains itself
6. A minimum of 2 business days must be allowed between receipt by APA Group of this Request and a response. However, more time for notification may be necessary
7. For any gas leak related work this application must be accompanied by a detailed sequence of events, outlining all aspects of work involved and work is not permitted until an Authority to Work is issued
8. For class 1 and 2 Dial Before You Dig, APA Group will arrange for an inspector to be on site as necessary during the work. An inspector must be present at all times for works involving excavation within 1m of the Gas Mains. APA Group will advise the requirement for an inspector for other works within 3m of the Gas Mains
9. The applicant is responsible for any damage resulting from the work and all consequential damages and losses arising from such damage and therefore must insure against every liability of the contractor in respect of or arising out of any loss of life, loss of or damage to property of person (both real and personal), arising out of or in any way connected to this permit.
10. Rates applicable to APA on-site representation for supervision or location exclude GST.

0419 444 669
admin@mossenviro.com
ABN 53 126 494 776
www.mossenviro.com
PO Box 390, Tamworth NSW 2340

# APPENDIX C – NSW EPA CONTAMINATED LAND RECORD

# Search results

Your search for: LGA: TAMWORTH REGIONAL COUNCIL

Matched 11 notices relating to 5 sites.

Search Again

Refine Search

| Suburb | Address | Site Name | Notices related to this site |
|---|---|---|---|
| DURI | 13 Railway AVENUE | Duri Store | 1 current |
| SOUTH TAMWORTH | 251 - 253 Goonoo Goonoo ROAD | Coles Express Tamworth | 4 current |
| TAMWORTH | 115 Marius STREET | Elgas Depot (former gasworks) | 2 current |
| TAMWORTH | 49 GUNNEDAH ROAD | Gunnedah Road Site | 2 former |
| WOOLOMIN | 65 Nundle ROAD | Woolomin Gold Rush Store | 2 former |

Page 1 of 1

5 November 2022

0419 444 669
ABN 53 126 494 776
admin@mossenviro.com
www.mossenviro.com
PO Box 390, Tamworth NSW 2340

# APPENDIX D – LABORATORY RESULTS

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

# CERTIFICATE OF ANALYSIS 310991

## Client Details

| | |
|---|---|
| **Client** | Moss Environmental |
| **Attention** | Elizabeth Ogunsote |
| **Address** | 24 Fitzroy Street, Tamworth, NSW, 2340 |

## Sample Details

| | |
|---|---|
| **Your Reference** | **Moss Environmental- J000109 Arcadia Estate PSI** |
| **Number of Samples** | 23 Soil, 2 Water |
| **Date samples received** | 18/11/2022 |
| **Date completed instructions received** | 18/11/2022 |

## Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

## Report Details

| | |
|---|---|
| **Date results requested by** | 25/11/2022 |
| **Date of Issue** | 25/11/2022 |

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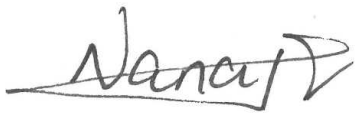
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

**Results Approved By**
Diego Bigolin, Inorganics Supervisor
Giovanni Agosti, Group Technical Manager
Josh Williams, Organics and LC Supervisor
Kyle Gavrily, Senior Chemist
Liam Timmins, Organic Instruments Team Leader
Loren Bardwell, Development Chemist

**Authorised By**



Nancy Zhang, Laboratory Manager

| vTRH(C6-C10)/BTEXN in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-12 | 310991-16 | 310991-19 | 310991-23 | 310991-24 |
| Your Reference | UNITS | SP-M | SP-Q | SP-T | Trip Spike | Trip Blank |
| Depth | | 0.1 | 0.1 | 0.1 | - | - |
| Date Sampled | | 15/11/2022 | 15/11/2022 | 15/11/2022 | 16/11/2022 | 16/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date extracted | - | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| TRH $C_6$ - $C_9$ | mg/kg | <25 | <25 | <25 | [NA] | <25 |
| TRH $C_6$ - $C_{10}$ | mg/kg | <25 | <25 | <25 | [NA] | <25 |
| vTPH $C_6$ - $C_{10}$ less BTEX (F1) | mg/kg | <25 | <25 | <25 | [NA] | <25 |
| Benzene | mg/kg | <0.2 | <0.2 | <0.2 | 101% | <0.2 |
| Toluene | mg/kg | <0.5 | <0.5 | <0.5 | 102% | <0.5 |
| Ethylbenzene | mg/kg | <1 | <1 | <1 | 102% | <1 |
| m+p-xylene | mg/kg | <2 | <2 | <2 | 103% | <2 |
| o-Xylene | mg/kg | <1 | <1 | <1 | 100% | <1 |
| Naphthalene | mg/kg | <1 | <1 | <1 | [NT] | <1 |
| Total +ve Xylenes | mg/kg | <1 | <1 | <1 | [NT] | <1 |
| *Surrogate* aaa-Trifluorotoluene | % | 100 | 107 | 105 | 115 | 107 |

| svTRH (C10-C40) in Soil | | | | |
|---|---|---|---|---|
| Our Reference | | 310991-12 | 310991-16 | 310991-19 |
| Your Reference | UNITS | SP-M | SP-Q | SP-T |
| Depth | | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil |
| Date extracted | - | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 23/11/2022 | 23/11/2022 | 23/11/2022 |
| TRH $C_{10}$ - $C_{14}$ | mg/kg | <50 | <50 | <50 |
| TRH $C_{15}$ - $C_{28}$ | mg/kg | <100 | <100 | <100 |
| TRH $C_{29}$ - $C_{36}$ | mg/kg | <100 | <100 | <100 |
| Total +ve TRH (C10-C36) | mg/kg | <50 | <50 | <50 |
| TRH >$C_{10}$ -$C_{16}$ | mg/kg | <50 | <50 | <50 |
| TRH >$C_{10}$ - $C_{16}$ less Naphthalene (F2) | mg/kg | <50 | <50 | <50 |
| TRH >$C_{16}$ -$C_{34}$ | mg/kg | <100 | <100 | <100 |
| TRH >$C_{34}$ -$C_{40}$ | mg/kg | <100 | <100 | <100 |
| Total +ve TRH (>C10-C40) | mg/kg | <50 | <50 | <50 |
| *Surrogate* o-Terphenyl | % | 86 | 86 | 84 |

| PAHs in Soil | | | | |
|---|---|---|---|---|
| Our Reference | | 310991-12 | 310991-16 | 310991-19 |
| Your Reference | UNITS | SP-M | SP-Q | SP-T |
| Depth | | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil |
| Date extracted | - | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 24/11/2022 | 24/11/2022 | 24/11/2022 |
| Naphthalene | mg/kg | <0.1 | <0.1 | <0.1 |
| Acenaphthylene | mg/kg | <0.1 | <0.1 | <0.1 |
| Acenaphthene | mg/kg | <0.1 | <0.1 | <0.1 |
| Fluorene | mg/kg | <0.1 | <0.1 | <0.1 |
| Phenanthrene | mg/kg | <0.1 | <0.1 | <0.1 |
| Anthracene | mg/kg | <0.1 | <0.1 | <0.1 |
| Fluoranthene | mg/kg | <0.1 | <0.1 | <0.1 |
| Pyrene | mg/kg | <0.1 | <0.1 | <0.1 |
| Benzo(a)anthracene | mg/kg | <0.1 | <0.1 | <0.1 |
| Chrysene | mg/kg | <0.1 | <0.1 | <0.1 |
| Benzo(b,j+k)fluoranthene | mg/kg | <0.2 | <0.2 | <0.2 |
| Benzo(a)pyrene | mg/kg | <0.05 | <0.05 | <0.05 |
| Indeno(1,2,3-c,d)pyrene | mg/kg | <0.1 | <0.1 | <0.1 |
| Dibenzo(a,h)anthracene | mg/kg | <0.1 | <0.1 | <0.1 |
| Benzo(g,h,i)perylene | mg/kg | <0.1 | <0.1 | <0.1 |
| Total +ve PAH's | mg/kg | <0.05 | <0.05 | <0.05 |
| Benzo(a)pyrene TEQ calc (zero) | mg/kg | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene TEQ calc(half) | mg/kg | <0.5 | <0.5 | <0.5 |
| Benzo(a)pyrene TEQ calc(PQL) | mg/kg | <0.5 | <0.5 | <0.5 |
| *Surrogate p*-Terphenyl-d14 | % | 67 | 69 | 65 |

| Organochlorine Pesticides in soil | | | | |
|---|---|---|---|---|
| Our Reference | | 310991-12 | 310991-16 | 310991-19 |
| Your Reference | UNITS | SP-M | SP-Q | SP-T |
| Depth | | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil |
| Date extracted | - | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 24/11/2022 | 24/11/2022 | 24/11/2022 |
| alpha-BHC | mg/kg | <0.1 | <0.1 | <0.1 |
| HCB | mg/kg | <0.1 | <0.1 | <0.1 |
| beta-BHC | mg/kg | <0.1 | <0.1 | <0.1 |
| gamma-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 |
| Endosulfan II | mg/kg | <0.1 | <0.1 | <0.1 |
| pp-DDD | mg/kg | <0.1 | <0.1 | <0.1 |
| Endrin Aldehyde | mg/kg | <0.1 | <0.1 | <0.1 |
| pp-DDT | 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 |
| Total +ve DDT+DDD+DDE | mg/kg | <0.1 | <0.1 | <0.1 |
| *Surrogate* TCMX | % | 75 | 75 | 73 |

| Organophosphorus Pesticides in Soil | | | | |
|---|---|---|---|---|
| Our Reference | | 310991-12 | 310991-16 | 310991-19 |
| Your Reference | UNITS | SP-M | SP-Q | SP-T |
| Depth | | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil |
| Date extracted | - | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 24/11/2022 | 24/11/2022 | 24/11/2022 |
| Dichlorvos | mg/kg | <0.1 | <0.1 | <0.1 |
| Dimethoate | mg/kg | <0.1 | <0.1 | <0.1 |
| Diazinon | mg/kg | <0.1 | <0.1 | <0.1 |
| Chlorpyriphos-methyl | mg/kg | <0.1 | <0.1 | <0.1 |
| Ronnel | 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 |
| Chlorpyriphos | mg/kg | <0.1 | <0.1 | <0.1 |
| Parathion | mg/kg | <0.1 | <0.1 | <0.1 |
| Bromophos-ethyl | mg/kg | <0.1 | <0.1 | <0.1 |
| Ethion | mg/kg | <0.1 | <0.1 | <0.1 |
| Azinphos-methyl (Guthion) | mg/kg | <0.1 | <0.1 | <0.1 |
| *Surrogate* TCMX | % | 75 | 75 | 73 |

| PCBs in Soil | | | | |
|---|---|---|---|---|
| Our Reference | | 310991-12 | 310991-16 | 310991-19 |
| Your Reference | UNITS | SP-M | SP-Q | SP-T |
| Depth | | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil |
| Date extracted | - | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 24/11/2022 | 24/11/2022 | 24/11/2022 |
| 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 |
| Total +ve PCBs (1016-1260) | mg/kg | <0.1 | <0.1 | <0.1 |
| *Surrogate* TCMX | % | 75 | 75 | 73 |

| Acid Extractable metals in soil | | | | |
|---|---|---|---|---|
| Our Reference | | 310991-12 | 310991-16 | 310991-19 |
| Your Reference | UNITS | SP-M | SP-Q | SP-T |
| Depth | | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil |
| Date prepared | - | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Date analysed | - | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Arsenic | mg/kg | 5 | <4 | <4 |
| Cadmium | mg/kg | <0.4 | <0.4 | <0.4 |
| Chromium | mg/kg | 14 | 15 | 13 |
| Copper | mg/kg | 29 | 28 | 33 |
| Lead | mg/kg | 13 | 9 | 9 |
| Mercury | mg/kg | <0.1 | <0.1 | <0.1 |
| Nickel | mg/kg | 15 | 9 | 11 |
| Zinc | mg/kg | 49 | 33 | 44 |

| Moisture | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-1 | 310991-2 | 310991-3 | 310991-4 | 310991-5 |
| Your Reference | UNITS | SP-A | SP-B | SP-C | SP-D | SP-E |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 16/11/2022 | 16/11/2022 | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 |
| Moisture | % | 16 | 16 | 18 | 13 | 16 |

| Moisture | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-6 | 310991-7 | 310991-8 | 310991-9 | 310991-10 |
| Your Reference | UNITS | SP-F | SP-G | SP-H | SP-I | SP-J |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 16/11/2022 | 15/11/2022 | 16/11/2022 | 16/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 |
| Moisture | % | 18 | 21 | 16 | 15 | 15 |

| Moisture | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-11 | 310991-12 | 310991-13 | 310991-14 | 310991-15 |
| Your Reference | UNITS | SP-L | SP-M | SP-N | SP-O | SP-P |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 16/11/2022 | 15/11/2022 | 15/11/2022 | 16/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 |
| Moisture | % | 28 | 18 | 17 | 29 | 22 |

| Moisture | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-16 | 310991-17 | 310991-18 | 310991-19 | 310991-20 |
| Your Reference | UNITS | SP-Q | SP-R | SP-S | SP-T | SP-T2 |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 16/11/2022 | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 |
| Moisture | % | 15 | 14 | 21 | 16 | 14 |

| Moisture | | |
|---|---|---|
| Our Reference | | 310991-21 |
| Your Reference | UNITS | SP-1 |
| Depth | | 0.1 |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Soil |
| Date prepared | - | 22/11/2022 |
| Date analysed | - | 23/11/2022 |
| Moisture | % | 23 |

| Acid Extractable Cations in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-1 | 310991-2 | 310991-3 | 310991-4 | 310991-5 |
| Your Reference | UNITS | SP-A | SP-B | SP-C | SP-D | SP-E |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 16/11/2022 | 16/11/2022 | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Date analysed | - | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Sodium | mg/kg | 180 | 60 | 80 | 100 | 60 |

| Acid Extractable Cations in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-6 | 310991-7 | 310991-8 | 310991-9 | 310991-10 |
| Your Reference | UNITS | SP-F | SP-G | SP-H | SP-I | SP-J |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 16/11/2022 | 15/11/2022 | 16/11/2022 | 16/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Date analysed | - | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Sodium | mg/kg | 100 | 90 | 60 | 100 | 110 |

| Acid Extractable Cations in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-11 | 310991-12 | 310991-13 | 310991-14 | 310991-15 |
| Your Reference | UNITS | SP-L | SP-M | SP-N | SP-O | SP-P |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 16/11/2022 | 15/11/2022 | 15/11/2022 | 16/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Date analysed | - | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Sodium | mg/kg | 70 | 110 | 70 | 70 | 90 |

| Acid Extractable Cations in Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-16 | 310991-17 | 310991-18 | 310991-19 | 310991-20 |
| Your Reference | UNITS | SP-Q | SP-R | SP-S | SP-T | SP-T2 |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 16/11/2022 | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Date analysed | - | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 | 25/11/2022 |
| Sodium | mg/kg | 90 | 110 | 80 | 90 | 60 |

| Acid Extractable Cations in Soil | | |
|---|---|---|
| Our Reference | | 310991-21 |
| Your Reference | UNITS | SP-1 |
| Depth | | 0.1 |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Soil |
| Date prepared | - | 25/11/2022 |
| Date analysed | - | 25/11/2022 |
| Sodium | mg/kg | 80 |

| Misc Inorg - Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-1 | 310991-2 | 310991-3 | 310991-4 | 310991-5 |
| Your Reference | UNITS | SP-A | SP-B | SP-C | SP-D | SP-E |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 16/11/2022 | 16/11/2022 | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 18/11/2022 | 18/11/2022 | 18/11/2022 | 18/11/2022 | 18/11/2022 |
| Date analysed | - | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 |
| pH 1:5 soil:water | pH Units | 7.8 | 6.7 | 6.7 | 6.0 | 6.5 |
| Estimated Salinity* | mg/kg | 150 | 74 | 100 | 1,300 | 71 |

| Misc Inorg - Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-6 | 310991-7 | 310991-8 | 310991-9 | 310991-10 |
| Your Reference | UNITS | SP-F | SP-G | SP-H | SP-I | SP-J |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 16/11/2022 | 15/11/2022 | 16/11/2022 | 16/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 18/11/2022 | 18/11/2022 | 18/11/2022 | 18/11/2022 | 18/11/2022 |
| Date analysed | - | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 |
| pH 1:5 soil:water | pH Units | 6.9 | 6.6 | 6.5 | 6.3 | 6.2 |
| Estimated Salinity* | mg/kg | 150 | 85 | 71 | 71 | 260 |

| Misc Inorg - Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-11 | 310991-12 | 310991-13 | 310991-14 | 310991-15 |
| Your Reference | UNITS | SP-L | SP-M | SP-N | SP-O | SP-P |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 16/11/2022 | 15/11/2022 | 15/11/2022 | 16/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 18/11/2022 | 18/11/2022 | 18/11/2022 | 18/11/2022 | 18/11/2022 |
| Date analysed | - | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 |
| pH 1:5 soil:water | pH Units | 6.0 | 6.2 | 6.2 | 6.5 | 6.5 |
| Estimated Salinity* | mg/kg | 130 | 110 | 110 | 170 | 290 |

| Misc Inorg - Soil | | | | | | |
|---|---|---|---|---|---|---|
| Our Reference | | 310991-16 | 310991-17 | 310991-18 | 310991-19 | 310991-20 |
| Your Reference | UNITS | SP-Q | SP-R | SP-S | SP-T | SP-T2 |
| Depth | | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Date Sampled | | 15/11/2022 | 16/11/2022 | 15/11/2022 | 15/11/2022 | 15/11/2022 |
| Type of sample | | Soil | Soil | Soil | Soil | Soil |
| Date prepared | - | 18/11/2022 | 18/11/2022 | 18/11/2022 | 18/11/2022 | 18/11/2022 |
| Date analysed | - | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 | 23/11/2022 |
| pH 1:5 soil:water | pH Units | 7.1 | 7.0 | 7.3 | 7.0 | 6.2 |
| Estimated Salinity* | mg/kg | 100 | 76 | 250 | 100 | 120 |

| Misc Inorg - Soil | | |
|---|---|---|
| Our Reference | | 310991-21 |
| Your Reference | UNITS | SP-1 |
| Depth | | 0.1 |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Soil |
| Date prepared | - | 18/11/2022 |
| Date analysed | - | 23/11/2022 |
| pH 1:5 soil:water | pH Units | 6.3 |
| Estimated Salinity* | mg/kg | 95 |

| vTRH(C6-C10)/BTEXN in Water | | |
|---|---|---|
| Our Reference | | 310991-25 |
| Your Reference | UNITS | Rinsate |
| Depth | | - |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Water |
| Date extracted | - | 24/11/2022 |
| Date analysed | - | 25/11/2022 |
| TRH $C_6$ - $C_9$ | µg/L | <10 |
| TRH $C_6$ - $C_{10}$ | µg/L | <10 |
| TRH $C_6$ - $C_{10}$ less BTEX (F1) | µg/L | <10 |
| Benzene | µg/L | <1 |
| Toluene | µg/L | <1 |
| Ethylbenzene | µg/L | <1 |
| m+p-xylene | µg/L | <2 |
| o-xylene | µg/L | <1 |
| Naphthalene | µg/L | <1 |
| *Surrogate* Dibromofluoromethane | % | 102 |
| *Surrogate* toluene-d8 | % | 100 |
| *Surrogate* 4-BFB | % | 101 |

| svTRH (C10-C40) in Water | | |
|---|---|---|
| Our Reference | UNITS | 310991-25 |
| Your Reference | | Rinsate |
| Depth | | - |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Water |
| Date extracted | - | 22/11/2022 |
| Date analysed | - | 23/11/2022 |
| TRH $C_{10}$ - $C_{14}$ | µg/L | <50 |
| TRH $C_{15}$ - $C_{28}$ | µg/L | <100 |
| TRH $C_{29}$ - $C_{36}$ | µg/L | <100 |
| Total +ve TRH (C10-C36) | µg/L | <50 |
| TRH >$C_{10}$ - $C_{16}$ | µg/L | <50 |
| TRH >$C_{10}$ - $C_{16}$ less Naphthalene (F2) | µg/L | <50 |
| TRH >$C_{16}$ - $C_{34}$ | µg/L | <100 |
| TRH >$C_{34}$ - $C_{40}$ | µg/L | <100 |
| Total +ve TRH (>C10-C40) | µg/L | <50 |
| *Surrogate* o-Terphenyl | % | 76 |

| PAHs in Water | | |
|---|---|---|
| Our Reference | UNITS | 310991-25 |
| Your Reference | | Rinsate |
| Depth | | - |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Water |
| Date extracted | - | 22/11/2022 |
| Date analysed | - | 23/11/2022 |
| Naphthalene | µg/L | <1 |
| Acenaphthylene | µg/L | <1 |
| Acenaphthene | µg/L | <1 |
| Fluorene | µg/L | <1 |
| Phenanthrene | µg/L | <1 |
| Anthracene | µg/L | <1 |
| Fluoranthene | µg/L | <1 |
| Pyrene | µg/L | <1 |
| Benzo(a)anthracene | µg/L | <1 |
| Chrysene | µg/L | <1 |
| Benzo(b,j+k)fluoranthene | µg/L | <2 |
| Benzo(a)pyrene | µg/L | <1 |
| Indeno(1,2,3-c,d)pyrene | µg/L | <1 |
| Dibenzo(a,h)anthracene | µg/L | <1 |
| Benzo(g,h,i)perylene | µg/L | <1 |
| Benzo(a)pyrene TEQ | µg/L | <5 |
| Total +ve PAH's | µg/L | NIL (+)VE |
| *Surrogate p*-Terphenyl-d14 | % | 77 |

| Organochlorine Pesticides in Water | | |
|---|---|---|
| Our Reference | | 310991-25 |
| Your Reference | UNITS | Rinsate |
| Depth | | - |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Water |
| Date extracted | - | 22/11/2022 |
| Date analysed | - | 23/11/2022 |
| alpha-BHC | µg/L | <0.2 |
| HCB | µg/L | <0.2 |
| beta-BHC | µg/L | <0.2 |
| gamma-BHC | µg/L | <0.2 |
| Heptachlor | µg/L | <0.2 |
| delta-BHC | µg/L | <0.2 |
| Aldrin | µg/L | <0.2 |
| Heptachlor Epoxide | µg/L | <0.2 |
| gamma-Chlordane | µg/L | <0.2 |
| alpha-Chlordane | µg/L | <0.2 |
| Endosulfan I | µg/L | <0.2 |
| pp-DDE | µg/L | <0.2 |
| Dieldrin | µg/L | <0.2 |
| Endrin | µg/L | <0.2 |
| Endosulfan II | µg/L | <0.2 |
| pp-DDD | µg/L | <0.2 |
| Endrin Aldehyde | µg/L | <0.2 |
| pp-DDT | µg/L | <0.2 |
| Endosulfan Sulphate | µg/L | <0.2 |
| Methoxychlor | µg/L | <0.2 |
| *Surrogate* TCMX | % | 76 |

| OP Pesticides in Water | | |
|---|---|---|
| Our Reference | | 310991-25 |
| Your Reference | UNITS | Rinsate |
| Depth | | - |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Water |
| Date extracted | - | 22/11/2022 |
| Date analysed | - | 23/11/2022 |
| Dichlorvos | µg/L | <0.2 |
| Dimethoate | µg/L | <0.2 |
| Diazinon | µg/L | <0.2 |
| Chlorpyriphos-methyl | µg/L | <0.2 |
| Ronnel | µg/L | <0.2 |
| Fenitrothion | µg/L | <0.2 |
| Malathion | µg/L | <0.2 |
| Chlorpyriphos | µg/L | <0.2 |
| Parathion | µg/L | <0.2 |
| Bromophos ethyl | µg/L | <0.2 |
| Ethion | µg/L | <0.2 |
| Azinphos-methyl (Guthion) | µg/L | <0.2 |
| *Surrogate* TCMX | % | 76 |

| PCBs in Water | | |
|---|---|---|
| Our Reference | | 310991-25 |
| Your Reference | UNITS | Rinsate |
| Depth | | - |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Water |
| Date extracted | - | 22/11/2022 |
| Date analysed | - | 23/11/2022 |
| Aroclor 1016 | µg/L | <2 |
| Aroclor 1221 | µg/L | <2 |
| Aroclor 1232 | µg/L | <2 |
| Aroclor 1242 | µg/L | <2 |
| Aroclor 1248 | µg/L | <2 |
| Aroclor 1254 | µg/L | <2 |
| Aroclor 1260 | µg/L | <2 |
| *Surrogate* TCMX | % | 76 |

| Metals in Water - Dissolved | | |
|---|---|---|
| Our Reference | | 310991-25 |
| Your Reference | UNITS | Rinsate |
| Depth | | - |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Water |
| Date digested | - | 23/11/2022 |
| Date analysed | - | 23/11/2022 |
| Arsenic - Dissolved | mg/L | <0.05 |
| Cadmium - Dissolved | mg/L | <0.01 |
| Chromium - Dissolved | mg/L | <0.01 |
| Copper - Dissolved | mg/L | <0.01 |
| Lead - Dissolved | mg/L | <0.03 |
| Mercury - Dissolved | mg/L | <0.0005 |
| Nickel - Dissolved | mg/L | <0.02 |
| Zinc - Dissolved | mg/L | <0.02 |

| Cations in water Dissolved | | |
|---|---|---|
| Our Reference | | 310991-25 |
| Your Reference | UNITS | Rinsate |
| Depth | | - |
| Date Sampled | | 16/11/2022 |
| Type of sample | | Water |
| Date digested | - | 23/11/2022 |
| Date analysed | - | 24/11/2022 |
| Sodium - Dissolved | mg/L | <0.5 |

| Miscellaneous Inorganics | | | |
|---|---|---|---|
| Our Reference | | 310991-22 | 310991-25 |
| Your Reference | UNITS | SW-1 | Rinsate |
| Depth | | - | - |
| Date Sampled | | 16/11/2022 | 16/11/2022 |
| Type of sample | | Water | Water |
| Date prepared | - | 22/11/2022 | 22/11/2022 |
| Date analysed | - | 22/11/2022 | 22/11/2022 |
| pH | pH Units | [NA] | 6.1 |
| Salinity as NaCl* | g/L | 0.08 | <0.01 |

| Method ID | Methodology Summary |
|---|---|
| **Inorg-001** | pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times. |
| **Inorg-002** | Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons. |
| **Inorg-008** | Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours. |
| **Inorg-034** | Soil samples are extracted and measured using a conductivity cell and dedicated meter. |
| **Metals-020** | Determination of various metals by ICP-AES. |
| **Metals-021** | Determination of Mercury by Cold Vapour AAS. |
| **Org-020** | 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-020** | Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.<br><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.<br><br>Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40). |
| **Org-021** | Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. |
| **Org-021** | Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.<br>Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs. |
| **Org-022** | Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS. |
| **Org-022/025** | Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. |
| **Org-022/025** | Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS.<br><br>Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT. |
| **Org-022/025** | Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. |

| Method ID | Methodology Summary |
|---|---|
| Org-022/025 | Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.<br>For soil results:-<br>1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present.<br>2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL.<br>3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above.<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-023 | Water samples are analysed directly by purge and trap GC-MS. |
| Org-023 | Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. |
| Org-023 | 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-023 | 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.<br>Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes. |

| QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-12 | [NT] |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | [NT] |
| Date analysed | - | | | 25/11/2022 | [NT] | [NT] | [NT] | [NT] | 25/11/2022 | [NT] |
| TRH $C_6$ - $C_9$ | mg/kg | 25 | Org-023 | <25 | [NT] | [NT] | [NT] | [NT] | 116 | [NT] |
| TRH $C_6$ - $C_{10}$ | mg/kg | 25 | Org-023 | <25 | [NT] | [NT] | [NT] | [NT] | 116 | [NT] |
| Benzene | mg/kg | 0.2 | Org-023 | <0.2 | [NT] | [NT] | [NT] | [NT] | 114 | [NT] |
| Toluene | mg/kg | 0.5 | Org-023 | <0.5 | [NT] | [NT] | [NT] | [NT] | 120 | [NT] |
| Ethylbenzene | mg/kg | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 116 | [NT] |
| m+p-xylene | mg/kg | 2 | Org-023 | <2 | [NT] | [NT] | [NT] | [NT] | 111 | [NT] |
| o-Xylene | mg/kg | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 117 | [NT] |
| Naphthalene | mg/kg | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* aaa-Trifluorotoluene | % | | Org-023 | 110 | [NT] | [NT] | [NT] | [NT] | 118 | [NT] |

| QUALITY CONTROL: svTRH (C10-C40) in Soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-12 | [NT] |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | [NT] |
| Date analysed | - | | | 23/11/2022 | [NT] | [NT] | [NT] | [NT] | 23/11/2022 | [NT] |
| TRH $C_{10}$ - $C_{14}$ | mg/kg | 50 | Org-020 | <50 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| TRH $C_{15}$ - $C_{28}$ | mg/kg | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 85 | [NT] |
| TRH $C_{29}$ - $C_{36}$ | mg/kg | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 86 | [NT] |
| TRH >$C_{10}$ -$C_{16}$ | mg/kg | 50 | Org-020 | <50 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| TRH >$C_{16}$ -$C_{34}$ | mg/kg | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 85 | [NT] |
| TRH >$C_{34}$ -$C_{40}$ | mg/kg | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 86 | [NT] |
| *Surrogate* o-Terphenyl | % | | Org-020 | 86 | [NT] | [NT] | [NT] | [NT] | 88 | [NT] |

| QUALITY CONTROL: PAHs in Soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-12 | [NT] |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | [NT] |
| Date analysed | - | | | 24/11/2022 | [NT] | [NT] | [NT] | [NT] | 24/11/2022 | [NT] |
| Naphthalene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 80 | [NT] |
| Acenaphthylene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Acenaphthene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 79 | [NT] |
| Fluorene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 67 | [NT] |
| Phenanthrene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 82 | [NT] |
| Anthracene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Fluoranthene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 82 | [NT] |
| Pyrene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 83 | [NT] |
| Benzo(a)anthracene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chrysene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 63 | [NT] |
| Benzo(b,j+k)fluoranthene | mg/kg | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Benzo(a)pyrene | mg/kg | 0.05 | Org-022/025 | <0.05 | [NT] | [NT] | [NT] | [NT] | 86 | [NT] |
| Indeno(1,2,3-c,d)pyrene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Dibenzo(a,h)anthracene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Benzo(g,h,i)perylene | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate p*-Terphenyl-d14 | % | | Org-022/025 | 74 | [NT] | [NT] | [NT] | [NT] | 71 | [NT] |

| QUALITY CONTROL: Organochlorine Pesticides in soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-12 | [NT] |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | [NT] |
| Date analysed | - | | | 24/11/2022 | [NT] | [NT] | [NT] | [NT] | 24/11/2022 | [NT] |
| alpha-BHC | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 84 | [NT] |
| HCB | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| beta-BHC | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 84 | [NT] |
| gamma-BHC | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Heptachlor | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 81 | [NT] |
| delta-BHC | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aldrin | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 81 | [NT] |
| Heptachlor Epoxide | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 68 | [NT] |
| gamma-Chlordane | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| alpha-chlordane | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Endosulfan I | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| pp-DDE | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 72 | [NT] |
| Dieldrin | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| Endrin | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 76 | [NT] |
| Endosulfan II | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| pp-DDD | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 68 | [NT] |
| Endrin Aldehyde | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| pp-DDT | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Endosulfan Sulphate | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 80 | [NT] |
| Methoxychlor | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* TCMX | % | | Org-022/025 | 78 | [NT] | [NT] | [NT] | [NT] | 75 | [NT] |

| QUALITY CONTROL: Organophosphorus Pesticides in Soil | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-12 | [NT] |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | [NT] |
| Date analysed | - | | | 24/11/2022 | [NT] | [NT] | [NT] | [NT] | 24/11/2022 | [NT] |
| Dichlorvos | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 81 | [NT] |
| Dimethoate | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Diazinon | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chlorpyriphos-methyl | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Ronnel | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 75 | [NT] |
| Fenitrothion | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 79 | [NT] |
| Malathion | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 69 | [NT] |
| Chlorpyriphos | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Parathion | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 82 | [NT] |
| Bromophos-ethyl | mg/kg | 0.1 | Org-022 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Ethion | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | 78 | [NT] |
| Azinphos-methyl (Guthion) | mg/kg | 0.1 | Org-022/025 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* TCMX | % | | Org-022/025 | 78 | [NT] | [NT] | [NT] | [NT] | 75 | [NT] |

| QUALITY CONTROL: PCBs in Soil | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-12 | [NT] |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | [NT] |
| Date analysed | - | | | 24/11/2022 | [NT] | [NT] | [NT] | [NT] | 24/11/2022 | [NT] |
| Aroclor 1016 | mg/kg | 0.1 | Org-021 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1221 | mg/kg | 0.1 | Org-021 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1232 | mg/kg | 0.1 | Org-021 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1242 | mg/kg | 0.1 | Org-021 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1248 | mg/kg | 0.1 | Org-021 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1254 | mg/kg | 0.1 | Org-021 | <0.1 | [NT] | [NT] | [NT] | [NT] | 84 | [NT] |
| Aroclor 1260 | mg/kg | 0.1 | Org-021 | <0.1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* TCMX | % | | Org-021 | 78 | [NT] | [NT] | [NT] | [NT] | 75 | [NT] |

| QUALITY CONTROL: Acid Extractable metals in soil | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date prepared | - | | | 25/11/2022 | [NT] | [NT] | [NT] | [NT] | 25/11/2022 | [NT] |
| Date analysed | - | | | 25/11/2022 | [NT] | [NT] | [NT] | [NT] | 25/11/2022 | [NT] |
| Arsenic | mg/kg | 4 | Metals-020 | <4 | [NT] | [NT] | [NT] | [NT] | 94 | [NT] |
| Cadmium | mg/kg | 0.4 | Metals-020 | <0.4 | [NT] | [NT] | [NT] | [NT] | 97 | [NT] |
| Chromium | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | [NT] | [NT] | 91 | [NT] |
| Copper | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | [NT] | [NT] | 92 | [NT] |
| Lead | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | [NT] | [NT] | 91 | [NT] |
| Mercury | mg/kg | 0.1 | Metals-021 | <0.1 | [NT] | [NT] | [NT] | [NT] | 93 | [NT] |
| Nickel | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | [NT] | [NT] | 91 | [NT] |
| Zinc | mg/kg | 1 | Metals-020 | <1 | [NT] | [NT] | [NT] | [NT] | 91 | [NT] |

| QUALITY CONTROL: Acid Extractable Cations in Soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | 310991-2 |
| Date prepared | - | | | 25/11/2022 | 1 | 25/11/2022 | 25/11/2022 | | 25/11/2022 | 25/11/2022 |
| Date analysed | - | | | 25/11/2022 | 1 | 25/11/2022 | 25/11/2022 | | 25/11/2022 | 25/11/2022 |
| Sodium | mg/kg | 10 | Metals-020 | <10 | 1 | 180 | 180 | 0 | 92 | 88 |

| QUALITY CONTROL: Acid Extractable Cations in Soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-2 | 310991-18 |
| Date prepared | - | | | [NT] | 11 | 25/11/2022 | 25/11/2022 | | 25/11/2022 | 25/11/2022 |
| Date analysed | - | | | [NT] | 11 | 25/11/2022 | 25/11/2022 | | 25/11/2022 | 25/11/2022 |
| Sodium | mg/kg | 10 | Metals-020 | [NT] | 11 | 70 | 70 | 0 | 89 | 89 |

| QUALITY CONTROL: Acid Extractable Cations in Soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | [NT] | [NT] |
| Date prepared | - | | | [NT] | 17 | 25/11/2022 | 25/11/2022 | | [NT] | [NT] |
| Date analysed | - | | | [NT] | 17 | 25/11/2022 | 25/11/2022 | | [NT] | [NT] |
| Sodium | mg/kg | 10 | Metals-020 | [NT] | 17 | 110 | 130 | 17 | [NT] | [NT] |

| QUALITY CONTROL: Misc Inorg - Soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-1 | [NT] |
| Date prepared | - | | | 18/11/2022 | 1 | 18/11/2022 | 18/11/2022 | | 18/11/2022 | [NT] |
| Date analysed | - | | | 23/11/2022 | 1 | 23/11/2022 | 23/11/2022 | | 23/11/2022 | [NT] |
| pH 1:5 soil:water | pH Units | | Inorg-001 | [NT] | 1 | 7.8 | 7.8 | 0 | 101 | [NT] |
| Estimated Salinity* | mg/kg | 5 | Inorg-034 | <5 | 1 | 150 | 160 | 6 | [NT] | [NT] |

| QUALITY CONTROL: Misc Inorg - Soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-2 | [NT] |
| Date prepared | - | | | [NT] | 4 | 18/11/2022 | 18/11/2022 | | 18/11/2022 | [NT] |
| Date analysed | - | | | [NT] | 4 | 23/11/2022 | 23/11/2022 | | 23/11/2022 | [NT] |
| pH 1:5 soil:water | pH Units | | Inorg-001 | [NT] | 4 | 6.0 | 6.0 | 0 | 100 | [NT] |
| Estimated Salinity* | mg/kg | 5 | Inorg-034 | [NT] | 4 | 1300 | 1300 | 0 | [NT] | [NT] |

| QUALITY CONTROL: Misc Inorg - Soil | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | [NT] | [NT] |
| Date prepared | - | | | [NT] | 19 | 18/11/2022 | 18/11/2022 | | [NT] | [NT] |
| Date analysed | - | | | [NT] | 19 | 23/11/2022 | 23/11/2022 | | [NT] | [NT] |
| pH 1:5 soil:water | pH Units | | Inorg-001 | [NT] | 19 | 7.0 | 7.0 | 0 | [NT] | [NT] |
| Estimated Salinity* | mg/kg | 5 | Inorg-034 | [NT] | 19 | 100 | 96 | 4 | [NT] | [NT] |

| QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W3 | [NT] |
| Date extracted | - | | | 24/11/2022 | [NT] | [NT] | [NT] | [NT] | 24/11/2022 | [NT] |
| Date analysed | - | | | 25/11/2022 | [NT] | [NT] | [NT] | [NT] | 25/11/2022 | [NT] |
| TRH $C_6$ - $C_9$ | µg/L | 10 | Org-023 | <10 | [NT] | [NT] | [NT] | [NT] | 101 | [NT] |
| TRH $C_6$ - $C_{10}$ | µg/L | 10 | Org-023 | <10 | [NT] | [NT] | [NT] | [NT] | 101 | [NT] |
| Benzene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Toluene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 104 | [NT] |
| Ethylbenzene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 106 | [NT] |
| m+p-xylene | µg/L | 2 | Org-023 | <2 | [NT] | [NT] | [NT] | [NT] | 99 | [NT] |
| o-xylene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Naphthalene | µg/L | 1 | Org-023 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* Dibromofluoromethane | % | | Org-023 | 102 | [NT] | [NT] | [NT] | [NT] | 101 | [NT] |
| *Surrogate* toluene-d8 | % | | Org-023 | 101 | [NT] | [NT] | [NT] | [NT] | 106 | [NT] |
| *Surrogate* 4-BFB | % | | Org-023 | 103 | [NT] | [NT] | [NT] | [NT] | 99 | [NT] |

| QUALITY CONTROL: svTRH (C10-C40) in Water | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W2 | [NT] |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | [NT] |
| Date analysed | - | | | 23/11/2022 | [NT] | [NT] | [NT] | [NT] | 23/11/2022 | [NT] |
| TRH $C_{10}$ - $C_{14}$ | µg/L | 50 | Org-020 | <50 | [NT] | [NT] | [NT] | [NT] | 86 | [NT] |
| TRH $C_{15}$ - $C_{28}$ | µg/L | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| TRH $C_{29}$ - $C_{36}$ | µg/L | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 86 | [NT] |
| TRH >$C_{10}$ - $C_{16}$ | µg/L | 50 | Org-020 | <50 | [NT] | [NT] | [NT] | [NT] | 86 | [NT] |
| TRH >$C_{16}$ - $C_{34}$ | µg/L | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| TRH >$C_{34}$ - $C_{40}$ | µg/L | 100 | Org-020 | <100 | [NT] | [NT] | [NT] | [NT] | 86 | [NT] |
| *Surrogate* o-Terphenyl | % | | Org-020 | 85 | [NT] | [NT] | [NT] | [NT] | 81 | [NT] |

| QUALITY CONTROL: PAHs in Water | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W2 | 310991-25 |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | 22/11/2022 |
| Date analysed | - | | | 23/11/2022 | [NT] | [NT] | [NT] | [NT] | 23/11/2022 | 23/11/2022 |
| Naphthalene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 92 | 98 |
| Acenaphthylene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Acenaphthene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 87 | 91 |
| Fluorene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 93 | 94 |
| Phenanthrene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 100 | 99 |
| Anthracene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Fluoranthene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 106 | 101 |
| Pyrene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 103 | 102 |
| Benzo(a)anthracene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chrysene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 89 | 89 |
| Benzo(b,j+k)fluoranthene | µg/L | 2 | Org-022/025 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Benzo(a)pyrene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | 84 | 84 |
| Indeno(1,2,3-c,d)pyrene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Dibenzo(a,h)anthracene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Benzo(g,h,i)perylene | µg/L | 1 | Org-022/025 | <1 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate p*-Terphenyl-d14 | % | | Org-022/025 | 93 | [NT] | [NT] | [NT] | [NT] | 100 | 89 |

| QUALITY CONTROL: Organochlorine Pesticides in Water | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W2 | 310991-25 |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | 22/11/2022 |
| Date analysed | - | | | 23/11/2022 | [NT] | [NT] | [NT] | [NT] | 23/11/2022 | 23/11/2022 |
| alpha-BHC | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 96 | 99 |
| HCB | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| beta-BHC | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 99 | 98 |
| gamma-BHC | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Heptachlor | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 105 | 101 |
| delta-BHC | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aldrin | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 109 | 104 |
| Heptachlor Epoxide | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 108 | 104 |
| gamma-Chlordane | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| alpha-Chlordane | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Endosulfan I | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| pp-DDE | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 107 | 108 |
| Dieldrin | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 106 | 104 |
| Endrin | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 100 | 105 |
| Endosulfan II | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| pp-DDD | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 100 | 109 |
| Endrin Aldehyde | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| pp-DDT | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Endosulfan Sulphate | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 102 | 102 |
| Methoxychlor | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* TCMX | % | | Org-022/025 | 84 | [NT] | [NT] | [NT] | [NT] | 87 | 89 |

| QUALITY CONTROL: OP Pesticides in Water | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W2 | 310991-25 |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | 22/11/2022 |
| Date analysed | - | | | 23/11/2022 | [NT] | [NT] | [NT] | [NT] | 23/11/2022 | 23/11/2022 |
| Dichlorvos | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 118 | 112 |
| Dimethoate | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Diazinon | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Chlorpyriphos-methyl | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Ronnel | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 85 | 98 |
| Fenitrothion | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 87 | 92 |
| Malathion | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 110 | 94 |
| Chlorpyriphos | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 104 | 102 |
| Parathion | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 82 | 88 |
| Bromophos ethyl | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Ethion | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | 92 | 93 |
| Azinphos-methyl (Guthion) | µg/L | 0.2 | Org-022/025 | <0.2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* TCMX | % | | Org-022/025 | 84 | [NT] | [NT] | [NT] | [NT] | 87 | 89 |

| QUALITY CONTROL: PCBs in Water | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W2 | 310991-25 |
| Date extracted | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | 22/11/2022 |
| Date analysed | - | | | 23/11/2022 | [NT] | [NT] | [NT] | [NT] | 23/11/2022 | 23/11/2022 |
| Aroclor 1016 | µg/L | 2 | Org-021 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1221 | µg/L | 2 | Org-021 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1232 | µg/L | 2 | Org-021 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1242 | µg/L | 2 | Org-021 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1248 | µg/L | 2 | Org-021 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| Aroclor 1254 | µg/L | 2 | Org-021 | <2 | [NT] | [NT] | [NT] | [NT] | 120 | 118 |
| Aroclor 1260 | µg/L | 2 | Org-021 | <2 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |
| *Surrogate* TCMX | % | | Org-021 | 84 | [NT] | [NT] | [NT] | [NT] | 87 | 89 |

| QUALITY CONTROL: Metals in Water - Dissolved | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W1 | [NT] |
| Date digested | - | | | 23/11/2022 | [NT] | [NT] | [NT] | [NT] | 23/11/2022 | [NT] |
| Date analysed | - | | | 23/11/2022 | [NT] | [NT] | [NT] | [NT] | 23/11/2022 | [NT] |
| Arsenic - Dissolved | mg/L | 0.05 | Metals-020 | <0.05 | [NT] | [NT] | [NT] | [NT] | 100 | [NT] |
| Cadmium - Dissolved | mg/L | 0.01 | Metals-020 | <0.01 | [NT] | [NT] | [NT] | [NT] | 92 | [NT] |
| Chromium - Dissolved | mg/L | 0.01 | Metals-020 | <0.01 | [NT] | [NT] | [NT] | [NT] | 91 | [NT] |
| Copper - Dissolved | mg/L | 0.01 | Metals-020 | <0.01 | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Lead - Dissolved | mg/L | 0.03 | Metals-020 | <0.03 | [NT] | [NT] | [NT] | [NT] | 91 | [NT] |
| Mercury - Dissolved | mg/L | 0.0005 | Metals-021 | <0.0005 | [NT] | [NT] | [NT] | [NT] | 93 | [NT] |
| Nickel - Dissolved | mg/L | 0.02 | Metals-020 | <0.02 | [NT] | [NT] | [NT] | [NT] | 94 | [NT] |
| Zinc - Dissolved | mg/L | 0.02 | Metals-020 | <0.02 | [NT] | [NT] | [NT] | [NT] | 93 | [NT] |

| QUALITY CONTROL: Cations in water Dissolved | | | | | Duplicate | | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W1 | [NT] |
| Date digested | - | | | 23/11/2022 | [NT] | [NT] | [NT] | [NT] | 23/11/2022 | [NT] |
| Date analysed | - | | | 24/11/2022 | [NT] | [NT] | [NT] | [NT] | 24/11/2022 | [NT] |
| Sodium - Dissolved | mg/L | 0.5 | Metals-020 | <0.5 | [NT] | [NT] | [NT] | [NT] | 104 | [NT] |

| QUALITY CONTROL: Miscellaneous Inorganics | | | | | | Duplicate | | | Spike Recovery % | |
|---|---|---|---|---|---|---|---|---|---|---|
| Test Description | Units | PQL | Method | Blank | # | Base | Dup. | RPD | LCS-W1 | [NT] |
| Date prepared | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | [NT] |
| Date analysed | - | | | 22/11/2022 | [NT] | [NT] | [NT] | [NT] | 22/11/2022 | [NT] |
| pH | pH Units | | Inorg-001 | [NT] | [NT] | [NT] | [NT] | [NT] | 98 | [NT] |
| Salinity as NaCl* | g/L | 0.01 | Inorg-002 | <0.01 | [NT] | [NT] | [NT] | [NT] | [NT] | [NT] |

## Result Definitions

| | |
|---|---|
| **NT** | Not tested |
| **NA** | Test not required |
| **INS** | Insufficient sample for this test |
| **PQL** | Practical Quantitation Limit |
| **<** | Less than |
| **>** | Greater than |
| **RPD** | Relative Percent Difference |
| **LCS** | Laboratory Control Sample |
| **NS** | Not specified |
| **NEPM** | National Environmental Protection Measure |
| **NR** | Not Reported |

## Quality Control Definitions

| | |
|---|---|
| **Blank** | This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples. |
| **Duplicate** | This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable. |
| **Matrix Spike** | A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist. |
| **LCS (Laboratory Control Sample)** | This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample. |
| **Surrogate Spike** | Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples. |

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

## Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

ALS Environmental

# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **ES2241858** | Page | : 1 of 7 |
| Client | : **MOSS ENVIRONMENTAL** | Laboratory | : Environmental Division Sydney |
| Contact | : ELIZABETH OGUNSOTE | Contact | : Customer Services ES |
| Address | : 24 Fitzroy St<br>Tamworth 2340 | Address | : 277-289 Woodpark Road Smithfield NSW Australia 2164 |
| Telephone | : ---- | Telephone | : +61-2-8784 8555 |
| Project | : J000109 | Date Samples Received | : 18-Nov-2022 15:10 |
| Order number | : ---- | Date Analysis Commenced | : 21-Nov-2022 |
| C-O-C number | : ---- | Issue Date | : 07-Dec-2022 12:28 |
| Sampler | : DA, EO | | |
| Site | : ---- | | |
| Quote number | : EN/333 | | |
| 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, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

## *Signatories*

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

| *Signatories* | *Position* | *Accreditation Category* |
|---|---|---|
| Ankit Joshi | Senior Chemist - Inorganics | Sydney Inorganics, Smithfield, NSW |
| Edwandy Fadjar | Organic Coordinator | Sydney Inorganics, Smithfield, NSW |
| Edwandy Fadjar | Organic Coordinator | Sydney Organics, Smithfield, NSW |

## General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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 Contract for details.

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) 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.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | Sample ID | SP-2 0.1 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|
| | | | Sampling date / time | 10-Nov-2022 00:00 | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | ES2241858-001 | -------- | -------- | -------- | -------- |
| | | | | Result | ---- | ---- | ---- | ---- |
| **EA002: pH 1:5 (Soils)** | | | | | | | | |
| **pH Value** | ---- | 0.1 | pH Unit | **6.3** | ---- | ---- | ---- | ---- |
| **EA014 Total Soluble Salts** | | | | | | | | |
| **Total Soluble Salts** | ---- | 5 | mg/kg | **47** | ---- | ---- | ---- | ---- |
| **EA055: Moisture Content (Dried @ 105-110°C)** | | | | | | | | |
| **Moisture Content** | ---- | 1.0 | % | **24.0** | ---- | ---- | ---- | ---- |
| **ED093S: Soluble Major Cations** | | | | | | | | |
| **Sodium** | 7440-23-5 | 10 | mg/kg | <10 | ---- | ---- | ---- | ---- |
| **EG005(ED093)T: Total Metals by ICP-AES** | | | | | | | | |
| **Arsenic** | 7440-38-2 | 5 | mg/kg | **7** | ---- | ---- | ---- | ---- |
| **Cadmium** | 7440-43-9 | 1 | mg/kg | <1 | ---- | ---- | ---- | ---- |
| **Chromium** | 7440-47-3 | 2 | mg/kg | **15** | ---- | ---- | ---- | ---- |
| **Copper** | 7440-50-8 | 5 | mg/kg | **31** | ---- | ---- | ---- | ---- |
| **Lead** | 7439-92-1 | 5 | mg/kg | **15** | ---- | ---- | ---- | ---- |
| **Nickel** | 7440-02-0 | 2 | mg/kg | **15** | ---- | ---- | ---- | ---- |
| **Zinc** | 7440-66-6 | 5 | mg/kg | **64** | ---- | ---- | ---- | ---- |
| **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 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Sample ID | SP-2 0.1 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 10-Nov-2022 00:00 | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2241858-001 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EP068A: Organochlorine Pesticides (OC) - Continued** | | | | | | | | | |
| Endrin | 72-20-8 | 0.05 | mg/kg | | <0.05 | ---- | ---- | ---- | ---- |
| 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 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Sample ID | SP-2 0.1 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 10-Nov-2022 00:00 | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2241858-001 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued** | | | | | | | | | |
| Acenaphthylene | 208-96-8 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Acenaphthene | 83-32-9 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Fluorene | 86-73-7 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Phenanthrene | 85-01-8 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Anthracene | 120-12-7 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Fluoranthene | 206-44-0 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Pyrene | 129-00-0 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benz(a)anthracene | 56-55-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Chrysene | 218-01-9 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(b+j)fluoranthene | 205-99-2 205-82-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(k)fluoranthene | 207-08-9 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(a)pyrene | 50-32-8 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Indeno(1.2.3.cd)pyrene | 193-39-5 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Dibenz(a.h)anthracene | 53-70-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Benzo(g.h.i)perylene | 191-24-2 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ^ Sum of polycyclic aromatic hydrocarbons | ---- | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (zero) | ---- | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (half LOR) | ---- | 0.5 | mg/kg | | **0.6** | ---- | ---- | ---- | ---- |
| ^ Benzo(a)pyrene TEQ (LOR) | ---- | 0.5 | mg/kg | | **1.2** | ---- | ---- | ---- | ---- |
| **EP080/071: Total Petroleum Hydrocarbons** | | | | | | | | | |
| C6 - C9 Fraction | ---- | 10 | mg/kg | | <10 | ---- | ---- | ---- | ---- |
| 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 | ---- | ---- | ---- | ---- |

## Analytical Results

| Sub-Matrix: SOIL (Matrix: SOIL) | | | | Sample ID | SP-2 0.1 | ---- | ---- | ---- | ---- |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Sampling date / time | 10-Nov-2022 00:00 | ---- | ---- | ---- | ---- |
| Compound | CAS Number | LOR | Unit | | ES2241858-001 | -------- | -------- | -------- | -------- |
| | | | | | Result | ---- | ---- | ---- | ---- |
| **EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued** | | | | | | | | | |
| ^ >C10 - C16 Fraction minus Naphthalene (F2) | ---- | 50 | mg/kg | | <50 | ---- | ---- | ---- | ---- |
| **EP080: BTEXN** | | | | | | | | | |
| Benzene | 71-43-2 | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| Toluene | 108-88-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Ethylbenzene | 100-41-4 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| meta- & para-Xylene | 108-38-3 106-42-3 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ortho-Xylene | 95-47-6 | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| ^ Sum of BTEX | ---- | 0.2 | mg/kg | | <0.2 | ---- | ---- | ---- | ---- |
| ^ Total Xylenes | ---- | 0.5 | mg/kg | | <0.5 | ---- | ---- | ---- | ---- |
| Naphthalene | 91-20-3 | 1 | mg/kg | | <1 | ---- | ---- | ---- | ---- |
| **EP066S: PCB Surrogate** | | | | | | | | | |
| Decachlorobiphenyl | 2051-24-3 | 0.1 | % | | **93.5** | ---- | ---- | ---- | ---- |
| **EP068S: Organochlorine Pesticide Surrogate** | | | | | | | | | |
| Dibromo-DDE | 21655-73-2 | 0.05 | % | | **102** | ---- | ---- | ---- | ---- |
| **EP068T: Organophosphorus Pesticide Surrogate** | | | | | | | | | |
| DEF | 78-48-8 | 0.05 | % | | **53.1** | ---- | ---- | ---- | ---- |
| **EP075(SIM)S: Phenolic Compound Surrogates** | | | | | | | | | |
| Phenol-d6 | 13127-88-3 | 0.5 | % | | **85.0** | ---- | ---- | ---- | ---- |
| 2-Chlorophenol-D4 | 93951-73-6 | 0.5 | % | | **86.0** | ---- | ---- | ---- | ---- |
| 2.4.6-Tribromophenol | 118-79-6 | 0.5 | % | | **91.7** | ---- | ---- | ---- | ---- |
| **EP075(SIM)T: PAH Surrogates** | | | | | | | | | |
| 2-Fluorobiphenyl | 321-60-8 | 0.5 | % | | **85.0** | ---- | ---- | ---- | ---- |
| Anthracene-d10 | 1719-06-8 | 0.5 | % | | **96.8** | ---- | ---- | ---- | ---- |
| 4-Terphenyl-d14 | 1718-51-0 | 0.5 | % | | **87.0** | ---- | ---- | ---- | ---- |
| **EP080S: TPH(V)/BTEX Surrogates** | | | | | | | | | |
| 1.2-Dichloroethane-D4 | 17060-07-0 | 0.2 | % | | **86.9** | ---- | ---- | ---- | ---- |
| Toluene-D8 | 2037-26-5 | 0.2 | % | | **93.3** | ---- | ---- | ---- | ---- |
| 4-Bromofluorobenzene | 460-00-4 | 0.2 | % | | **89.2** | ---- | ---- | ---- | ---- |

## 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 |

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# APPENDIX E – LOGIT DIGITAL SOIL LOGS

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-A<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **16/11/2022 14:20** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **16/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Hand Auger** | DTW After Drilling (m): | **0.15** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy areas on surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.12582, 150.89209** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | (0m) Topsoil | | | 0 |
| | | | | DP | 14:22 | | | (0.05m) Lean CLAY with sand (CL); little medium-coarse sand, trace silt, mostly clay, nonplastic, soft, dry, light brown | | SP-A | |
| | | | | DP | | | | (0.15m) Light brown soil, dry, clay soil, lean clay. A bit of fine and coarse, muddy towards bore depth | | | |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared to 0.0' using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-B<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **16/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **16/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Hand Auger** | DTW After Drilling (m): | **0.15** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy top soil** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.12629, 150.89451** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | | | | (0m) Topsoil<br><br>(0.05m) Elastic SILT with sand (MH); few fine sand, some silt, some clay, low plasticity, soft, moist, dark brown<br><br>(0.15m) As Above | | SP-B | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Field notes: Dark brown soil, moist, silty clayey soil, no gravel, poorly graded, no rocks in soil profile

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-C<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Hand Auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy surface on top soil** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.12723, 150.89837** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | (0m) Topsoil | | | 0 |
| | | | | DP | 09:45 | | | (0.05m) Poorly graded GRAVEL with clay (GP-GC); some fine-coarse grained gravel, trace fine sand, little clay, dense, moist, black<br>(0.09m) As Above | | SP-C | |
| | | | | | | | | (0.15m) Surface soil collected. Boring terminated | | | |
| 1 | | | | | | | | | | | 1 |

NOTES: Jarrett's hand auger was used to collect soil sample

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-D<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Hand Auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy, dry soil surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.12769, 150.90132** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | (0m) Topsoil<br>(0.03m) Poorly graded SAND with gravel (SP); some coarse grained sand, little coarse gravel, trace silt, loose, dry, light yellowish-brown | | SP-D | 0 |
| | | | | DP | | | | (0.1m) As Above | | | |
| | | | | | | | | (0.15m) Surface soil collected... boring completed | | | |
| 1 | | | | | | | | | | | 1 |

NOTES: A Jarrett's hand auger was used for sample collection

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-E<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Hand Auger** | DTW After Drilling (m): | **0.15** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.12796, 150.90465** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | | | | (0m) Topsoil<br>(0.03m) Well-graded SAND with gravel (SW); some fine-medium grained sand, little coarse gravel, few clay, loose, dry, light reddish-brown | | SP-E | 0 |
| | | | | | | | | (0.15m) Boring terminated | | | |
| 1 | | | | | | | | | | | 1 |

NOTES: A Jarrett's hand auger was used for sample collection

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-F<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Hand Auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy, moist surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13153, 150.90372** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | | | | (0m) Topsoil | | | 0 |
| | | | | | | | | (0.05m) SILT with sand (ML); trace fine sand, some silt, little clay, medium plasticity, soft, moist, very dark black | | | |
| | | | | | | | | (0.1m) Poorly graded GRAVEL (GP); some coarse grained gravel, few fine-medium sand, trace silt, trace clay, loose, slightly moist, very dark black | | SP-F | |
| | | | | | | | | (0.15m) Sample collected at depth. Auger resistance due to presence of rocks at bore depth | | | |
| 1 | | | | | | | | | | | 1 |

NOTES: A Jarrett hand auger was used for sample collection

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-G<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.22** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **0** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Moist surface, Grassy** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13122, 150.90110** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | | | | (0m) Topsoil | | SP-2 | 0 |
| | | | | | | | | (0.05m) Sandy elastic SILT (MH); trace fine-medium sand, few silt, trace clay, low plasticity, soft, moist, dark brown<br>(0.1m) Fat CLAY with sand (CH); trace fine sand, some clay, low plasticity, soft, wet, very dark brown<br>(0.15m) Fat CLAY (CH); trace silt, mostly clay, medium plasticity, very soft, saturated, dark greenish-black<br>(0.2m) As Above | | | |
| 1 | | | | | | | | (0.22m) Boring terminated... Triplicate sample SP-2 collected at depth | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-H<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **16/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **16/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's Hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Loose and moist soil on surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13070, 150.89789** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | 09:00 | | | (0m) Topsoil<br>(0.03m) Well-graded SAND with silt (SW-SM); some coarse grained sand, trace silt, medium dense, moist, light greenish-brown<br>(0.1m) Poorly graded SAND with silt (SP-SM); trace coarse grained sand, trace silt, few clay, loose, wet, dark greenish-brown<br>(0.14m) Water<br>(0.15m) Boring terminated | | SP-H | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-I<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **16/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **16/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's Hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy, loose, moist soil on surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13014, 150.89429** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | | | | (0m) Topsoil<br>(0.03m) Poorly graded SAND (SP); some medium-coarse grained sand, few silt, loose, slightly moist, light reddish-brown<br>(0.1m) Lean CLAY with sand (CL); trace medium-coarse sand, little silt, little clay, nonplastic, dry, light reddish-brown<br>(0.14m) Fat CLAY with sand (CH); trace fine-medium sand, little silt, some clay, high plasticity, stiff, moist, dark brown<br>(0.15m) Boring terminated | | SP-1 | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-J<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **16/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **16/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy and moist surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13560, 150.89690** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | | | | (0m) Topsoil | | SP-J | 0 |
| | | | | | | | | (0.05m) Lean CLAY with sand (CL); few fine-medium sand, few silt, trace clay, low plasticity, soft, slightly moist, light brown<br>(0.1m) Sandy lean CLAY (CL); little fine sand, little silt, some clay, medium plasticity, soft, moist, dark black | | | |
| 1 | | | | | | | | (0.15m) Boring terminated | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-L<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **16/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **16/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Poorly graded loose soil at surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13490, 150.90290** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | | | | (0m) Topsoil<br><br>(0.05m) Fat CLAY with sand (CH); few fine-medium sand, trace silt, little clay, low plasticity, soft, slightly moist, dark black<br>(0.1m) As Above<br><br>(0.15m) Boring terminated | | SP-L | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-M<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **16/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **16/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy and stiff soil at surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13800, 150.90250** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | 14:10 | | | (0m) Topsoil<br>(0.01m) Fat CLAY (CH); little fine sand, mostly clay, high plasticity, medium stiff, moist, dark black<br><br>(0.1m) Fat CLAY with sand (CH); trace fine sand, little silt, mostly clay, medium plasticity, medium stiff, moist, dark black<br>(0.15m) Boring terminated | | SP-M | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-N<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Hand Auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Moist sandy soil at surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13760, 150.90000** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | 11:40 | | | (0m) Topsoil<br>(0.03m) Sandy lean CLAY (CL); few medium sand, trace silt, mostly clay, medium plasticity, soft, moist, light yellowish-brown<br>(0.1m) Lean CLAY with sand (CL); few medium sand, few silt, some clay, medium plasticity, soft, moist, light yellowish-brown<br>(0.15m) Boring terminated | | SP-N | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-O<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **16/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **16/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's Hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy and moist surface soil** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13720, 150.89730** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | 12:30 | | | (0m) Topsoil | | SP-O | 0 |
| | | | | | | | | (0.03m) Elastic SILT with sand (MH); little medium sand, few silt, few clay, medium plasticity, soft, wet, dark greenish-brown | | | |
| | | | | | | | | (0.14m) Water retained in profile. No gravel or rocks in soil. Medium dense soil. | | | |
| | | | | | | | | (0.15m) Boring terminated | | | |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-P<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Moist surface soil** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.14020, 150.89690** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | 11:20 | | | (0m) Topsoil<br>(0.02m) Sandy lean CLAY (CL); little fine sand, few silt, little clay, medium plasticity, medium stiff, moist, dark black<br>(0.1m) Lean CLAY (CL); few fine sand, little silt, little clay, medium plasticity, medium stiff, moist, very dark yellowish-black<br>(0.15m) Boring terminated | | SP-P | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-Q<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **16/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **16/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Loose surface with vegetation surrounding borehole** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.14070, 150.89900** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | 14:20 | | | (0m) Topsoil<br>(0.03m) Poorly graded GRAVEL with silt (GP-GM); trace coarse grained gravel, few medium-coarse sand, trace silt, very loose, dry, dark brown<br>(0.1m) As Above | | SP-Q | 0 |
| | | | | | | | | (0.15m) Boring terminated | | | |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-R<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Dry, loose surface soil** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.14080, 150.90190** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | | | | (0m) Topsoil<br>(0.03m) Silty GRAVEL with sand (GM); some coarse grained gravel, little medium sand, little silt, trace clay, loose, dry, black<br>(0.1m) As Above<br>(0.15m) Boring terminated | | SP-R | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-S<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Wet top soil** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.13220, 150.89780** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | 10:50 | | | (0m) Topsoil<br>(0.03m) Sandy SILT (ML) with gravel; little fine-coarse gravel, little fine-medium sand, mostly silt, trace clay, medium plasticity, soft, wet, light brown<br>(0.05m) Water present in profile<br>(0.1m) Lean CLAY with sand (CL); few fine-medium sand, few silt, little clay, medium plasticity, soft, wet, light brown<br>(0.15m) Boring terminated | | SP-S | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-T<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **0.15** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Dry loose soil at surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.12720, 150.90510** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | 12:00 | | | (0m) Topsoil<br>(0.01m) Silty SAND with gravel (SM); little medium grained sand, little fine-coarse gravel, few silt, very loose, dry, light reddish-brown<br><br>(0.1m) Poorly graded GRAVEL (GP); mostly coarse grained gravel, trace fine-medium sand, few silt, very loose, dry<br>(0.15m) Boring terminated... Auger resistance to rock at bore depth | | SP-T | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

| | | |
|---|---|---|
| MOSS ENVIRONMENTAL | **Client:** CSO Engineers<br>**Project:** Arcadia Estate<br>**Address:** Burgmann's Lane Warral, Tamworth NSW, Australia | **BORING LOG**<br>**Boring No.** SP-T2<br>**Page:** 1 of 1 |

| | | | |
|---|---|---|---|
| Drilling Start Date: | **15/11/2022** | Boring Depth (m): | **0.15** |
| Drilling End Date: | **15/11/2022** | Boring Diameter (mm): | **80.00** |
| Drilling Company: | **Moss Environmental** | Sampling Method(s): | **Direct Push** |
| Drilling Method: | **Direct Push** | DTW During Drilling (m): | **N/A** |
| Drilling Equipment: | **Jarrett's hand auger** | DTW After Drilling (m): | **N/A** |
| Driller: | **Dasuni Algiriyage** | Ground Surface Elev. (m): | **Grassy surface** |
| Logged By: | **Elizabeth Ogunsote** | Location (Lat, Long): | **-31.12580, 150.90530** |

| DEPTH (m) | LITHOLOGY | WATER LEVEL | BORING COMPLETION | COLLECT: Sample Type | COLLECT: Time | COLLECT: Blow Counts | COLLECT: Recovery (m) | SOIL/ROCK VISUAL DESCRIPTION | MEASURE: PID (ppm) | MEASURE: Lab Sample | DEPTH (m) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | DP | 12:15 | | | (0m) Topsoil<br>(0.01m) Well-graded SAND with gravel (SW); mostly medium grained sand, some coarse gravel, little silt, loose, slightly moist, brown<br>(0.05m) Poorly graded GRAVEL (GP); little fine-coarse grained gravel, trace fine-medium sand, loose, slightly moist, brown<br>(0.1m) As Above: ...presence of rocks along soil profile<br>(0.15m) Boring terminated | | SP-T2 | 0 |
| 1 | | | | | | | | | | | 1 |

NOTES: Hole precleared using hand auger.

MOSS ENVIRONMENTAL

# BORING AND WELL LOG LEGEND

## SURFACE
- ASPHALT
- CONCRETE
- FILL
- TOPSOIL
- AIR
- ICE

## USCS
- Well-graded GRAVEL (GW)
- Poorly graded GRAVEL (GP)
- Silty GRAVEL (GM)
- Clayey GRAVEL (GC)
- Silty, Clayey GRAVEL (GC-GM)
- Well-graded GRAVEL with silt (GW-GM)
- Poorly graded GRAVEL with silt (GP-GM)
- Well-graded GRAVEL with clay (GW-GC)
- Poorly graded GRAVEL with clay (GP-GC)
- Well-graded SAND (SW)
- Poorly graded SAND (SP)
- Silty SAND (SM)
- Clayey SAND (SC)
- Silty, Clayey SAND (SC-SM)
- Well-graded SAND with silt (SW-SM)
- Poorly graded SAND with silt (SP-SM)
- Well-graded SAND with clay (SW-SC)
- Poorly graded SAND with clay (SP-SC)
- SILT (ML)
- Lean CLAY (CL)
- Silty CLAY (CL-ML)
- Organic SOIL (OL)
- Elastic SILT (MH)
- Fat CLAY (CH)
- Organic SOIL (OH)
- Organic SOIL (OL/OH)
- PEAT (PT)
- BEDROCK
- IGNEOUS Rock
- METAMORPHIC Rock
- SEDIMENTARY Rock
- WATER

## Non-USCS
- Gravel
- Sand
- Silt
- Clayey Silt
- Silt & Clay
- Clay & Silt
- Silty Clay
- Clay
- Boulders
- Cobbles
- Peastone
- Glacial Till
- Iron Ore
- Wood
- Peat
- Saprolite
- Ash
- Waste

## Volume Descriptors
- Trace = <5%
- Few = 5-10%
- Little = 15-25%
- Some = 30-45%
- Mostly = >=50%

## Water Levels
- Water Level During Drilling
- Water Level at End of Drilling/in Completed Well

## Well/Boring Completion
- Cap
- Riser
- Screen
- End Plug
- Annular Seal
- Sanitary Seal (Bentonite Slurry/Chips/Pellets/Powder, Other)
- Filter Pack (Sand, Gravel, Other)
- Backfill

## Sample Type
- GR — Grab
- EN — Encore
- SS — Split Spoon
- SH — Shelby Tube
- CO — Core Barrel
- DP — Direct Push
- ID — Lab Sample and ID