Technical Report – Soils and Contamination

Virya Energy

Yanco Delta Wind Farm
2 June 2022

Executive summary

Virya Energy is proposing to construct, operate and maintain the Yanco Delta Wind Farm (the Project). Approval is sought under Division 4.7 of Part 4 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) and Part 9, Division 1 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Project would involve the construction, operation and maintenance of a wind farm with up to 208 wind turbine generators (WTGs), a battery energy storage system (BESS) and associated electrical infrastructure. The generating capacity of the wind farm is approximately 1,500 megawatts (MW).

This soils and contamination assessment has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) relating to soil and contamination impacts and will assist the Minister for Planning to make a determination on whether or not to approve the Project. This assessment provides an assessment of potential impacts of the Project on soil and contamination and outlines proposed management measures.

Assessment methodology

To support the preparation of the EIS, Jacobs has completed a Stage 1 contamination investigation (this report). The objective of the Stage 1 contamination investigation is to identify potential areas of environmental interest (AEI) with respect to contamination and specific geological conditions (i.e. acid sulfate soils, salinity and erosion hazards) which may impact the construction and operation of the Project. Where potential impacts were identified, management and/or mitigation measures have been provided.

The methodology for this Stage 1 contamination investigation included:

- Desktop review of available information sources to understand the existing environment and potential for contamination and specific geological conditions within the Project area
- A high-level prioritisation exercise, including identification of AEIs and assessment of potential impacts to construction/operation from contamination and specific geological conditions (with no mitigation measures) to environmental and human receptors in the context of proposed construction activities and operation of the Project
- Identification of appropriate mitigation and management responses for contamination and/or specific geological conditions, or where further investigation or remediation may be required.

Overview of soil and contamination impacts

Based on the results of the Stage 1 contamination investigation, a number of AEIs were identified. The potential impacts on the Project from the identified AEIs were classified as very low and low. The majority of the Project area has an extremely low or low probability of Acid Sulfate Soil (ASS) occurrence, however, small areas near to still water bodies and water courses have been identified as having high ASS potential.

Residual contamination (if present) and specific geological conditions (with the exception of ASS/PASS, if present) are unlikely to impact on the operation of the Project.

Based on the available information, and on the knowledge that the expected impacts of the Project have been assessed as very low to low, the cumulative impacts from the interaction of the multiple known local projects in relation to contamination are expected to be low.

Management measures

Management measures implemented during construction, operation and decommissioning of the Project would avoid, mitigate or manage identified potential soil and contamination impacts.

Based on the potential impacts identified, construction within the Project area would be managed in accordance with the Project specific Construction Environmental Management Plan (CEMP). This plan should include the implementation of an unexpected finds procedure. As all AEIs have been assessed as having a very low and low impact potential (from contamination or specific geological conditions), therefore the application of the CEMP (including the unexpected finds procedure), associated plans and standard mitigation measures would be sufficient to manage any residual contamination risks during construction.

Excavation work required as part of construction and/or operation within or adjacent to areas of high ASS potential will require additional investigation prior to construction activities to assess the presence of ASS or potential ASS (PASS). If ASS or PASS are identified during investigations, an appropriate ASS management plan must be developed and implemented prior to any excavation works. Should sites be upgraded to a moderate to very high impact potential as a result of an unexpected find(s) or ASS investigations, subsequent investigations would be required. Additional mitigation and management measures may also be required, and would be dependent on the outcomes of the subsequent investigations.

As a site inspection has not been completed as part of this investigation, a visual inspection must be completed prior to construction. Inspection can be completed by any person with knowledge of the unexpected finds procedure, prior to the commencement of excavation works associated with construction to ensure no obvious signs of contamination are present where works are to occur (i.e. staining, fly-tipped waste, odours etc.). Should indicators of contamination be observed, the unexpected finds procedure must be followed:

- Indicators of contamination must be documented where found, and an appropriate sampling program designed
- Sampling program will be implemented if indicators of contamination are identified, and a report on the existing contamination prepared
- If contamination is present, further investigation, management and/or remediation will be required.

Conclusion

Potential impacts to the Project and to surrounding environmental and human receptors were classified as very low and low. Following the implementation of environmental management measures, the potential impacts on soils and contamination as a result of the Project are expected to be low.

Contents

Appendices

Tables

Figures

Glossary and terms

Term	Definition
ABS	Australian Bureau of Statistics
AEI	Areas of Environmental Interest
AHD	Australian Height Datum
ANZECC & ARMCANZ	Australian and New Zealand Guidelines for Fresh and Marine Water Quality
AS	Australian Standard
ASC	Australian Soil Classification
ASRIS	Australian Soil Resource Information System
ASS	Acid Sulfate Soils
ASSMAC	Acid Sulfate Soils Management Advisory Committee
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
BTEX	Benzene, toluene, ethylbenzene and xylene
CEMP	Construction environmental management framework
CLM	Contaminated Land Management
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DECCW	Department of Environment, Climate Change and Water
DPE	Department of Planning and Environment
DWER	Department of Water and Environmental Regulation
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	Environmental Protection Agency
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
EPL	Environmental Protection Licence
HEPA	PFAS National Environmental Management Plan
LEP	Local Environment Plan
LGAs	Local government area
MBO	Monosulfic black ooze
MW	Mega watts
NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999, as revised in 2013
NSW	New South Wales
OEH	Office of Environment and Heritage
PAH	Polycyclic aromatic hydrocarbons

Term	Definition
PASS	Potential Acid Sulfate Soils
POEO	*Protection of the Environment Operations Act 1997*
REZ	Renewable Energy Zone
SAR	Site Audit Report
SAS	Site Audit Statement
SEAR	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
VIC	Victoria
VOC	Volatile Organic Compounds
WTG	Wind Turbine Generators

1. Introduction

1.1 Background

Virya Energy is proposing to construct the Yanco Delta Wind Farm (the Project). Approval is sought under Division 4.7 of Part 4 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act) and Part 9, Division 1 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The Project would involve the construction, operation and maintenance of a wind farm with up to 208 wind turbine generators (WTGs), a battery energy storage system (BESS) and associated electrical infrastructure. The generating capacity of the wind farm is approximately 1,500 megawatts (MW). The Project would be located within the South-West Renewable Energy Zone (REZ), 10 kilometres north-west of the town of Jerilderie, within the Murrumbidgee Council and Edward River Council Local Government Areas (LGAs) (refer to **Figure 1-1**).

The Project area is defined as the property boundaries of Project landowners (i.e. landowners that have entered into agreements with Virya Energy to have WTGs or associated infrastructure on their properties).

1.2 Project description

The Project would include the following key features:

- Up to 208 WTGs to a maximum tip height of 270 metres
- Generating capacity of approximately 1500 MW
- BESS, approximately 800 MW/800 megawatt hours (MWh) (type yet to be determined)
- Permanent ancillary infrastructure, including operation and maintenance facility, internal roads, hardstands, underground and overhead cabling, wind monitoring masts, central primary substation and up to eight collector substations
- Temporary facilities, including site compounds, laydown areas, stockpiles, gravel borrow pit(s) and concrete batch plants.

An indicative Project layout is provided in **Figure 1-2**.

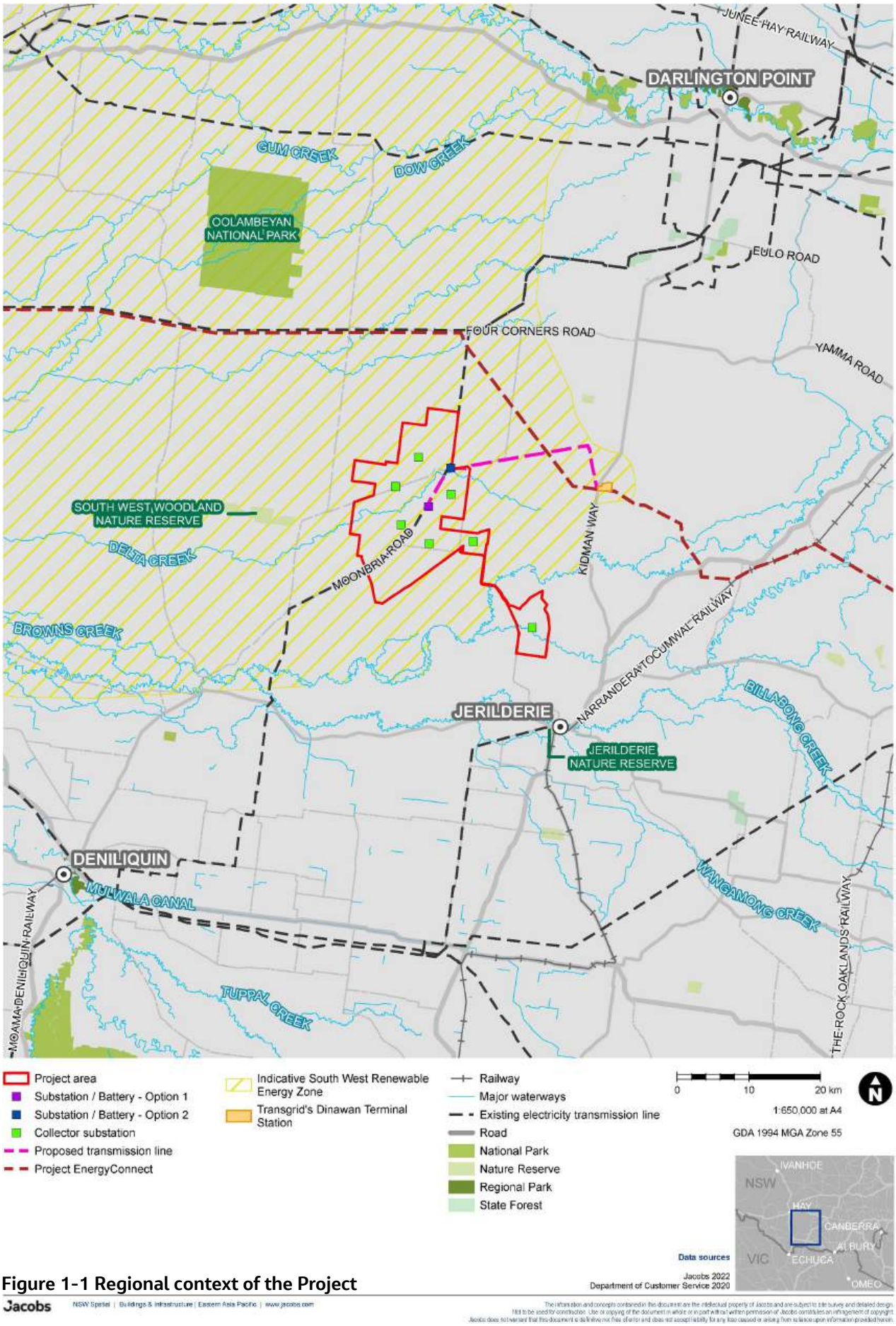


Figure 1-1 Regional context of the Project

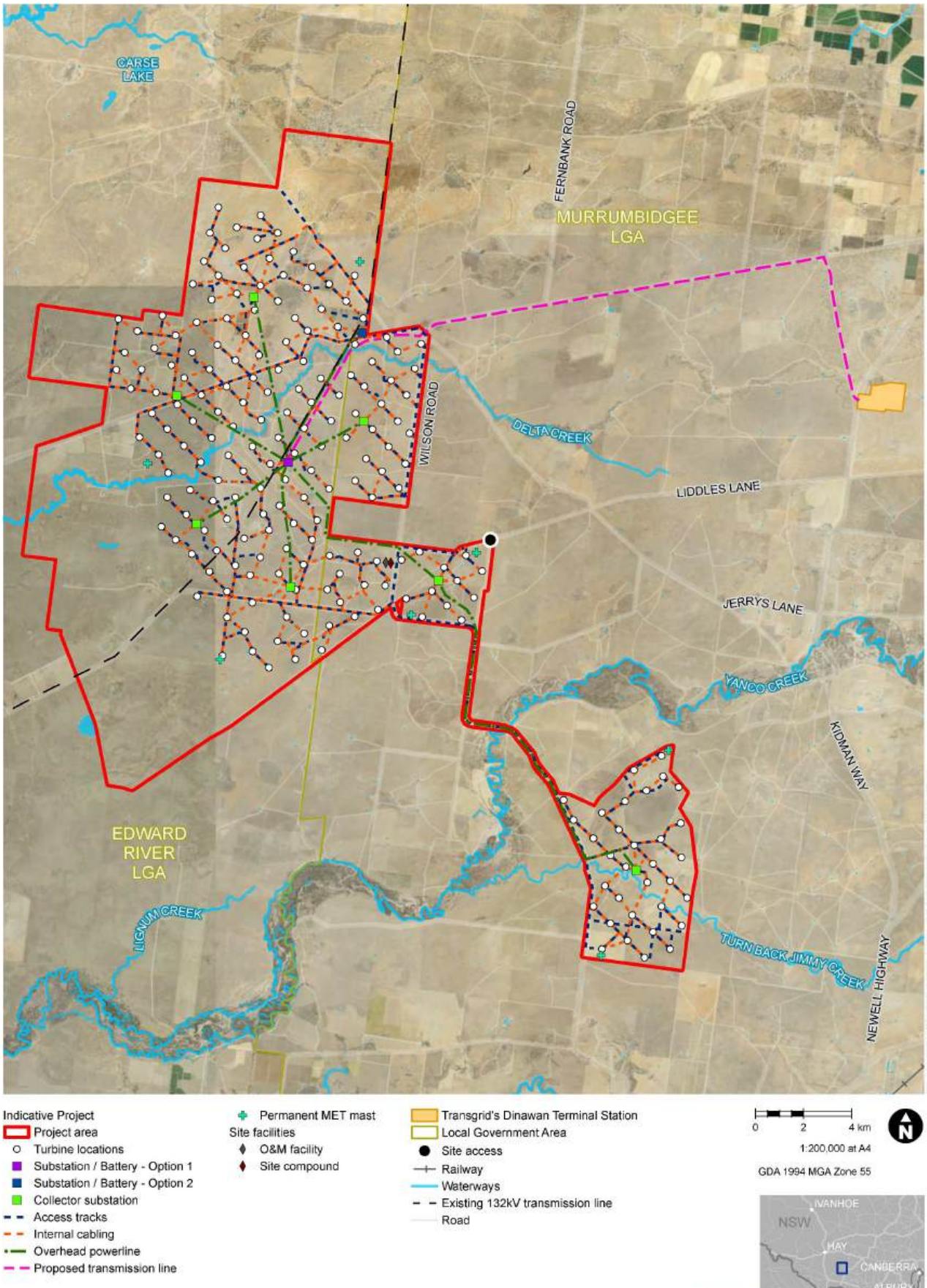


Figure 1-2 Indicative Project layout

1.3 Secretary's Environmental Assessment Requirements

This Stage 1 contamination investigation forms part of the environmental impact statement (EIS) for the Project. The EIS has been prepared under Division 4.7 of the EP&A Act. This assessment has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) (SSD-41743746) relating to soil and contamination impacts and will assist the Minister for Planning to make a determination on whether or not to approve the Project.

Table 1-1 outlines the SEARs relevant to this assessment along with a reference to where these are addressed.

Table 1-1 SEARs relevant to soils and contamination

Secretary's requirement	Where addressed in this report
Water and Soils – the EIS must:	
▪ an assessment of the likely impacts of the development (including flooding) on surface water and groundwater resources traversing the site and surrounding watercourses (including their Strahler Stream Order), drainage channels, wetlands, riparian land, farm dams, groundwater dependent ecosystems and acid sulfate soils, related infrastructure, adjacent licensed water users and basic landholder rights, and measures proposed to monitor, reduce and mitigate these impacts	Potential impacts to groundwater and surface water resources from soils and contamination, are detailed in **Section 7.2** and **Section 8.2**. Further information on impacts to surface water quality and groundwater resources is provided in the Surface water quality and groundwater technical report (Jacobs 2022a).
▪ a description of the measures to minimise surface and groundwater impacts, including how works on erodible soil types would be managed and any contingency requirements to address residual impacts in accordance with the *Managing Urban Stormwater: Soils and Construction series of guidelines*;	A description of erodible soils and soil erosion hazard is provided in **Section 7.3**. Environmental management measures including measures for groundwater, surface water and erodible soil types in accordance with Managing Urban Stormwater: Soils and Construction series of guidelines is provided in the Surface water quality and groundwater technical report (Jacobs 2022a).
▪ An assessment of risks of dust generation and propose mitigation measures designed in accordance with the Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales (DECC, 2005).	Assessment of impacts of dust generation discussed in **Section 7.3** and **Section 8.3**; mitigation measures included in **Chapter 11**. Further information on air quality impacts in accordance with the Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales is provided in Chapter 14 (Air Quality) of the EIS.

1.4 Structure of this report

The structure and content of this report are outlined in **Table 1-2**.

Table 1-2 Structure and content

Chapter	Description
Chapter 1 Introduction	Outlines key elements of the Project, SEARs and the structure of this report (this Chapter)
Chapter 2 Policy and planning setting	Provides an outline of the statutory context, including applicable legislation and planning policies
Chapter 3 Assessment methodology	Provides a description of the assessment methodology for this assessment
Chapter 4 Existing environment	Provides a preliminary description of the existing environment
Chapter 5 Information review	Presents findings of the review of LotSearch Report (2022)
Chapter 6 Contamination investigation findings	Presents a description of Areas of Environmental Interest (AEI) found during the investigation, as well as a high-level contamination prioritisation exercise
Chapter 7 Potential construction impacts	Presents the outcomes of the construction impact assessment
Chapter 8 Potential operational impacts	Presents the outcomes of the operational impact assessment
Chapter 9 Potential decommissioning impacts	Provides assessment of the soils and contamination impacts from decommissioning of the Project.
Chapter 10 Potential cumulative impacts	Presents the qualitative assessment of potential cumulative construction and operational soil and contamination impacts with other projects near the Project
Chapter 11 Environmental management measures	Presents the soil and contamination management measures applicable for the Project
Chapter 12 Conclusion	Summarises the findings of this report
References	Provides details of external sources used
Appendix A Historical aerial review	Presents the findings of the historical aerial review
Appendix B Groundwater bore summary	Presents a summary of the groundwater bores present onsite and within a 1km buffer area
Appendix C LotSearch Report	Provides a copy of the LotSearch report

2. Legislative and policy context

2.1 Regulatory policies/relevant guidelines

In preparing this technical report, the following guidelines were considered (where relevant):

- Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land (Department of Urban Affairs and Planning and Environment Protection Authority (EPA), 1998)
- Contaminated Land Guidelines. Consultants Reporting on Contaminated Land (NSW EPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (as revised 2013)
- PFAS National Environmental Management Plan, Version 2 (HEPA, 2020).

Should site investigations, remediation work and validation be carried out, these activities would be carried out in accordance with the relevant guidelines or other appropriate/endorsed guidelines.

3. Assessment methodology

The objective of this Stage 1 contamination investigation is to identify potential areas of environmental interest (AEI) with respect to contamination and specific geological conditions (i.e. acid sulfate soils, salinity and erosion hazards) which may impact upon the construction and operation of the Project. Where potential impacts have been identified, management and/or mitigation measures have been provided.

The AEIs are those areas that have potential risks associated with soil, groundwater and/or vapour contamination. These risks may be present as a result of historical and/or current activities carried out on land within and/or next to the Project area. AEIs also include areas with geological conditions within the construction Project area that may be characterized as having potential to be acid forming, have erosion potential, and/or be saline.

The methodology for this Stage 1 contamination investigation is outlined in the following sections and has included:

- A desktop review of available information sources to understand the existing environment and potential for contamination within the Project area
- A high-level prioritisation exercise including identification of AEIs (with respect to contamination and specific geological conditions) and assessment of potential impacts of Project construction and/or operation (with no mitigation measures) to environmental and human receptors; and potential impacts of AEIs to Project construction and / or operation
- Identification of appropriate mitigation and management measures for contamination and/or specific geological conditions which could impact upon the construction and/or operation of the Project.

For the purpose of this Stage 1 contamination investigation, the Project area is about 33,000 hectares. The majority of Project components are within the Project area (see **Figure 3-1**). Additional Project components which are external to the Project area include road upgrades and transmission line.

3.1 Desktop review

The desktop assessment involved a review of publicly available information relevant to the Project area to understand the existing environment, and the potential impact from contamination and specific geological conditions on the Project (both construction and operation). Additionally, an environmental data report was requested from LotSearch (2022) which provided environmental data across the Project area. The LotSearch report (2022) was reviewed as part of this Stage 1 contamination investigation. The review of information is presented as **Chapter 3.3** and includes:

- Review of existing land uses within and in the vicinity of the Project area and transmission line routes, and information on topography, geology, soils, hydrogeology and receiving environments
- Review of historical aerial photographs (1958 to 2021 (where available))
- Publicly available information via general internet searches for the key words (contamination, remediation and site investigation) for areas and major projects adjoining the Project area.
- Review of information provided.

A broad assessment of current and historical land use (based on an understanding of the information above) within and immediately adjacent to the transmission line route was also undertaken to assess potential contamination impacts.

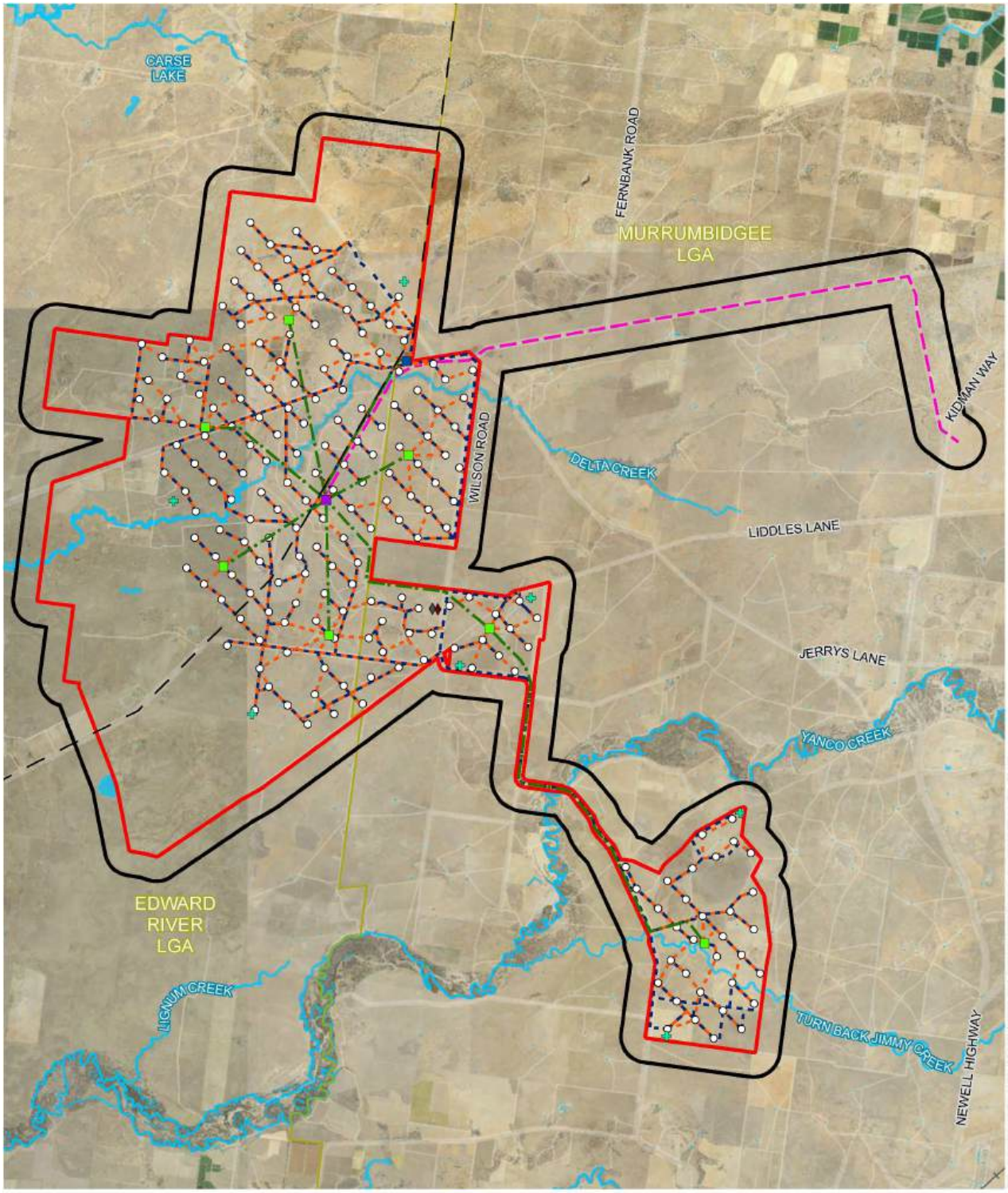


Figure 3-1 Study area

3.1.1 Review of existing information

A review of publicly available information was undertaken from the following sources:

- Council websites
- Geographical and soil mapping
  - Review of the NSW Seamless Geology Data Version 2.1 (Geological Survey of NSW, 2021)
  - Review of the Reconnaissance Soil and Land Resources of the Murray Catchment (NSW Office of Environment and Heritage, 2010)
  - Review of eSpade (Department of Planning, Industry and Environment, 2022)
- Bureau of Meteorology (BoM) data, including:
  - Climate and rainfall data
  - Groundwater dependent ecosystems information
- NSW Environment Protection Agency (EPA) data, including:
  - Record of Notices (under section 58 of the *Contaminated Land Management Act 1997* (CLM Act))
  - List of contaminated sites notified to the NSW EPA (under section 60 of the CLM Act)
- ASRIS database
- The WaterNSW groundwater database
- LotSearch report which included data on:
  - Historical aerial photography (from the years 1958 – 2021)
  - NSW EPA Contaminated Sites Register
  - Licenced, delicenced and formerly licenced activities under the POEO Act 1997
  - Former gasworks
  - Waste management and liquid fuel facilities
  - PFAS investigation and management programs
  - Defence sites
  - Historical business directories (i.e. drycleaners, motor garages and service stations)
  - EPA sites with other contamination issues
  - Current and historical mining and exploration titles
  - Naturally occurring asbestos potential
  - ASS soils
  - Salinity
  - Topography
  - Geology
  - Soils.

3.1.2 Historical aerial photography

Historical aerial photographs sourced from LotSearch (2022) (refer **Appendix C**) were reviewed for the years 1958, 1961, 1964, 1967, 1968, 1970, 1976, 1977, 1986, 1991, 1993, 1996, 2012, 2013, 2015, 2018, 2020 and 2021. The Project area was broken up into 18 parts for the historical aerial photographs to cover the entirety of the Project area. The historical aerial photography review has been summarised in **Section 5.1** and the complete historical aerial photography review has been included in **Appendix A**. The review focused on potential AEIs and general land use that could potentially impact or be impacted by the construction and/or operation of the Project.

3.1.3 Previous contaminated sites investigations

No previous contaminated sites investigations were available for review for the Project area.

3.2 High level prioritisation exercise

A high-level prioritisation exercise was carried out to assist in assessing the potential impact from construction and/or operation to expose contamination and/or specific geological conditions to human and/or ecological receptors. The exercise considered source-pathway-receptor relationships consistent with a conceptual site model, as defined by the National Environment Protection (Assessment of Site Contamination) Measure 1999, and revised 2013 (NEPM, 2013). The prioritisation exercise considered the following:

Contamination severity and extent:

- Known or potential sources of contamination and likely potential contaminants of concern
- The type of potentially affected media (soil, sediment, groundwater, surface water)
- Approximate spatial distribution of potential contamination, and proximity to construction activities
- The nature of the proposed construction or operational activities (e.g. surface disturbance, construction of temporary facilities and laydown areas, excavation required for WTG footings etc) and whether such activities would expose known or potential areas of contamination.

Pathways and receptors:

- Assessment of potential pathways from a contamination source to a receptor without mitigation measures – Pathways include dust generation, vapour/gas emissions, excavation and disposal or reuse of soils, extraction and disposal or reuse of groundwater from dewatering or drainage, migration of groundwater via preferential pathways and surface water erosion. It was assumed that where construction and/or operational activities would expose known or potential areas of contamination, the exposure pathways to personnel occupying the Project area could be complete (i.e. personnel occupying the Project area could be exposed to contamination). Where construction and/or operational activities are located within and/or adjacent to sensitive environmental receptors, pathways could exist as a result of uncontrolled site discharges during construction and/or operation
- Potential human and ecological receptors (including location, and potential for primary or secondary contact with contamination) – Potential receptors comprise Project construction workers and visitors, operational staff and maintenance workers, neighbouring and Host Landowners/operators, receiving water bodies and ecological receptors. Exposure pathways to these receptors include direct dermal contact (der), ingestion (ing) or inhalation (inh) by human receptors and uptake by aquatic flora and intake by aquatic fauna.

Based on this prioritisation exercise, sites were categorised into five categories of contamination potential (negligible, very low, low, moderate and high) representing potential impacts to construction and/or operation without mitigation measures. The matrix used for categorising potential impacts from construction and/or operation is provided in **Table 3-1**.

The categories of potential contamination impacts to construction and/or operation represent a qualitative assessment. Although not definitive, examples of the contamination status represented by the categories is provided below:

- *Negligible impact* – could represent minimal volumes of contaminated materials, likely to be diluted and limited to surface soils, with pathways readily managed with typical soil and water controls and personnel protective equipment (PPE), and readily remediated by standard construction methods
- *Very low to low impact* – could represent smaller volumes of contaminated materials, likely to be limited to surface soils, with pathways readily managed with typical soil and water controls and personnel protective equipment (PPE), and readily remediated by standard construction methods
- *Moderate impact* could represent larger volumes of contaminated materials, with pathways readily managed with typical soil and water controls and PPE and readily remediated by standard construction methods or smaller volumes of more complex contamination which may require specialised remediation methods and specialised management measures for pathways
- *High impact* – could represent more significant exposure risks, contaminated groundwater and gas/vapours, increased quantum of contaminated materials and wider contamination extent requiring remediation and specialised remediation methods. Pathways may require specialised management measures.

Table 3-1 Contamination potential matrix

		Contamination severity and extent				
		SE1 Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	**SE2** Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	**SE3** Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	**SE4** Known contamination present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	**SE5** Known contamination present in the media of concern at concentrations above the relevant assessment criteria and widespread
Pathways and receptors	**PR1** Media of concern is unlikely to coincide with or otherwise impact on the construction and/or operation of the project *AND/OR* No or unlikely exposure pathway for human or ecological receptor's during construction and/or operation.	Negligible	Very Low	Very Low	Low	Low
	PR2 Media of concern may intersect the construction and/or operation of the project. *AND* Exposure pathway for human or ecological receptors could be present and complete during construction and/or operation	Very Low	Low	Low	Moderate	Moderate
	PR3 Media of concern would intersect the construction and/or operation of the project *AND* Exposure pathway for human or ecological receptors could be present and complete during construction and/or operation	Low	Low	Moderate	Moderate	High

3.3 Cumulative assessment

Potential cumulative impacts from contamination have been assessed in consideration of the interaction of multiple projects (including construction of the Project) that would increase, decrease and/or alter potential contamination impacts to common human and/or environmental receptors.

Cumulative impacts would be dependent on a variety of factors including the presence of contamination and the type of potentially affected media (e.g. soil, groundwater), the nature and timing of construction disturbance (associated with the Project and other projects), as well as complete exposure pathways for contamination to human and/or environmental receptors.

Contamination impacts from individual projects, prior to appropriate typical mitigation measures being implemented could include (but are not limited) to the following:

- Excavation activities and liberation of contamination (as dust or fibres) which could deposit on adjacent land and be transported by surface water flows to surrounding areas
- Importing of fill from off site sources
- Spills / leaks during construction and/or operation from machinery impacting soil, surface and / or groundwater.

It should be noted that contamination is reported as a concentration (e.g. mg/kg, µg/L, g/m3) and not as mass. As such, the measurement of contamination from multiple sources at a receptor is not compounded, rather it would be reported as an average concentration. If contamination is not migrating from source sites at concentrations above criteria protective of receptors, then the cumulative contamination from the source sites is unlikely to impact upon that receptor.

Results of the cumulative impact assessment are provided in **Chapter 10**.

4. Existing environment

4.1 Land use zones

The Project area is zoned as RU1 – Primary Production under the Conargo local environment plan (LEP) and Jerilderie LEP, for agricultural activity (see **Figure 4-1**). From 1835 the land encompassing the Project area was utilised for pastoral purposes. Initially, cattle was the primary industry in the region, with a number of squatters establishing stations or runs along Billabong Creek by 1840. By the 1860s, sheep had become more economically prominent. However, parts of the Project area are comprised of native vegetation.

The Project area is located on private properties owned by eight landowners. Virya Energy has secured Option to Lease agreements with landowners for the construction, operation and maintenance of the Project. Parcels of Crown land are located within the Project area. These Crown land areas are also travelling stock reserves with medium to high conservational values.

Some areas within the Project area are mapped, in draft, as State Significant Agricultural Land based on existing state-wide information where the most relevant characteristics related to the best agricultural lands are used. Based on feedback collected during the exhibition period, the draft map is ongoing iterations and would refine the areas considered the best agricultural lands in the state.

4.2 Topography

The topography of the Project area is relatively flat with very gentle undulations, sloping gently down gradient from east to west (see **Figure 4-2**). The ground surface typically lies between 100 and 114 metres Australian Height Datum (mAHD). A water course known as, Delta Creek, runs from east to west across the northern portion of the site. The southern portion of the Project area intersects Turn Back Jimmy Creek.

4.3 Geology

The Project area is located across several geological formations (see **Figure 4-3**), the larger and more extensive of these being the Shepparton Formation (Czs), deriving from sediments deposited during the Plio-Pleistocene Epoch (5,000,000 to 12,000 years ago). These deposits represent the most recent infilling of the Tertiary Murray Basin and consist of alluvial sands, silts and clays (The Geological Society of America, 2012). The sediments within the Shepparton Formation form the subsurface component to the Riverine Plain and range from poorly sorted gravels to clay. These sediments were primarily deposited by alluvial action and are mantled by a thin layer of parna (wind-blown calcareous clay). The older alluvial plains, comprising of Shepparton Formation sediments, are typically dominated by a level topography with distinct shallow drainage depressions (Pels 1971, Cupper, White et al. 2003, Stone 2006). Traces of the distributary channels that built the Riverine Plain are preserved upon the surface of the Shepparton Formation. These are leveed or prior streams that bear little resemblance to the modern drainage system.

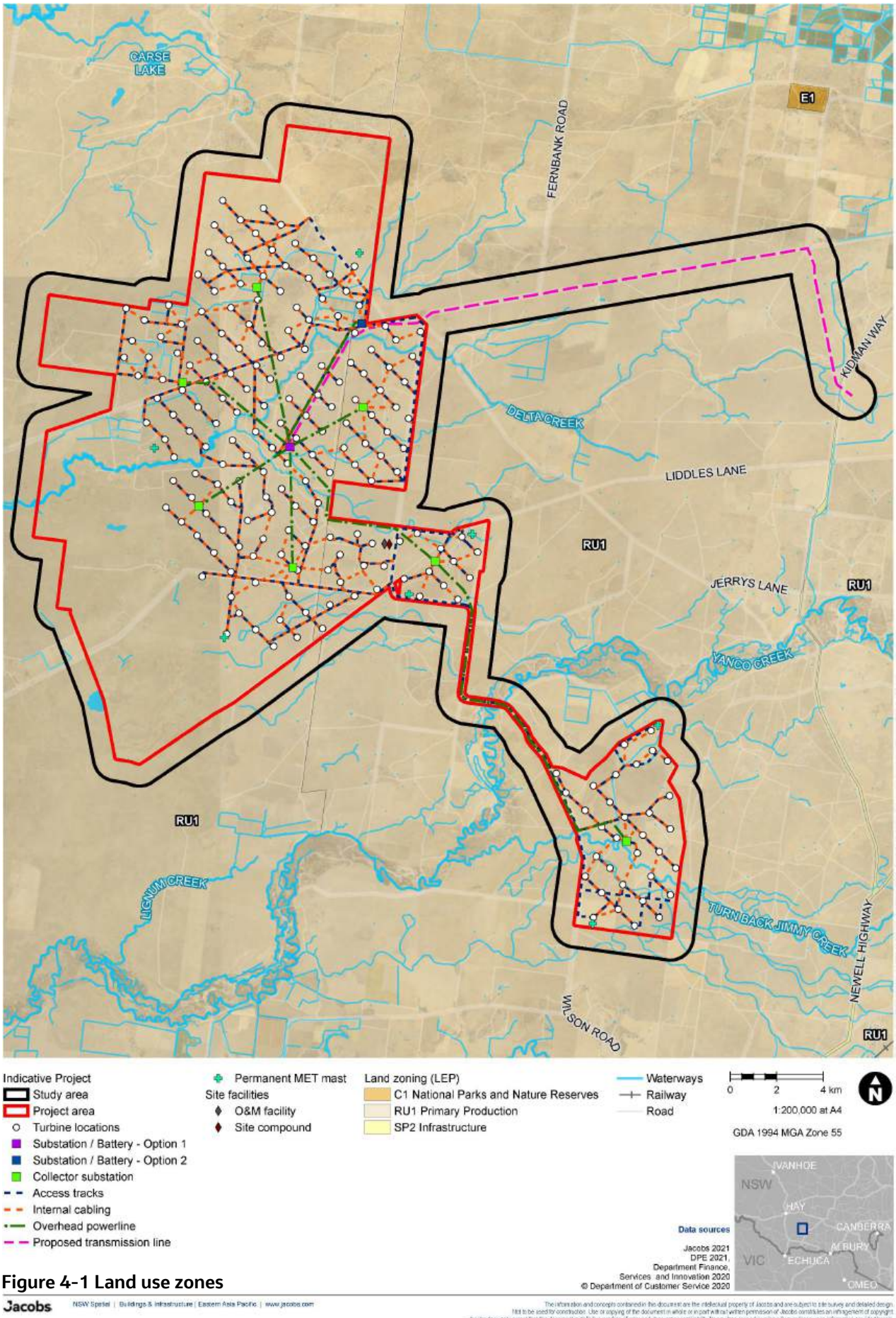


Figure 4-1 Land use zones

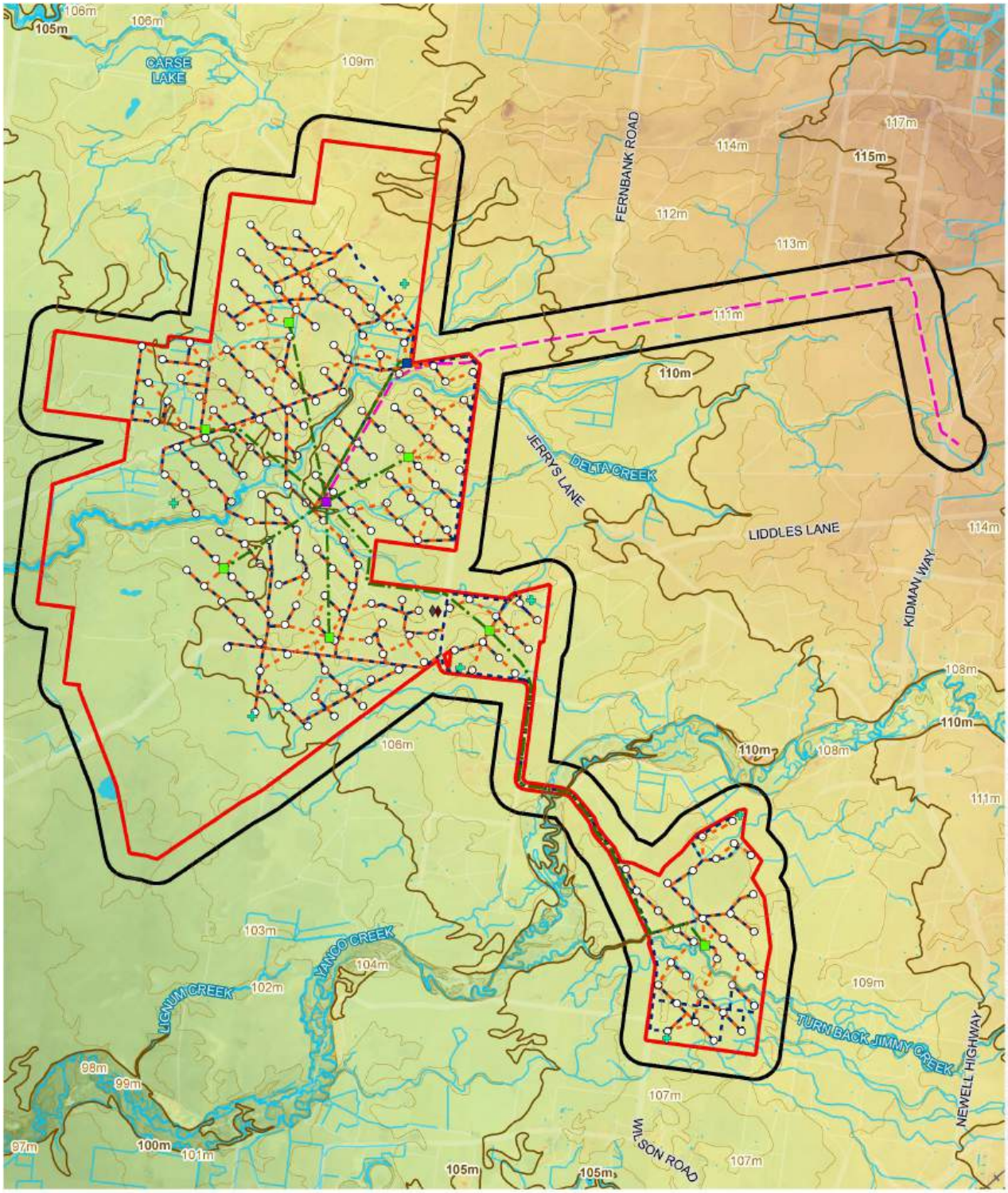


Figure 4-2 Topography

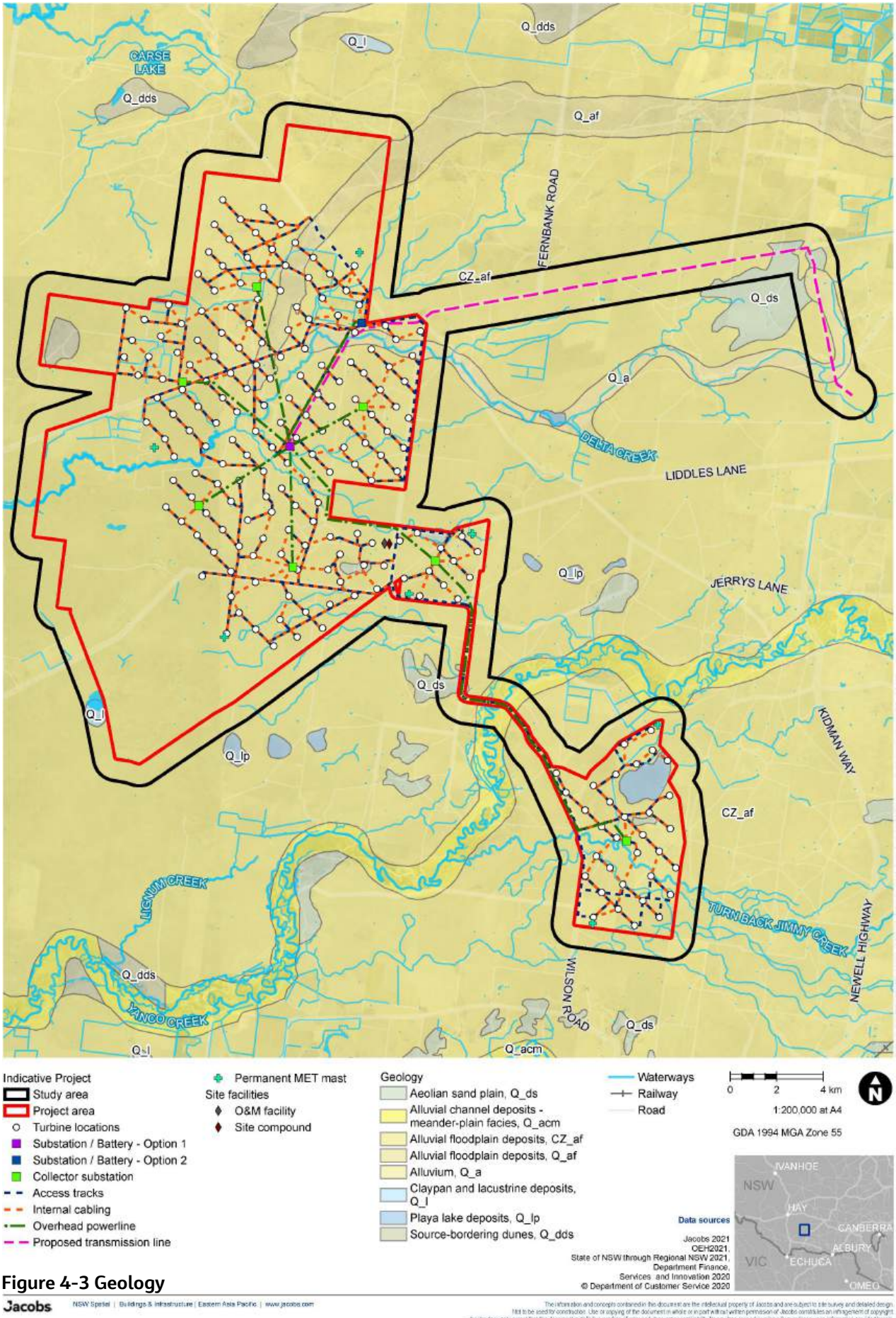


Figure 4-3 Geology

4.4 Soils

4.4.1 Soil landscapes

Soil Landscape Maps (accessed from eSpade (Department of Planning, Industry and Environment (DPIE), 2022)) were available for the southern half of the Project area only (south of Moonbria). Based on a review of the 1:250,000 scale Soil Landscape Reconnaissance Maps for the Murray Catchment, the southern half of the Project area includes predominantly three soil landscapes as follows:

- Jerilderie (jex) – Broad level plains on alluvium deposits from the Riverine Plains
- Coleambally (clo) – Undulating sand plains deposited from re-worked alluvium, sand ridges and swales present
- Yancobong (ybz) – Confined alluvial floodplains and channels from Billabong Creek and Yanco Creek, and their palaeochannels.

Small pockets of the following soil landscapes are also present within the Project area:

- Currawarna (cww) – Slight undulation and gently inclined dunes of thick (>2 metres) windblown sand layers, underlain by thick alluvium
- Lake Gunbar (lgt) – Low-lying areas and depressions within the Riverine Plains, comprised of cracking clays, self-mulching and surface crusting surfaces
- Lake Urana (lky) – Ephemeral clay lake beds of varying size, with lunettes (ylw) to the east and north.
- Yanga Lunettes (ylw) – Crescent-shaped dunes formed on the eastern margins of lake beds and water body relicts. Calcareous soils dominate, with duplex and solodic soils present on lower slopes
- Niemur River (nmu) – Active inset floodplains and meander plains of the Niemur, Edward and Wakool Rivers and their tributaries and distributaries, extending from Lockhart in the east into the far west of the catchment
- Coleambally Variant A (cloa) – Level sandplains, with relicts of prior streams now infilled with shallow aeolian deposits.

The location and extent of each soil landscape is closely related to surface landform and topography. Soil landscapes across the Project area are presented in **Figure 4-4**.

Jerilderie soils are located throughout the majority the Project area, excluding in the vicinity of Delta and Yanco Creeks and several other small areas (DPIE, 2022). They are described as alluvium deposits consisting of red and brown sub-plastic chromosols and sodosols, with reddish brown chromosol/vertosols and grey and brown self-mulching and epipedal vertosols which are closely related to the prior stream network, palaeochannels and drainage. Topsoils are often fragile and held together by surface crusts of lichens/moss, the destruction of which followed by wind erosion can lead to localized severe scalding. Heavier cracking soils are less prone to wind erosion. Subsoils contain various amounts of salt content, with the potential to become mobile and cause salinization should water tables rise. Gilgais occur locally.

Coleambally soils are located in the vicinity of the western half of Delta Creek, and multiple localized areas within the Project area (DPIE, 2022). They are described as predominantly arenic rudosols, occasionally grading to red kandosols. Adjacent levees/lower slopes commonly support scalded red and brown sodosols. Occasionally confined within the unit are low lying channels containing grey and brown vertosols. Wind and sheet erosion is common especially on crests and upper slopes, reducing the already low water-holding capacity and fertility of the topsoil. High recharge hazard, with localized salinity hazards and high water tables at the boundary with the alluvial plain.

Yancobong soils are present in the vicinity of Yanco Creek, with soils consisting predominantly of epipedal and crusty black, brown and grey vertosols in low lying depressions next to current channels (DPIE, 2022). Some more regularly inundated channels support redoxic hydrosols. Occasional small source bordering dunes are present dominated by arenic rudosols. Occasional red and brown sodosols and sub-plastic chromosols occur on adjacent plains which are easily scalded. Soils are poorly drained and deform easily when wet.

Within the Project area primarily Cenozoic aged alluvial floodplain soils are present, with alluvial channel deposits, alluvial floodplain deposits and aeolian sand plains present in smaller areas (Department of Planning and Environment, Division of Resources and Geoscience (DPE), 2022). Geotechnical investigations (Jacobs, 2022) including ASC soil type mapping, indicated the presence of predominantly grey, brown and red clays, with small areas of siliceous sands and red-brown earths. Sampling from this geotechnical investigation found primarily hard to very stiff clay soils, along with some sandy clay and dense silty sand present.

In addition, soils present within the Project area largely consist of Chromosols and Sodosols, with Vertosols common in low lying channels and depressions, occurrences of Rudosols and occasionally Kandosols predominantly along Delta Creek (refer to **Figure 4-5**).

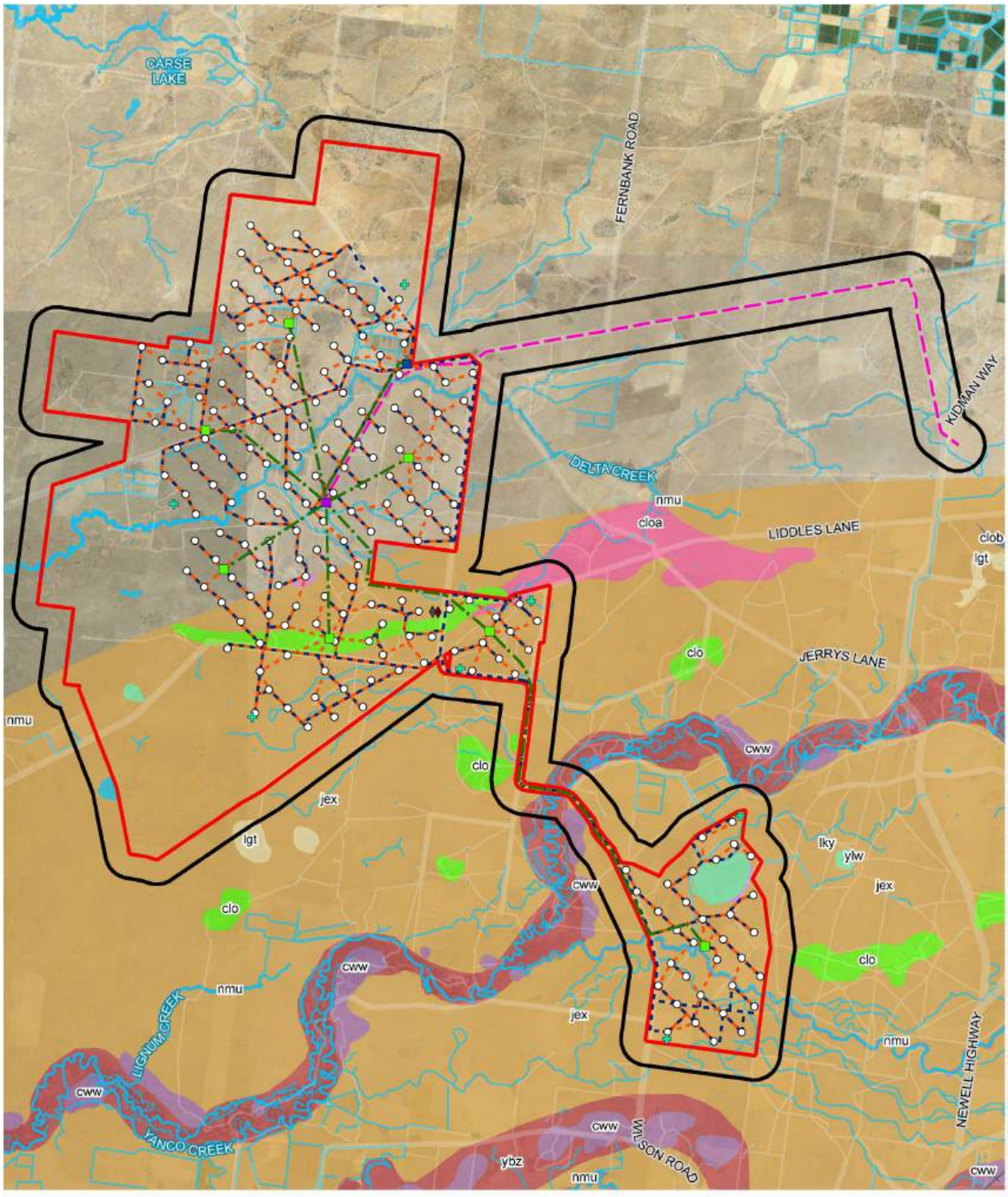


Figure 4-4 Soil Landscapes

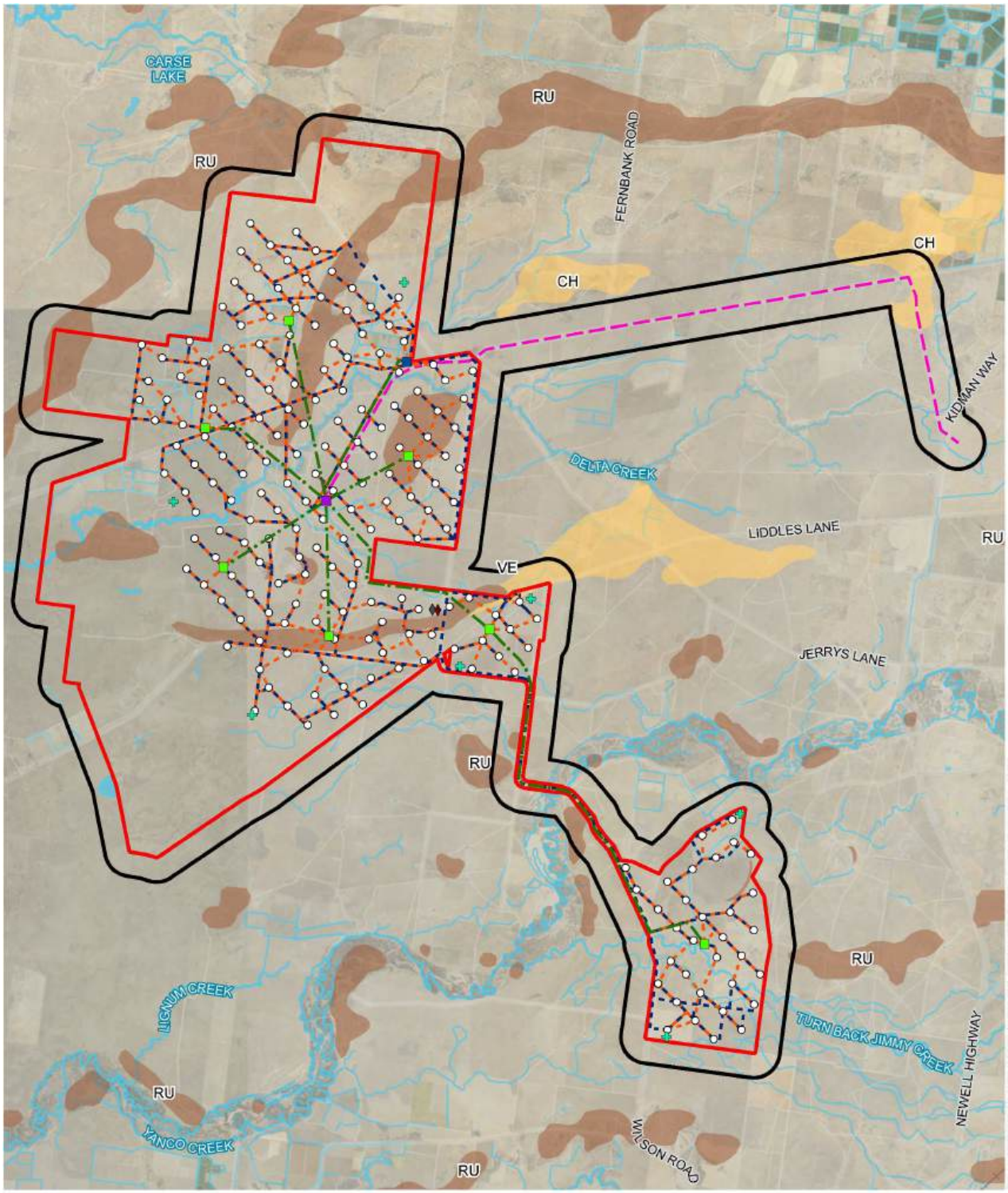


Figure 4-5 Soil classification

4.4.2 Acid Sulfate Soils

Acid Sulfate Soils (ASS) is the common name for naturally occurring sediments and soils containing iron sulphides. The exposure of these soils to oxygen by drainage or excavation, oxidises the iron sulphides and generates sulfuric acid. The sulfuric acid can be readily released into the environment, with potential adverse effects on the natural and built environments. The majority of ASS are formed when available sulfate (which occurs widely in seawater, marine sediment, or saturated decaying organic material) reacts with dissolved iron and iron minerals forming iron sulfide minerals, the most common being pyrite. This generally limits their occurrence to deeper marine sediments and low-lying sections of coastal floodplains, rivers and creeks where surface elevations are less than about reduced level (RL) five metres AHD.

The Acid Sulfate Soil Manual (ASSMAC, 1998) outlines the three steps required to establish whether ASS are present on a site:

- **Step 1** - consult ASS risk maps within applicable LEPs. A search was undertaken within Murrumbidgee Council (Jerilderie, 2013) and Edwards River Council (Deniliquin, 1997) and Conargo,2013)) LEPs for ASS risk maps covering the Project area and proposed location of transmission line to determine the probability of ASS occurrence. ASS risk maps within LEPs typically categorise ASS in terms of Class (i.e. Class 1, 2, 3 or 4). The search found no ASS risk maps that exist for the Project area within the LEPs and so conclusions can be drawn that there is no known or expected occurrence of ASS within the Project area, as such no ASS risk was attributed to soils in the area. ASSMAC (1998) states that if, after Step 1, the works are not in or near a mapped area, proceed without further consideration of ASS. However due to the absence of ASS risk maps in relevant LEPs, for the purpose of this assessment Steps 2 and 3 detailed within ASSMAC (1998) have also been considered to verify the risk of acid sulfate soils within the Project area.
- **Step 2 -** establish whether ASS are present on a site and to assess if the area meets specific geomorphic and other site criteria as detailed below:
  - Sediments of recent geological age (Holocene)
  - Soil horizons of less than five metres AHD
  - Marine or estuarine sediments and tidal lakes
  - In coastal wetlands or back swamp areas, waterlogged or scalded areas, interdune swales or coastal sand dunes
  - In areas where the dominant vegetation is mangroves, reeds, rushes, and other swamp-tolerant or marine vegetation such as swamp mahogany, paperbark and swamp oak
  - In areas identified in geological descriptions or in maps as bearing sulphide minerals, coal deposits or former marine shales/sediments
  - Deep, older estuarine sediments greater than 10 metres below ground level (mbgl), Holocene or Pleistocene age (only an issue if deep excavation or drainage is proposed).
  - Based on the Step 2 desktop assessment, the Project area does not meet the site criteria for the presence of ASS detailed in ASSMAC (1998).
- **Step 3 -** undertake investigations which "should include a field inspection to consider soil and surface and sub-surface water characteristics". As Step 1 and Step 2 demonstrated a low risk of encountering ASS soils, Step 3 was not required for the purposes of this investigation. However, prior to construction in the vicinity of waterways / water courses, ASS sampling will need to be conducted to investigate presence / absence.

In addition to the above assessment, a search of the Australian Soil Resource Information System's (ASRIS 2018) online ASS risk maps was undertaken. The risk maps indicate that, although the Project would be located within an area considered to have an extremely low and low probability of ASS occurrence, there are small sections within the Project area of high probability of ASS occurrence along Delta Creek and between Yanco Creek and Turn Back Jimmy Creek (refer to **Figure 4-6**). This is supported by the fact that inland ASS are known to develop in saline conditions along inland waterways (OEH, 2019), as there are moderate salinity levels indicated to be present within the Project area (see **Section 4.4.4**).

The results from the LotSearch (2022) report confirmed the extremely low to low probability of ASS occurrence, with small sections of high probability ASS occurrence along Delta Creek and between Yanco Creek and Turn Back Jimmy Creek.

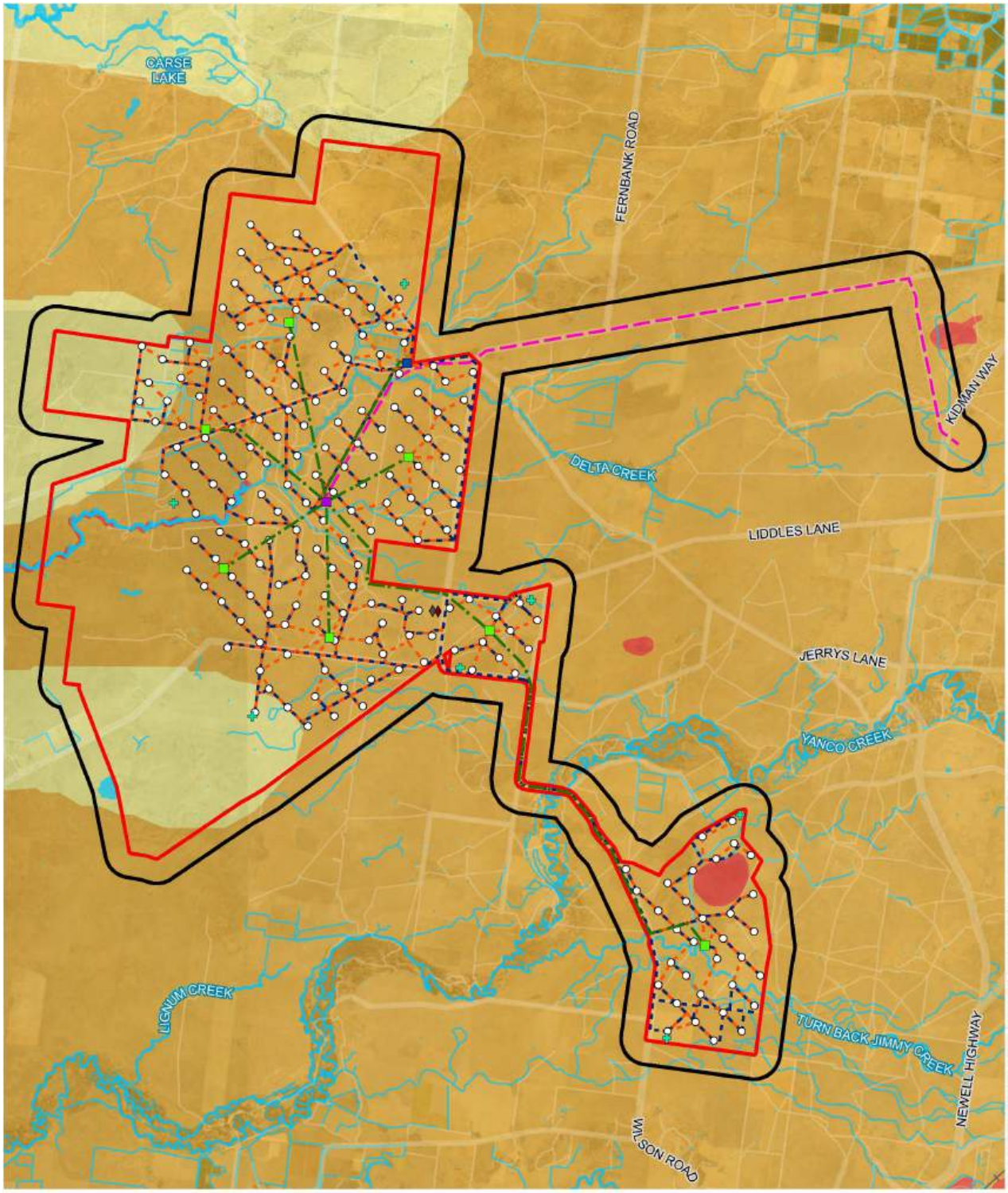


Figure 4-6 Acid sulfate soils

4.4.3 Acid rock

Acid rock is defined as rock that contains sulfide or sulfate minerals (commonly pyrite) which has the potential to oxidise when exposed and produce sulfuric acid. Acid Rock is potentially an issue where the sulfide bearing rock that has previously been protected from weathering, or is below the water table, becomes exposed such as in deep cuttings.

Sedimentary pyrite is a common constituent of organic rich, typically fine-grained marine and anoxic terrestrial sediments. Metal sulfides or sedimentary pyrite are associated with many iron ore deposits, including coal, precious metals, base metals and uranium (VIC EPA, 2009).

To date, no occurrences of acid rock have been documented within the soil landscapes / geology present within the Project area.

4.4.4 Salinity

Soil salinity is a complex issue relating to salt and water cycles both above and below the ground. Surface water and groundwater can dissolve and mobilise salts and cause their accumulation in other areas. Development can cause changes to these water flows and cause salt to accumulate in different areas.

There are no current records of dryland salinity within the Project area as indicated in the LotSearch report (2022). The Overall Salinity Hazard in the Hydrogeological Landscapes of New South Wales and the Australian Capital Territory Map (DPIE, 2022) characterises the soils within the construction area and along the transmission line as a moderate overall salinity hazard. Soils within the Project area and along the transmission line showed a high potential for land salinity.

Salinity can also be associated with sodic soils such as Sodosols, as well as Vertosols, Kurosols and Kandosols, which are present on site (see **Section 4.4**). Areas of current or potential soil salinity may be encountered along the Project area where there is alluvium, waterlogged ground or shallow groundwater. A soil salinity risk map is presented as **Figure 4-7**.

4.5 Hydrogeology

The Riverina Bioregion encompasses the alluvial fans of the Lachlan, Murrumbidgee and Murray Rivers to the west of the Great Diving Range. The landscape of the upper catchment area consists of a series of low gradient, overlapping alluvial fans. The lower catchment tract is primarily floodplain with overflow lakes (such as Lake Urana located 30 kilometres to the east of the Project area). The discharge from current and past streams controls patterns of sediment distribution which in turn determines the landscape including which soils and vegetation are present. The initial desktop survey indicates that the Project area has limited topographic variation and consists primarily of low relief alluvial floodplain and drainage lines (named and unnamed waterways and flood-runners).

On a regional scale, the Project would be located within the lower Murrumbidgee River Catchment in southern NSW which drains a total area of around 84,000 square kilometres (DPI, 2021b). The Murrumbidgee River Catchment flows in a south-westerly direction from its headwaters in Kosciuszko National Park to the alluvial floodplains at the western end of the valley where the Project would be situated. More locally, the Project area is situated on an alluvial floodplain between two waterways, Yanco Creek in the southern extent and Delta Creek in the northern extent. Yanco Creek is a major perennial waterway which flows south-west toward the Murray River. Delta Creek is a minor, ephemeral waterway which also drains in a south-westerly direction during significant rainfall, although does not connect to any downstream major channel unless the area is flooded.

The Project area traverses Delta Creek. The southern portion of the Project area also intersects Turn Back Jimmy Creek. Yanco Creek is located between the northern and southern portions of the Project area.

The Project area is largely flat with some minor drainage depressions that hold water during rainfall and flooding, and flow in a south-westerly direction. A slope dips toward Delta Creek in the northern portion of the Project. Several minor topographic depressions on the floodplain hold water for longer, creating scattered swamp environments within the Project area.

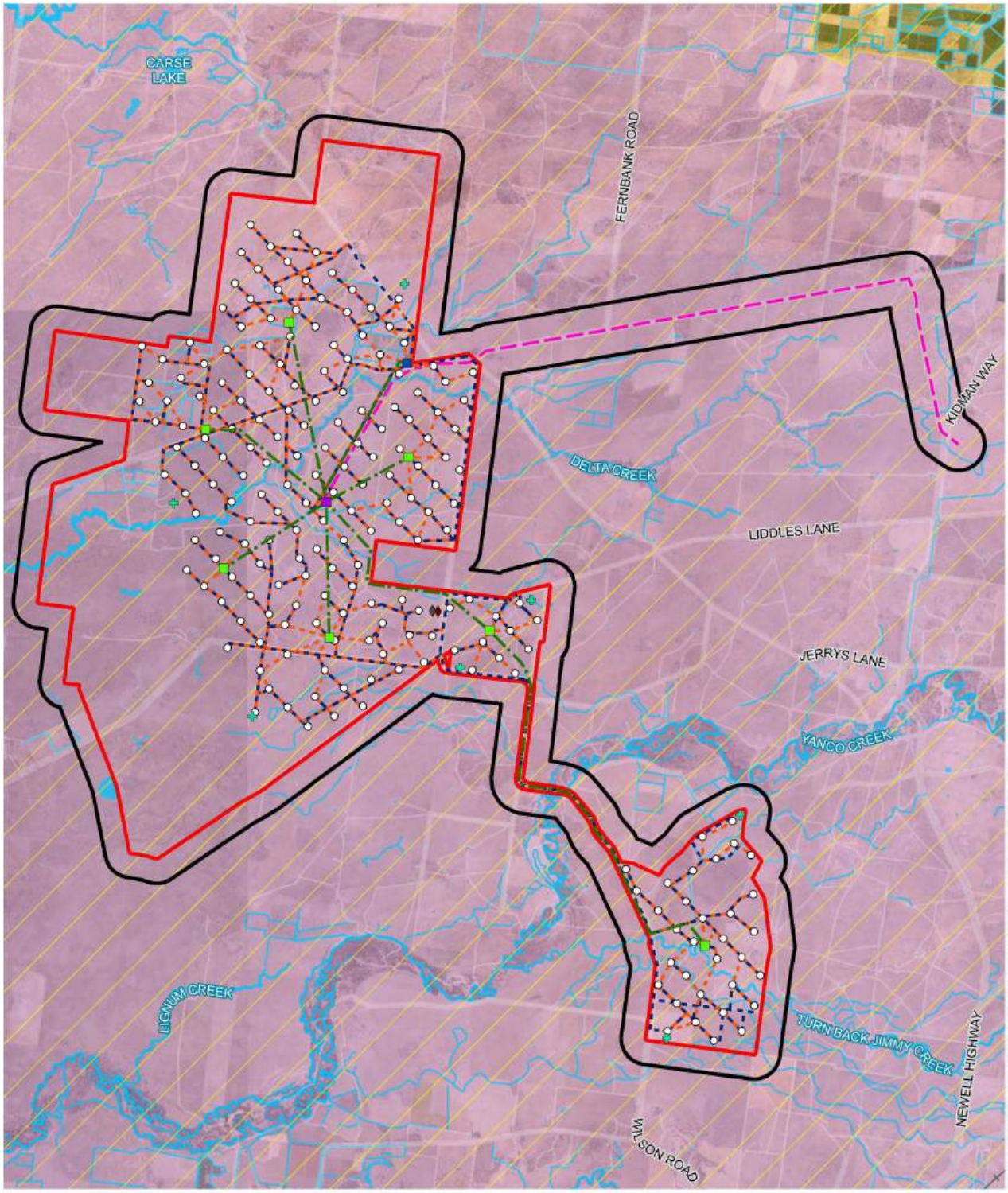


Figure 4-7 Salinity

4.5.1 Licensed groundwater bores

Within the study area, there are 127 registered groundwater bores according to the BoM's Australian Groundwater Explorer (BoM, 2022). With the following bore usages recorded:

- Stock – 62 bores
- Monitoring – 24 bores
- Unknown – 12 bores
- Household use – 13 bores
- Irrigation – 14 bores
- Exploration – 2 bores.

Given the topography of the site gently slopes from east to west, the groundwater bores within the western portion of the Project area are anticipated to be hydraulically down gradient from construction and operational activities. Groundwater bores located in the western portion of the Project area include bores with potential sensitive beneficial usage such as for irrigation, stock and household uses and for water supply as demonstrated in in **Figure 4-8**.

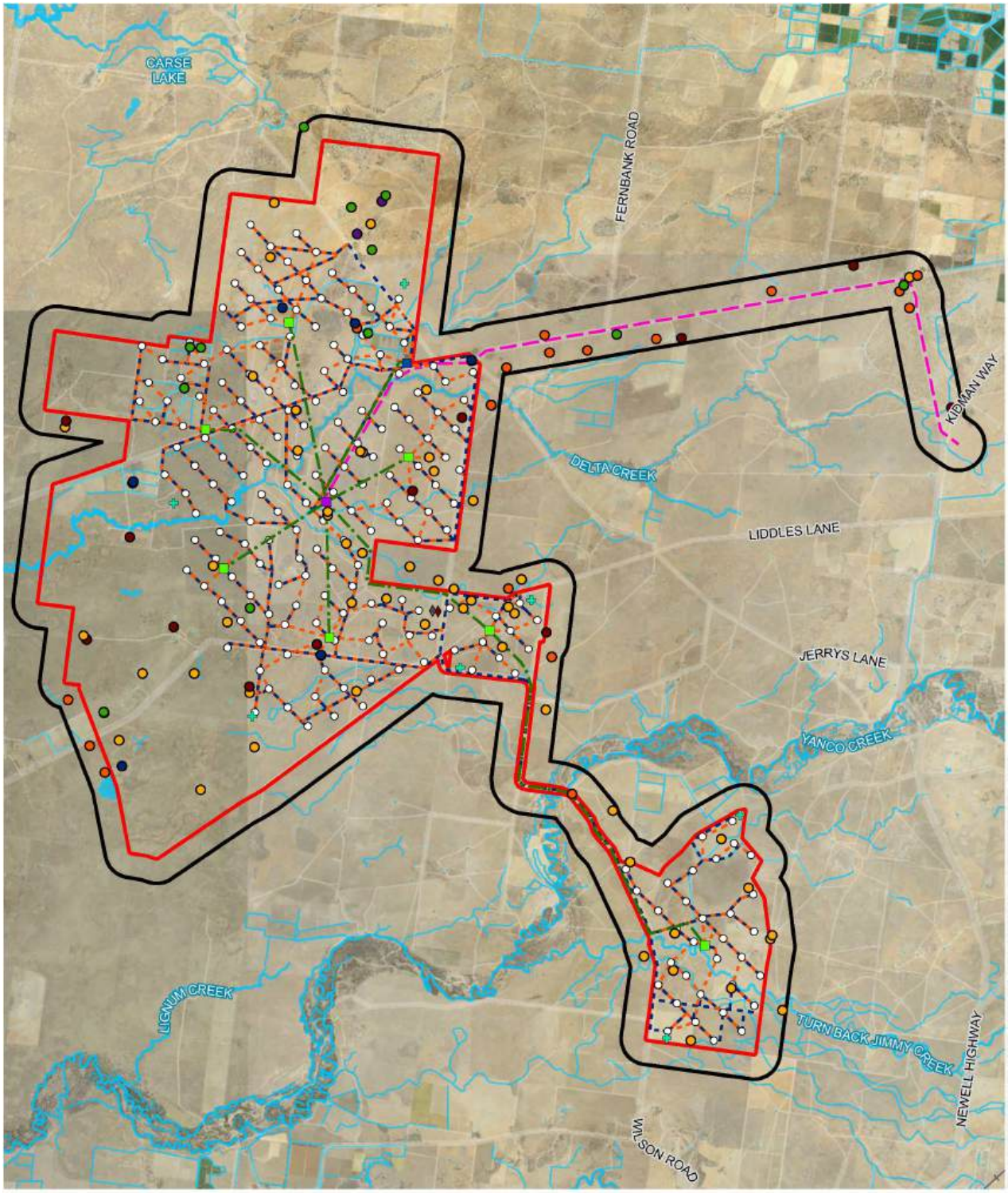


Figure 4-8 Groundwater bores

5. Information review

The following information has been summarised from an environmental data report provided by LotSearch (2022). The LotSearch report provides environmental information, as well as historical aerial photographs across the Project area. The full LotSearch report (2022) is included in **Appendix C**.

5.1 Historical aerial photography review

A review of available historical aerial photography was conducted from selected years between 1958 to 2021. A complete record of the aerial review has been included in **Appendix A**. A summary of resulting AEI as identified through the historical aerial photography review is presented in **Table 5-1**.

The historical aerial photography review indicated that the Project area has remained largely under agricultural land use since the 1950s, with evidence of the development of agricultural infrastructure, and an increased presence of cropping/grazing in more recent decades. In 1958 a rectangular section of land was cleared resembling an airstrip, situated approximately five kilometres north-west of Yanco Creek, surrounding Wilson Road, Moonbria Road and Liddles Lane (along the western edge of Part 3 site area, refer to **Appendix A**). Further development to the Project area included the construction of numerous dams. A potential historical quarry pre-dating the available aerials is present approximately 1.2 kilometres to the west of Wilson Road and 3.5 kilometres south of Mabins Well Road, bordered by vegetation (refer to **Appendix A** Part 13; refer to **Table 5-1**). Erosion is evident throughout the Project area, as are roads, tracks and gilgais (large depressions supporting potentially arid vegetation).

The areas surrounding the Project area are characterised as primarily agricultural land with historical use for cropping and grazing to the west and north-west, with some areas of vegetation to the north-east, small dwellings to the north and south-east, dams to the east, and irrigated cropping to the south and south-east.

Table 5-1 Areas of Potential Interest

Area of Interest	Location within Project area
Potential historical airstrip	A cleared rectangular area on the western edge of the Part 3 site area at the intersection of Wilson Road and Moonbria Road. The Part 3 area listed in **Appendix A** is situated approximately 5km north-west of Yanco Creek, surrounding Wilson Road and Moonbria Road.
Potential historical quarry	The quarry is located approximately 1.2 km to the west of Wilson Road and 3.5 km south of Mabins Well Road, bordered by vegetation within the Part 13 site area.
Agricultural infrastructure i.e. storage tanks, historical buildings (i.e. homesteads, sheds), dams	Throughout Project area
Cropping, grazing and farming land	Throughout Project area
Roads and tracks	Throughout Project area

5.1.1 NSW EPA Contaminated Sites Register

A search conducted on 27 April 2022 of the NSW EPA Contaminated Sites Record of Notices (under section 58 of the *Contaminated Land Management Act 1997*) and the list of contaminated sites notified to the NSW EPA (under section 60 of the *Contaminated Land Management Act 1997*) indicated that there were no sites registered with the NSW EPA within 500 meters of the Project area and the transmission line alignment that were either regulated, formerly regulated or had been notified.

5.1.2 Licensed, delicensed and formerly licensed activities under the POEO Act 1997

A search of current Environment Protection Licences (EPLs) or licensed / delicensed activities as detailed in the Lotsearch (April 2022) report indicated no records within the Project area.

Three formerly licensed activities have been recorded within the Project area, as shown in **Table 5-2**.

Table 5-2 Formerly Licenced Activities under the POEO Act, 1997

Licence No	Organisation	Location	Status	Issued Date	Activity	Direction
4653	Luhrmann Environment Management Pty Ltd	Waterways throughout NSW	Surrendered	06/09/2000	Other Activities / non-scheduled activity – application of herbicides	On-site
4838	Robert Orchard	Various waterways throughout NSW – Sydney NSW 2000	Surrendered	07/09/2000	Other activities / non-scheduled activity – Application of Herbicides	On-site
6630	Sydney weed and pest management Pty Ltd	Waterways throughout NSW – prospect, NSW, 2148	Surrendered	09/11/2000	Other activities / non-scheduled activity – Application of Herbicides	On-site

The above former licensed activities are associated with state-wide activities that involve the control of vegetation within and adjacent to waterways. The specific activities associated with these former licenses may not have been undertaken within the waterways located within the Project area.

5.1.3 Former gasworks

A search of former gasworks as detailed in the Lotsearch (April 2022) report indicated no records within the Project area.

5.1.4 Waste management and liquid fuel facilities

A search of waste management and liquid fuel facilities as detailed in the Lotsearch (April 2022) report indicated no records within the Project area.

5.1.5 PFAS investigation and management programs

A search of PFAS investigation and management programs as detailed in the Lotsearch (April 2022) report indicated no records within the Project area.

5.1.6 Defence Sites

A search of defence sites as detailed in the Lotsearch (April 2022) report indicated no records within the Project area.

5.1.7 Historical business directories - Dry cleaners, motor garages & service stations

A search of historical business directories for potential contaminating activities/operations (dry cleaners, motor garages and service stations) as detailed in the Lotsearch (April 2022) report indicated no records within the Project area.

5.1.8 EPA sites with other contamination issues

A search of EPA sites with other contamination issues as detailed in the Lotsearch (April 2022) report indicated no records within the Project area.

5.1.9 Current and historical mining and exploration titles

There are no current mining or exploration titles located within the Project area, as noted in the LotSearch Report (2022) included in **Appendix C**. There are 17 historical mining and exploration titles located on site for petroleum and minerals, with the most recent title ending in 2008. However, there is little indication of significant historical mining activities from the historical aerial photography review (e.g. no evidence of railways, industrial facilities, plant, large open cut areas or large areas of spoil / stockpiles).

5.1.10 Naturally occurring asbestos potential

A search of naturally occurring asbestos records as detailed in the Lotsearch (April 2022) report indicated no records within the Project area.

5.2 Information review summary

Based on the review of information, there is little evidence of historical and/or current activities which would have potentially caused significant contamination within the Project area. Historical and current activities identified to have been undertaken within the Project area which could have potentially caused low level/diffuse or localised contamination include:

- Agricultural and rural land use (e.g. pesticide / herbicide application, chemical storage, maintenance activities, waste disposal, dip sites)
- Quarrying (processing, plant, chemical storage, explosives)
- Airstrip (aircraft maintenance, refuelling, leaks and spills)
- Ground disturbance works for roads and tracks (importation of fill material of unknown quality).

5.3 Site inspection

A site inspection by a qualified contaminated land consultant was not undertaken as part of this Stage 1 contamination investigation and therefore the desktop findings listed in **Section 3.3** and **Chapter 5** have not been groundtruthed. The results of other environmental site inspections have been discussed with the inspecting environmental scientists (i.e. ecology and heritage consultants), and photographs have been reviewed to confirm the results of the desktop assessment. Notable observations (with respect to potential contamination sources) included isolated abandoned and/or wrecked car bodies, outhouses and various other historical buildings including a shearing shed. The potential historical quarry was inspected by a heritage consultant who noted the potential quarry was likely a dam that was empty at the time of inspection. Remnants of an old camp potentially dating back to the 1920s/30s was noted adjacent to the dam.

6. Contamination Investigation Findings

6.1 Areas of Environmental Interest

6.1.1 High Level Contamination Prioritisation

A high-level contamination prioritisation assessment was undertaken for the Project area, identifying and classifying AEIs by their potential contamination impact to the construction and/or operation of the Project without environmental management measures. The results of the contamination prioritisation assessments are required to support and inform current decisions that focus on potential exposure risks to human health and the environment caused by residual levels of contaminants across the Project area, and the potential for construction and operations works to exacerbate or change contaminant behaviour. Residual, historical contamination may have been inferred at a given location, based on the past land use or an assumption that contaminating activities may be associated with an activity, such as agricultural land usage and the application of herbicides. Under the existing agricultural land use, it would be considered common practice to apply herbicides to control weeds. With a change of land use such as a wind farm, the construction activity of excavating herbicide impacted soil could pose an exposure risk to construction workers during excavation or mobilise potential contamination sources during construction activities.

This assessment was based on available information as discussed in S**ection 3.3** and **Chapter 5**. The results of this assessment are presented in **Table 6-1**.

Table 6-1 High Level Contamination Prioritisation

Construction element	Site of concern and potential source of contamination	Contamination severity and extent assessment			Pathways and receptors Assessment of relationship to Project area and scope				Potential contamination impact
		Media and COPCs	Contamination status	Refer to Table 3-1	Location relative to Project area	Potential for contamination to be intersected by Project work	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 3-1	
Turbine, access tracks/internal cabling; substation/battery; overhead powerline; transmission line	AEI 1 Potential ASS risk within the waterbodies and watercourses on site	Surface soils, sediments Low pH and heavy metals	Contamination (specific geological condition) possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Watercourses and water bodies within Project area – Yanco Creek, Delta Creek, Turn Back Jimmy Creek; area approximately 3.5km north of Yanco Creek and 9.2km west of Kidman Way	ASS (if present) may be exposed during excavation activities in vicinity of waterways	Media of concern may intersect the construction scope and Project operation (where excavation works occur within/adjacent to AEI). Environmental receptors may be impacted by increased acid conditions and the uptake of mobilised contamination by aquatic flora and intake by aquatic fauna.	PR2	Low
Turbine, access tracks/internal cabling; substation/battery; overhead powerline; transmission line	AEI 2 Historical application of herbicides to waterbodies and watercourses on site	Surface water, sediment, surface soils Herbicides	Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1	Watercourses and water bodies within Project area – Yanco Creek, Delta Creek, Turn Back Jimmy Creek, as well as smaller tributaries on site	Contamination (if present) may be exposed or encountered during excavation activities in vicinity of waterways	Media of concern may intersect the construction scope and Project operation (where excavation works occur within/adjacent to AEI) Construction workers, operational staff and maintenance workers may be exposed to contamination via contact (der, ing) with potentially contaminated surface and/or groundwater, sediment or soils. Uptake by aquatic flora and intake by aquatic fauna may occur. Users of groundwater bores with potential sensitive beneficial uses may be impacted should contamination be mobilised and enter groundwater.	PR2	Very Low

Construction element	Site of concern and potential source of contamination	Contamination severity and extent assessment			Pathways and receptors Assessment of relationship to Project area and scope				Potential contamination impact
		Media and COPCs	Contamination status	Refer to Table 3-1	Location relative to Project area	Potential for contamination to be intersected by Project work	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 3-1	
Turbines, access tracks/internal cabling, substations/battery, transmission line; overhead powerline	AEI 3 Agricultural Infrastructure i.e. water tanks, buildings / structures (homesteads, sheds), current or historical sheep or cattle dips, potential chemical and/or fuel storage (underground or aboveground storage tanks)	Surface soils, shallow groundwater, surface water Asbestos, heavy metals, hydrocarbons, (TRH, BTEX, PAH), volatile organic compounds (VOC and SVOC), phenols, pesticides, herbicides, nutrients	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Across Project area	Contamination (if present) may be exposed during excavation activities within the footprint of the AEI	Media of concern may intersect the construction scope and Project operation (where excavation works occur within/adjacent to AEI) Construction workers, operational staff and maintenance workers may be exposed to contamination via contact (der, ing) with potentially contaminated surface and/or groundwater, sediment or soils. Uptake by aquatic flora and intake by aquatic fauna may occur. Users of groundwater bores with potential sensitive beneficial uses may be impacted should contamination be mobilised and enter groundwater.	PR2	Low
Turbines, access tracks/internal cabling, substations/battery, transmission line; overhead powerline	AEI 4 General cropping and farming activities – herbicide, pesticide and fertiliser application	Surface soils, sediment, surface water, groundwater Heavy metals, hydrocarbons, (TRH), volatile organic compounds (VOC and SVOC), pesticides, herbicides, nutrients	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and potentially widespread	SE3	Across Project area	Contamination (if present) may be exposed during excavation activities within the footprint of the AEI	Media of concern may intersect the construction scope and Project operation (where excavation works occur within/adjacent to AEI) Construction workers, operational staff and maintenance workers may be exposed to contamination via contact (der, ing) with potentially contaminated surface and/or groundwater, sediment or soils. Uptake by aquatic flora and intake by aquatic fauna may occur. Users of groundwater bores with potential sensitive beneficial uses may be impacted should contamination be mobilised and enter groundwater.	PR2	Low
Turbines, access track/internal cabling	AEI 5 Potential historical quarry pre-dating aerials (unconfirmed) – material processing, plant, chemical storage, explosives	Groundwater, surface soils, fill soils, surface water Heavy metals, cyanide compounds, hydrocarbons, (TRH, BTEX, PAH), volatile organic compounds (VOC and SVOC), explosive compounds NB. Contaminants would vary depending	Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1	Approximately 1.2km to the west of Wilson Road and 3.5km south of Mabins Well Road, bordered by vegetation	Contamination (if present) may be exposed during excavation activities within the footprint of the AEI	Media of concern may intersect the construction scope and Project operation (where excavation works occur within/adjacent to AEI) Construction workers, operational staff and maintenance workers may be exposed to contamination via contact (der, ing) with contaminated soils and/or surface water and groundwater. Users of groundwater bores with potential sensitive beneficial uses may	PR2	Very Low

Construction element	Site of concern and potential source of contamination	Contamination severity and extent assessment			Pathways and receptors Assessment of relationship to Project area and scope				Potential contamination impact
		Media and COPCs	Contamination status	Refer to Table 3-1	Location relative to Project area	Potential for contamination to be intersected by Project work	Exposure pathways (der – direct contact, ing – ingestion or inh – inhalation)	Refer to Table 3-1	
		on type of materials being mined / quarried / processed.					be impacted should contamination be mobilised and enter groundwater.		
Turbines, access track/internal cabling	AEI 6 Potential rural airstrip (historical, unconfirmed) - aircraft maintenance, refuelling, leaks and spills	Surface soils, shallow groundwater Heavy metals, hydrocarbons, (TRH, BTEX, PAH), volatile organic compounds (VOC and SVOC), per and polyfluoroalkyl substances (PFAS)	Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1	Intersection of Moonbria Rd and Wilson Rd	Contamination (if present) may be exposed during excavation activities within the footprint of the AEI	Media of concern may intersect the construction scope and Project operation (where excavation works occur within/adjacent to AEI) Construction workers, operational staff and maintenance workers may be exposed to contamination via contact (der, ing) with contaminated soils and/or groundwater. Users of groundwater bores with potential sensitive beneficial uses may be impacted should contamination be mobilised and enter groundwater.	PR2	Very Low
Turbines, access tracks/internal cabling, substations/battery, transmission line; overhead powerline	AEI 7 Building of roads and tracks - importation of fill material of unknown quality	Surface soils. Asbestos, heavy metals, hydrocarbons, (TRH, BTEX, PAH), phenols, pesticides, herbicides, polychlorinated biphenyls (PCB), per and polyfluoroalkyl substances (PFAS)	Low potential for contamination to be present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE1	Across Project area	Contamination (if present) may be exposed during excavation activities within the footprint of the AEI	Media of concern may intersect the construction scope and Project operation (where excavation works occur within/adjacent to AEI) Construction workers, operational staff and maintenance workers may be exposed to contamination via contact (der, ing) with contaminated soils	PR2	Very Low
Turbines, access tracks/internal cabling, substations/battery, transmission line; overhead powerline	AEI 8 Fly tipped waste (household, building material, cars, asbestos, chemical containers, general agricultural waste)	Surface soils Asbestos, heavy metals, hydrocarbons, (TRH, BTEX, PAH), volatile organic compounds (VOC and SVOC), phenols, pesticides, herbicides, nutrients	Contamination possibly present in the media of concern at concentrations above the relevant assessment criteria and limited in extent	SE2	Across Project area (higher potential in vicinity of roads and creeks)	Surficial contamination (if present) may be exposed during excavation activities within the footprint of the AEI	Media of concern may intersect the construction scope and Project operation (where excavation works occur within/adjacent to AEI) Construction workers, operational staff and maintenance workers may be exposed to contamination via contact (der, ing) with contaminated soils and/or materials	PR2	Low

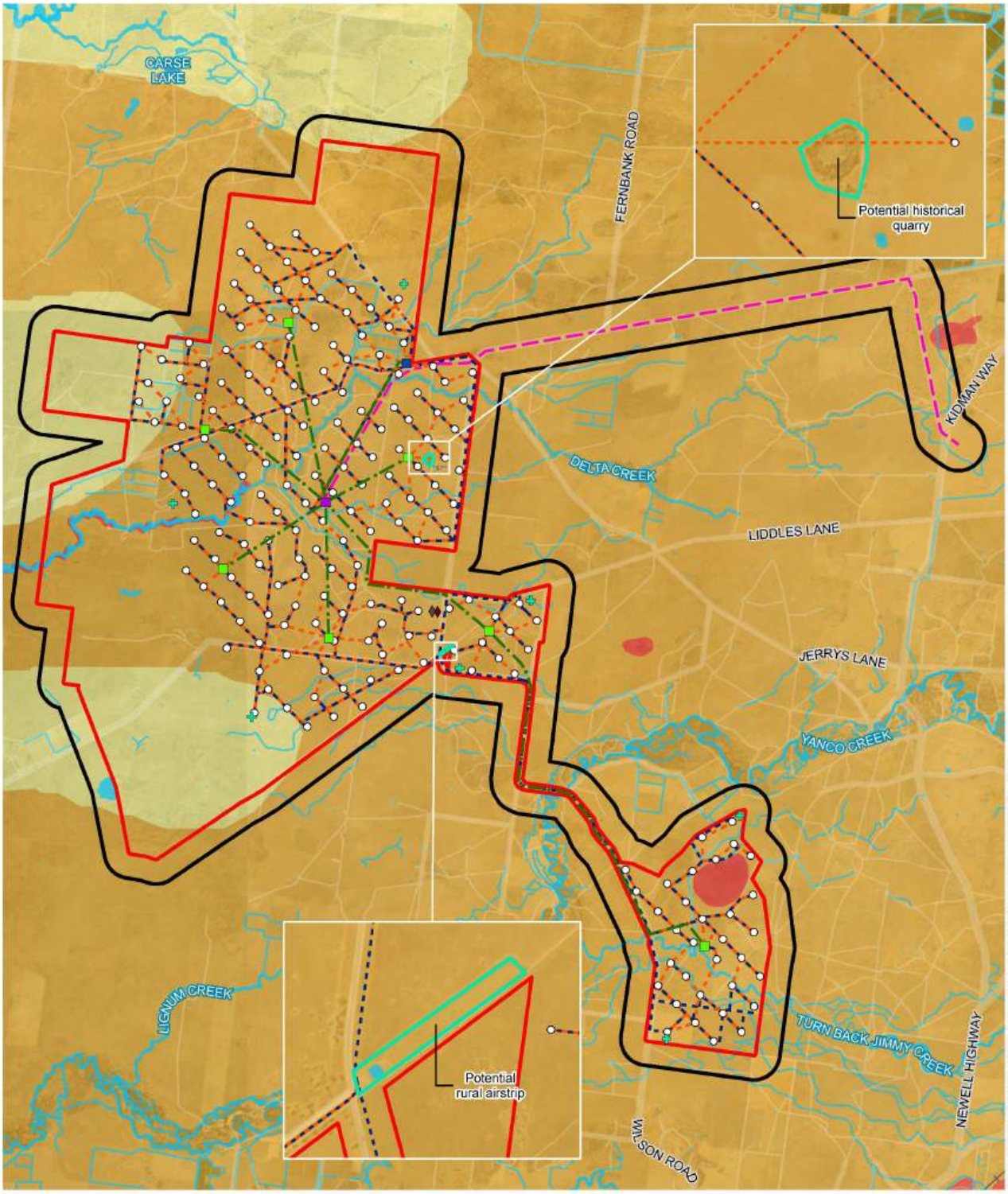


Figure 6-1 Areas of environmental interest

7. Potential construction impacts

Based on the information reviewed as part of this Stage 1 contamination investigation, the eight AEIs identified have been ranked as having a very low to low contamination impact potential. However, due to the qualitative and high-level nature of this report there is a possibility that unexpected contamination with a higher potential impact could be found on site during construction of the Project.

A summary of all AEIs is provided below in **Table 7-1** which indicates the risk level of potential impacts on soil, surface water, and groundwater, if applicable to the medium.

Table 7-1 Risk classification of potential contamination impacts to AEI

AEI	Contamination Impact Risk classification		
	Soils	Surface water	Groundwater
AEI 1 Potential ASS risk within the waterbodies and watercourses on site	Low	-	-
AEI 2 Historical application of herbicides to waterbodies and watercourses on site	Low	Very Low - Low	Very Low - Low
AEI 3 Agricultural Infrastructure i.e. water tanks, buildings / structures (homesteads, sheds), current or historical sheep or cattle dips, potential chemical and/or fuel storage (underground or aboveground storage tanks)	Low	Very Low - Low	Very Low - Low
AEI 4 General cropping and farming activities – herbicide, pesticide and fertiliser application	Low	Very Low - Low	Very Low - Low
AEI 5 Potential historical quarry pre-dating aerials (unconfirmed) – material processing, plant, chemical storage, explosives	Low	Very Low - Low	Very Low - Low
AEI 6 Potential rural airstrip (historical, unconfirmed) - aircraft maintenance, refuelling, leaks and spills	Low	-	Very Low - Low
AEI 7 Building of roads and tracks - importation of fill material of unknown quality	Low	-	-
AEI 8 Fly tipped waste (household, building material, cars, asbestos, chemical containers, general agricultural waste)	Low	-	-

7.1 Contamination – soils

While the potential for contaminated soil to exist within the Project area is low, it may be encountered during construction activities. If contamination risks are not quantified and appropriately managed on site, construction activities may expose workers, the public and environmental receptors to contaminated soil.

Potential impacts as a result of disturbance of contaminated soil without appropriate management and/or remediation may include:

- Contaminant exposure risk to Project personnel, surrounding landowners and the general public
- Contaminant exposure to environmental receptors
- Cross contamination associated with the incorrect handling or disposal of spoil/unexpected finds
- Contamination of previously clean areas.

Potentially contaminated soils which may be exposed during onsite excavation activities include soils associated with the following AEIs in **Table 7-2** below.

All potential soil contamination that may be identified can be managed subject to the implementation of appropriate management measures and/or remediation.

Higher risks and increased management and/or remediation effort during construction could be associated where materials contain dispersible fibres (i.e. asbestos), could generate vapours (hydrocarbons and VOC) or contain concentrations of contaminants which categorise material at a higher waste classifications (i.e. restricted or hazardous waste). Based on the findings of this investigation, there is little evidence to suggest that the aforementioned materials are present on site. However, should indicators of such materials be found on site, site inspections and subsequent investigations would be required to determine appropriate management measures and/or remediation which would be completed prior to the commencement or re-commencement of excavation activities associated with construction.

Table 7-2 Potential contamination sources - soil

AEI	Contamination Source	Impact - Soil
AEI 1 Potential ASS risk within the waterbodies and watercourses within Project area	Surface soils within the vicinity of water bodies have the potential to be ASS.	Increased potential for impact is likely to be associated with the removal of potentially impacted surface soils to facilitate the construction of turbines, access tracks/internal cabling, substation/battery, overhead powerlines and the transmission line. Additionally, the handling/management of materials within spoil storage areas (i.e. where potentially contaminated materials need to be disturbed and handled during construction) and where vegetation is to be removed may increase contamination risks to the Project. Significant excavation of existing surface soils in the vicinity of water bodies is unlikely to occur across other areas of the Project area. However, disturbance of surface soils associated with site preparation and general construction activities could increase the potential for impact.
AEI 2 Historical application of herbicides to waterbodies and watercourses on site	Surface soils within the vicinity of water bodies have the potential to be impacted through the historical use of herbicides.	Increased potential for impact is likely to be associated with the removal of potentially impacted surface soils to facilitate the construction of turbines, access tracks/internal cabling, substation/battery, overhead powerlines and the transmission line. Additionally, the handling/management of materials within spoil storage areas (i.e. where potentially contaminated materials need to be disturbed and handled during construction) and where vegetation is to be removed may increase contamination risks to the Project. Significant excavation of existing surface soils in the vicinity of water bodies is unlikely to occur across other areas of the Project area. However, disturbance of surface soils associated with site preparation and general construction activities could increase the potential for impact.
AEI 3 Agricultural Infrastructure	Surface soils within the vicinity of agricultural infrastructure across the Project area may be impacted by hazardous building materials (asbestos, lead), localised spills/leaks from storage tanks and maintenance activities (hydrocarbons, BTEX, PAH, phenols), current or historical sheep and cattle dips (heavy metals and pesticides) and the general use of pesticides, herbicides and/or fertilisers.	Increased potential for impact is likely to be associated with the removal of potentially contaminated surface soils to facilitate the construction of the turbines, access tracks/internal cabling, substations/battery the transmission line and overhead powerlines, and the handling/management of materials within spoil storage areas (i.e. where potentially contaminated materials need to be disturbed and handled during construction). Disturbance of surface soils associated with site preparation and general construction activities could also increase the potential for impact.

AEI	Contamination Source	Impact - Soil
AEI 4 General cropping and farming activities	Surface soils across the Project area may be impacted by pesticides, herbicides, fertilizer and the use of current or historical sheep and cattle dips (heavy metals, pesticides	Increased potential for impact is likely to be associated with the removal of potentially contaminated surface soils to facilitate the construction of turbines, access tracks/internal cabling, substations/battery, the transmission line and overhead powerlines, areas where vegetation is to be removed and the handling/management of materials within spoil storage areas (i.e. where potentially contaminated materials need to be disturbed and handled during construction). Disturbance of surface soils associated with site preparation and general construction activities could also increase the potential for impact.
AEI 5 Potential historical quarry	Surface soils within the vicinity of the potential historical quarry may be impacted by heavy metals, cyanide compounds, hydrocarbons, (TRH, BTEX, PAH), volatile organic compounds (VOC and SVOC), explosive compounds associated with material processing, plant, chemical storage and explosives (use and storage).	Increased potential for impact is likely to be associated with the removal of potentially contaminated surface soils to facilitate the construction of turbines and access tracks/internal cabling, vegetation removal and the handling/management of materials within spoil storage areas (i.e. where potentially contaminated materials need to be disturbed and handled during construction).
AEI 6 Potential rural airstrip	Surface soils within the vicinity of the potential rural airstrip may be impacted by heavy metals, hydrocarbons (TRH, BTEX, PAH), volatile organic compounds (VOC and SVOC), per and polyfluoroalkyl substances (PFAS) associated with aircraft maintenance, refuelling, leaks and spills.	Increased potential for impact is likely to be associated with the removal of potentially contaminated surface soils to facilitate the construction of access tracks/internal cabling, vegetation removal and the handling/management of materials within spoil storage areas (i.e. where potentially contaminated materials need to be disturbed and handled during construction). The potential airstrip appears to have been inactive in recent years. Further investigation will be conducted prior to construction to confirm if it is a historical airstrip.
AEI 7 Building of roads and tracks	Surface soils within the vicinity of roads and tracks may be impacted by asbestos, heavy metals, hydrocarbons, (TRH, BTEX, PAH), phenols, pesticides, herbicides, polychlorinated biphenyls (PCB), per and polyfluoroalkyl substances (PFAS) associated with the use of fill materials of unknown quality.	Increased potential for impact is likely to be associated with the removal of potentially contaminated surface soils to facilitate the construction of turbines, access tracks/internal cabling, substations/battery, the transmission line and overhead powerlines, vegetation removal and the handling/management of materials within spoil storage areas (i.e. where potentially contaminated materials need to be disturbed and handled during construction). Disturbance of surface soils associated with site preparation and general construction activities could also increase the potential for impact.

AEI	Contamination Source	Impact - Soil
AEI 8 Fly-tipped waste (household, building material, cars, asbestos containing materials)	Surface soils within the vicinity of fly-tipped waste may be impacted by asbestos, heavy metals, hydrocarbons, (TRH, BTEX, PAH), volatile organic compounds (VOC and SVOC), phenols, pesticides and herbicides.	Increased potential for impact is likely to be associated with the removal of potentially contaminated surface soils to facilitate the construction of turbines, access tracks/internal cabling, substations/battery, the transmission line and overhead powerlines, vegetation removal and the handling/management of materials within spoil storage areas (i.e. where potentially contaminated materials need to be disturbed and handled during construction). Disturbance of surface soils associated with site preparation and general construction activities could also increase the potential for impact.

7.2 Contamination – groundwater and surface water

7.2.1 Groundwater

Contaminated groundwater may be encountered during Project construction activities, namely during excavation in the vicinity of AEIs with contamination potential. If groundwater contamination is not assessed and appropriately managed, construction activities may expose workers, the public and environmental receptors to contaminated groundwater via direct contact or discharge to surface waters. Potential impacts as a result of contact with or discharge of contaminated groundwater may include:

- Contaminant exposure risk to Project personnel, surrounding landowners and the general public
- Contaminant exposure to environmental receptors
- Degradation of aquatic ecosystems.

Based on the information reviewed, groundwater on site has a very low to low contamination impact potential. However, contamination could be present beneath the following AEIs as presented in **Table 7-3** below. All potential contamination of groundwater that may be identified can be managed subject to the implementation of appropriate management measures and/or remediation.

Higher risks and increased management and/or remediation effort are likely to be associated with groundwater contamination where the source is not located on the construction site (i.e. construction will not remove all and/or part of the contamination source). Based on the findings of this investigation this is expected to be unlikely, however in the unlikely event that an offsite contamination source be discovered the appropriate management measures and/or remediation can only be determined based on results of investigations which would be completed prior to the commencement of excavation activities associated with construction.

7.2.2 Surface water

Based on the findings of this contamination investigation, the risk of encountering contaminated surface water is considered to be low, however, contaminated surface water may still be encountered during the construction activities (if on-site surface water is used as part of construction activities). If surface water contamination is not assessed and appropriately managed, construction activities may expose workers, the public and environmental receptors to contaminated surface water via direct contact. Potential impacts as a result of contact with contaminated surface water may include:

- Contaminant exposure risk to Project personnel, surrounding landowners and the general public, on site and downstream
- Contaminant exposure to environmental receptors, on site and downstream
- Degradation of aquatic ecosystems, on site and downstream.

Based on the information reviewed, surface water on site has a very low to low contamination impact potential. However, contamination could be present in surface water associated with the following AEIs as demonstrated in **Table 7-3** below.

All potential contamination of surface water that may be identified can be managed subject to the implementation of appropriate management measures and/or remediation.

Higher risks and increased management and/or remediation effort are likely to be associated with surface water contamination where the source is not located on the construction site (i.e. construction will not remove all and/or part of the contamination source). Based on the findings of this investigation this is expected to be unlikely, however in the unlikely event that an offsite contamination source be discovered the appropriate management measures and/or remediation can only be determined based on results of site inspections and potential resulting investigations which would be completed prior to the commencement of excavation activities associated with construction.

Table 7-3 Potential contamination sources – groundwater and surface water

AEI	Contamination Source	Impact - Groundwater	Impact – Surface water
AEI 2 Historical application of herbicides to waterbodies and watercourses on site	Groundwater and surface water may be impacted by the historical use of herbicides.	Increased potential for impact is likely to be associated with the ingress of contaminated groundwater into excavation voids during the construction of the turbines, access tracks/internal cabling, substation/battery, overhead powerlines and the transmission line.	Increased potential for impact is likely to be associated with the use of surface water and disturbance of sediments during the construction of the turbines, access tracks/internal cabling, substation/battery, overhead powerlines and the transmission line. Use of surface water and/or disturbance of sediment associated with site preparation and general construction activities could also increase the potential for impact
AEI 3 Agricultural Infrastructure	Groundwater and surface water may be impacted by localised spills/leaks from storage tanks and maintenance activities (hydrocarbons, BTEX, PAH, phenols), current or historical sheep and cattle dips (heavy metals and pesticides) and the general use of pesticides, herbicides and/or fertilisers.	Increased potential for impact is likely to be associated with the ingress of contaminated groundwater into excavation voids during the construction of turbines, access tracks/internal cabling, substations/battery, the transmission line and overhead powerlines.	Increased potential for impact is likely to be associated with the use of surface water and/or disturbance of sediments during the construction of turbines, access tracks/internal cabling, substations/battery, the transmission line and overhead powerlines.
AEI 4 General cropping and farming activities	Groundwater and surface water maybe impacted by pesticides, herbicides, fertilizer and the use of current or historical sheep and cattle dips (heavy metals, pesticides).	Increased potential for impact is likely to be associated with the ingress of contaminated groundwater into excavation voids during the construction of turbines, access tracks/internal cabling, substations/battery, the transmission line and overhead powerlines.	Increased potential for impact is likely to be associated with the use of surface water and/or disturbance of sediment during the construction of turbines, access tracks/internal cabling, substations/battery, the transmission line and overhead powerlines. Use of surface water and/or disturbance of sediment associated with site preparation and general construction activities could also increase the potential for impact.

AEI	Contamination Source	Impact - Groundwater	Impact – Surface water
AEI 5 Potential historical quarry	Groundwater and surface water maybe impacted by heavy metals, cyanide compounds, hydrocarbons, (TRH, BTEX, PAH), volatile organic compounds (VOC and SVOC), explosive compounds associated with material processing, plant, chemical storage and explosives (use and storage).	Increased potential for impact is likely to be associated with the ingress of potentially contaminated groundwater into excavation voids during the construction of turbines, access tracks/internal cabling, substations/battery and proposed transmission line.	Increased potential for impact is likely to be associated with the use of surface water and/or disturbance of sediment during the construction of turbines, access tracks/internal cabling, substations/battery and proposed transmission line. The use of surface water and/or disturbance of sediment associated with site preparation and general construction activities could also increase the potential for impact.
AEI 6 Potential rural airstrip	Groundwater may be impacted by heavy metals, hydrocarbons (TRH, BTEX, PAH), volatile organic compounds (VOC and SVOC), per and polyfluoroalkyl substances (PFAS) associated with aircraft maintenance, refuelling, leaks and spills.	Increased potential for impact is likely to be associated with the ingress of contaminated groundwater into excavation voids during the construction of turbines and access tracks/internal cabling.	N/A

7.3 Soil erosion hazard

There is the potential for soils to be dispersed or transported to other locations within the Project area and offsite via erosion i.e. by water and/or wind. Erodibility potential may be increased in sodic, dispersive or reactive soils (Sodosols, as well as Vertosols, Kurosols and Kandosols) by construction activities such as excavation or associated vehicle or machinery traffic. If high intensity rainfall or flooding events occur during construction, the likelihood of adverse water erosions effects would be increased.

Erosion could result in the instability of landforms and structures, sedimentation, increased turbidity of waterways, exposure of fine-grained sediments of other soils and adverse effects from the generation of dush, potentially impacting adversely on sensitive ecological receptors, construction workers, landowners or neighbouring residents.

Based on the information reviewed, soils present throughout the southern half of the Project area have a high potential for erosion via wind and/or water. Potential soil erosion hazards can be managed subject to the implementation of appropriate management measures during construction.

7.4 Acid sulfate soils

There is the potential for ASS to be encountered in small areas, in the vicinity of waterbodies and water courses within the Project area (refer to **Figure 4-6**). If ASS are not managed properly, construction activities may cause acidification and contamination of environmental receptors, surrounding soils, surface waters and groundwater, as well as the mobilisation of further contaminants due to the acidification of the surrounding environment.

If ASS are not managed properly during construction, disturbance by drainage, lowering of water tables or excavation, oxidation of the sulphides in soils can create sulphuric acid which can trigger a range of flow-on effects, including:

- Acidification of groundwater, wetlands and waterways
- Damage to building footings and underground infrastructure from acid and sulfate attack
- Leaching of metals from the soils deteriorating groundwater, wetlands, rivers and estuaries
- Formation of black muds known as monosulphidic black ooze (MBO) that are highly reactive and prone to rapidly deoxygenating waters if disturbed (DWER, 2017).

This has the potential to result in:

- Further contamination of surrounding environment
- Large scale damage to aquatic ecosystems
- Corrosion of concrete and steel infrastructures.

All potential impacts of ASS that may be identified can be managed subject to undertaking ASS investigations prior to construction activities in areas of high ASS potential (Refer to **Figure 4-6**) where excavations will occur as part of construction and developing/implementing appropriate plans should ASS be identified.

Based on the information reviewed, areas in the vicinity of waterbodies and water courses within the Project area have been noted to have a high potential to produce ASS. However, based on the proposed scope and groundwater assessment undertaken by Jacobs (2022a) the groundwater table is unlikely to be lowered or impacted by construction activities.

7.5 Salinity

There is the potential for salinity to be encountered within the Project area. If salinity is not managed properly, construction activities may cause the rising of the groundwater table and the mobilisation of salts stored in soil surface and groundwater. The increased saline environment may cause:

- Waterlogging and/or scalding of soils
- Damage to aquatic and terrestrial ecosystems
- Adverse impacts to irrigated agriculture and horticulture
- Damage to infrastructure, increasing maintenance costs (NSW DPE, 2022a).

Based on the information reviewed, areas within the Project area have been noted to have a high potential for land salinity, and a moderate overall salinity hazard (refer to **Figure 4-7**). Additional saline areas may be present which have not yet been identified or may occur if site conditions change adversely. As part of any future design works, geotechnical investigations should be undertaken to assess the potential risk to structures from saline soils. Based on construction activities, the groundwater table and associated salinity is unlikely to be impacted by construction activities.

It is understood there will be limited clearing of vegetation as part of construction works, which will reduce the risk of rising water tables, therefore reducing the risk of salinity impacts.

8. Potential operational impacts

Based on the information reviewed as part of this Stage 1 contamination investigation, the AEIs identified have been ranked as having a very low to low contamination impact potential. However, due to the qualitative and high-level nature of this report there is a possibility that contamination from Project activities could impact upon sensitive environmental and human receptors during operation. Excavation activities associated with general maintenance activities during operation have not been considered as part of this assessment. These potential impacts are outlined below.

8.1 Contamination – soils

During the operational phase of the Project it is not expected that there will be a significant impact to soils from contamination, nor is it expected that contaminated soils will impact upon the operation of the Project. There is the potential for minor spills from on-site traffic or maintenance work, chemical storage and for exposure of potentially contaminated soil (if present) associated with AEIs during maintenance work.

The management of minor spills, leaks, chemical storage and exposure to soil contamination (if present) during operation of the Project would be managed in accordance with the Project specific operational environmental management plan.

8.2 Contamination – groundwater and surface water

It is not expected that the on-site works associated with the operational phase of the Project will intercept the regional groundwater table, therefore it is unlikely that groundwater will be exposed during operation.

The management of minor spills, leaks, chemical storage and exposure to groundwater contamination (if present) during operation of the Project would be managed in accordance with the Project specific operational environmental management plan.

During the operational phase of the Project, risks to surface water from contamination are primarily associated with the establishment of new permanent impervious surfaces (concreted areas, hardstands), the operation and maintenance facility, and the use of internal access tracks to, from, and between WTGs. Appropriate operational environmental management plans will be prepared and implemented to manage and minimise these potential risks.

It is not expected that contaminated surface water (if present) on-site will impact upon the operation of the Project as on-site surface water is unlikely to be used as part of operational activities. There is a potential for contamination of on-site surface water from upstream spills or application of fertilisers and chemicals used in farming, however the potential contamination impact of these to the Project is expected to be minimal because on-site surface water is unlikely to be used as part of operational activities.

8.3 Soil erosion hazard

During the operational phase of the Project it is not expected that activities would create an increased risk of soil erosion. Roads would be graded, cleared areas would be landscaped, and erosion protection measures established. There would be minimal risk of soil erosion and subsequent transport of sediment into nearby receiving waterways. To manage the minimal risk of erosion and sedimentation during operation, site stabilisation measures in relation to maintenance of access tracks, waterway crossing and other areas susceptible to erosion will be implemented following construction. Where required, erosion and sediment controls will be retained for the operational phase. Natural soil erosion due to the dispersive soils present on site may occur. However, with appropriate erosion protection methods this is not expected to impact on the Project.

8.4 Acid Sulfate Soils

Project operations are unlikely to expose ASS (if present).

All potential impacts of ASS identified can be managed subject to undertaking ASS investigations prior to construction activities in areas of high ASS potential (Refer to **Figure 4-6**) where excavations will occur as part of operation and developing/implementing appropriate plans should ASS be identified.

8.5 Salinity

Saline soils are not expected to impact upon the operation of the Project.

9. Potential decommissioning impacts

The decommissioning process for the Project would generally involve the removal of above ground infrastructure, including WTGs, electrical infrastructure and maintenance buildings unless required for the future land use of the Project area. If a future use is identified for any above ground infrastructure associated with the Project, that infrastructure may be retained in agreement with the interested stakeholders. Otherwise, all above ground electrical infrastructure would be removed during the decommissioning phase.

Filled areas and hardstand surfaces would remain in place. Drainage swales around the filled areas will be retained. Underground infrastructure such as underground cables and footings, would generally remain in situ to avoid further disturbance. It is assumed that underground cables will not be oil filled. Some infrastructure, such as access tracks and laydown areas, may be of benefit to the landowners and may be retained in situ following an agreement with the landowners.

During decommissioning, existing access tracks would generally be used for equipment access and removal of materials from the Project area. As soils present throughout the southern half of the Project area have a high potential for erosion via wind and/or water, potential soil erosion hazards must be managed subject to the implementation of appropriate management measures during construction. Disturbed areas would be rehabilitated to meet the intended final land use and be comparable with pre-construction conditions in consultation with landowners.

Based on the above, it is not anticipated that there would be any additional soil and contamination impacts.

10. Cumulative impacts

Cumulative impacts have the potential to occur when impacts from a project interact or overlap with impacts from other projects and can potentially result in a larger overall effect (positive or negative) on the environment, businesses or local communities. Cumulative impacts may occur during construction stages when projects are constructed concurrently or consecutively. Projects constructed consecutively (or sequentially) can result in construction activities occurring over an extended period of time with little or no break in construction activities, potentially causing increased impacts and construction fatigue for local communities.

The extent to which another development or activity could interact with the construction of the proposal would depend on its scale, location and/or timing of construction. Generally, cumulative impacts would be expected to occur where multiple long-duration construction activities are undertaken close to, and over a similar timescale to, construction activities for the proposal, or where consecutive construction occurs in the same area.

The overall effect of cumulative benefits or impacts could be positive or negative, depending on the nature of the projects and the nearby communities and environment.

Recently completed and proposed projects identified within the broader regional area are considered with respect to the Project's potential environmental impacts, as discussed in **Chapter 7** and **Chapter 8**, to inform the following cumulative impact assessment in **Table 10-1**.

Table 10-1 Projects considered in the cumulative impact assessment

Project (approval status)	Contamination Impacts	Contamination impacts of the Project	Cumulative Impacts
Project EnergyConnect (Eastern) (Approved)	Low potential for hydrocarbon contamination to soil, surface water and groundwater from potential vehicle accidents, leaks and spills in the transmission easement or at proposed substation sites. Low potential for hydrocarbon contamination to migrate off-site.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Low cumulative impacts expected. The Project footprint and EnergyConnect footprint do not appear to directly overlap, however both intersect Yanco Creek at nearby points and have the potential for surface water contamination at both of these areas. However, given both projects are expected to be managed with the implementation of appropriate control measures, cumulative construction impacts are expected to remain low. Similarly, the projects are not expected to contribute to cumulative soil and contamination impacts during operation.
Coleambally BESS (Planning)	Low risk of soil contamination from potential fuel and chemical spills (fuels, lubricants, herbicides). No expected risk of potential contamination to waterbodies/courses as none are located within project area.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Very low to negligible cumulative impacts expected. The proposed Coleambally BESS and ancillary infrastructure does not overlap with the Project footprint, and does not intersect any mutual environmental receivers (waterbodies or courses). The projects may interact temporally, however they are spatially isolated. During any timeframes where construction activities are concurrent, increased soil and contamination impacts may be possible and would be likely to be focussed on soil erosion. However, given these impacts are expected to be managed by implementing appropriate mitigation controls, the cumulative impacts are expected to be minor. Similarly, given the projects are geographically isolated, the projects are not expected to contribute to cumulative soil and contamination impacts during operation.

Project (approval status)	Contamination Impacts	Contamination impacts of the Project	Cumulative Impacts
Woodland BESS (Planning)	Low risk of soil contamination during development, as there will be minimal storage of chemicals or other contaminants at the site during construction and operation. The site is mapped as "ground water vulnerable", however construction and operation is not expected to impact on groundwater.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Very low to negligible cumulative impact expected. The proposed Woodland BESS project area does not overlap with the Project footprint and does not intersect any mutual environmental receivers (waterbodies or courses). The projects may interact temporally, however they are spatially isolated. During any timeframes where construction activities are concurrent, increased soil and contamination impacts may be possible and would be likely to be focussed on soil erosion. However, given these impacts are expected to be managed by implementing appropriate mitigation controls, the cumulative impacts are expected to be minor. Similarly, given the projects are geographically isolated, the projects are not expected to contribute to cumulative soil and contamination impacts during operation.
Dinawan Energy Hub (Announced)	No publicly available proposal, EIS, or report has been submitted to the NSW planning portal at this time. Therefore, the specific potential contamination impacts cannot be assessed.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Low cumulative impact expected. The initial mapped area of Dinawan Energy Hub (DEH) is directly adjacent to the Project area. They share site boundaries and a mutual watercourse, Delta Creek. If DEH is approved, there may be some temporal crossover between the projects. Both projects are in areas of moderate to high salinity potential, and both projects have the potential to impact on local soil erosion and ASS (if proposed construction activities occur within ASS impacted areas). Provided both projects are managed with the implementation of appropriate control measures, cumulative construction and operation impacts are expected to be low.

Project (approval status)	Contamination Impacts	Contamination impacts of the Project	Cumulative Impacts
Victoria to NSW Interconnector West (Announced)	No publicly available proposal, EIS, or report has been submitted to the NSW planning portal at this time. Therefore, the specific potential contamination impacts cannot be assessed.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Negligible cumulative impacts expected. The projects are temporally (based on projected construction timeframes) and geographically isolated from one another. Provided both projects are managed with the implementation of appropriate control measures, cumulative construction and operation impacts are expected to be negligible.
Micro Solar Farm (Approved)	Based on the Council Assessment Report submitted to the NSW Planning Portal, potential contamination impacts revolve around leaching of chemicals that may be utilised on site and through nutrients from chemical application and from stock, which have the potential to impact on groundwater and surface water. Additionally, the site is at high risk of soil structural decline. The project plans to manage these risks under a CEMP and OEMP during construction and	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Negligible cumulative impacts expected. The expected location of the Coleambally Micro Solar Farm is north east of the Project boundary, with no apparent overlapping project elements. No indication of construction and operation timeframes have been indicated for the Micro Solar Farm. Given that the projects are geographically isolated from one and another and that both projects are to be managed with the implementation of appropriate control measures, cumulative construction and operation impacts are expected to be negligible.

Project (approval status)	Contamination Impacts	Contamination impacts of the Project	Cumulative Impacts
	operation to minimise impacts to the surrounding environment.		
Riverina and Darlington Point BESS (Approved)	Based on the Modification Report submitted to the NSW Planning Portal no additional soil, surface water and/or groundwater risks of contamination were identified for this modification. This project is a modification to an existing, already constructed solar farm/BESS on this site. Management measures for previously identified contamination risks were not identified within the Modification Report.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Very low to negligible cumulative impact expected. The approved Darlington Point BESS does not overlap with the Project footprint and does not intersect any mutual environmental receivers (waterbodies or courses). Additionally, no contamination risks were identified for the Darlington Point BESS. The projects may interact temporally, however they are spatially isolated. Given both projects are expected to be managed with the implementation of appropriate control measures, cumulative construction impacts are expected to be negligible. Similarly, the projects are not expected to contribute to cumulative soil and contamination impacts during operation.

Project (approval status)	Contamination Impacts	Contamination impacts of the Project	Cumulative Impacts
Keri Keri Wind Farm (Planning)	The EIS is currently being prepared and therefore potential soil and contamination impacts have not yet been assessed.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Negligible cumulative impacts expected. The projects appear to be geographically isolated from one another. Construction and operation timeframes for the wind farm project are not yet established. Provided both projects are managed with the implementation of appropriate control measures, cumulative construction and operation impacts are expected to be negligible.
Baldon Wind Farm (Planning)	The EIS is currently being prepared and therefore potential soil and contamination impacts have not yet been assessed.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Very low to negligible cumulative impact expected. The proposed Baldon Wind Farm project area does not overlap with the Project footprint and does not intersect any mutual environmental receivers (waterbodies or courses). The projects may interact temporally; however they are spatially isolated and construction and operation timeframes for the Baldon Wind Farm have not been confirmed. During any timeframes where construction activities are concurrent, increased soil and contamination impacts may be possible and would be likely to be focussed on soil erosion. However, given these impacts are expected to be managed by implementing appropriate mitigation controls, the cumulative impacts are expected to be minor. Similarly, given the projects are geographically isolated, the projects are not expected to contribute to cumulative soil and contamination impacts during operation.

Project (approval status)	Contamination Impacts	Contamination impacts of the Project	Cumulative Impacts
Keri Keri Solar Farm (Planning)	The EIS is currently being prepared and therefore potential soil and contamination impacts have not yet been assessed.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Very low to negligible cumulative impact expected. The proposed Keri Keri Solar Farm project area does not overlap with the Project footprint and does not intersect any mutual environmental receivers (waterbodies or courses). The projects may interact temporally; however they are spatially isolated and construction and operation timeframes for the Keri Keri Solar Farm have not been confirmed. During any timeframes where construction activities are concurrent, increased soil and contamination impacts may be possible and would be likely to be focussed on soil erosion. However, given these impacts are expected to be managed by implementing appropriate mitigation controls, the cumulative impacts are expected to be minor. Similarly, given the projects are geographically isolated, the projects are not expected to contribute to cumulative soil and contamination impacts during operation.
Bullawah Wind Farm (Announced)	No publicly available proposal, EIS, or report has been submitted to the NSW planning portal at this time. Therefore, the specific potential contamination impacts cannot be assessed.	Low potential for contamination to soil, surface water and groundwater from potential fuel and/or chemical spills and leaks, and disturbance of potential historical contamination during excavation. Potential contamination impacts are expected to be able to be managed under a CEMP and Unexpected Finds Procedure. It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the AEIs within the Project area will impact significantly on the Project during the operational phase.	Negligible cumulative impacts expected. The projects appear to be geographically isolated from one another. Construction and operation timeframes for the wind farm project are not yet established. Provided both projects are managed with the implementation of appropriate control measures, cumulative construction and operation impacts are expected to be negligible.

With respect to existing contamination (known and potential), the construction of the Project is likely to reduce any overall contamination loading currently existing within the Project area and the transmission line associated with the removal and/or management of contaminated materials to facilitate construction (e.g. excavation of contaminated soils and / or material to facilitate turbine or access road construction). Therefore, the Project is not expected to contribute significantly to the cumulative impacts from interacting projects in the area.

Based on the available information, and on the knowledge that the expected impacts of the Project have been assessed as very low to low, the cumulative impacts from the interaction of the multiple known local projects in relation to contamination are expected to be low.

11. Environmental management measures

The following management measures detailed in **Table 11-1** have been developed to specifically manage potential soil and contamination impacts which have been predicted during construction and operation of the Project (refer to **Chapter 7** and **Chapter 8**).

The requirement for a construction erosion sediment control plan (ESCP) with specific erosion and sediment control measures to be implemented within the Project area in accordance with the principles and requirements of Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom, 2004) is detailed in the Surface water and groundwater technical report (Jacobs 2022a).

Similarly, the requirement to manage minor spills, leaks, chemical storage and exposure to residual contamination (if present) during operation of the Project is also detailed in the Surface water and groundwater technical report (Jacobs 2022a).

Table 11-1 Soils and contamination environmental management measures

Impact	Reference	Management / mitigation measure	Responsibility	Timing
Acid sulfate soils	SC01	For excavation work that is required as part of construction and/or operation within or adjacent to areas of high ASS potential as detailed in **Figure 4-6**, investigations will be undertaken to assess the presence of ASS or potential ASS (PASS). If ASS or PASS are identified during investigations, an appropriate ASS management plan will be developed and implemented prior to any excavation work to facilitate construction and/or operation are undertaken.	Construction contractor	Prior to construction
Unexpected contamination	SC02	The CEMP will include an unexpected finds procedure in the event of unexpected contamination.	Construction contractor	Prior to construction
Unexpected contamination	SC03	A visual inspection of the disturbance footprint will be completed prior to construction to confirm the findings of the Soils and contamination technical report. Inspection can be completed by any person with knowledge of the unexpected finds protocol to ensure no obvious signs of contamination are present where work will occur (i.e. staining, fly-tipped waste, odours etc.). Should indicators of contamination be observed during construction, the unexpected finds procedure will be followed: ▪ Indicators of contamination must be documented, and an appropriate sampling program designed ▪ Sampling program will be implemented, and a report on the existing contamination prepared ▪ If contamination is present, further investigation, management and/or remediation will be required.	Construction contractor	Prior to construction
Unexpected contamination	SC04	Should areas within the Project area be upgraded to a moderate to very high contamination impact potential, as a result of an unexpected find/s and subsequent investigation/s, additional measures will be implemented in accordance with relevant guidelines as recommended by a qualified contamination consultant. These additional mitigation and management measures will be dependent on the outcomes from the subsequent investigations, which may include: ▪ Remedial Action Plans ▪ Involvement of an accredited Site Auditor, and issue of a Site Audit Statement and Site Audit Report ▪ ASS Management Plan.	Construction contractor in consultation with a contamination land consultant	Prior to construction, Construction

12. Conclusion

A Stage 1 desktop contamination investigation was completed by Jacobs to support the EIS for the Project. Eight AEIs were identified (refer to **Section 6.1**) and assessed as having either very low or low potential contamination impact. Outcomes of the assessment are summarised below:

- Soil contamination – Contamination in soils may be mobilised during construction work where ground disturbance activities, potential removal of vegetation and/or management and transportation of spoil materials is to occur in areas potentially contaminated areas. Potential sources of contamination in surface soils include:
  - Soils associated with waterbodies and watercourses within the Project area which could be impacted by ASS or the historical application of herbicides
  - Soils within the vicinity of agricultural infrastructure (historical or current)
  - Land associated with general cropping and/or farming activities
  - The potential historical quarry and potential historical airstrip
  - Construction associated with roads and tracks
  - Fly-tipped waste in the Project area.
- Groundwater contamination – contamination may be encountered in groundwater during construction activities, namely during excavation in the vicinity of AEIs with contamination potential. Contaminated groundwater may be present beneath the following AEIs:
  - Waterbodies and water courses within the Project area which could be impacted by the historical use of herbicides
  - Agricultural infrastructure (historical or current) may have caused localised spills/leaks of contaminants into groundwater
  - Land associated with general cropping and farming activities
  - Potential historical quarry and potential rural airstrip.
- Surface water contamination – contamination may be encountered in surface water during construction activities (if on-site surface water is used as part of construction activities). Contamination may be present in areas associated with the following AEIs:
  - Waterbodies and water courses within the Project area which could be impacted by the historical use of herbicides.
  - Agricultural infrastructure (historical or current) may have caused localised spills/leaks of contaminants into surface water.
  - Land associated with general cropping and farming activities.
  - Potential historical quarry.
- Potential impacts from soil erosion – soils within the Project area have a high erodibility potential as they consist largely of Chromosols, Sodosols and Vertosols (based on soil mapping data available for the southern half of the site). Soils may be dispersed or transported to other locations within the Project area and offsite via erosion i.e. by water and/or wind. This may impact the stability of landforms and structures, sedimentation and increase the turbidity of waterways, potentially impacting adversely on ecological and human receptors, and cultural heritage sites (where present).
- Potential impacts from ASS – areas in the vicinity of waterbodies and water courses within the Project area have been noted to have a high potential to produce ASS. If ASS are not managed properly, construction activities may cause acidification and contamination of environmental receptors, surrounding soils, surface waters and groundwater, as well as the mobilisation of further contaminants due to the acidification of the surrounding environment.
- Potential impacts from salinity – areas within the Project area have been noted to have a high potential for land salinity, and a moderate overall salinity hazard. However, based on the proposed scope, and groundwater assessment undertaken by Jacobs (2022a) the groundwater table and associated salinity is unlikely to be impacted by construction activities.

It is not expected that operational activities will impact significantly on the surrounding environmental and human receptors. It is also not expected that the aforementioned AEIs will impact significantly on the Project during the operational phase.

Potential impacts to the Project and to surrounding environmental and human receptors were classified as very low and low, therefore mitigation measures recommended are as follows:

- Construction throughout the Project area would be managed in accordance with the CEMP. This plan will include the implementation of an unexpected finds procedure
- As a site inspection has not been completed as part of this investigation, a visual inspection must be completed when the final construction footprint is known. The inspection can be completed by any person with knowledge of the unexpected finds protocol, prior to the commencement of excavation works associated with construction to ensure no obvious signs of contamination are present where works are to occur (i.e. staining, fly-tipped waste, odours etc.). Should indicators of contamination be observed during the site inspection/s, the unexpected finds procedure must be followed:
    - Indicators of contamination must be documented where found, and an appropriate sampling program designed
    - Sampling program will be implemented if indicators of contamination are identified, and a report on the existing contamination prepared
    - If contamination is present, further investigation, management and/or remediation will be required.
- For excavation work required as part of construction and/or operation within or adjacent to areas of high ASS potential as detailed in **Figure 4-6**, investigations will be undertaken to assess the presence of ASS or potential ASS (PASS). If ASS or PASS are identified during investigations, an appropriate ASS management plan will be developed and implemented prior to any excavation works to facilitate construction and/or operation are undertaken
- Should areas be upgraded to a moderate to very high contamination impact potential as a result of an unexpected find/s and subsequent investigation/s, additional measures will be implemented. These additional mitigation and management measures would be dependent on the outcomes from the subsequent investigations, such as the development of Remedial Action Plans (RAPs), involvement of an accredited Site Auditor, and issue of a SAS and SAR, and/or the development of an ASS Management Plan (ASSMP)
- Residual contamination (if present) and specific geological conditions (with the exception of ASS/PASS, if present) are unlikely to impact on the operation of the Project. The management of minor spills, leaks, chemical storage and exposure to residual contamination (if present) during operation of the Project would be managed in accordance with the Project specific operational environmental management plan.

References

ASRIS. 2013. *Australian Soil Resource Information System*. [online] Available at: http://www.asris.csiro.au/mapping/viewer.html.

Bureau of Meteorology 2022, *Australian Groundwater Explorer*, accessed at http://www.bom.gov.au/water/groundwater/explorer/map.shtml in May 2022.

DPE, 2022a. *Types of salinity and their prevention*. [online] Available at: https://www.environment.nsw.gov.au/topics/land-and-soil/soil-degradation/salinity/type-of-salinity-and-their-prevention

Department of Planning and Environment, Division of Resources and Geoscience (DPE) 2022b. *MinView*. State of New South Wales through Regional NSW 2021. Available at: https://minview.geoscience.nsw.gov.au/#/?lon=145.6624&lat=-35.04205&z=10&bm=bm3&l=ge611:n:100,ge610:n:100,ge69:n:100,ge68:n:100,ge67:n:100,ge66:n:100,ge65:n:100,ge64:n:100,ge63:n:100,ge62:n:100,ge61:n:100,ge612:y:100,hi1:n:25,wa1:y:100,ut1:y:50,ad0:y:100

DPIE, 2019. *Acid Sulfate Soils.* [online]. Available at: https://www.environment.nsw.gov.au/topics/land-and-soil/soil-degradation/acid-sulfate-soils#:~:text=and%20Shoalhaven%20rivers.-,Inland,means%20living%20without%20air)%20conditions.

DPIE, 2021. *Cumulative Impact Assessment Guidelines for State Significant Projects*. [online]. Available at: https://www.planning.nsw.gov.au/-/media/Files/DPE/Guidelines/Policy-and-legislation/SSPT-Guidelines/GD1259-RAF-Assessing-Cumulative-Impacts-Guide-final.pdf

DPIE, 2022. *eSPADE*. State of NSW and Department of Planning, Industry and Environment. Available at: https://www.environment.nsw.gov.au/eSpade2Webapp#

Jacobs, 2022a. Yanco Delta Wind Farm, Surface Water Quality and Groundwater Technical Report.

Jacobs, 2022b. Yanco-Delta Wind Farm Project, Geotechnical Investigations Report.

Office of Environment and Heritage, 2010. *Reconnaissance Soil and Land Resources of the Murray Catchment*, NSW Office of Environment and Heritage, Sydney. Available at: https://datasets.seed.nsw.gov.au/dataset/reconnaissance-soil-and-land-resources-of-the-murray-catchment

Stone, Y., Ahern, C. and Blunden, B., 1998. *Acid Sulfate Soils Manual 1998*. [online] Wollongbar: Acid Sulfate Soil Management Advisory Committee. Available at: https://www.environment.nsw.gov.au/resources/epa/Acid-Sulfate-Manual-1998.pdf.

VIC EPA, 2009. Acid Sulfate Soil and Rock (655.1). [online] Available at: https://www.epa.vic.gov.au/about-epa/publications/655-1

Appendix A. Historical Aerial Review

Year	Section of Site	Site Observation	Surrounding Areas
1958 (b/w)	Part 2 - East of Yanco Creek, encompassing Wilson Rd and Milthorpe Lane	Largely cleared agricultural land with large pockets of vegetation lining Yanco Creek, and large areas of scattered vegetation throughout. Evidence of water in creek. Evidence of grazing/farming throughout and adjacent to Yanco Creek, small dwelling (pocket of buildings), dirt roads and associated farmland to the west of Yanco Creek.	Largely cleared agricultural land with large pockets of vegetation lining Yanco Creek. Large, cropped area adjacent to Yanco Creek on the western side, spreading into the south-east of the Project area.
	Part 3 - Approximately 5km north-west of Yanco Creek, surrounding Wilson Road and Moonbria Road	Largely cleared agricultural land with small pockets of vegetation. Cleared rectangular strip of land potentially indicating rural airstrip or area designated for electrical transmission at western edge of site area.	Largely cleared agricultural land with small pockets of vegetation. Small dwelling to the north of Project area.
	Part 4 - Adjacent/west of Part 3, along Moonbria Road	Largely cleared agricultural land with small pockets of vegetation. Evidence of farmed land with agricultural dwelling located approximately 1km north of Moonbria Road.	Largely cleared agricultural land with small pockets of vegetation.
	Part 7 - Immediately north of Part 5, approximately 1km east of Moonbria	Cleared agricultural land, small areas of scattered vegetation. Multiple small agricultural dwellings, evidence of cropping.	Cleared agricultural land.
	Part 13 – Adjacent to Wilson Road (west of), south of Delta Creek	Largely cleared agricultural land. Large potential historical quarry present approximately 1.2km to the west of Wilson Road, 3.5km south of Mabins Well Road, bordered by vegetation.	Largely cleared agricultural land.
	Part 14 – North of Delta Creek, 1km north of Mabins Well Road and directly west of Goolgumbla Road	Largely cleared agricultural land.	Largely cleared agricultural land.

Year	Section of Site	Site Observation	Surrounding Areas
	Part 15 - West of intersection of Wilson Road and McLennons Bore Road	Largely cleared agricultural land, with areas of vegetation.	Largely cleared agricultural land.
	Part 16 - East of Pooginook Road and Goolgumbla Road	Largely cleared agricultural land.	Largely cleared agricultural land.
	Part 17 - South of Yanco Creek	Largely cleared agricultural land.	Largely cleared agricultural land. Area of vegetation surrounding Yanco Creek.
	Part 18 - South of Part 17	Largely cleared agricultural land.	Largely cleared agricultural land.
1961 (b/w)	Part 5 - Approximately 2.5km south-east of Moonbria	Cleared agricultural land, small dwelling in south-west of site area.	Cleared agricultural land. Two large defined areas of lower elevation, potentially impacted by water - arid vegetation present.
	Part 6 - Moonbria road, adjacent/west of Part 5	Cleared agricultural land. Large area of lower elevation to the north of Moonbria Road - potentially impacted by water, arid vegetation present.	Largely cleared agricultural land.
1964 (b/w)	Part 1 - North of Yanco Creek, south of Liddles Lane	Largely unchanged.	Largely unchanged.
	Part 2 - East of Yanco Creek, encompassing Wilson Rd and Milthorpe Lane	Largely unchanged with some additional dwellings.	Largely unchanged.
	Part 3 - Approximately 5km north-west of Yanco Creek, surrounding Wilson Road, Moonbria Road and Liddles Lane	Largely unchanged. Addition of multiple new small dams.	Largely unchanged. An area of semi-sparse vegetation is present to the north of the eastern corner of the Project area, not visible in previous image. Evidence of erosion to the north and west of vegetation (eroding dam).
	Part 4 - Adjacent/west of Part 3, along Moonbria Road	Largely unchanged. Small area of erosion in the northernmost area of site - possible indication of early dam construction.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
	Part 5 - Approximately 2.5km south-east of Moonbria	Largely unchanged.	Largely unchanged.
	Part 6 - Moonbria Road, adjacent/west of Part 5	Largely unchanged.	Largely unchanged.
	Part 16 - East of Pooginook Road and Goolgumbla Road	Largely unchanged.	Largely unchanged.
	Part 17 - South of Yanco Creek	Largely unchanged.	Largely unchanged.
	Part 18 - South of Part 17	Largely unchanged.	Largely unchanged.
1967 (b/w)	Part 9 - South of Delta Creek, approximately 2km north-west of Moonbria	Largely cleared agricultural land. Delta Creek largely empty. Rural dwelling and associated infrastructure. Evidence of farming.	Largely cleared agricultural land.
	Part 10 – North of Delta Creek, intersected by Mabins Well Road and to the west of Carrathool Road, approximately 5km north-west of Moonbria	Largely cleared agricultural land. Farmed land.	Largely cleared agricultural land with evidence of farming.
	Part 11 - Approximately 3.5km north of Delta Creek, on Mabins Well Road	Largely cleared agricultural land.	Largely cleared agricultural land
	Part 12 - South of Mabins Well Road, 2km west of Wilson Road	Largely cleared agricultural land.	Largely cleared agricultural land.
	Part 15 - West of intersection of Wilson Road and McLennons Bore Road	Largely unchanged.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
1968 (b/w)	Part 7 - Immediately north of Part 5, approximately 1km east of Moonbria	Largely unchanged.	Largely unchanged.
	Part 8 - Immediately west of Part 7, Moonbria	Largely cleared agricultural land, dwellings and associated farmland infrastructure just west of Moonbria Road, evidence of cropping, several small dams.	Largely cleared agricultural land, multiple small dams.
1970 (b/w)	Part 9 - South of Delta Creek, approximately 2km north-west of Moonbria	Largely unchanged.	Largely unchanged. Dam visible approximately 1km north of Moonbria Road, in later aerials (1996+) this dam appears more like a quarry.
	Part 10 – North of Delta Creek, intersected by Mabins Well Road and to the west of Carrathool Road, approximately 5km north-west of Moonbria	Largely unchanged.	Largely unchanged.
	Part 11 - Approximately 3.5km north of Delta Creek, on Mabins Well Road	Largely unchanged.	Largely unchanged.
	Part 12 - South of Mabins Well Road, 2km west of Wilson Road	Largely unchanged.	Largely unchanged.
	Part 14 – North of Delta Creek, 1km north of Mabins Well Road and directly west of Goolgumbla Road	Largely cleared agricultural land.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
1976 (b/w)	Part 1 - North of Yanco Creek, south of Liddles Lane. NB - only southern half of site visible	Largely unchanged.	Largely unchanged.
	Part 2 - East of Yanco Creek, encompassing Wilson Rd and Milthorpe Lane	Largely unchanged.	Largely unchanged.
	Part 3 - Approximately 5km north-west of Yanco Creek, surrounding Wilson Road, Moonbria Road and Liddles Lane	Largely unchanged.	Largely unchanged.
	Part 4 - Adjacent/west of Part 3, along Moonbria Road	Largely unchanged.	Largely unchanged.
	Part 5 - Approximately 2.5km south-east of Moonbria	Largely unchanged, updated technology used in aerial photos highlights potential areas of historical soaking.	Largely unchanged.
	Part 17 - South of Yanco Creek	Largely unchanged.	Largely unchanged.
	Part 18 - South of Part 17	Largely unchanged.	Largely unchanged.
	Part 6 - Moonbria Road, adjacent/west of Part 5 Note: only covers eastern half of the site area	Largely unchanged.	Largely unchanged.
	Part 7 - Immediately north of Part 5, approximately 1km east of Moonbria	Largely unchanged.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
	Part 8 - Immediately west of Part 7, Moonbria	Largely unchanged.	Largely unchanged.
	Part 9 - South of Delta Creek, approximately 2km north-west of Moonbria	Largely unchanged.	Largely unchanged.
	Part 13 – Adjacent to Wilson Road (west of), south of Delta Creek Note: only covers southern half of the site	Largely unchanged.	Largely unchanged.
	Part 15 - West of intersection of Wilson Road and McLennons Bore Road	Largely unchanged.	Largely unchanged.
	Part 17 - South of Yanco Creek	Largely unchanged.	Largely unchanged. Increased grazing activity south of the site.
	Part 18 - South of Part 17	Largely unchanged.	Largely unchanged.
1977 (b/w)	Part 16 - East of Pooginook Road and Goolgumbla Road	Largely unchanged, slight increase in cropping activity.	Largely unchanged.
1986 (b/w)	Part 1 - North of Yanco Creek, south of Liddles Lane	Increase in cropping/farming activities, numerous dams constructed. Additional small dwelling constructed just north of Yanco Creek. Some clearing of vegetation in vicinity of original dwelling.	Increase in vegetation surrounding Yanco Creek, additional dwelling constructed south-east of Project area.
	Part 2 - East of Yanco Creek, encompassing Wilson Rd and Milthorpe Lane	Largely unchanged.	Largely unchanged. Evidence of circular cropping/irrigation approximately 1km south of Project area

Year	Section of Site	Site Observation	Surrounding Areas
	Part 3 - Approximately 5km north-west of Yanco Creek, surrounding Wilson Road, Moonbria Road and Liddles Lane	Largely unchanged.	Largely unchanged.
	Part 4 - Adjacent/west of Part 3, along Moonbria Road Note: only southern third of site visible	Largely unchanged.	Largely unchanged.
	Part 6 - Moonbria Road, adjacent/west of Part 5	Largely unchanged.	Largely unchanged.
	Part 8 - Immediately west of Part 7, Moonbria	Largely unchanged.	Largely unchanged.
	Part 9 - South of Delta Creek, approximately 2km north-west of Moonbria	Largely unchanged.	Largely unchanged.
	Part 10 – North of Delta Creek, intersected by Mabins Well Road and to the west of Carrathool Road, approximately 5km north-west of Moonbria	Largely unchanged.	Largely unchanged.
	Part 13 – Adjacent to Wilson Road (west of), south of Delta Creek	Largely unchanged.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
	Part 14 – North of Delta Creek, 1km north of Mabins Well Road and directly west of Goolgumbla Road	Largely unchanged.	Largely unchanged.
	Part 15 - West of intersection of Wilson Road and McLennons Bore Road	Largely unchanged.	Largely unchanged.
	Part 16 - East of Pooginook Road and Goolgumbla Road Note: only small south eastern corner visible	Largely unchanged.	Largely unchanged.
	Part 17 - South of Yanco Creek	Largely unchanged.	Largely unchanged.
	Part 18 - South of Part 17	Largely unchanged.	Largely unchanged.
1991 (b/w)	Part 1 - North of Yanco Creek, south of Liddles Lane	Largely unchanged.	Largely unchanged.
	Part 3 - Approximately 5km north-west of Yanco Creek, surrounding Wilson Road, Moonbria Road and Liddles Lane	Largely unchanged. Small amount of clearing in pockets of vegetation.	Largely unchanged.
	Part 4 - Adjacent/west of Part 3, along Moonbria Road	Largely unchanged.	Largely unchanged.
	Part 5 - Approximately 2.5km south-east of Moonbria	Largely unchanged.	Largely unchanged.
	Part 6 - Moonbria Road, adjacent/west of Part 5	Largely unchanged. Several small dams constructed.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
	Part 7 - Immediately north of Part 5, approximately 1km east of Moonbria	Largely unchanged.	Largely unchanged.
	Part 8 - Immediately west of Part 7, Moonbria	Largely unchanged.	Largely unchanged.
	Part 9 - South of Delta Creek, approximately 2km north-west of Moonbria	Largely unchanged.	Largely unchanged.
	Part 10 – North of Delta Creek, intersected by Mabins Well Road and to the west of Carrathool Road, approximately 5km north-west of Moonbria	Largely unchanged	Largely unchanged
	Part 11 - Approximately 3.5km north of Delta Creek, on Mabins Well Road	Largely unchanged	Largely unchanged
	Part 12 - South of Mabins Well Road, 2km west of Wilson Road	Largely unchanged.	Largely unchanged.
	Part 13 - Adjacent to Wilson Road (west of), south of Delta Creek	Largely unchanged. Increase in farming activity.	Largely unchanged.
	Part 15 - West of intersection of Wilson Road and McLennons Bore Road	Largely unchanged. Increase in cropping activity.	Largely unchanged.
1993 (colour)	Part 16 - East of Pooginook Road and Goolgumbla Road	Largely unchanged.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
1996 (colour)	Part 1 - North of Yanco Creek, south of Liddles Lane	Additional dwelling constructed approximately 1.5km north of original dwelling. Additional dams constructed.	Largely unchanged.
	Part 2 - East of Yanco Creek, encompassing Wilson Rd and Milthorpe Lane	Largely unchanged. Wilson Road asphalted.	Largely unchanged.
	Part 3 - Approximately 5km north-west of Yanco Creek, surrounding Wilson Road, Moonbria Road and Liddles Lane	Largely unchanged.	Largely unchanged.
	Part 5 - Approximately 2.5km south-east of Moonbria	Largely unchanged.	Largely unchanged.
	Part 6 - Moonbria Road, adjacent/west of Part 5	Largely unchanged.	Largely unchanged.
	Part 7 - Immediately north of Part 5, approximately 1km east of Moonbria	Largely unchanged.	Largely unchanged. Moderate size dam constructed east of the Project area, just north of Moonbria Road.
	Part 8 - Immediately west of Part 7, Moonbria	Largely unchanged.	Largely unchanged.
	Part 9 - South of Delta Creek, approximately 2km north-west of Moonbria	Largely unchanged.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
	Part 10 – North of Delta Creek, intersected by Mabins Well Road and to the west of Carrathool Road, approximately 5km north-west of Moonbria	Largely unchanged. Evidence of irrigation and farming.	Largely unchanged
	Part 11 - Approximately 3.5km north of Delta Creek, on Mabins Well Road	Largely unchanged. Area of cropping and irrigation just south of Mabins Well Road	Largely unchanged.
	Part 12 - South of Mabins Well Road, 2km west of Wilson Road	Largely unchanged.	Largely unchanged.
	Part 13 - Adjacent to Wilson Road (west of), south of Delta Creek	Largely unchanged.	Largely unchanged.
	Part 14 – North of Delta Creek, 1km north of Mabins Well Road and directly west of Goolgumbla Road	Largely unchanged, with the exception of an area of cropping land established.	Largely unchanged.
	Part 15 - West of intersection of Wilson Road and McLennons Bore Road	Largely unchanged, with the exception of an irrigation dam established.	Largely unchanged.
	Part 16 - East of Pooginook Road and Goolgumbla Road	Largely unchanged.	Largely unchanged.
	Part 17 - South of Yanco Creek	Largely unchanged. Area of erosion or bare earth to the south of the site.	Largely unchanged. Areas of erosion.
	Part 18 - South of Part 17	Largely unchanged. Areas of erosion or bare earth to the north of the site.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
2012 (colour)	Part 1 - North of Yanco Creek, south of Liddles Lane	Largely unchanged, increase in tracks throughout landscape.	Largely unchanged.
	Part 2 - East of Yanco Creek, encompassing Wilson Rd and Milthorpe Lane	Largely unchanged.	Largely unchanged. Increase in irrigation and cropping south-east of Project area.
	Part 3 - Approximately 5km north-west of Yanco Creek, surrounding Wilson Road, Moonbria Road and Liddles Lane	Largely unchanged.	Largely unchanged.
	Part 17 - South of Yanco Creek	Largely unchanged with an increase in erosion and farming activity – dams established. Vineyard established.	Largely unchanged, with increase in farming and cropping activity. Vineyard established 2.5km south of the site.
	Part 18 - South of Part 17 (skewed colour gradient, difficult to discern accurate colours/details)	Increase in farming activity, vineyard established.	Largely unchanged.
2013 (colour) NB - colour gradient is skewed, difficult to discern accurate colours/details	Part 5 - Approximately 2.5km south-east of Moonbria	Largely unchanged.	Largely unchanged.
	Part 7 - Immediately north of Part 5, approximately 1km east of Moonbria	Largely unchanged.	Largely unchanged.
	Part 14 – North of Delta Creek, 1km north of Mabins Well Road and directly west of Goolgumbla Road	Increase in cropping land. Aerial unclear.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
2015 (colour)	Part 6 - Moonbria Road, adjacent/west of Part 5	Largely unchanged.	Largely unchanged.
2018 (colour)	Part 17 - South of Yanco Creek	Largely unchanged.	Largely unchanged.
	Part 18 - South of Part 17 (skewed colour gradient, difficult to discern accurate colours/details)	Largely unchanged.	Largely unchanged.
2020 (colour)	Part 5 - Approximately 2.5km south-east of Moonbria	Largely unchanged	Largely unchanged
	Part 6 - Moonbria Road, adjacent/west of Part 5	Largely unchanged.	Largely unchanged. Cropped area immediately west of site area.
	Part 7 - Immediately north of Part 5, approximately 1km east of Moonbria	Largely unchanged.	Largely unchanged.
	Part 8 - Immediately west of Part 7, Moonbria	Largely unchanged.	Largely unchanged. Large area of cropping established to the west of northern extent of site area. Evidence of erosion within this area.
	Part 9 - South of Delta Creek, approximately 2km north-west of Moonbria	Largely unchanged with an increase in vegetation. Increase in cropping activity.	Largely unchanged.
	Part 11 - Approximately 3.5km north of Delta Creek, on Mabins Well Road	Increase in cropping activity.	Largely unchanged, slight increase in cropping activity.
	Part 12 - South of Mabins Well Road, 2km west of Wilson Road	Largely unchanged.	Largely unchanged.

Year	Section of Site	Site Observation	Surrounding Areas
	Part 16 - East of Pooginook Road and Goolgumbla Road	Largely unchanged, increase in farming activity around rural dwelling and associated infrastructure.	Largely unchanged.
2021 (colour)	Part 1 - North of Yanco Creek, south of Liddles Lane	Largely unchanged	Largely unchanged
	Part 2 - East of Yanco Creek, encompassing Wilson Rd and Milthorpe Lane	Largely unchanged.	Largely unchanged.
	Part 3 - Approximately 5km north-west of Yanco Creek, surrounding Wilson Road, Moonbria Road and Liddles Lane	Largely unchanged.	Largely unchanged. New dwelling and associated infrastructure approximately 1.5km north of site area.
	Part 4 - Adjacent/west of Part 3, along Moonbria Road	Largely unchanged.	Largely unchanged.
	Part 13 - Adjacent to Wilson Road (west of), south of Delta Creek	Largely unchanged.	Largely unchanged.

Appendix B. Groundwater bore summary

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Salinity (mg/L)	SWL (mbgl)	Distance	Direction
10003902	GW021743	Stock and Domestic	Non-functional	Stock	-	0m	On-site
10005984	GW401592	Monitoring	Unknown	-	-	0m	On-site
10006591	GW030959	Irrigation	Unknown	-	-	0m	On-site
10008097	GW005735	Monitoring	Functional	Good Stock	21.9	921m	East
10008343	GW012526	Stock and Domestic	Functioning	-	-	0m	On-site
10009322	GW006121	Monitoring	Functional	Brackish	-	695m	East
10012492	GW401105	Stock and Domestic	Functioning	-	18	0m	On-site
10013461	GW500968	Unknown	Unknown	-	-	0m	On-site
10013914	GW012530	Stock and Domestic	Unknown	-	-	0m	On-site
10014629	GW404533	Stock and Domestic	Functioning	-	16	0m	On-site
10015999	GW401077	Unknown	Abandoned	-	-	0m	On-site
10016949	GW016841	Monitoring	Functional	Good	-	0m	On-site
10018023	GW069100	Monitoring	Functional	1001-3000 ppm	16.2	0m	On-site
10020019	GW017783	Stock and Domestic	Unknown	Very Good	-	0m	On-site
10020404	GW050058	Stock and Domestic	Non-functional	1001-3000 ppm	-	0m	On-site

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Salinity (mg/L)	SWL (mbgl)	Distance	Direction
10021748	GW015806	Stock and Domestic	Unknown	-	-	384m	South East
10022471	GW500964	Irrigation	Unknown	-	26.2	0m	On-site
10022620	GW056003	Stock and Domestic	Unknown	1001-3000 ppm	-	0m	On-site
10026827	GW505660	Water Supply	Unknown	200	27	0m	On-site
10027151	GW504942	Stock and Domestic	Functioning	-	21	0m	On-site
10027682	GW504597	Stock and Domestic	Functioning	1400	18	0m	On-site
10028019	GW400022	Monitoring	Functional	-	-	442m	East
10029641	GW504596	Stock and Domestic	Functioning	1600	18	0m	On-site
10033667	GW022389	Monitoring	Functional	-	-	718m	East
10034322	GW012864	Stock and Domestic	Decommissioned	-	-	544m	North East
10036744	GW012527	Stock and Domestic	Functioning	-	-	384m	South East
10037181	GW028134	Stock and Domestic	Unknown	Stock	-	0m	On-site
10037380	GW021876	Monitoring	Functional	Good	-	762m	North East
10037738	GW010437	Water Supply	Unknown	-	-	0m	On-site
10038337	GW027399	Stock and Domestic	Unknown	Good Stock	-	0m	On-site

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Salinity (mg/L)	SWL (mbgl)	Distance	Direction
10038483	GW018406	Stock and Domestic	Unknown	-	-	191m	South East
10040118	GW055642	Stock and Domestic	Unknown	0-500 ppm	-	0m	On-site
10042263	GW004966	Stock and Domestic	Functional	Good	-	0m	On-site
10042294	GW055541	Stock and Domestic	Unknown	501-1000 ppm	-	0m	On-site
10042839	GW504687	Water Supply	Functioning	good	22	395m	North West
10043599	GW504552	Stock and Domestic	Functioning	-	18	0m	On-site
10044631	GW402608	Unknown	Unknown	-	-	940m	South East
10047946	GW501831	Water Supply	Unknown	-	-	0m	On-site
10049550	GW413978	Stock and Domestic	Functioning	-	20	822m	East
10050409	GW415941	Stock and Domestic	Functioning	-	19	105m	South East
10053436	GW500974	Irrigation	Removed	-	-	0m	On-site
10055004	GW416754	Stock and Domestic	Unknown	-	0	0m	On-site
10057270	GW017204	Stock and Domestic	Unknown	-	-	0m	On-site
10058196	GW012535	Stock and Domestic	Functioning	-	-	0m	On-site
10061790	GW500971	Irrigation	Removed	-	-	0m	On-site

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Salinity (mg/L)	SWL (mbgl)	Distance	Direction
10062802	GW012863	Monitoring	Functional	-	-	751m	North East
10067472	GW404535	Stock and Domestic	Functioning	-	16	433m	East
10068348	GW504598	Stock and Domestic	Functioning	-	-	0m	On-site
10069200	GW011206	Stock and Domestic	Unknown	-	-	0m	On-site
10070687	GW400787	Water Supply	Unknown	Good	10	0m	On-site
10071007	GW012529	Stock and Domestic	Functioning	-	-	0m	On-site
10071598	GW027400	Stock and Domestic	Unknown	Good Stock	-	0m	On-site
10072574	GW504920	Stock and Domestic	Functioning	-	-	197m	East
10074770	GW060954	Stock and Domestic	Unknown	1001-3000 ppm	-	0m	On-site
10074934	GW063528	Stock and Domestic	Unknown	1001-3000 ppm	-	0m	On-site
10075514	GW504943	Stock and Domestic	Functioning	-	-	0m	On-site
10075920	GW401137	Stock and Domestic	Functioning	-	-	564m	East
10076631	GW054830	Exploration	Proposed	Very Good	-	0m	On-site
10077516	GW047719	Irrigation	Unknown	-	-	0m	On-site
10077796	GW401702	Irrigation	Abandoned	-	-	978m	North

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Salinity (mg/L)	SWL (mbgl)	Distance	Direction
10078373	GW400006	Unknown	Unknown	-	-	0m	On-site
10079441	GW012895	Monitoring	Functional	-	-	0m	On-site
10081822	GW011053	Water Supply	Unknown	Good	-	0m	On-site
10083573	GW030946	Irrigation	Unknown	-	-	0m	On-site
10086699	GW012531	Stock and Domestic	Functioning	-	-	0m	On-site
10087971	GW051060	Stock and Domestic	Unknown	Good	-	0m	On-site
10088806	GW505673	Stock and Domestic	Functioning	800	22	0m	On-site
10089203	GW012857	Monitoring	Functional	-	-	695m	East
10090474	GW050845	Unknown	Functioning	-	-	0m	On-site
10091141	GW505682	Stock and Domestic	Unknown	1400	21	0m	On-site
10092834	GW012532	Stock and Domestic	Decommissioned	-	-	98m	South East
10094046	GW504944	Stock and Domestic	Functioning	-	-	0m	On-site
10094176	GW049337	Water Supply	Unknown	501-1000 ppm	-	0m	On-site
10095052	GW012891	Monitoring	Functional	-	-	0m	On-site
10096496	GW010625	Monitoring	Functional	-	23.5	718m	East
10096943	GW504599	Stock and Domestic	Functioning	2000	18	0m	On-site

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Salinity (mg/L)	SWL (mbgl)	Distance	Direction
10098197	GW012525	Stock and Domestic	Functioning	-	-	846m	South East
10099116	GW504945	Stock and Domestic	Functioning	-	21	0m	On-site
10099505	GW056482	Stock and Domestic	Unknown	Good	-	0m	On-site
10101154	GW063601	Stock and Domestic	Functioning	Good	-	182m	East
10102602	GW401136	Monitoring	Functional	-	18	396m	East
10103937	GW045660	Stock and Domestic	Unknown	Stock	-	0m	On-site
10104018	GW049139	Water Supply	Unknown	1001-3000 ppm	-	0m	On-site
10104655	GW504414	Irrigation	Abandoned	-	-	0m	On-site
10105245	GW069099	Water Supply	Unknown	1001-3000 ppm	19.6	0m	On-site
10107217	GW026634	Stock and Domestic	Unknown	Fresh	-	98m	South East
10109732	GW033799	Stock and Domestic	Unknown	-	-	0m	On-site
10110110	GW045915	Monitoring	Functional	Stock	-	0m	On-site
10111027	GW021745	Stock and Domestic	Unknown	-	-	0m	On-site
10112207	GW023038	Stock and Domestic	Unknown	Good	-	544m	North East
10116708	GW011881	Stock and Domestic	Unknown	-	-	985m	South East

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Salinity (mg/L)	SWL (mbgl)	Distance	Direction
10116823	GW056467	Stock and Domestic	Unknown	501-1000 ppm	-	882m	South East
10121000	GW403747	Monitoring	Unknown	-	30	26m	North East
10121717	GW400379	Stock and Domestic	Unknown	390	-	0m	On-site
10122960	GW504134	Stock and Domestic	Functioning	1300	23	0m	On-site
10123044	GW405114	Water Supply	Functioning	300	29.9	0m	On-site
10124834	GW416368	Stock and Domestic	Functioning	700	23	0m	On-site
10124835	GW505577	Stock and Domestic	Functioning	450	27.7	0m	On-site
10125356	GW403746	Monitoring	Unknown	-	31.6	0m	On-site
10125790	GW403747	Unknown	Unknown	-	30	26m	North East
10127221	GW400533	Unknown	Unknown	150	12.9	292m	East
10128814	GW403747	Monitoring	Unknown	-	30	13m	North East
10129071	GW403746	Monitoring	Unknown	-	31.6	0m	On-site
10129659	GW403747	Unknown	Unknown	-	30	26m	North East
10130425	GW500469	Irrigation	Unknown	300	20	0m	On-site
10132173	GW505650	Stock and Domestic	Functioning	700	28	0m	On-site
10134388	GW400050	Monitoring	Functional	600	-	0m	On-site
10134462	GW403746	Unknown	Unknown	-	31.6	0m	On-site

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Salinity (mg/L)	SWL (mbgl)	Distance	Direction
10137814	GW501581	Water Supply	Unknown	1750	25.5	0m	On-site
10138144	GW039266	Stock and Domestic	Unknown	501-1000 ppm	-	0m	On-site
10142442	GW405115	Water Supply	Functioning	400	27.3	0m	On-site
10142699	GW039270	Exploration	Proposed	501-1000 ppm	-	0m	On-site
10142927	GW500504	Irrigation	Unknown	300	20	0m	On-site
10143187	GW505480	Stock and Domestic	Functioning	740	20.7	0m	On-site
10143620	GW021744	Stock and Domestic	Non-functional	3001-7000 ppm	-	0m	On-site
10144002	GW084103	Monitoring	Unknown	-	11.7	15m	South East
10146061	GW403746	Unknown	Unknown	-	31.6	0m	On-site
10146337	GW069098	Stock and Domestic	Unknown	400	-	0m	On-site
10146623	GW063047	Irrigation	Unknown	0-500 ppm	-	0m	On-site
10150237	GW403747	Unknown	Unknown	-	30	26m	North East
10150261	GW403746	Unknown	Unknown	-	31.6	0m	On-site
10150264	GW403747	Unknown	Unknown	-	30	26m	North East
10150291	GW403746	Unknown	Unknown	-	31.6	0m	On-site
10150756	GW506269	Monitoring	Functioning	-	-	472m	South West
10152253	GW505912	Stock and Domestic	Functioning	-	-	0m	On-site

NGIS Bore ID	NSW Bore ID	Bore Type	Status	Salinity (mg/L)	SWL (mbgl)	Distance	Direction
10152903	GW506176	Stock and Domestic	Functioning	-	-	638m	North West
10153769	GW506273	Monitoring	Unknown	-	-	615m	South West
10155620	GW506272	Monitoring	Functioning	-	-	296m	South West

Appendix C. LotSearch Report

LOTSEARCH

LOTSEARCH ENVIRO LITE

Date: 27 Apr 2022 16:28:06

Reference: LS031622 EL

Address: 1836 Mabins Well Road, Moonbria, NSW 2710

Dataset Listing

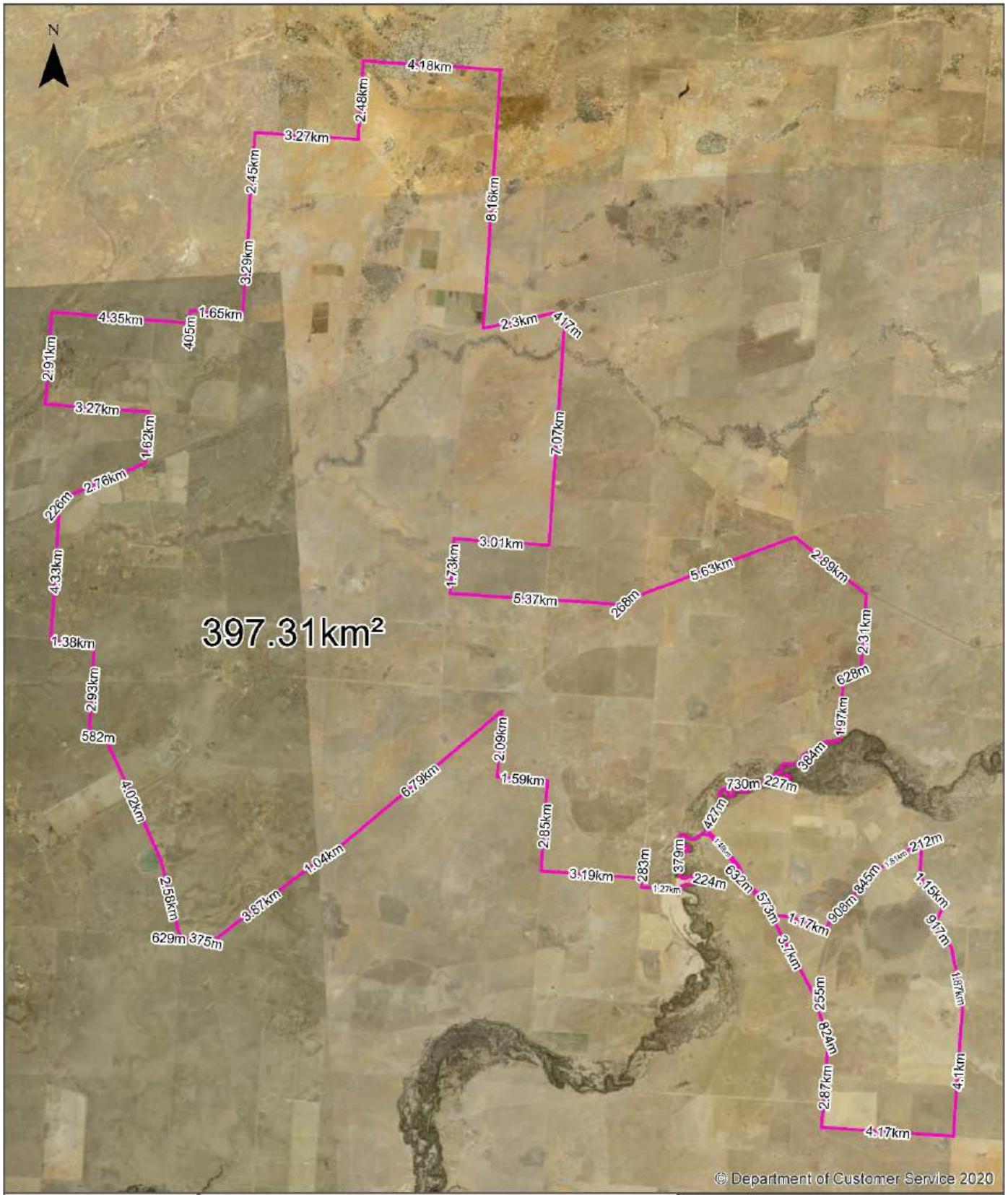
Datasets contained within this report, detailing their source and data currency:

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	06/04/2022	06/04/2022	Quarterly	-	-	-	-
Topographic Data	NSW Department of Customer Service - Spatial Services	25/06/2019	25/06/2019	Annually	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	19/04/2022	11/04/2022	Monthly	1000m	0	0	0
Contaminated Land Records of Notice	Environment Protection Authority	05/04/2022	05/04/2022	Monthly	1000m	0	0	0
Former Gasworks	Environment Protection Authority	02/03/2022	14/07/2021	Quarterly	1000m	0	0	0
National Waste Management Facilities Database	Geoscience Australia	12/05/2021	07/03/2017	Annually	1000m	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	15/02/2021	13/07/2012	Annually	1000m	0	0	0
EPA PFAS Investigation Program	Environment Protection Authority	28/03/2022	14/07/2021	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Department of Defence	06/04/2022	06/04/2022	Monthly	2000m	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Department of Defence	06/04/2022	06/04/2022	Monthly	2000m	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	06/04/2022	06/04/2022	Monthly	2000m	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Department of Defence	03/03/2022	03/03/2022	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	05/04/2022	05/04/2022	Monthly	1000m	0	0	0
Delicensed POEO Activities still regulated by the EPA	Environment Protection Authority	05/04/2022	05/04/2022	Monthly	1000m	0	0	0
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	05/04/2022	05/04/2022	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	0
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	19/08/2021	19/08/2021	Quarterly	1000m	11	11	14
Tanks (Areas)	NSW Department of Customer Service - Spatial Services	19/08/2021	19/08/2021	Quarterly	1000m	0	0	0
Tanks (Points)	NSW Department of Customer Service - Spatial Services	19/08/2021	19/08/2021	Quarterly	1000m	21	21	25
Major Easements	NSW Department of Customer Service - Spatial Services	19/08/2021	19/08/2021	Quarterly	1000m	3	4	4
State Forest	Forestry Corporation of NSW	25/02/2021	14/02/2021	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)	08/10/2014	17/03/2000	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	88	97	159

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	7	8	8
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	2	2	2
Environmental Planning Instrument Acid Sulfate Soils	NSW Department of Planning, Industry and Environment	06/04/2022	18/02/2022	Monthly	500m	0	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000m	3	3	3
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	20/04/2022	20/04/2022	Monthly	1000m	0	0	0
Mining Title Applications	NSW Department of Industry	20/04/2022	20/04/2022	Monthly	1000m	0	0	0
Historic Mining Titles	NSW Department of Industry	20/04/2022	20/04/2022	Monthly	1000m	20	20	20
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	2	2
Commonwealth Heritage List	Australian Government Department of the Agriculture, Water and the Environment	18/05/2021	20/11/2019	Annually	1000m	0	0	0
National Heritage List	Australian Government Department of the Agriculture, Water and the Environment	18/05/2021	20/11/2019	Annually	1000m	0	0	0
State Heritage Register - Curtilages	NSW Department of Planning, Industry and Environment	19/08/2021	25/06/2021	Quarterly	1000m	0	0	0
Environmental Planning Instrument Local Heritage	NSW Department of Planning, Industry and Environment	06/04/2022	25/03/2022	Monthly	1000m	0	0	0
Bush Fire Prone Land	NSW Rural Fire Service	26/04/2022	08/12/2021	Weekly	1000m	2	2	2
Native Vegetation of the Murray Catchment Management Authority	NSW Office of Environment & Heritage	19/02/2015	24/08/2011	As required	1000m	40	42	45
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	14/08/2017	15/05/2017	Annually	1000m	4	4	4
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000m	19	19	19
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	26/04/2022	26/04/2022	Weekly	10000m	-	-	-

Site Diagram

1836 Mabins Well Road, Moonbria, NSW 2710



Legend

- Site Boundary
- Internal Parcel Boundaries

Total Area: 397.31km²

Total Perimeter: 161km

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: 0 900 1,800 3,600 5,400 7,200 9,000 Meters

Data Sources: Aerial Imagery:
© NSW Department of Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 27 April 2022

Contaminated Land

1836 Mabins Well Road, Moonbria, NSW 2710

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

1836 Mabins Well Road, Moonbria, NSW 2710

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

1836 Mabins Well Road, Moonbria, NSW 2710

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

1836 Mabins Well Road, Moonbria, NSW 2710

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

1836 Mabins Well Road, Moonbria, NSW 2710

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

1836 Mabins Well Road, Moonbria, NSW 2710

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

EPA Activities

1836 Mabins Well Road, Moonbria, NSW 2710

Licensed Activities under the POEO Act 1997

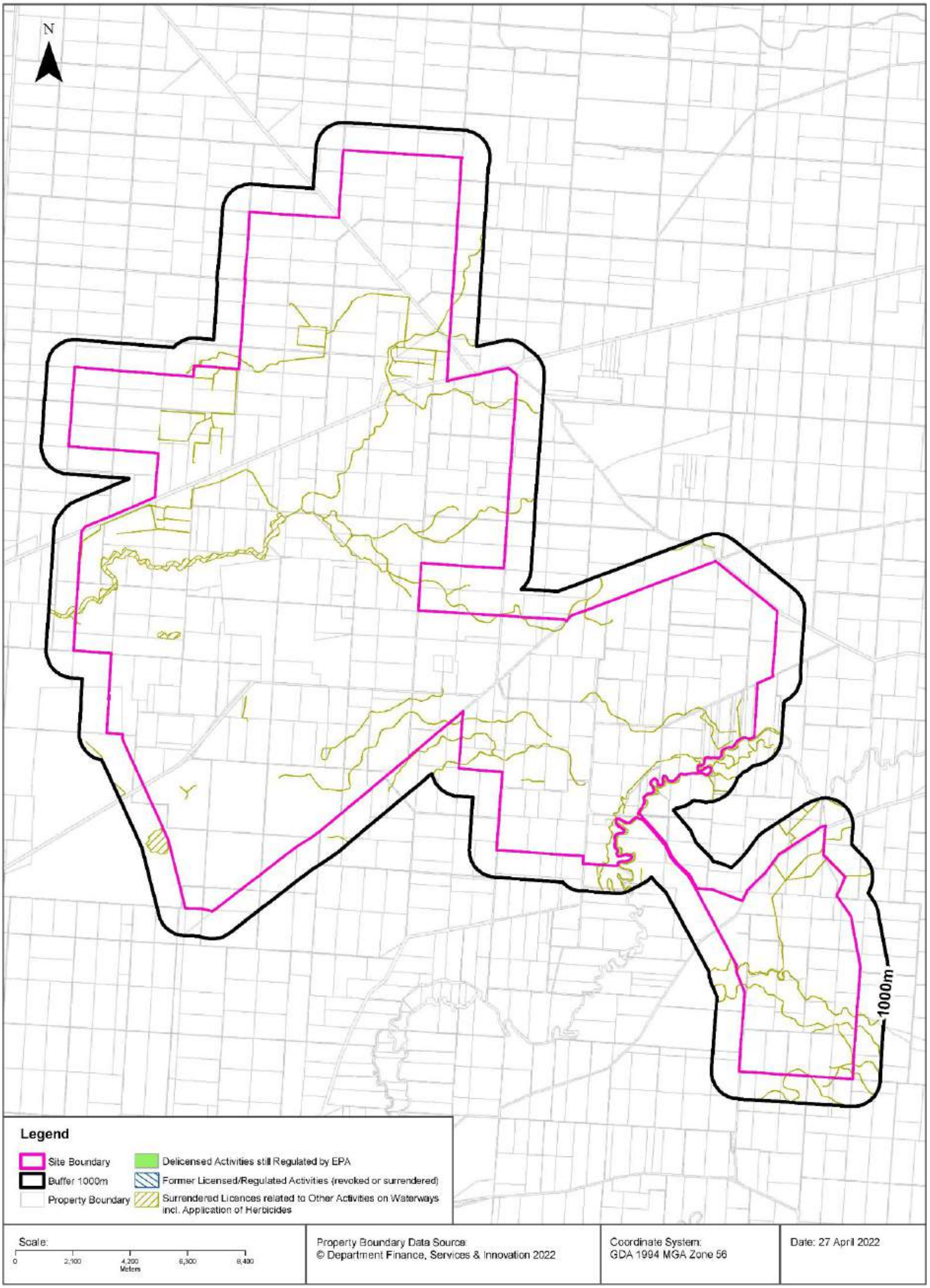
Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

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

POEO Licence Data Source: Environment Protection Authority

Delicensed & Former Licensed EPA Activities

1836 Mabins Well Road, Moonbria, NSW 2710



EPA Activities

1836 Mabins Well Road, Moonbria, NSW 2710

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

1836 Mabins Well Road, Moonbria, NSW 2710

Business Directory Records 1950-1991
Premise or Road Intersection Matches

Universal Business Directory records from years 1991, 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, 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
N/A	No records in buffer					

Historical Business Directories

1836 Mabins Well Road, Moonbria, NSW 2710

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						

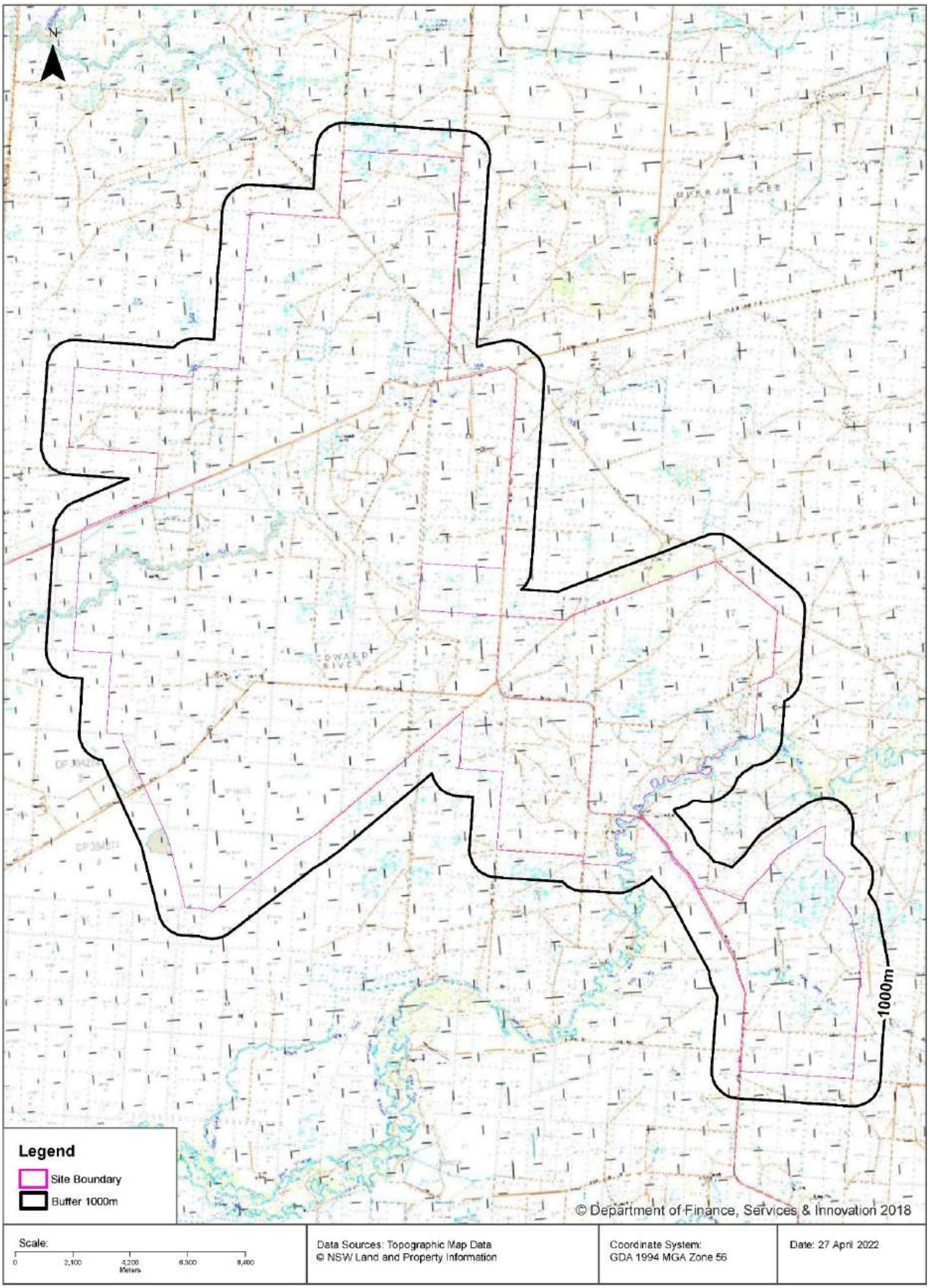
Dry Cleaners, Motor Garages & Service Stations
Road or Area Matches

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					

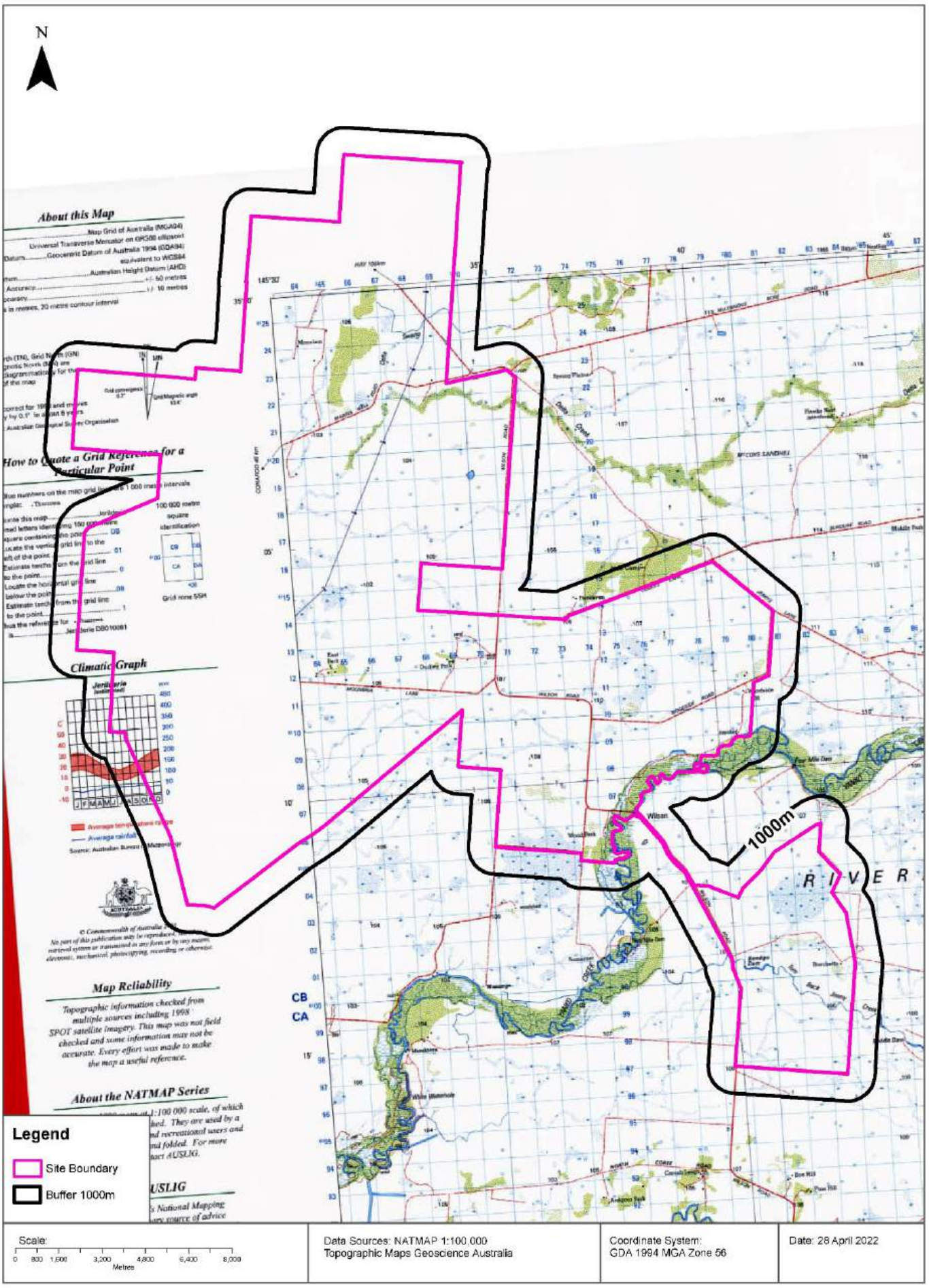
Topographic Map 2015

1836 Mabins Well Road, Moonbria, NSW 2710



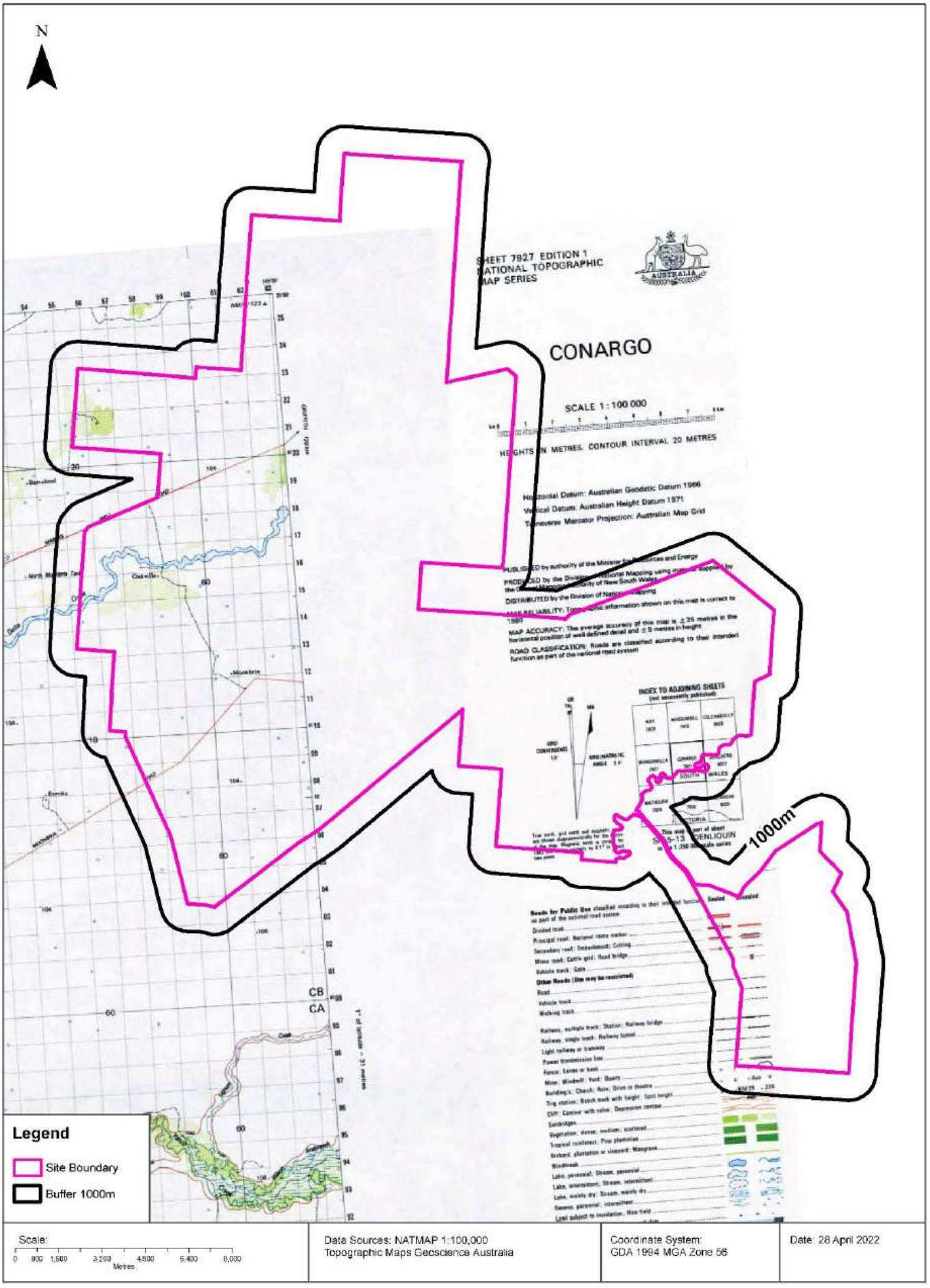
Historical Map 1998

1836 Mabins Well Road, Moonbria, NSW 2710



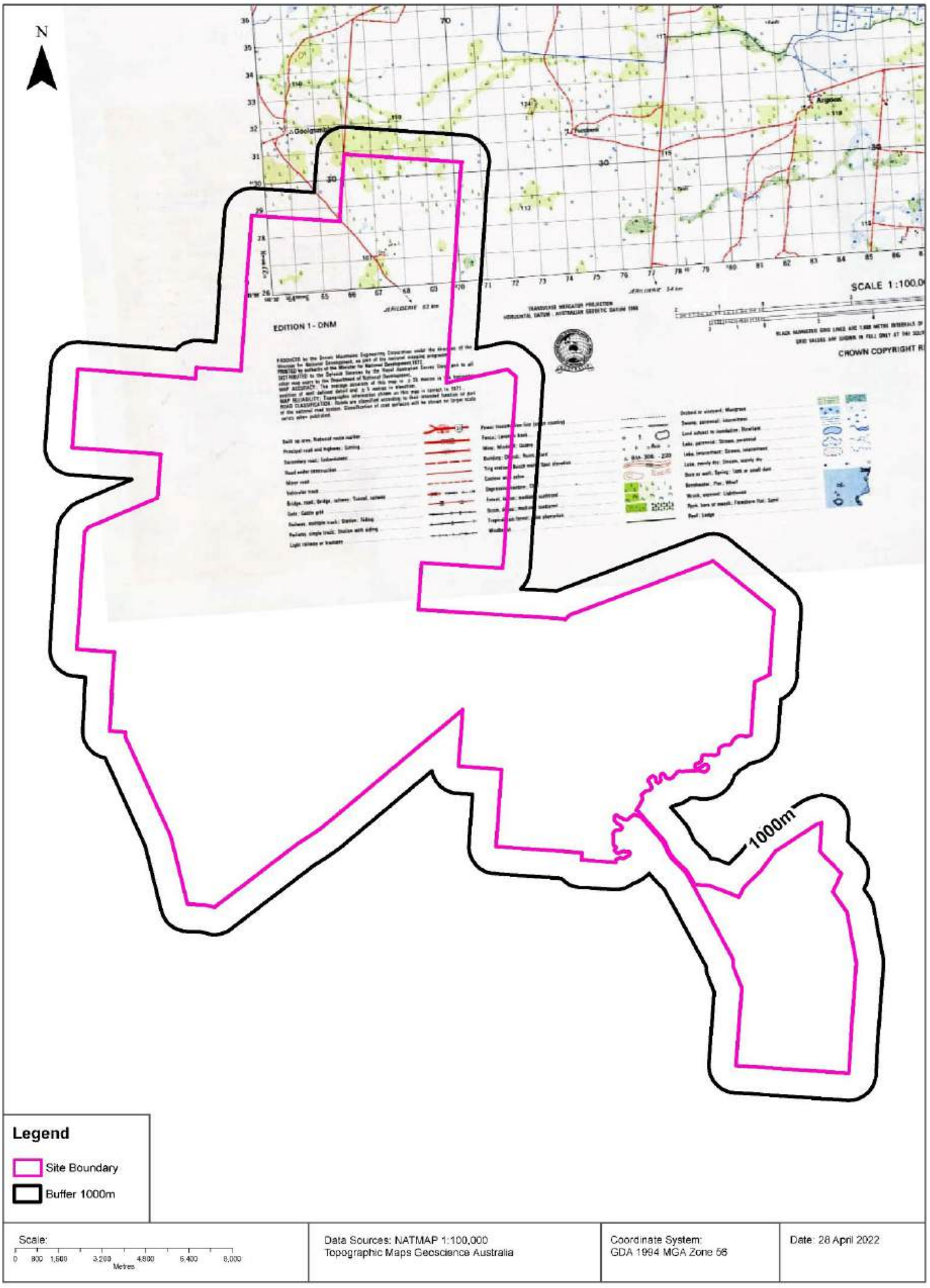
Historical Map 1980

1836 Mabins Well Road, Moonbria, NSW 2710



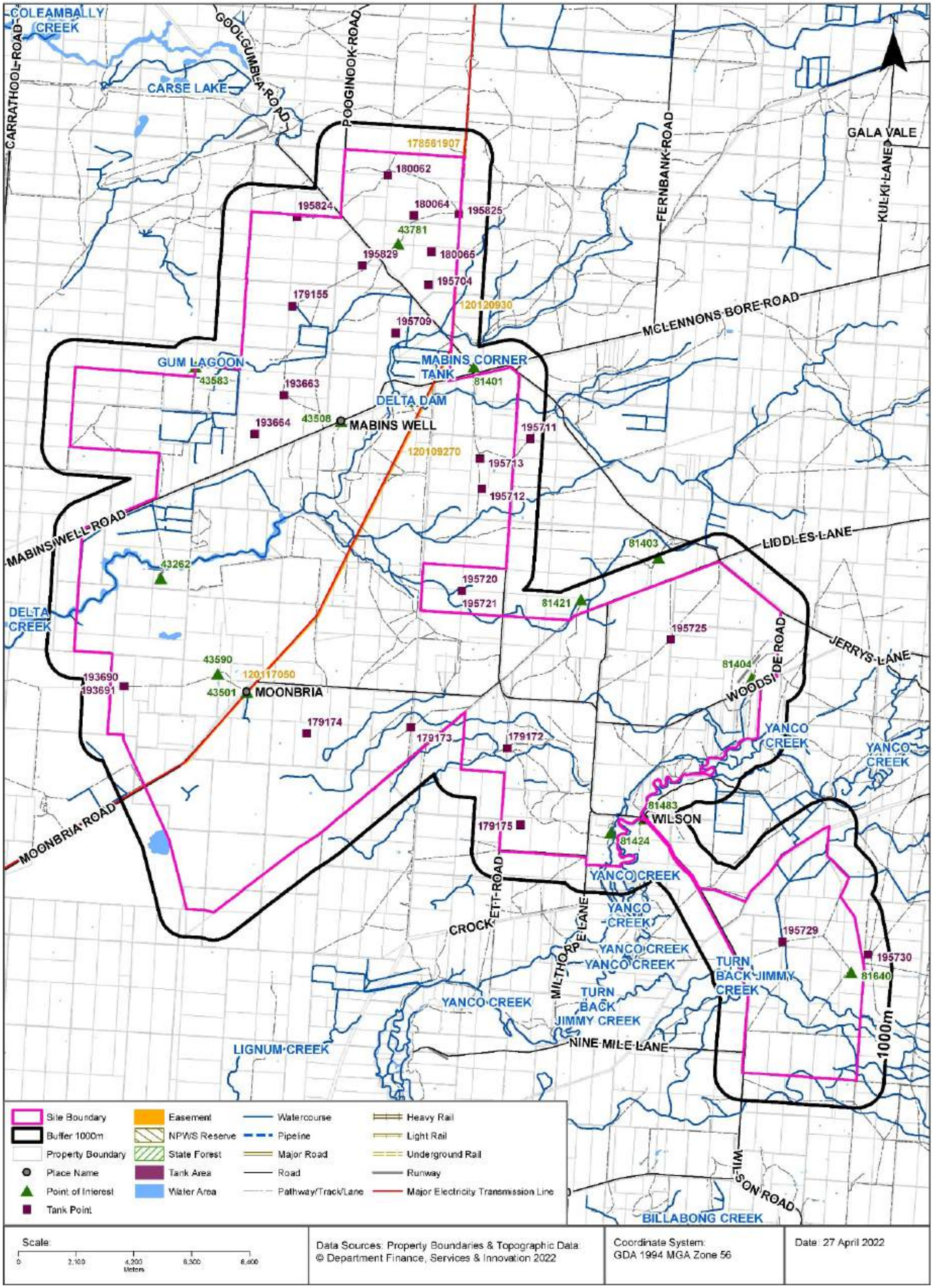
Historical Map 1972

1836 Mabins Well Road, Moonbria, NSW 2710



Topographic Features

1836 Mabins Well Road, Moonbria, NSW 2710



Topographic Features

1836 Mabins Well Road, Moonbria, NSW 2710

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
81483	Rural Place	WILSON	0m	On-site
43781	Homestead	DELTA	0m	On-site
43472	Manmade Waterbody	DELTA DAM	0m	On-site
43583	Natural Waterbody	GUM LAGOON	0m	On-site
43508	Locality	MABINS WELL	0m	On-site
43262	Homestead	OAKVILLE	0m	On-site
43501	Locality	MOONBRIA	0m	On-site
43590	Homestead	MOONBRIA	0m	On-site
81424	Homestead	WOOD PARK	0m	On-site
81404	Homestead	WOODSIDE	0m	On-site
81640	Homestead	BURCHETTS	0m	On-site
81401	Manmade Waterbody	MABINS CORNER TANK	314m	North
81421	Homestead	DUNRAVEN	469m	East
81403	Homestead	NEW CAMP	926m	East

Topographic Features

1836 Mabins Well Road, Moonbria, NSW 2710

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
179155	Water	Operational		01/01/2015	0m	On-site
179172	Water	Operational		01/01/2015	0m	On-site
179173	Water	Operational		01/01/2015	0m	On-site
179174	Water	Operational		01/01/2015	0m	On-site
179175	Water	Operational		01/01/2015	0m	On-site
180062	Water	Operational		01/12/2014	0m	On-site
180064	Water	Operational		01/12/2014	0m	On-site
180065	Water	Operational		01/12/2014	0m	On-site
193663	Water	Operational		01/12/2011	0m	On-site
193664	Water	Operational		01/12/2011	0m	On-site
193690	Water	Operational		01/12/2011	0m	On-site
193691	Water	Operational		01/12/2011	0m	On-site
195704	Water	Operational		01/01/2015	0m	On-site
195709	Water	Operational		01/01/2015	0m	On-site
195712	Water	Operational		01/01/2015	0m	On-site
195713	Water	Operational		01/01/2015	0m	On-site
195725	Water	Operational		01/01/2015	0m	On-site
195729	Water	Operational		01/01/2015	0m	On-site
195824	Water	Operational		01/12/2014	0m	On-site
195825	Water	Operational		01/12/2014	0m	On-site
195829	Water	Operational		01/12/2014	0m	On-site
195730	Water	Operational		01/01/2015	236m	South East
195711	Water	Operational		01/01/2015	561m	North East

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
195721	Water	Operational		01/01/2015	816m	East
195720	Water	Operational		01/01/2015	824m	East

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
120117050	Primary	Undefined		0m	On-site
120109270	Primary	Undefined		0m	On-site
120120930	Primary	Undefined		0m	On-site
178561907	Primary	Electricity	45m	41m	North

Topographic Features

1836 Mabins Well Road, Moonbria, NSW 2710

State Forest

What State Forest exist within the dataset buffer?

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

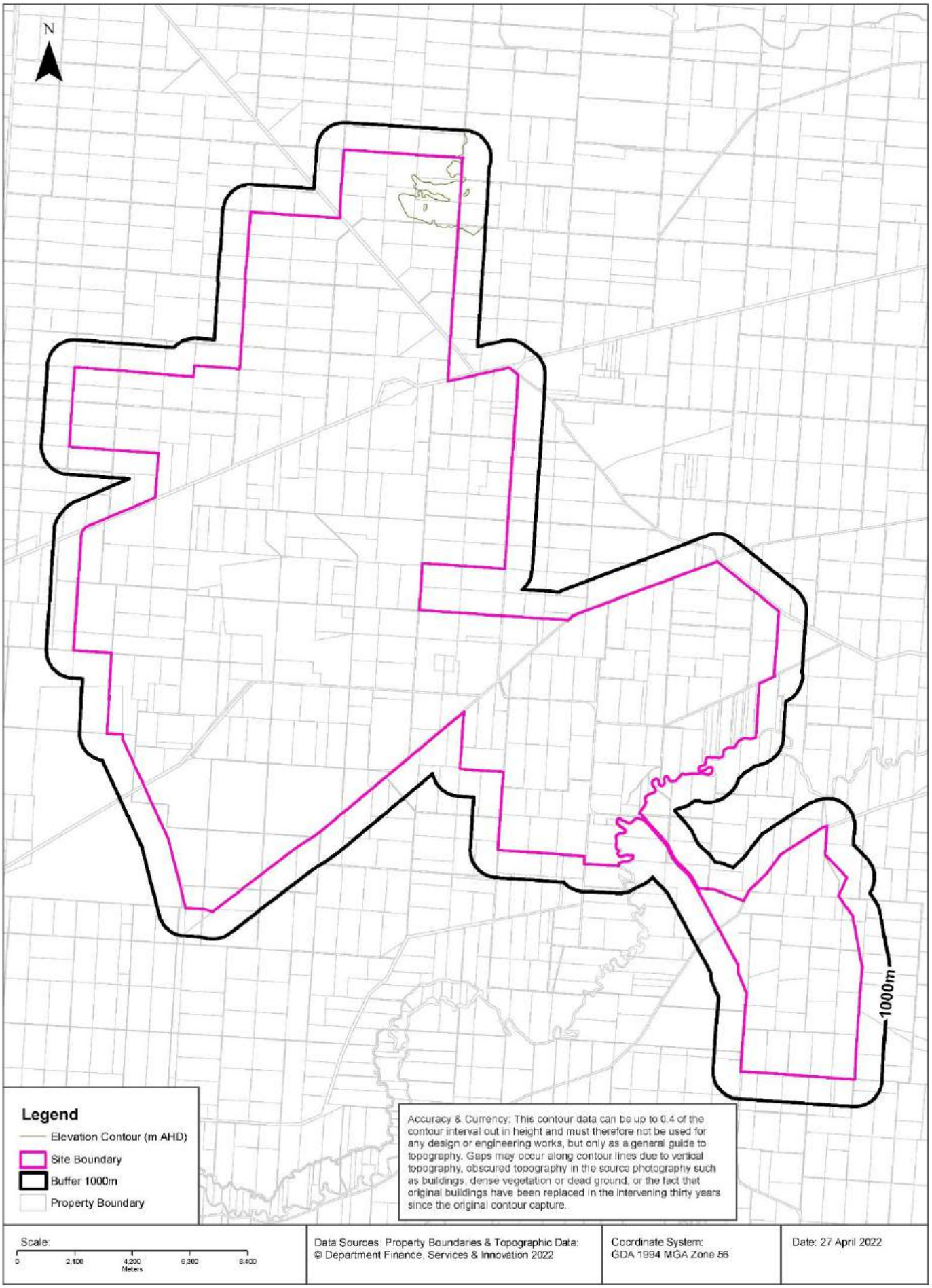
National Parks and Wildlife Service Reserves

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)

1836 Mabins Well Road, Moonbria, NSW 2710



Hydrogeology & Groundwater

1836 Mabins Well Road, Moonbria, NSW 2710

Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Porous, extensive highly productive aquifers	0m	On-site
Porous, 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

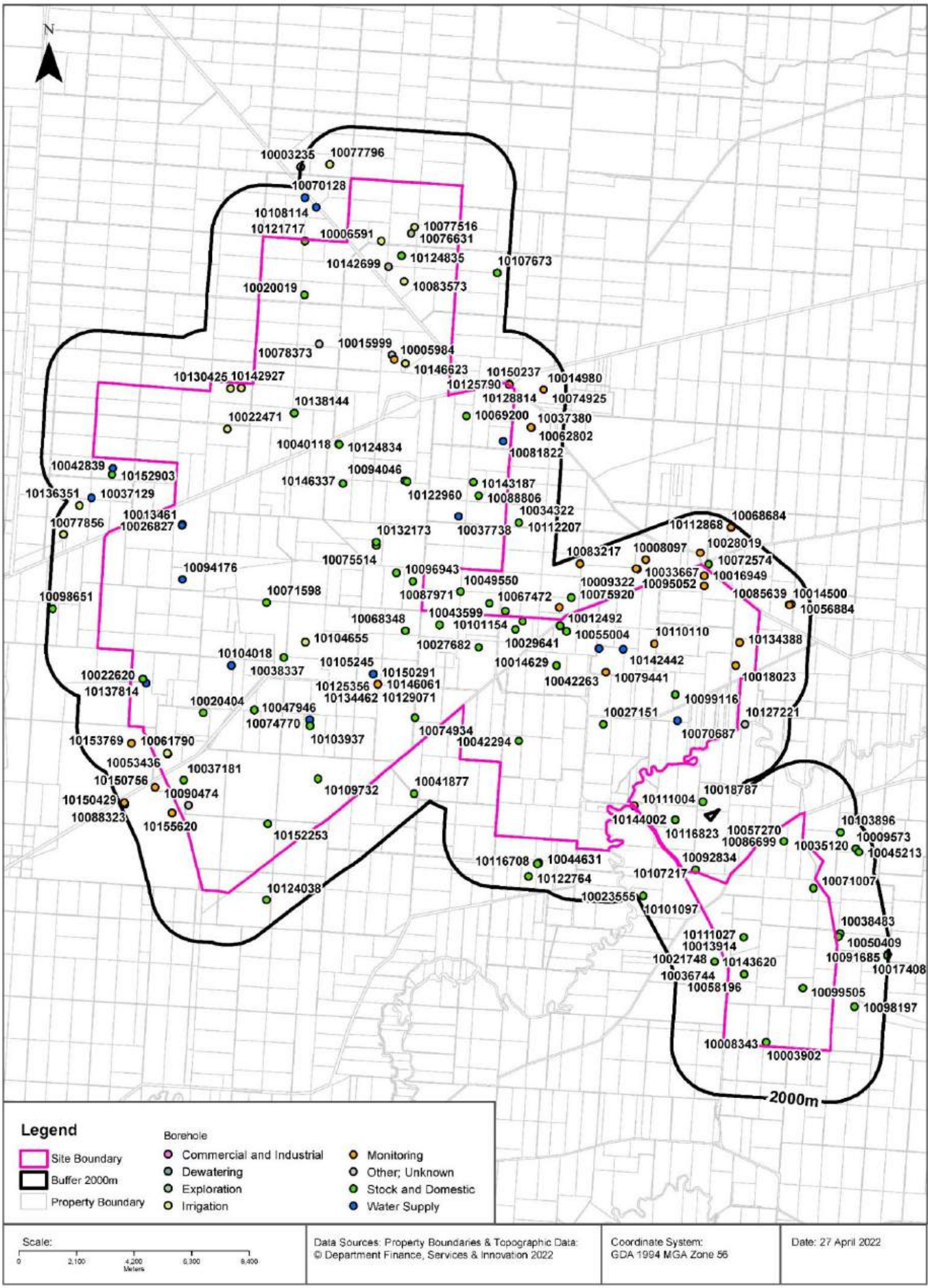
Temporary water restrictions relating to the Botany Sands aquifer within the dataset buffer:

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

1836 Mabins Well Road, Moonbria, NSW 2710



Hydrogeology & Groundwater

1836 Mabins Well Road, Moonbria, NSW 2710

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
10003902	GW021743	Stock and Domestic	Non-functional	01/08/1964	66.40		AHD	Stock			0m	On-site
10005984	GW401592	Monitoring	Unknown	23/10/2000	223.00		AHD				0m	On-site
10006591	GW030959	Irrigation	Unknown	01/11/1981			AHD				0m	On-site
10008343	GW012526	Stock and Domestic	Functioning	01/01/1909	43.90		AHD				0m	On-site
10012492	GW401105	Stock and Domestic	Functioning		30.00	107.97	AHD			18.00	0m	On-site
10013461	GW500968	Unknown	Unknown	27/11/1994	152.00		AHD				0m	On-site
10013914	GW012530	Stock and Domestic	Unknown	01/01/1908	41.80		AHD				0m	On-site
10014629	GW404533	Stock and Domestic	Functioning	01/01/1950	20.00		AHD		0.030	16.00	0m	On-site
10015999	GW401077	Unknown	Abandoned	01/04/1999	182.00		AHD				0m	On-site
10016949	GW016841	Monitoring	Functional	01/02/1958	47.90	110.18	AHD	Good			0m	On-site
10018023	GW069100	Monitoring	Functional	14/04/1991	53.50	110.03	AHD	1001-3000 ppm	2.770	16.20	0m	On-site
10020019	GW017783	Stock and Domestic	Unknown	01/12/1959	50.30		AHD	Very Good			0m	On-site
10020404	GW050058	Stock and Domestic	Non-functional	01/10/1979	46.30		AHD	1001-3000 ppm			0m	On-site
10022471	GW500964	Irrigation	Unknown	29/09/1999	198.00		AHD		220.000	26.20	0m	On-site
10022620	GW056003	Stock and Domestic	Unknown	01/01/1982	47.90		AHD	1001-3000 ppm			0m	On-site
10026827	GW505660	Water Supply	Unknown	17/06/2014	204.00		AHD	200	200.000	27.00	0m	On-site
10027151	GW504942	Stock and Domestic	Functioning	01/01/1960	20.00		AHD			21.00	0m	On-site
10027682	GW504597	Stock and Domestic	Functioning	20/05/2011	20.00		AHD	1400		18.00	0m	On-site
10029641	GW504596	Stock and Domestic	Functioning	01/05/1972	50.00		AHD	1600		18.00	0m	On-site
10037181	GW028134	Stock and Domestic	Unknown	01/09/1967	58.80		AHD	Stock			0m	On-site
10037738	GW010437	Water Supply	Unknown	01/05/1953	35.40		AHD				0m	On-site
10038337	GW027399	Stock and Domestic	Unknown	01/12/1966	33.50		AHD	Good Stock			0m	On-site
10040118	GW055642	Stock and Domestic	Unknown	01/02/1982	61.20		AHD	0-500 ppm			0m	On-site
10042263	GW004966	Stock and Domestic	Functional	01/01/1959	26.20		AHD	Good			0m	On-site
10042294	GW055541	Stock and Domestic	Unknown	01/02/1982	36.30		AHD	501-1000 ppm			0m	On-site
10043599	GW504552	Stock and Domestic	Functioning	12/05/2011	25.00		AHD			18.00	0m	On-site
10047946	GW501831	Water Supply	Unknown	21/12/2001	79.50		AHD				0m	On-site
10053436	GW500974	Irrigation	Removed	01/05/1997	198.00		AHD				0m	On-site
10055004	GW416754	Stock and Domestic	Unknown	19/12/2017	64.00		AHD			0.00	0m	On-site

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
10057270	GW017204	Stock and Domestic	Unknown	01/01/1958	58.80		AHD				0m	On-site
10058196	GW012535	Stock and Domestic	Functioning	01/01/1927	39.00		AHD				0m	On-site
10061790	GW500971	Irrigation	Removed	01/04/1997	201.00		AHD				0m	On-site
10068348	GW504598	Stock and Domestic	Functioning	20/05/2011	20.00		AHD				0m	On-site
10069200	GW011206	Stock and Domestic	Unknown	01/07/1955	40.20		AHD				0m	On-site
10070687	GW400787	Water Supply	Unknown	18/12/1998	79.00		AHD	Good	0.126	10.00	0m	On-site
10071007	GW012529	Stock and Domestic	Functioning	01/01/1945	70.70		AHD				0m	On-site
10071598	GW027400	Stock and Domestic	Unknown	01/12/1966	35.10		AHD	Good Stock			0m	On-site
10074770	GW060954	Stock and Domestic	Unknown	01/07/1985	73.20		AHD	1001-3000 ppm			0m	On-site
10074934	GW063528	Stock and Domestic	Unknown	01/03/1988	52.40		AHD	1001-3000 ppm			0m	On-site
10075514	GW504943	Stock and Domestic	Functioning	01/01/1960	39.00		AHD				0m	On-site
10076631	GW054830	Exploration	Proposed	01/01/1981	120.00	110.00	AHD	Very Good			0m	On-site
10077516	GW047719	Irrigation	Unknown	01/08/1980	104.20		AHD				0m	On-site
10078373	GW400006	Unknown	Unknown	30/06/1995	120.00		AHD				0m	On-site
10079441	GW012895	Monitoring	Functional	01/01/1956	26.10	108.15	AHD				0m	On-site
10081822	GW011053	Water Supply	Unknown	01/12/1954	35.10		AHD	Good			0m	On-site
10083573	GW030946	Irrigation	Unknown	01/09/1981		108.00	AHD				0m	On-site
10086699	GW012531	Stock and Domestic	Functioning	01/01/1916	21.90		AHD				0m	On-site
10087971	GW051060	Stock and Domestic	Unknown	01/07/1979	50.60		AHD	Good			0m	On-site
10088806	GW505673	Stock and Domestic	Functioning	06/02/2014	52.00		AHD	800	3.000	22.00	0m	On-site
10090474	GW050845	Unknown	Functioning		36.60		AHD				0m	On-site
10091141	GW505682	Stock and Domestic	Unknown	28/11/2014	59.00		AHD	1400	3.000	21.00	0m	On-site
10094046	GW504944	Stock and Domestic	Functioning	01/01/1960	45.00		AHD				0m	On-site
10094176	GW049337	Water Supply	Unknown	01/04/1979	48.20		AHD	501-1000 ppm			0m	On-site
10095052	GW012891	Monitoring	Functional	01/01/1956	28.30	110.11	AHD				0m	On-site
10096943	GW504599	Stock and Domestic	Functioning	20/05/2011	33.00		AHD	2000		18.00	0m	On-site
10099116	GW504945	Stock and Domestic	Functioning	01/01/1960	33.00		AHD			21.00	0m	On-site
10099505	GW056482	Stock and Domestic	Unknown	01/03/1982	58.50		AHD	Good			0m	On-site
10103937	GW045660	Stock and Domestic	Unknown	01/03/1977	41.20		AHD	Stock			0m	On-site
10104018	GW049139	Water Supply	Unknown	01/12/1978	144.00		AHD	1001-3000 ppm			0m	On-site
10104655	GW504414	Irrigation	Abandoned	11/12/2002	204.00		AHD				0m	On-site
10105245	GW069099	Water Supply	Unknown	02/03/1991	65.50		AHD	1001-3000 ppm	2.500	19.60	0m	On-site
10109732	GW033799	Stock and Domestic	Unknown	01/11/1971	40.30		AHD				0m	On-site
10110110	GW045915	Monitoring	Functional	01/04/1977	45.00	109.05	AHD	Stock			0m	On-site
10111027	GW021745	Stock and Domestic	Unknown	01/08/1964	41.80		AHD				0m	On-site

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
10121717	GW400379	Stock and Domestic	Unknown	20/07/1994	71.60		AHD	390			0m	On-site
10122960	GW504134	Stock and Domestic	Functioning	13/10/2010	56.00		AHD	1300	3.000	23.00	0m	On-site
10123044	GW405114	Water Supply	Functioning	25/06/2009	86.00		AHD	300	1.000	29.90	0m	On-site
10124834	GW416368	Stock and Domestic	Functioning	11/09/2013	67.00		AHD	700	2.000	23.00	0m	On-site
10124835	GW505577	Stock and Domestic	Functioning	08/05/2012	92.00		AHD	450	2.000	27.70	0m	On-site
10125356	GW403746	Monitoring	Unknown	29/04/2007	234.00	105.26	AHD		4.000	31.60	0m	On-site
10129071	GW403746	Monitoring	Unknown	29/04/2007	234.00	105.26	AHD		4.000	31.60	0m	On-site
10130425	GW500469	Irrigation	Unknown	19/08/1997	157.00		AHD	300		20.00	0m	On-site
10132173	GW505650	Stock and Domestic	Functioning	02/04/2014	55.00		AHD	700	5.000	28.00	0m	On-site
10134388	GW400050	Monitoring	Functional	04/08/1991	108.00	110.22	AHD	600			0m	On-site
10134462	GW403746	Unknown	Unknown	29/04/2007		105.26	AHD		4.000	31.60	0m	On-site
10137814	GW501581	Water Supply	Unknown	01/06/2003	61.00		AHD	1750	3.800	25.50	0m	On-site
10138144	GW039266	Stock and Domestic	Unknown	01/06/1982	44.00		AHD	501-1000 ppm			0m	On-site
10142442	GW405115	Water Supply	Functioning	18/06/2009	119.00		AHD	400	2.500	27.30	0m	On-site
10142699	GW039270	Exploration	Proposed	01/06/1982	69.60		AHD	501-1000 ppm			0m	On-site
10142927	GW500504	Irrigation	Unknown	19/08/1997	157.00		AHD	300		20.00	0m	On-site
10143187	GW505480	Stock and Domestic	Functioning	13/01/1994	52.00		AHD	740	0.625	20.70	0m	On-site
10143620	GW021744	Stock and Domestic	Non-functional	01/08/1964	50.30		AHD	3001-7000 ppm			0m	On-site
10146061	GW403746	Unknown	Unknown	29/04/2007		105.26	AHD		4.000	31.60	0m	On-site
10146337	GW069098	Stock and Domestic	Unknown	12/03/1991	64.90		AHD	400			0m	On-site
10146623	GW063047	Irrigation	Unknown	01/10/1987	160.50		AHD	0-500 ppm			0m	On-site
10150261	GW403746	Unknown	Unknown			105.26	AHD		4.000	31.60	0m	On-site
10150291	GW403746	Unknown	Unknown			105.26	AHD		4.000	31.60	0m	On-site
10152253	GW505912	Stock and Domestic	Functioning	27/11/2019	121.50		AHD				0m	On-site
10128814	GW403747	Monitoring	Unknown	31/05/2007	229.00	107.94	AHD		2.000	30.00	13m	North East
10144002	GW084103	Monitoring	Unknown	11/07/2001	11.35		AHD			11.70	15m	South East
10121000	GW403747	Monitoring	Unknown	31/05/2007	229.00	107.94	AHD		2.000	30.00	26m	North East
10125790	GW403747	Unknown	Unknown	31/05/2007		107.94	AHD		2.000	30.00	26m	North East
10129659	GW403747	Unknown	Unknown	31/05/2007		107.94	AHD		2.000	30.00	26m	North East
10150237	GW403747	Unknown	Unknown			107.94	AHD		2.000	30.00	26m	North East
10150264	GW403747	Unknown	Unknown			107.94	AHD		2.000	30.00	26m	North East
10092834	GW012532	Stock and Domestic	Decommissioned	01/01/1915	25.30		AHD				98m	South East
10107217	GW026634	Stock and Domestic	Unknown	01/05/1967	32.30		AHD	Fresh			98m	South East
10050409	GW415941	Stock and Domestic	Functioning	08/02/2012	55.00		AHD		3.000	19.00	105m	South East
10101154	GW063601	Stock and Domestic	Functioning	01/01/1987	36.60		AHD	Good			182m	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
10038483	GW018406	Stock and Domestic	Unknown	01/06/1960	56.70		AHD				191m	South East
10072574	GW504920	Stock and Domestic	Functioning	25/07/2011	20.00		AHD				197m	East
10127221	GW400533	Unknown	Unknown	05/09/1991	34.50		AHD	150	0.980	12.90	292m	East
10155620	GW506272	Monitoring	Functioning	11/05/1998	172.00		AHD				296m	South West
10021748	GW015806	Stock and Domestic	Unknown	01/10/1957	51.20		AHD				384m	South East
10036744	GW012527	Stock and Domestic	Functioning	01/01/1956	21.00		AHD				384m	South East
10042839	GW504687	Water Supply	Functioning	01/01/1950	35.00		AHD	good		22.00	395m	North West
10102602	GW401136	Monitoring	Functional		30.00	108.06	AHD			18.00	396m	East
10067472	GW404535	Stock and Domestic	Functioning	01/01/1975	20.00		AHD		0.030	16.00	433m	East
10028019	GW400022	Monitoring	Functional	02/08/1995	140.50	110.28	AHD				442m	East
10150756	GW506269	Monitoring	Functioning	30/06/1997	198.00		AHD				472m	South West
10034322	GW012864	Stock and Domestic	Decommissioned	01/01/1956	47.50		AHD				544m	North East
10112207	GW023038	Stock and Domestic	Unknown	01/12/1965	53.60		AHD	Good			544m	North East
10075920	GW401137	Stock and Domestic	Functioning	23/03/2000		108.29	AHD				564m	East
10153769	GW506273	Monitoring	Unknown	20/05/1998	175.00		AHD				615m	South West
10152903	GW506176	Stock and Domestic	Functioning	22/12/2015			AHD				638m	North West
10009322	GW006121	Monitoring	Functional	01/01/1937	29.30	109.37	AHD	Brackish			695m	East
10089203	GW012857	Monitoring	Functional	01/01/1956	29.90	109.37	AHD				695m	East
10033667	GW022389	Monitoring	Functional	01/02/1965	76.20	109.35	AHD				718m	East
10096496	GW010625	Monitoring	Functional	01/06/1953	72.80	109.35	AHD		0.810	23.50	718m	East
10062802	GW012863	Monitoring	Functional	01/01/1956	31.70	108.82	AHD				751m	North East
10037380	GW021876	Monitoring	Functional	01/07/1964	39.00	108.82	AHD	Good			762m	North East
10049550	GW413978	Stock and Domestic	Functioning	04/12/2009	30.00		AHD			20.00	822m	East
10098197	GW012525	Stock and Domestic	Functioning	01/01/1936	39.60		AHD				846m	South East
10116823	GW056467	Stock and Domestic	Unknown	01/02/1982	43.90		AHD	501-1000 ppm			882m	South East
10008097	GW005735	Monitoring	Functional	01/01/1933	29.00	109.55	AHD	Good Stock	0.250	21.90	921m	East
10044631	GW402608	Unknown	Unknown	15/06/1994	33.00		AHD				940m	South East
10077796	GW401702	Irrigation	Abandoned	03/04/2001	242.00		AHD				978m	North
10116708	GW011881	Stock and Domestic	Unknown	01/01/1936	39.60		AHD				985m	South East
10124038	GW504229	Stock and Domestic	Functioning	14/06/2009	122.00		AHD	500	1.260	25.60	1133m	South West
10014980	GW012862	Monitoring	Functional	01/01/1956	35.10	109.20	AHD				1154m	North East
10074925	GW017312	Monitoring	Functional	01/03/1958	33.20	109.20	AHD	Good			1155m	North East
10014500	GW013908	Monitoring	Functional	01/01/1959	29.30	111.19	AHD				1196m	East
10085639	GW012521	Monitoring	Functional	01/01/1915	28.70	111.19	AHD				1204m	East
10103896	GW059836	Stock and Domestic	Unknown	01/11/1984	42.00		AHD	1001-3000 ppm			1256m	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
10108114	GW017769	Water Supply	Unknown	01/10/1959	46.30		AHD	Good			1260m	North
10056884	GW416912	Stock and Domestic	Functioning	10/04/2018	45.00		AHD			0.00	1281m	East
10009573	GW023474	Stock and Domestic	Unknown	01/01/1966	21.90		AHD				1367m	South East
10035120	GW012536	Stock and Domestic	Decommissioned	01/01/1928	22.90		AHD				1367m	South East
10041877	GW505627	Stock and Domestic	Functioning	18/10/2012	33.00		AHD		0.500	18.00	1400m	South
10045213	GW416909	Stock and Domestic	Functioning	09/04/2018	78.00		AHD			0.00	1436m	South East
10037129	GW500942	Water Supply	Unknown	01/01/1973	40.00		AHD	Good		22.00	1485m	West
10018787	GW026633	Stock and Domestic	Unknown	01/04/1967	59.10		AHD				1495m	South East
10111004	GW012534	Stock and Domestic	Decommissioned	01/01/1915	20.70		AHD				1495m	South East
10122764	GW400776	Stock and Domestic	Unknown	23/01/1998	57.20		AHD	1000	0.750	16.90	1500m	South East
10136351	GW037877	Irrigation	Functioning	01/04/1974	137.10		AHD				1524m	West
10107673	GW017615	Stock and Domestic	Unknown	01/09/1959	63.40		AHD	Good Stock			1578m	North
10070128	GW065223	Water Supply	Unknown	20/10/1988	54.50		AHD	0-500 ppm			1602m	North
10077856	GW056587	Irrigation	Unknown	01/06/1982	48.60		AHD	501-1000 ppm			1603m	West
10083217	GW005736	Monitoring	Functional	01/02/1933	67.40	108.66	AHD	Fresh			1675m	East
10023555	GW012533	Stock and Domestic	Non-functional	01/01/1938	56.40		AHD				1761m	South East
10101097	GW019051	Stock and Domestic	Unknown	01/02/1961	34.10		AHD	Good			1761m	South East
10088323	GW501050	Irrigation	Unknown	13/07/2003	191.00		AHD		220.000	29.00	1800m	South West
10150429	GW506267	Monitoring	Functioning	30/04/1997	201.00		AHD				1811m	South West
10098651	GW056714	Stock and Domestic	Unknown	01/07/1982	45.70		AHD	1001-3000 ppm			1832m	West
10068684	GW011849	Monitoring	Functional	01/01/1956	32.90	110.94	AHD				1835m	East
10112868	GW032076	Monitoring	Functional	01/12/1969	74.40	110.94	AHD				1842m	East
10017408	GW010928	Stock and Domestic	Unknown	01/07/1954	43.30		AHD	1001-3000 ppm			1980m	South East
10091685	GW416625	Water Supply	Functioning	06/02/2013	72.50		AHD	1400	3.000	22.00	1983m	South East
10003235	GW042143	Unknown	Unknown		30.50		AHD				1999m	North

Hydrogeology & Groundwater

1836 Mabins Well Road, Moonbria, NSW 2710

Driller's Logs

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

NGIS Bore ID	Drillers Log	Distance	Direction
10003902	0.00m-0.91m Clay 0.91m-3.05m Clay 3.05m-6.40m Clay 6.40m-12.19m Clay 12.19m-16.46m Clay 16.46m-17.68m Sand 17.68m-18.59m Clay 18.59m-21.34m Clay 21.34m-23.77m Sand 23.77m-28.65m Clay 28.65m-31.09m Clay 31.09m-35.97m Clay 35.97m-42.67m Clay 42.67m-44.20m Clay 44.20m-44.81m Sand 44.81m-47.55m Clay 47.55m-60.05m Clay 60.05m-66.45m Clay 66.45m-66.46m Sand	0m	On-site
10005984	0.00m-10.00m Clay 10.00m-13.00m Sand 13.00m-20.00m Clay 20.00m-22.00m Sand 22.00m-54.00m Clay 54.00m-62.00m Sand 62.00m-67.00m Clay 67.00m-71.00m Sand 71.00m-74.00m Clay 74.00m-86.00m Sand 86.00m-107.00m Sand 107.00m-127.00m Sand 127.00m-139.00m Clay 139.00m-145.00m Sand 145.00m-147.00m Clay 147.00m-148.00m Sand 148.00m-171.00m Clay 171.00m-182.00m Invalid Code 182.00m-193.00m Sand 193.00m-208.00m Invalid Code 208.00m-209.00m Sand 209.00m-213.00m Invalid Code 213.00m-220.00m Sand 220.00m-223.00m Bedrock	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10006591	0.00m-1.00m Clay 1.00m-2.00m Clay 2.00m-6.00m Clay 6.00m-8.00m Clay 8.00m-9.00m Clay 9.00m-10.00m Clay 10.00m-12.00m Clay 12.00m-14.50m Clay 14.50m-15.00m Clay 15.00m-17.00m Clay 17.00m-22.00m Clay 22.00m-24.00m Sand 22.00m-24.00m Gravel 24.00m-28.00m Clay 28.00m-29.50m Sand 29.50m-32.00m Clay 32.00m-34.00m Clay 34.00m-37.00m Clay 37.00m-38.00m Clay 38.00m-40.00m Clay 40.00m-46.00m Clay 46.00m-50.00m Clay 50.00m-52.00m Clay 52.00m-60.00m Clay 60.00m-63.50m Clay 63.50m-65.50m Clay 65.50m-67.00m Clay 67.00m-82.50m Clay 82.50m-84.50m Clay 84.50m-86.00m Clay 86.00m-88.00m Clay 88.00m-90.00m Sand 90.00m-90.50m Clay 90.50m-99.30m Sand 99.30m-102.00m (Unknown) 102.00m-123.00m Clay 123.00m-130.00m Clay 130.00m-130.50m Clay 130.50m-133.00m Lignite 133.00m-135.00m Clay 135.00m-139.00m Clay 139.00m-171.00m Lignite 171.00m-174.00m Clay 174.00m-178.00m Lignite 178.00m-180.00m Clay 180.00m-184.00m Lignite	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10013461	0.00m-1.00m Topsoil 1.00m-5.00m Clay 5.00m-10.00m Clay 10.00m-13.00m Sand 13.00m-20.00m Clay 20.00m-26.00m Clay 26.00m-28.00m Sandstone 28.00m-36.00m Clay 36.00m-38.00m Clay 38.00m-41.00m Sand 41.00m-43.00m Invalid Code 43.00m-48.00m Clay 48.00m-58.00m Invalid Code 58.00m-60.00m Clay 60.00m-65.00m Invalid Code 65.00m-67.00m Clay 67.00m-70.00m Clay 70.00m-72.00m Sand 72.00m-77.00m Clay 77.00m-80.00m Clay 80.00m-82.00m Clay 82.00m-84.00m Sand 84.00m-86.00m Clay 86.00m-94.00m Sand Grains (Lithic) 94.00m-96.00m Sand 96.00m-100.00m Clay 100.00m-102.00m Sand 102.00m-107.00m Sand 107.00m-113.00m Sand 113.00m-117.00m Sand 117.00m-120.00m Coal 120.00m-134.00m Coal 134.00m-138.00m Clay 138.00m-141.00m Invalid Code 141.00m-145.00m Sand 145.00m-153.00m Coal 153.00m-155.00m Sand 155.00m-160.00m Clay 160.00m-165.00m Clay 165.00m-170.00m Invalid Code 170.00m-174.00m Clay	0m	On-site
10015999	0.00m-1.00m Topsoil 1.00m-2.00m Clay 2.00m-7.00m Invalid Code 7.00m-14.00m Sand 14.00m-21.00m Clay 21.00m-28.00m Clay 28.00m-37.00m Clay 37.00m-40.00m Clay 40.00m-44.00m Invalid Code 44.00m-57.00m Clay 57.00m-66.00m Sand 66.00m-69.00m Invalid Code 69.00m-72.00m Sand 72.00m-82.00m Invalid Code 82.00m-89.00m Sand 89.00m-106.00m Sand 106.00m-109.00m Invalid Code 109.00m-132.50m Siltstone 132.50m-182.00m Invalid Code	0m	On-site
10016949	0.00m-0.91m Clay 0.91m-7.32m Clay 7.32m-9.14m Clay 9.14m-15.54m Clay 15.54m-21.34m Clay 21.34m-23.77m Clay 23.77m-26.82m Clay 26.82m-28.04m Clay 28.04m-28.65m Sand 28.65m-32.00m Clay 32.00m-35.36m Clay 35.36m-35.51m Sand 35.51m-41.15m Clay 41.15m-46.33m Clay 46.33m-47.55m 47.55m-47.85m Clay	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10018023	0.00m-1.00m Clay 1.00m-4.50m Clay 4.50m-9.00m Sand 9.00m-19.00m Clay 19.00m-19.50m Sand 19.50m-39.50m Clay 39.50m-45.50m Clay 45.50m-49.00m Clay 49.00m-51.50m Sand 51.50m-53.50m Clay	0m	On-site
10020019	0.00m-6.71m Clay 6.71m-28.65m Clay 28.65m-34.75m Clay 34.75m-35.05m Sand 35.05m-47.85m Clay 47.85m-50.29m Clay 50.29m-50.31m Sand	0m	On-site
10020404	0.00m-0.90m Clay 0.90m-6.40m Clay 6.40m-9.70m Clay 9.70m-13.10m Clay 13.10m-19.50m Clay 19.50m-22.20m Sand 22.20m-28.60m Clay 28.60m-31.40m Sand 31.40m-35.40m Clay 35.40m-37.80m Clay 37.80m-40.20m Sand 40.20m-46.33m Clay	0m	On-site
10022471	0.00m-1.00m Topsoil 1.00m-3.00m Clay 3.00m-6.00m Sand 6.00m-12.00m Clay 12.00m-15.00m Clay 15.00m-19.00m Clay 19.00m-22.00m Sand 22.00m-30.00m Clay 30.00m-31.00m Sand 31.00m-32.00m Clay 32.00m-43.00m Clay 43.00m-64.00m Clay 64.00m-66.00m Sand 66.00m-69.00m Clay 69.00m-72.00m Sand 72.00m-75.00m Sand 75.00m-76.00m Clay 76.00m-79.50m Clay 79.50m-83.00m Clay 83.00m-85.75m Sand 85.75m-87.50m Clay 87.50m-90.90m Sand 90.90m-95.00m Clay 95.00m-96.00m Sand 96.00m-100.00m Sand 100.00m-101.00m Clay 101.00m-104.00m Sand 104.00m-105.50m Sand 105.50m-106.00m Clay 106.00m-107.00m Sand 107.00m-113.00m Sand 113.00m-120.00m Sand 120.00m-124.50m Invalid Code 124.50m-130.00m Clay 130.00m-134.00m Silt 134.00m-136.00m Coal 136.00m-139.00m Invalid Code 139.00m-145.00m Sand 145.00m-146.00m Clay 146.00m-148.00m Coal 148.00m-152.00m Invalid Code 152.00m-157.00m Coal 157.00m-160.00m Silt 160.00m-163.00m Sand 163.00m-164.00m Clay 164.00m-166.00m Sand 166.00m-169.75m Sand 169.75m-170.00m Invalid Code 170.00m-176.00m Sand 176.00m-189.00m Silt 189.00m-190.00m Sand 190.00m-198.00m Sand 198.00m-199.00m Silt 199.00m-207.50m Sand 207.50m-208.50m Coal	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10022620	0.00m-2.44m Clay 2.44m-11.28m Clay 11.28m-16.46m Clay 16.46m-24.99m Clay 24.99m-27.43m Clay 27.43m-29.26m Clay 29.26m-30.48m Sand 30.48m-47.85m Clay 30.48m-47.85m Sand	0m	On-site
10026827	0.00m-11.00m clay 11.00m-15.00m sand 15.00m-68.00m clay 68.00m-70.00m sand 70.00m-86.50m clay 86.50m-90.00m sand 90.00m-95.00m silt 95.00m-116.00m sand 116.00m-135.50m silt 135.50m-155.00m sand 155.00m-180.00m clay 180.00m-182.00m sand 182.00m-185.50m clay, soft 185.50m-191.00m sand 191.00m-194.50m fine sand, and silt 194.50m-204.00m sand	0m	On-site
10037181	0.00m-0.61m Topsoil 0.61m-5.49m Clay 5.49m-9.75m Clay 9.75m-11.28m Clay 11.28m-14.33m Sand 14.33m-14.94m Clay 14.94m-19.20m Clay 19.20m-19.81m Sand 19.81m-26.52m Clay 26.52m-28.04m Silt 28.04m-31.39m Clay 31.39m-36.27m Clay 36.27m-44.50m Sand 44.50m-51.82m Clay 51.82m-54.25m Clay 54.25m-57.61m Clay 57.61m-58.83m Clay 58.83m-58.84m Sand	0m	On-site
10037738	0.00m-7.92m Clay 7.92m-10.97m Sand 10.97m-17.68m Clay 17.68m-20.73m Invalid Code 20.73m-24.38m Clay 24.38m-26.82m Invalid Code 26.82m-35.36m Clay	0m	On-site
10038337	0.00m-0.61m Clay 0.61m-6.10m Clay 6.10m-8.84m Clay 8.84m-9.75m Sand 9.75m-10.97m Clay 10.97m-19.81m Clay 19.81m-22.86m Clay 22.86m-26.82m Sand 26.82m-33.53m Clay 33.53m-33.54m Sand	0m	On-site
10040118	0.00m-3.60m Clay 3.60m-4.50m Sand 4.50m-40.20m Clay 40.20m-41.40m 41.40m-61.20m Clay 61.20m-61.25m Sand	0m	On-site
10042263	0.00m-7.62m Clay 7.62m-9.75m Clay 9.75m-10.36m Sand 10.36m-15.54m Clay 15.54m-18.90m Clay 18.90m-24.69m Sand 24.69m-26.21m Clay	0m	On-site
10042294	0.00m-5.49m Clay 5.49m-6.10m Clay 6.10m-8.84m Clay 8.84m-9.45m Sand 9.45m-28.04m Clay 28.04m-29.87m Sand 29.87m-33.53m Sand 33.53m-36.27m Sand	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10047946	0.00m-1.00m Topsoil 1.00m-4.00m Clay 4.00m-5.00m Clay 5.00m-9.00m Sand 9.00m-19.00m Clay 19.00m-24.00m Clay 24.00m-28.00m Clay 28.00m-34.00m Sand 34.00m-41.00m Clay 41.00m-48.00m Sand 48.00m-75.50m Clay 75.50m-78.00m Sand 78.00m-81.00m Clay	0m	On-site
10053436	0.00m-1.00m Topsoil 1.00m-2.00m Sand Grains (Lithic) 2.00m-6.50m Sand 6.50m-15.00m Clay 15.00m-16.00m Sand Grains (Lithic) 16.00m-22.00m Clay 22.00m-23.00m Sand 23.00m-24.00m Sand 24.00m-29.00m Clay 29.00m-31.00m Sand 31.00m-45.00m Clay 45.00m-51.00m Clay 51.00m-59.00m Clay 59.00m-61.00m Sand Grains (Lithic) 61.00m-62.00m Sand 62.00m-63.00m Sand 63.00m-68.00m Clay 68.00m-72.00m Clay 72.00m-82.50m Clay 82.50m-85.00m Sand 85.00m-88.00m Sand 88.00m-89.00m Clay 89.00m-96.00m Clay 96.00m-97.00m Sand 97.00m-98.00m Sand 98.00m-99.00m Sand 99.00m-100.00m Sand 100.00m-104.00m Clay 104.00m-105.00m Clay 105.00m-107.00m Sand 107.00m-108.00m Clay 108.00m-111.00m Clay 111.00m-112.00m Clay 112.00m-113.00m Sand 113.00m-114.00m Sand 114.00m-117.50m Sand 117.50m-118.00m Clay 118.00m-124.00m Sand 124.00m-130.00m Clay 130.00m-135.00m Invalid Code 135.00m-142.00m Clay 142.00m-143.00m Invalid Code 143.00m-144.00m Sand 144.00m-147.00m Sand 147.00m-153.70m Clay 153.70m-154.00m Sand 154.00m-154.50m Sand 154.50m-155.00m Invalid Code 155.00m-156.00m Coal 156.00m-161.00m Siltstone 161.00m-162.00m Sediment 162.00m-164.00m Sediment 164.00m-168.00m Clay 168.00m-169.00m Silt 169.00m-170.00m Sand 170.00m-172.00m Siltstone 172.00m-175.00m Coal 175.00m-176.00m Silt 176.00m-177.00m Sand 177.00m-180.00m Invalid Code 180.00m-182.00m Clay 182.00m-187.00m Sand 187.00m-188.00m Invalid Code 188.00m-189.00m Invalid Code 189.00m-191.00m Sand 191.00m-192.00m Sand 192.00m-193.00m Sand 193.00m-195.00m Sand 195.00m-196.00m Iron Oxide 196.00m-197.00m Sand 197.00m-198.00m Invalid Code	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10057270	0.00m-3.35m Clay 3.35m-3.96m Clay 3.96m-10.97m Sand 10.97m-13.72m Clay 13.72m-15.85m Clay 15.85m-19.20m Sand 19.20m-23.77m Clay 23.77m-24.69m Clay 24.69m-24.99m Sand 24.99m-28.96m Clay 28.96m-32.61m Clay 32.61m-43.89m Clay 43.89m-46.33m Clay 46.33m-52.12m Clay 52.12m-55.78m Clay 55.78m-58.22m Clay 58.22m-58.83m Clay 58.83m-58.84m Sand	0m	On-site
10061790	0.00m-1.00m Clay 1.00m-8.00m Clay 8.00m-9.00m Clay 9.00m-11.00m Clay 11.00m-16.00m Sand 16.00m-26.00m Clay 26.00m-28.00m Invalid Code 28.00m-30.00m Sand 30.00m-32.50m Sand 32.50m-35.00m Clay 35.00m-36.00m Sand 36.00m-44.00m Clay 44.00m-46.00m Sand Grains (Lithic) 46.00m-53.00m Clay 53.00m-58.00m Sand 58.00m-65.00m Sand 65.00m-66.00m Sand 66.00m-81.00m Clay 81.00m-82.00m Sand 82.00m-83.00m Sand 83.00m-84.00m Sand Grains (Lithic) 84.00m-97.00m Clay 97.00m-100.00m Invalid Code 100.00m-101.00m Sand Grains (Lithic) 101.00m-105.00m Clay 105.00m-108.00m Sand Grains (Lithic) 108.00m-110.00m Sand 110.00m-111.00m Sand 111.00m-113.00m Gravel 113.00m-114.00m Sand 114.00m-116.00m Sand Grains (Lithic) 116.00m-117.00m Sand 117.00m-118.00m Sand 118.00m-120.00m Invalid Code 120.00m-128.00m Invalid Code 128.00m-130.00m Silt 130.00m-135.00m Invalid Code 135.00m-137.00m Sand 137.00m-138.00m Sand 138.00m-141.00m Sand 141.00m-142.00m Invalid Code 142.00m-145.00m Sand 145.00m-147.00m Invalid Code 147.00m-150.00m Sand 150.00m-154.00m Invalid Code 154.00m-155.00m Silt 155.00m-170.00m Invalid Code 170.00m-172.00m Sand 172.00m-173.00m Sand 173.00m-175.00m Sand 175.00m-176.00m Sand 176.00m-182.00m Sand 182.00m-183.00m Silt 183.00m-186.00m Clay 186.00m-191.00m Silt 191.00m-192.00m Sand 192.00m-195.00m Sand 195.00m-196.00m Sand 196.00m-197.00m Sand Grains (Lithic) 197.00m-198.00m Sand 198.00m-199.00m Sand Grains (Lithic) 199.00m-201.00m Sand Grains (Lithic) 201.00m-201.00m Silt	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10069200	0.00m-7.32m Clay 7.32m-18.90m Clay 18.90m-20.73m Clay 20.73m-22.25m Clay 22.25m-24.69m Clay 24.69m-25.30m Sand 25.30m-27.43m Clay 27.43m-34.75m Sand 34.75m-38.71m Clay 38.71m-40.23m Sand	0m	On-site
10070687	0.00m-6.00m Invalid Code 6.00m-13.00m Invalid Code 13.00m-79.00m Invalid Code	0m	On-site
10071598	0.00m-0.91m Clay 0.91m-5.18m Clay 5.18m-6.10m Clay 6.10m-8.53m Clay 8.53m-15.85m Clay 15.85m-16.15m Gravel 16.15m-17.68m Clay 17.68m-18.29m Clay 18.29m-19.20m Clay 19.20m-22.86m Sand 22.86m-25.60m Clay 25.60m-26.52m Sand 26.52m-35.05m Clay 35.05m-35.07m Sand	0m	On-site
10074770	0.00m-0.91m Loam 0.91m-3.66m Clay 3.66m-9.14m Clay 9.14m-15.24m Clay 15.24m-16.15m Sand 16.15m-21.95m Clay 21.95m-28.04m Clay 28.04m-31.09m Clay 31.09m-32.31m Clay 32.31m-39.62m Clay 39.62m-42.67m Clay 42.67m-48.77m Clay 48.77m-49.07m Sand 49.07m-73.15m Sand 49.07m-73.15m Clay	0m	On-site
10074934	0.00m-4.26m Clay 4.26m-5.79m Clay 5.79m-9.45m Sand 9.45m-13.41m Clay 13.41m-17.98m Sand 17.98m-20.42m Clay 20.42m-22.86m Sand 22.86m-27.43m Clay 27.43m-30.79m Silt 30.79m-52.43m Clay 52.43m-52.44m Sand	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10076631	0.00m-0.20m Clay 0.00m-0.20m Topsoil 0.20m-1.00m Clay 1.00m-1.50m Clay 1.50m-2.50m Clay 2.50m-3.00m Clay 3.00m-4.00m Sand 4.00m-5.00m Sand 4.00m-5.00m Clay 5.00m-6.00m Limestone 5.00m-6.00m 6.00m-7.50m Clay 7.50m-9.00m Sand 9.00m-10.00m Clay 10.00m-12.50m Clay 12.50m-14.00m Sand 14.00m-17.00m Clay 17.00m-19.00m Clay 19.00m-20.00m Clay 20.00m-21.50m Clay 21.50m-24.00m Sand 24.00m-25.50m Clay 25.50m-26.50m Clay 26.50m-29.00m Sand 29.00m-31.00m Clay 31.00m-32.50m Clay 32.50m-33.00m Clay 33.00m-34.00m Clay 34.00m-35.50m Clay 35.50m-36.50m Clay 36.50m-39.00m Clay 39.00m-40.00m Clay 40.00m-41.00m Clay 41.00m-43.00m Clay 43.00m-44.00m Clay 44.00m-45.00m Clay 45.00m-55.50m Clay 55.50m-57.00m Clay 57.00m-67.50m Clay 67.50m-68.00m Sand 68.00m-72.00m Clay 72.00m-76.00m Clay 76.00m-81.00m Clay 81.00m-82.00m Sand 82.00m-85.00m Clay 85.00m-87.00m Sand 87.00m-90.00m Sand 90.00m-91.00m Sand 91.00m-120.00m (Unknown) 91.00m-120.00m	0m	On-site
10077516	0.00m-0.60m Soil 0.60m-3.30m Clay 3.30m-7.80m Sand 7.80m-25.20m Clay 25.20m-26.10m Sand 26.10m-33.10m Clay 33.10m-34.10m Sand 34.10m-37.80m Clay 37.80m-40.80m Sand 40.80m-53.60m Clay 53.60m-54.20m Sand 54.20m-66.40m Clay 66.40m-68.20m Clay 68.20m-70.10m Sand 70.10m-71.90m Clay 71.90m-75.40m Clay 75.40m-76.50m Clay 76.50m-77.70m Clay 77.70m-78.30m Sand 78.30m-82.90m Clay 82.90m-89.00m Clay 89.00m-90.20m Sand 90.20m-92.00m Sand 92.00m-96.90m Clay 96.90m-98.70m Sand 98.70m-99.00m Clay 99.00m-104.20m Gravel	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10078373	0.00m-7.00m 7.00m-9.00m 9.00m-13.00m 13.00m-15.00m 15.00m-26.00m 26.00m-33.00m 33.00m-37.00m 37.00m-42.00m 42.00m-49.00m 49.00m-52.00m 52.00m-59.00m 59.00m-61.00m 61.00m-65.00m 65.00m-69.00m 69.00m-70.00m 70.00m-75.00m 75.00m-84.00m 84.00m-86.00m 86.00m-93.00m 93.00m-98.00m 98.00m-103.00m 103.00m-110.00m 110.00m-115.00m 115.00m-120.00m 120.00m-122.00m 122.00m-127.00m	0m	On-site
10081822	0.00m-0.30m Loam 0.30m-7.62m Clay 7.62m-10.67m Sand 10.67m-11.58m Clay 11.58m-14.63m Sand 14.63m-15.85m Clay 15.85m-21.03m Clay 21.03m-27.43m Sand 27.43m-29.57m Clay 29.57m-29.87m Sand 29.87m-32.61m Clay 32.61m-34.14m Clay 34.14m-35.05m Sand 35.05m-35.07m Clay	0m	On-site
10083573	0.00m-0.60m Topsoil 0.60m-1.50m Clay 1.50m-8.00m Clay 8.00m-9.00m Clay 9.00m-19.00m Clay 19.00m-20.00m Clay 20.00m-23.00m Clay 23.00m-28.00m Clay 28.00m-29.50m Clay 29.50m-32.00m Clay 32.00m-33.00m Clay 33.00m-36.00m Clay 36.00m-44.00m Clay 44.00m-49.00m Clay 49.00m-53.00m Clay 53.00m-54.00m Clay 54.00m-57.00m Clay 57.00m-58.00m Clay 58.00m-67.00m Clay 67.00m-68.00m Clay 68.00m-69.00m Clay 69.00m-70.00m Clay 70.00m-74.50m Clay 74.50m-78.50m Clay 78.50m-83.00m Clay 83.00m-85.00m Sand 85.00m-93.00m Sand 93.00m-103.00m Clay 103.00m-104.00m Clay 103.00m-104.00m Gravel 104.00m-105.00m Clay 104.00m-105.00m Gravel 105.00m-107.00m Gravel 107.00m-108.00m Gravel 108.00m-112.00m Clay 112.00m-114.00m Lignite 114.00m-118.00m Clay 118.00m-121.00m Clay 121.00m-129.00m Clay 129.00m-130.00m Clay 130.00m-137.00m Clay	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10087971	0.00m-2.43m Clay 2.43m-5.74m Clay 5.74m-12.80m Clay 12.80m-14.50m Clay 14.50m-22.50m Clay 22.50m-23.10m Sand 23.10m-26.40m Clay 26.40m-28.60m Sand 28.60m-31.30m Clay 31.30m-31.70m Sand 31.70m-50.60m Clay 50.60m-50.65m Sand	0m	On-site
10088806	0.00m-15.00m clay 15.00m-16.00m sand 16.00m-20.00m clay 20.00m-23.00m sand 23.00m-49.80m clay 49.80m-51.30m sand 51.30m-52.00m silt	0m	On-site
10091141	0.00m-13.00m clay 13.00m-22.00m silt 22.00m-27.00m sand 27.00m-35.00m clay 35.00m-36.00m sand 36.00m-55.00m clay 55.00m-58.00m sand 58.00m-59.00m clay	0m	On-site
10094176	0.00m-1.00m Sand 1.00m-2.40m Clay 2.40m-4.86m Clay 4.86m-11.27m Clay 11.27m-26.51m Clay 26.51m-27.01m Sand 27.01m-32.90m Clay 32.90m-33.40m Sand 33.40m-37.30m Clay 37.30m-38.80m Sand 38.80m-41.90m Clay 41.90m-48.17m Sand	0m	On-site
10099505	0.00m-0.60m Clay 0.60m-6.40m Clay 6.40m-8.50m Clay 8.50m-12.80m Sand 12.80m-35.30m Clay 35.30m-44.80m Clay 44.80m-45.40m Clay 45.40m-58.50m Clay 58.50m-58.51m Sand	0m	On-site
10103937	0.00m-0.60m Loam 0.60m-3.00m Loam 3.00m-4.60m Clay 4.60m-9.40m Sand 9.40m-11.00m Clay 11.00m-16.20m Clay 16.20m-17.70m Clay 17.70m-19.20m Sand 19.20m-25.60m Clay 25.60m-29.00m Clay 29.00m-29.90m Sand 29.90m-33.50m Clay 33.50m-36.30m Clay 36.30m-36.90m Sand 36.90m-39.30m Clay 39.30m-41.15m Clay 41.15m-41.16m (Unknown)	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10104018	0.00m-0.60m Loam 0.60m-2.40m Clay 2.40m-5.50m Sand 5.50m-13.70m Clay 13.70m-25.90m Clay 25.90m-26.80m Clay 26.80m-29.50m Clay 29.50m-43.30m Clay 43.30m-47.50m Sand 47.50m-55.80m Clay 55.80m-56.70m Clay 56.70m-58.80m Clay 58.80m-59.40m Clay 59.40m-64.00m Clay 64.00m-64.60m Clay 64.60m-65.20m Sand 65.20m-66.80m Clay 66.80m-67.40m Sand 67.40m-73.20m Clay 73.20m-79.30m Clay 79.30m-79.60m Limestone 79.60m-84.70m Clay 84.70m-86.00m Clay 86.00m-87.80m Clay 87.80m-88.70m Clay 88.70m-97.60m Clay 97.60m-106.40m Clay 106.40m-107.60m Clay 107.60m-119.80m Clay 119.80m-120.40m Clay 120.40m-121.30m Sand 121.30m-122.20m Coal 122.20m-128.00m Clay 128.00m-128.60m Sand 128.60m-138.90m Clay 138.90m-143.20m Sand 143.20m-143.80m Clay 143.80m-144.00m Sand	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10104655	0.00m-0.05m Topsoil 0.05m-9.00m Clay 9.00m-11.00m Clay 11.00m-12.00m Clay 12.00m-13.00m Sand 13.00m-20.00m Clay 20.00m-21.00m Clay 21.00m-27.00m Clay 27.00m-31.00m Sand 31.00m-50.00m Clay 50.00m-51.00m Sand 51.00m-59.00m Clay 59.00m-61.00m Sand 61.00m-65.00m Clay 65.00m-72.00m Clay 72.00m-75.00m Clay 75.00m-77.00m Sand 77.00m-79.00m Clay 79.00m-80.00m Sand 80.00m-95.00m Clay 95.00m-96.00m Sand 96.00m-97.00m Sand 97.00m-102.00m Clay 102.00m-112.00m Sand 112.00m-113.00m Sand 113.00m-117.50m Sand 117.50m-119.00m Coal 119.00m-124.00m Clay 124.00m-125.00m Clay 125.00m-127.00m Clay 127.00m-128.00m Silt 128.00m-130.00m Clay 130.00m-131.00m Clay 131.00m-142.00m Sand 142.00m-146.00m Silt 146.00m-148.00m Sand 148.00m-149.00m Sand 149.00m-150.00m Clay 150.00m-153.00m Silt 153.00m-158.00m Coal 158.00m-160.00m Sand 160.00m-162.00m Coal 162.00m-164.00m Silt 164.00m-166.00m Coal 166.00m-170.00m Clay 170.00m-171.00m Coal 171.00m-178.00m Clay 178.00m-196.00m Silt 196.00m-200.00m Coal 200.00m-202.00m Clay 202.00m-203.00m Coal 203.00m-204.00m Clay	0m	On-site
10105245	0.00m-1.00m Clay 1.00m-11.00m Clay 11.00m-15.50m Clay 15.50m-23.50m Clay 23.50m-28.00m Clay 28.00m-29.50m Sand 29.50m-48.20m Clay 48.20m-50.00m Sand 50.00m-58.50m Clay 58.50m-61.00m Sand 61.00m-65.50m Clay	0m	On-site
10109732	0.00m-2.13m Clay 2.13m-9.14m Clay 9.14m-12.80m Clay 12.80m-18.28m Clay 18.28m-22.25m Clay 22.25m-24.68m Clay 24.68m-25.60m Sand 25.60m-29.56m Clay 29.56m-35.66m Clay 35.66m-36.27m Sand 36.27m-38.70m Clay 38.70m-40.23m Clay 40.23m-40.33m Sand	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10110110	0.00m-1.00m Loam 1.00m-7.00m Clay 7.00m-9.00m Clay 9.00m-12.00m Clay 12.00m-14.00m Clay 14.00m-19.00m Clay 19.00m-24.00m Sand 24.00m-25.00m Clay 25.00m-31.00m Clay 31.00m-33.00m Clay 33.00m-40.00m Clay 40.00m-45.00m Sand	0m	On-site
10111027	0.00m-0.61m Clay 0.61m-3.66m Clay 3.66m-6.71m Clay 6.71m-8.84m Clay 8.84m-12.19m Sand 12.19m-13.41m Clay 13.41m-21.34m Clay 21.34m-24.99m Clay 24.99m-27.43m Clay 27.43m-28.04m Sand 28.04m-32.31m Clay 32.31m-37.19m Clay 37.19m-41.76m Clay 41.76m-41.77m Sand	0m	On-site
10121717	0.00m-9.45m 9.45m-13.40m 13.40m-24.60m 24.60m-27.70m 27.70m-33.20m 33.20m-35.60m 35.60m-38.40m 38.40m-40.80m 40.80m-46.60m 46.60m-49.20m 49.20m-49.30m 49.30m-50.30m 50.30m-50.40m 50.40m-67.60m 67.60m-68.90m 68.90m-71.60m	0m	On-site
10122960	0.00m-17.00m Clay 17.00m-22.00m Sand 22.00m-26.00m Clay 26.00m-27.00m Sand 27.00m-43.50m Clay 43.50m-44.00m Sand 44.00m-53.50m Clay 53.50m-55.00m Sand 55.00m-56.00m Silt	0m	On-site
10123044	0.00m-1.00m Topsoil 1.00m-18.50m Clay 18.50m-25.00m Sand 25.00m-27.00m Clay 27.00m-31.00m Sand 31.00m-74.00m Clay 74.00m-80.00m Clay 80.00m-86.00m Sand 86.00m-101.00m Sand	0m	On-site
10124834	0.00m-64.50m Clay 64.50m-66.00m Sand 66.00m-67.00m Clay	0m	On-site
10124835	0.00m-5.00m Sand 5.00m-9.00m Clay 9.00m-13.00m Sand 13.00m-18.00m Sand 18.00m-25.00m Clay 25.00m-29.00m Clay 29.00m-30.00m Sand 30.00m-64.00m Clay 64.00m-74.00m Sand 74.00m-81.00m Clay 81.00m-93.00m Sand	0m	On-site
10125356	0.00m-80.00m 0.00m-80.00m 80.00m-118.00m 80.00m-118.00m 118.00m-234.00m 118.00m-234.00m	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10129071	0.00m-80.00m 80.00m-118.00m 118.00m-234.00m	0m	On-site
10130425	0.00m-1.00m Topsoil 1.00m-6.00m Clay 6.00m-8.00m Sand 8.00m-11.00m Clay 11.00m-14.00m Clay 14.00m-16.00m Sand 16.00m-24.00m Clay 24.00m-30.00m Clay 30.00m-42.00m Clay 42.00m-43.00m Sand 43.00m-44.00m Sand 44.00m-60.00m Clay 60.00m-70.00m Clay 70.00m-71.50m Clay 71.50m-72.80m Sand 72.80m-82.00m Clay 82.00m-85.00m Sand 85.00m-86.00m Invalid Code 86.00m-89.00m Invalid Code 89.00m-99.00m Sand 99.00m-100.00m Clay 100.00m-101.00m Clay 101.00m-102.00m Sand 102.00m-107.00m Clay 107.00m-116.00m Sand 116.00m-117.00m Sand 117.00m-120.00m Sand 120.00m-123.00m Sand 123.00m-126.00m Clay 126.00m-128.00m Silt 128.00m-134.00m Clay 134.00m-151.00m Sand 151.00m-152.00m Sand 152.00m-160.00m Sand	0m	On-site
10132173	0.00m-20.00m clay 20.00m-21.00m sand 21.00m-52.50m clay 52.50m-54.00m sand 54.00m-55.00m silt	0m	On-site
10134388	0.00m-3.00m Topsoil 3.00m-9.50m Clay 9.50m-17.30m Sandy Clay 17.30m-35.50m Clay 35.50m-37.00m Sand 37.00m-42.00m Clay 42.00m-43.50m Sand 43.50m-50.50m Clay 50.50m-67.60m Clay 67.60m-73.50m Sand 73.50m-76.50m Clay 76.50m-79.00m Sand 79.00m-84.00m Clay 84.00m-91.00m Clay 91.00m-93.00m Sandy Clay 93.00m-99.00m Sand 99.00m-102.00m Silt 102.00m-103.50m Sand 103.50m-115.50m Silt 115.50m-120.00m Sand 120.00m-125.00m Sand 125.00m-128.00m Sand	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10134462	0.00m-3.00m Topsoil 3.00m-6.00m Clay, dark brown 6.00m-9.00m Clay, light grey 9.00m-16.00m Gravel, small 16.00m-20.00m Clay, brown 20.00m-27.00m Gravel, small 27.00m-31.00m Clay, light brown 31.00m-35.00m Sand 35.00m-56.00m Clay, light brown 56.00m-63.00m Sand 63.00m-73.00m Clay 73.00m-77.00m Sand 77.00m-79.00m Clay 79.00m-83.00m Sand, brown 83.00m-94.00m Sand, white coarse 94.00m-95.00m Clay 95.00m-119.00m Sand 119.00m-120.00m Clay, grey 120.00m-125.00m Clay, brown 125.00m-126.00m Sand 126.00m-127.00m Clay 127.00m-129.00m Sand 129.00m-132.00m Lignite 132.00m-134.00m Clay, grey 134.00m-138.00m Sand, fine 138.00m-142.00m Clay, grey 142.00m-149.00m Sand, coarse 149.00m-175.00m Clay 175.00m-189.00m Sand, medium, 5% Clay 189.00m-200.00m Sand, coarse, 5% Clay 200.00m-206.00m Clay 206.00m-225.00m Sand, coarse, Clay 225.00m-234.00m Sand, fine/coarse, 5% Clay	0m	On-site
10137814	0.00m-1.00m Topsoil 1.00m-11.00m Clay 11.00m-13.00m Sand 13.00m-21.00m Clay 21.00m-24.00m Sand Grains (Lithic) 24.00m-29.00m Sand 29.00m-32.50m Clay 32.50m-35.00m Sand Grains (Lithic) 35.00m-48.50m Sand 48.50m-55.50m Clay 55.50m-60.00m Sand Grains (Lithic) 60.00m-61.00m Clay	0m	On-site
10138144	0.00m-1.00m Topsoil 1.00m-8.00m Clay 8.00m-10.00m Clay 10.00m-27.50m Clay 27.50m-29.00m Clay 29.00m-43.00m Clay 43.00m-44.00m Silt	0m	On-site
10142442	0.00m-1.00m Topsoil 1.00m-8.00m Clay 8.00m-10.00m Sand 10.00m-34.00m Clay 34.00m-35.00m Sand 35.00m-47.00m Clay 47.00m-50.00m Sand 50.00m-71.00m Clay 71.00m-78.00m Sand 78.00m-81.00m Sand 81.00m-99.00m Clay 99.00m-105.00m Sand 105.00m-111.00m Clay 111.00m-119.00m Sand	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10142699	0.00m-1.00m Topsoil 1.00m-2.00m Sand 1.00m-2.00m Clay 1.00m-2.00m 2.00m-4.00m Clay 4.00m-8.00m Clay 8.00m-16.00m Clay 16.00m-18.00m Clay 18.00m-22.00m Clay 22.00m-26.00m Clay 26.00m-28.00m Clay 28.00m-30.00m Clay 30.00m-34.00m 30.00m-34.00m Sand 34.00m-38.00m Clay 38.00m-44.00m Clay 44.00m-46.00m Clay 46.00m-52.00m 46.00m-52.00m Clay 52.00m-59.50m Clay 59.50m-60.50m 59.50m-60.50m Sand 60.50m-61.00m Clay 60.50m-61.00m 61.00m-62.50m 61.00m-62.50m Sand 62.50m-63.50m Sand 62.50m-63.50m 63.50m-65.00m 63.50m-65.00m Sand 65.00m-67.50m Sand 65.00m-67.50m 67.50m-69.50m Clay 69.50m-69.60m Clay	0m	On-site
10142927	0.00m-1.00m Topsoil 1.00m-6.00m Clay 6.00m-8.00m Sand 8.00m-11.00m Clay 11.00m-14.00m Clay 14.00m-16.00m Sand 16.00m-24.00m Clay 24.00m-30.00m Clay 30.00m-42.00m Clay 42.00m-44.00m Sand 44.00m-60.00m Clay 60.00m-70.00m Clay 70.00m-71.50m Clay 71.50m-72.80m Sand 72.80m-82.00m Clay 82.00m-85.00m Sand 85.00m-86.00m Clay 86.00m-89.00m Clay 89.00m-99.00m Sand 99.00m-100.00m Clay 100.00m-101.00m Clay 101.00m-102.00m Sand 102.00m-107.00m Clay 107.00m-116.00m Sand 116.00m-117.00m Sand 117.00m-120.00m Sand 120.00m-123.00m Sand 123.00m-126.00m Clay 126.00m-128.00m Silt 128.00m-134.00m Clay 134.00m-151.00m Sand 151.00m-152.00m Sand 152.00m-160.00m Sand 160.00m-160.00m Invalid Code	0m	On-site
10143187	0.00m-3.00m Clay 3.00m-6.70m Sandy Clay 6.70m-9.10m Clay 9.10m-14.30m Clay 14.30m-16.10m Sand 16.10m-22.20m Clay 22.20m-28.30m Sand 28.30m-32.30m Clay 32.30m-35.00m Silty Clay 35.00m-35.30m Sand 35.30m-36.80m Clay 36.80m-50.20m Clay 50.20m-52.00m Sand	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10143620	0.00m-0.61m Clay 0.61m-2.44m Clay 2.44m-3.66m Clay 3.66m-5.49m Clay 5.49m-9.14m Clay 9.14m-12.80m Sand 12.80m-15.24m Clay 15.24m-17.68m Sand 17.68m-18.90m Clay 18.90m-22.86m Clay 22.86m-23.47m Sand 23.47m-32.00m Clay 32.00m-40.23m Clay 40.23m-42.67m Sand 42.67m-44.20m Gravel 44.20m-50.29m Clay 50.29m-50.31m Sand	0m	On-site
10146061	0.00m-3.00m Topsoil 3.00m-6.00m Clay, dark brown 6.00m-9.00m Clay, light grey 9.00m-16.00m Gravel, small 16.00m-20.00m Clay, brown 20.00m-27.00m Gravel, small 27.00m-31.00m Clay, light brown 31.00m-35.00m Sand 35.00m-56.00m Clay, light brown 56.00m-63.00m Sand 63.00m-73.00m Clay 73.00m-77.00m Sand 77.00m-79.00m Clay 79.00m-83.00m Sand, brown 83.00m-94.00m Sand, white coarse 94.00m-95.00m Clay 95.00m-119.00m Sand 119.00m-120.00m Clay, grey 120.00m-125.00m Clay, brown 125.00m-126.00m Sand 126.00m-127.00m Clay 127.00m-129.00m Sand 129.00m-132.00m Lignite 132.00m-134.00m Clay, grey 134.00m-138.00m Sand, fine 138.00m-142.00m Clay, grey 142.00m-149.00m Sand, coarse 149.00m-175.00m Clay 175.00m-189.00m Sand, medium, 5% Clay 189.00m-200.00m Sand, coarse, 5% Clay 200.00m-206.00m Clay 206.00m-225.00m Sand, coarse, Clay 225.00m-234.00m Sand, fine/coarse, 5% Clay	0m	On-site
10146337	0.00m-6.70m 6.70m-8.20m 8.20m-10.30m 10.30m-12.10m 12.10m-15.80m 15.80m-18.50m 18.50m-23.70m 23.70m-25.30m 25.30m-28.90m 28.90m-32.90m 32.90m-39.00m 39.00m-42.00m 42.00m-61.70m 61.70m-64.90m	0m	On-site
10146623	0.00m-19.00m Clay 19.00m-21.00m Sand 21.00m-27.00m Clay 27.00m-39.00m Clay 39.00m-40.00m Clay 40.00m-47.50m Clay 47.50m-52.00m Sand 52.00m-78.00m Clay 78.00m-84.00m Sand 84.00m-95.00m Clay 95.00m-112.00m Sand 112.00m-120.00m Clay 120.00m-123.50m Sand 123.50m-135.00m Clay 135.00m-142.00m Sand 142.00m-152.00m Clay 152.00m-154.00m Sand 154.00m-157.00m Coal 157.00m-159.00m Sand 159.00m-176.00m Clay	0m	On-site

NGIS Bore ID	Drillers Log	Distance	Direction
10150261	0.00m-3.00m Topsoil 3.00m-6.00m Clay, dark brown 6.00m-9.00m Clay, light grey 9.00m-16.00m Gravel, small 16.00m-20.00m Clay, brown 20.00m-27.00m Gravel, small 27.00m-31.00m Clay, light brown 31.00m-35.00m Sand 35.00m-56.00m Clay, light brown 56.00m-63.00m Sand 63.00m-73.00m Clay 73.00m-77.00m Sand 77.00m-79.00m Clay 79.00m-83.00m Sand, brown 83.00m-94.00m Sand, white coarse 94.00m-95.00m Clay 95.00m-119.00m Sand 119.00m-120.00m Clay, grey 120.00m-125.00m Clay, brown 125.00m-126.00m Sand 126.00m-127.00m Clay 127.00m-129.00m Sand 129.00m-132.00m Lignite 132.00m-134.00m Clay, grey 134.00m-138.00m Sand, fine 138.00m-142.00m Clay, grey 142.00m-149.00m Sand, coarse 149.00m-175.00m Clay 175.00m-189.00m Sand, medium, 5% Clay 189.00m-200.00m Sand, coarse, 5% Clay 200.00m-206.00m Clay 206.00m-225.00m Sand, coarse, Clay 225.00m-234.00m Sand, fine/coarse, 5% Clay	0m	On-site
10150291	0.00m-3.00m Topsoil 3.00m-6.00m Clay, dark brown 6.00m-9.00m Clay, light grey 9.00m-16.00m Gravel, small 16.00m-20.00m Clay, brown 20.00m-27.00m Gravel, small 27.00m-31.00m Clay, light brown 31.00m-35.00m Sand 35.00m-56.00m Clay, light brown 56.00m-63.00m Sand 63.00m-73.00m Clay 73.00m-77.00m Sand 77.00m-79.00m Clay 79.00m-83.00m Sand, brown 83.00m-94.00m Sand, white coarse 94.00m-95.00m Clay 95.00m-119.00m Sand 119.00m-120.00m Clay, grey 120.00m-125.00m Clay, brown 125.00m-126.00m Sand 126.00m-127.00m Clay 127.00m-129.00m Sand 129.00m-132.00m Lignite 132.00m-134.00m Clay, grey 134.00m-138.00m Sand, fine 138.00m-142.00m Clay, grey 142.00m-149.00m Sand, coarse 149.00m-175.00m Clay 175.00m-189.00m Sand, medium, 5% Clay 189.00m-200.00m Sand, coarse, 5% Clay 200.00m-206.00m Clay 206.00m-225.00m Sand, coarse, Clay 225.00m-234.00m Sand, fine/coarse, 5% Clay	0m	On-site
10128814	0.00m-88.00m 88.00m-139.00m 139.00m-229.00m	13m	North East
10144002	0.00m-2.00m Colour ygb, texture mc trcc 2.00m-4.00m Colour yb, texture mc 4.00m-10.50m Colour ygb, texture mc 10.50m-13.00m Colour yb, texture csc 13.00m-13.50m Colour yb, texture csc/gravel	15m	South East
10121000	0.00m-88.00m 0.00m-88.00m 88.00m-139.00m 88.00m-139.00m 139.00m-229.00m 139.00m-229.00m	26m	North East

NGIS Bore ID	Drillers Log	Distance	Direction
10125790	0.00m-1.00m Topsoil 1.00m-7.00m Clay, brown 7.00m-10.00m Sandy Clay 10.00m-13.00m Clay, coarse 13.00m-22.00m Clay, brown 22.00m-25.00m Clay, coarse 25.00m-33.00m Clay, brown 33.00m-37.00m Clay, coarse 37.00m-55.00m Clay, brown 55.00m-69.00m Clay, dark brown 69.00m-72.00m Clay, dar brown, Quartz content 72.00m-77.00m Clay, dark brown 77.00m-81.00m Sand, fine, brown 81.00m-92.00m Clay, brown 92.00m-139.00m Sand, light grey 139.00m-154.00m Lignite 154.00m-161.00m Sand & Lignite Bands 161.00m-204.00m Sand, dark grey 204.00m-216.00m Clay 216.00m-229.00m Sand, coarse, grey	26m	North East
10129659	0.00m-1.00m Topsoil 1.00m-7.00m Clay, brown 7.00m-10.00m Sandy Clay 10.00m-13.00m Clay, coarse 13.00m-22.00m Clay, brown 22.00m-25.00m Clay, coarse 25.00m-33.00m Clay, brown 33.00m-37.00m Clay, coarse 37.00m-55.00m Clay, brown 55.00m-69.00m Clay, dark brown 69.00m-72.00m Clay, dar brown, Quartz content 72.00m-77.00m Clay, dark brown 77.00m-81.00m Sand, fine, brown 81.00m-92.00m Clay, brown 92.00m-139.00m Sand, light grey 139.00m-154.00m Lignite 154.00m-161.00m Sand & Lignite Bands 161.00m-204.00m Sand, dark grey 204.00m-216.00m Clay 216.00m-229.00m Sand, coarse, grey	26m	North East
10150237	0.00m-1.00m Topsoil 1.00m-7.00m Clay, brown 7.00m-10.00m Sandy Clay 10.00m-13.00m Clay, coarse 13.00m-22.00m Clay, brown 22.00m-25.00m Clay, coarse 25.00m-33.00m Clay, brown 33.00m-37.00m Clay, coarse 37.00m-55.00m Clay, brown 55.00m-69.00m Clay, dark brown 69.00m-72.00m Clay, dar brown, Quartz content 72.00m-77.00m Clay, dark brown 77.00m-81.00m Sand, fine, brown 81.00m-92.00m Clay, brown 92.00m-139.00m Sand, light grey 139.00m-154.00m Lignite 154.00m-161.00m Sand & Lignite Bands 161.00m-204.00m Sand, dark grey 204.00m-216.00m Clay 216.00m-229.00m Sand, coarse, grey	26m	North East
10150264	0.00m-1.00m Topsoil 1.00m-7.00m Clay, brown 7.00m-10.00m Sandy Clay 10.00m-13.00m Clay, coarse 13.00m-22.00m Clay, brown 22.00m-25.00m Clay, coarse 25.00m-33.00m Clay, brown 33.00m-37.00m Clay, coarse 37.00m-55.00m Clay, brown 55.00m-69.00m Clay, dark brown 69.00m-72.00m Clay, dar brown, Quartz content 72.00m-77.00m Clay, dark brown 77.00m-81.00m Sand, fine, brown 81.00m-92.00m Clay, brown 92.00m-139.00m Sand, light grey 139.00m-154.00m Lignite 154.00m-161.00m Sand & Lignite Bands 161.00m-204.00m Sand, dark grey 204.00m-216.00m Clay 216.00m-229.00m Sand, coarse, grey	26m	North East

NGIS Bore ID	Drillers Log	Distance	Direction
10107217	0.00m-0.91m Clay 0.91m-6.10m Clay 6.10m-9.14m Clay 9.14m-14.63m Sand 14.63m-17.37m Clay 17.37m-19.20m Sand 19.20m-22.25m Clay 22.25m-25.60m Clay 25.60m-26.21m Silt 26.21m-28.04m Clay 28.04m-30.48m Clay 30.48m-31.70m Clay 31.70m-32.31m Clay 32.31m-32.32m Sand	98m	South East
10050409	0.00m-33.00m Clay 33.00m-34.00m Silt 34.00m-52.70m Clay 52.70m-54.20m Sand 54.20m-55.00m Sand	105m	South East
10101154	0.00m-3.66m Clay 3.66m-5.49m Sand 5.49m-24.99m Clay 24.99m-26.21m Sand 26.21m-31.70m Clay 31.70m-36.58m Sand	182m	East
10038483	0.00m-4.27m Clay 4.27m-6.10m Sand 6.10m-12.50m Clay 12.50m-14.02m Sand 14.02m-21.34m Clay 21.34m-24.38m Clay 24.38m-25.30m Clay 25.30m-51.21m Clay 51.21m-55.78m Clay 55.78m-56.69m Clay 56.69m-56.71m Sand	191m	South East
10127221	0.00m-1.00m 1.00m-7.00m 7.00m-11.00m 11.00m-18.90m 18.90m-24.50m 24.50m-26.00m 26.00m-30.00m 30.00m-33.00m 33.00m-44.50m 44.50m-45.50m 45.50m-49.50m	292m	East
10021748	0.00m-0.61m Subsoil 0.61m-2.13m Clay 2.13m-2.74m Sand 2.74m-15.24m Clay 15.24m-17.37m Sand 17.37m-21.34m Clay 21.34m-24.69m Sand 24.69m-29.26m Clay 29.26m-29.57m Clay 29.57m-36.27m Clay 36.27m-46.02m Clay 46.02m-46.33m Invalid Code 46.33m-49.38m Clay 49.38m-51.21m Sand	384m	South East

NGIS Bore ID	Drillers Log	Distance	Direction
10028019	0.00m-1.00m Topsoil 1.00m-2.00m Clay 2.00m-5.00m Clay 5.00m-9.00m Sand 9.00m-11.00m Clay 11.00m-13.00m Clay 13.00m-16.00m Clay 16.00m-18.00m Sand 18.00m-23.00m Clay 23.00m-26.00m Clay 26.00m-28.00m Clay 28.00m-31.00m Clay 31.00m-35.00m Sandy Clay 35.00m-38.00m Clay 38.00m-42.00m Clay 42.00m-44.00m Sand 44.00m-45.00m Clay 45.00m-47.00m Clay 47.00m-48.00m Clay 48.00m-51.00m Clay 51.00m-53.00m Clay 53.00m-55.00m Clay 55.00m-57.00m Clay 57.00m-58.00m Clay 58.00m-60.00m Clay 60.00m-62.00m Clay 62.00m-63.00m Sand 63.00m-68.00m Clay 68.00m-70.00m Sandy Clay 70.00m-71.00m Sand 71.00m-77.00m Clay 77.00m-78.00m Sand 78.00m-80.00m Sand 80.00m-82.00m Clay 82.00m-85.00m Sand 85.00m-87.00m Sand 87.00m-88.00m Sand 88.00m-90.00m Sand 90.00m-96.00m Sand 96.00m-98.00m Sand 98.00m-101.00m Sand 101.00m-103.00m Sand 103.00m-105.00m Sand 105.00m-106.00m Sand 106.00m-109.00m Sand 109.00m-112.00m Sand 112.00m-115.00m Sand 115.00m-118.00m Sand 118.00m-121.00m Clay 121.00m-125.00m Clay 125.00m-129.00m Clay 129.00m-131.00m Sand 131.00m-133.00m Sand 133.00m-134.00m Sand 134.00m-136.00m Sand 136.00m-138.00m Sand 138.00m-142.00m Sand 142.00m-144.00m Clay 144.00m-150.00m Clay 150.00m-154.00m Clay 154.00m-163.00m Clay 163.00m-173.00m Clay	442m	East
10112207	0.00m-0.61m Clay 0.61m-3.66m Clay 3.66m-11.58m Sand 11.58m-20.12m Clay 20.12m-25.60m Sand 25.60m-33.22m Clay 33.22m-35.05m Clay 35.05m-36.88m Clay 36.88m-53.64m Clay 53.64m-53.66m Sand	544m	North East
10009322	0.00m-3.05m Sand 3.05m-7.32m Clay 7.32m-21.34m Sand 21.34m-29.26m Clay	695m	East

NGIS Bore ID	Drillers Log	Distance	Direction
10033667	0.00m-1.22m Clay 1.22m-2.44m Clay 2.44m-7.62m Clay 7.62m-9.45m Clay 9.45m-10.67m Sand 10.67m-12.80m Clay 12.80m-14.02m Clay 14.02m-16.76m Clay 16.76m-17.37m Clay 17.37m-21.64m Sand 21.64m-24.99m Clay 24.99m-26.21m Clay 26.21m-28.65m Sand 28.65m-39.62m Clay 39.62m-42.67m Clay 42.67m-44.50m Clay 44.50m-46.94m Clay 46.94m-49.68m Clay 49.68m-50.90m Clay 50.90m-55.47m Clay 55.47m-70.10m Clay 70.10m-71.63m Clay 71.63m-73.15m Clay 73.15m-74.37m Clay 74.37m-76.20m Clay 76.20m-76.22m Sand	718m	East
10096496	0.00m-7.92m Clay 7.92m-9.45m Sand 9.45m-15.54m Clay 15.54m-22.25m 22.25m-28.35m Clay 28.35m-30.18m Sand 30.18m-37.49m Clay 37.49m-42.37m Silt 42.37m-60.05m Clay 60.05m-61.87m Silt 61.87m-68.58m Clay 68.58m-71.63m 71.63m-73.46m Clay	718m	East
10037380	0.00m-0.91m Clay 0.91m-3.35m Clay 3.35m-8.53m Clay 8.53m-9.75m Clay 9.75m-18.29m Clay 18.29m-23.47m Sand 23.47m-25.91m Clay 25.91m-28.04m Clay 28.04m-31.39m Clay 31.39m-32.92m Clay 32.92m-35.36m Clay 35.36m-39.01m Clay 39.01m-39.03m Sand	762m	North East
10049550	0.00m-4.00m Clay 4.00m-13.00m Clay 13.00m-14.00m Sand 14.00m-26.00m Clay 26.00m-28.00m Sand 28.00m-29.00m Sand 29.00m-30.00m Clay	822m	East
10116823	0.00m-0.60m Clay 0.60m-6.40m Clay 6.40m-15.20m Clay 15.20m-17.60m Sand 17.60m-18.20m Clay 18.20m-43.90m Clay 43.90m-43.91m Sand	882m	South East
10008097	0.00m-6.10m Clay 6.10m-16.76m Clay 16.76m-21.95m Clay 21.95m-22.56m Invalid Code 22.56m-24.99m (Unknown) 24.99m-28.96m Clay	921m	East

NGIS Bore ID	Drillers Log	Distance	Direction
10077796	0.00m-38.00m Clay 38.00m-39.00m Sand 39.00m-48.00m Clay 48.00m-53.00m Sand 53.00m-59.00m Clay 59.00m-66.00m Sand 66.00m-71.00m Clay 71.00m-76.00m Invalid Code 76.00m-86.00m Clay 86.00m-107.00m Sand 107.00m-110.00m Clay 110.00m-135.00m Sand 135.00m-148.00m Clay 148.00m-168.00m Sand 168.00m-171.00m Invalid Code 171.00m-204.00m Clay 204.00m-242.00m Sand 242.00m-242.00m Invalid Code	978m	North
10124038	0.00m-1.00m Clay 1.00m-9.40m Clay 9.40m-13.10m Sandy Clay 13.10m-14.90m Sand 14.90m-18.20m Clay 18.20m-26.20m Clay 26.20m-27.70m Sand 27.70m-40.20m Clay 40.20m-42.90m Clay 42.90m-43.90m Silty Clay 43.90m-55.70m Clay 55.70m-56.70m Sandy Clay 56.70m-61.50m Clay 61.50m-62.10m Sand 62.10m-64.60m Sandy Clay 64.60m-70.40m Clay 70.40m-74.30m Silty Clay 74.30m-75.60m Clay 75.60m-76.50m Sand 76.50m-77.70m Sandy Clay 77.70m-80.10m Clay 80.10m-81.40m Silty Clay 81.40m-82.60m Sand 82.60m-85.90m Sand 85.90m-90.50m Clay Loam 90.50m-91.50m Clay Loam 91.50m-95.70m Sand 95.70m-100.30m Sand 100.30m-101.50m Sandy Clay 101.50m-102.70m Clay 102.70m-108.80m Silty Clay 108.80m-113.40m Sand 113.40m-114.30m Silty Clay 114.30m-120.40m Sand 120.40m-121.90m Sandy Clay 121.90m-122.00m Clay	1133m	South West
10074925	0.00m-0.91m Clay 0.91m-2.44m Clay 2.44m-6.10m Clay 6.10m-7.62m Clay 7.62m-9.14m Clay 9.14m-15.54m Clay 15.54m-17.37m Clay 17.37m-18.29m Clay 18.29m-21.03m Clay 21.03m-21.95m Clay 21.95m-24.69m Clay 24.69m-25.60m Sand 25.60m-29.26m Clay 29.26m-33.22m Clay 33.22m-33.24m Sand	1155m	North East
10014500	0.00m-0.91m Clay 0.91m-3.66m Clay 3.66m-7.92m Clay 7.92m-12.80m Clay 12.80m-15.24m Clay 15.24m-18.90m Clay 18.90m-21.34m Clay 21.34m-25.91m Clay 25.91m-26.21m Sand 26.21m-28.65m Clay 28.65m-28.96m Sand 28.96m-29.26m Clay 29.26m-29.28m Sand	1196m	East

NGIS Bore ID	Drillers Log	Distance	Direction
10103896	0.00m-8.80m Clay 8.80m-14.30m Sand 14.30m-22.30m Clay 22.30m-26.50m Sand 26.50m-32.30m Clay 32.30m-33.80m Sand 33.80m-42.00m Clay 42.00m-42.01m Sand	1256m	South East
10108114	0.00m-0.30m Subsoil 0.30m-0.91m Clay 0.91m-3.35m Clay 3.35m-6.10m Sand 6.10m-18.90m Clay 18.90m-23.16m Clay 23.16m-24.38m Sand 24.38m-45.11m Clay 45.11m-46.33m Clay 46.33m-46.34m Sand	1260m	North
10009573	0.00m-3.05m Clay 3.05m-6.71m Clay 6.71m-12.19m Clay 12.19m-14.02m Clay 14.02m-14.94m Clay 14.94m-19.81m Clay 19.81m-21.95m Clay 19.81m-21.95m Sand	1367m	South East
10041877	0.00m-8.00m clay, grey 8.00m-13.00m clay, grey brown 13.00m-17.00m sandy clay, grey brown 17.00m-26.00m clay, grey 26.00m-29.00m sandy clay, grey brown 29.00m-33.00m fine sand, brown	1400m	South
10018787	0.00m-1.83m Clay 1.83m-3.96m Clay 3.96m-7.32m Clay 7.32m-11.89m Clay 11.89m-14.33m Clay 14.33m-15.85m Clay 15.85m-17.98m Sand 17.98m-19.51m Clay 19.51m-24.38m Clay 24.38m-31.09m Clay 31.09m-33.22m Clay 33.22m-38.40m Clay 38.40m-45.11m Clay 45.11m-46.33m Clay 46.33m-48.46m Clay 48.46m-49.68m Clay 49.68m-52.73m Clay 52.73m-54.86m Clay 54.86m-56.39m Clay 56.39m-59.13m Clay 59.13m-59.15m Sand	1495m	South East

NGIS Bore ID	Drillers Log	Distance	Direction
10136351	0.00m-0.60m Clay 0.60m-1.52m Clay 1.52m-6.09m Clay 6.09m-9.44m Clay 9.44m-11.27m Clay 11.27m-12.80m Sand 12.80m-15.24m Clay 15.24m-21.64m Clay 21.64m-26.21m Clay 26.21m-27.43m Clay 27.43m-29.26m Clay 29.26m-29.56m Sand 29.56m-30.48m Clay 30.48m-31.69m Sand 31.69m-33.22m Clay 33.22m-37.79m Clay 37.79m-41.14m Clay 41.14m-42.67m Clay 42.67m-43.58m Sand 43.58m-49.07m Clay 49.07m-49.98m Clay 49.98m-50.90m Sand 50.90m-52.42m Clay 52.42m-54.86m Sand 54.86m-56.08m Clay 56.08m-58.52m Clay 58.52m-60.35m Clay 60.35m-61.87m Sand 61.87m-64.00m Clay 64.00m-65.83m Clay 65.83m-74.67m Clay 74.67m-77.41m Clay 77.41m-78.02m Sand 78.02m-81.38m Clay 81.38m-82.29m Sand 82.29m-82.90m Clay 82.90m-84.12m Sand 84.12m-90.52m Clay 90.52m-92.96m Clay 92.96m-94.18m Sand 94.18m-96.01m Clay 96.01m-105.15m Clay 105.15m-109.72m Clay 109.72m-119.48m Clay 119.48m-123.44m Clay 123.44m-129.54m Clay 129.54m-131.67m Silt 131.67m-137.16m Clay	1524m	West
10107673	0.00m-2.44m Clay 2.44m-5.18m Clay 5.18m-5.49m Clay 5.49m-7.62m Sand 7.62m-9.75m Clay 9.75m-13.11m Sand 13.11m-22.25m Clay 22.25m-24.38m Sand 24.38m-27.43m Sand 27.43m-30.18m Clay 30.18m-33.53m Clay 33.53m-38.86m Clay 38.86m-39.01m Sand 39.01m-49.68m Clay 49.68m-58.52m Clay 58.52m-62.79m Clay 62.79m-63.40m Clay 63.40m-63.41m Sand	1578m	North
10077856	0.00m-1.20m Clay 1.20m-3.90m Clay 3.90m-6.10m Clay 6.10m-7.90m Sand 7.90m-29.20m Clay 29.20m-31.60m Sand 31.60m-40.40m Clay 40.40m-41.40m Sand 41.40m-48.60m Clay 48.60m-48.61m Sand	1603m	West

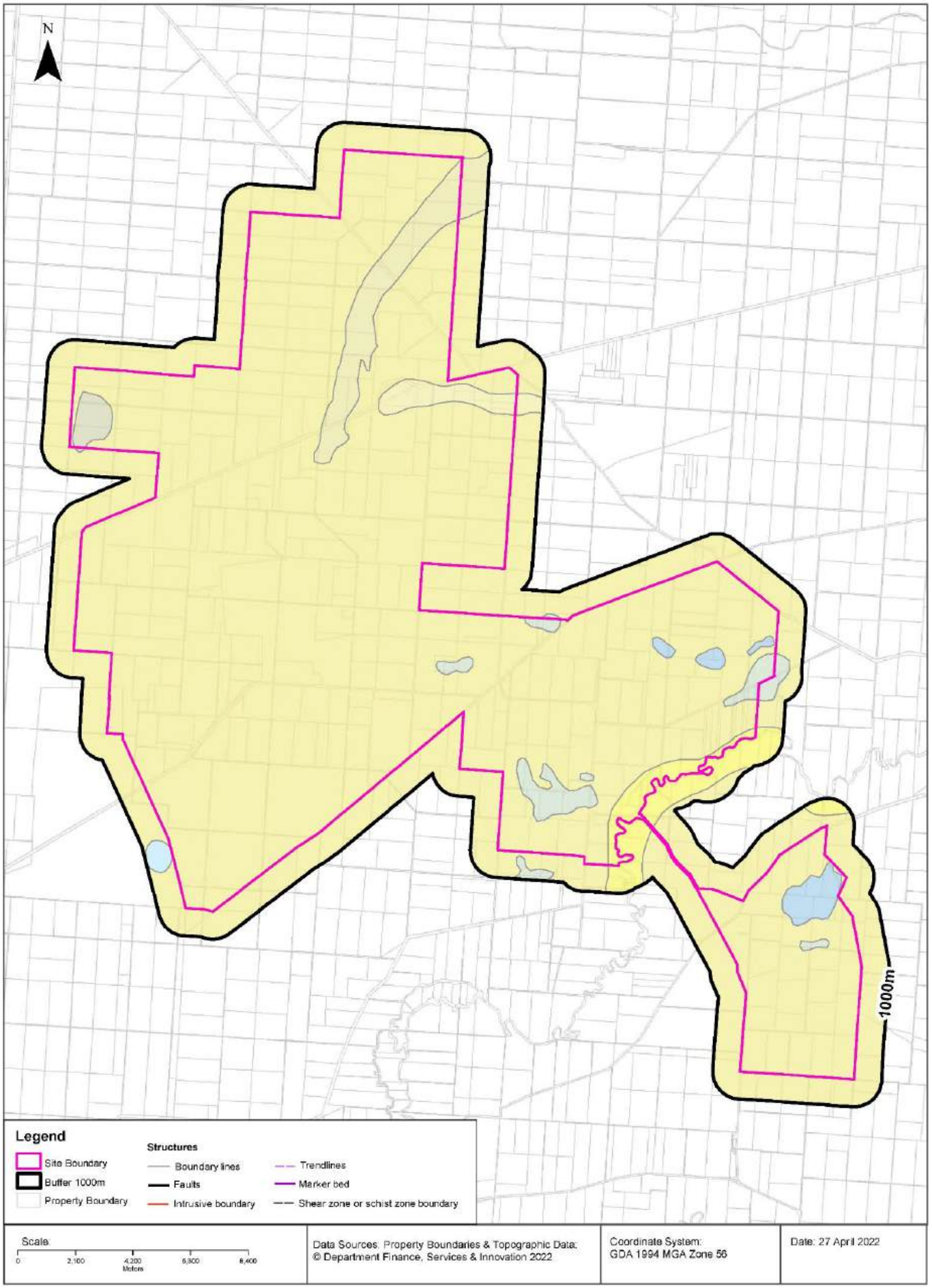
NGIS Bore ID	Drillers Log	Distance	Direction
10083217	0.00m-7.62m Clay 7.62m-12.19m Sand 12.19m-16.76m Clay 16.76m-19.20m Sand 19.20m-25.91m Clay 25.91m-25.92m (Unknown) 25.92m-27.43m (Unknown) 27.43m-34.44m Clay 34.44m-35.66m (Unknown) 35.66m-67.36m Clay	1675m	East
10023555	0.00m-3.96m Sand 3.96m-11.28m Clay 11.28m-13.72m Clay 13.72m-16.76m Sand 16.76m-26.52m Clay 26.52m-27.43m Clay 27.43m-32.00m Clay 32.00m-34.14m Clay 34.14m-46.33m Clay 46.33m-51.21m Sand 51.21m-56.39m Clay 56.39m-56.40m Sand	1761m	South East
10101097	0.00m-3.96m Sand 3.96m-11.28m Clay 11.28m-13.72m Clay 13.72m-16.76m Sand 16.76m-26.52m Clay 26.52m-27.43m Clay 27.43m-32.00m Clay 32.00m-34.14m Clay 34.14m-34.15m Sand	1761m	South East

NGIS Bore ID	Drillers Log	Distance	Direction
10088323	0.00m-0.50m Topsoil 0.50m-8.00m Clay 8.00m-11.00m Clay 11.00m-12.00m Clay 12.00m-14.00m Sand 14.00m-19.80m Clay 19.80m-21.00m Clay 21.00m-24.00m Clay 24.00m-26.50m Clay 26.50m-27.80m Clay 27.80m-30.50m Sand 30.50m-49.80m Clay 49.80m-51.50m Sand 51.50m-58.00m Clay 58.00m-59.30m Sand 59.30m-65.00m Clay 65.00m-72.00m Clay 72.00m-72.50m Clay 72.50m-73.50m Sand 73.50m-75.00m Clay 75.00m-80.60m Clay 80.60m-85.40m Sand 85.40m-88.20m Clay 88.20m-90.00m Clay 90.00m-95.00m Clay 95.00m-98.80m Clay 98.80m-99.00m Sand 99.00m-100.00m Sand 100.00m-100.40m Sand 100.40m-101.00m Clay 101.00m-102.00m Sand 102.00m-106.00m Sand 106.00m-107.00m Sand 107.00m-109.00m Sand 109.00m-110.00m Sand 110.00m-111.40m Sand 111.40m-112.00m Invalid Code 112.00m-113.00m Sand 113.00m-120.00m Sand 120.00m-122.00m Invalid Code 122.00m-127.00m Clay 127.00m-128.00m Sand 128.00m-128.80m Sand 128.80m-135.50m Invalid Code 135.50m-136.00m Sand 136.00m-137.50m Sand 137.50m-141.20m Clay 141.20m-144.00m Sand 144.00m-145.00m Sand 145.00m-146.90m Sand 146.90m-147.00m Invalid Code 147.00m-148.00m Sand 148.00m-149.00m Silt 149.00m-151.00m Silt 151.00m-152.00m Invalid Code 152.00m-153.00m Silt 153.00m-154.00m Invalid Code 154.00m-157.00m Silt 157.00m-158.00m Sand 158.00m-170.00m Invalid Code 170.00m-176.00m Sand 176.00m-181.50m Sand 181.50m-187.20m Invalid Code 187.20m-192.00m Sand 192.00m-194.00m Silt	1800m	South West
10098651	0.00m-1.20m Clay 1.20m-2.70m Clay 2.70m-4.80m Sand 4.80m-12.10m Clay 12.10m-14.50m Sand 14.50m-20.00m Clay 20.00m-20.60m Sand 20.60m-29.20m Clay 29.20m-29.50m Sand 29.50m-38.30m Clay 38.30m-38.40m Sand 38.40m-43.50m Clay 43.50m-45.70m Sand	1832m	West

NGIS Bore ID	Drillers Log	Distance	Direction
10112868	0.00m-0.61m Clay 0.61m-3.35m Clay 3.35m-6.10m Clay 6.10m-12.80m Clay 12.80m-21.34m Sand 21.34m-33.22m Clay 33.22m-33.38m Sand 33.38m-36.88m Clay 36.88m-44.50m Clay 44.50m-47.85m Clay 47.85m-61.26m Clay 61.26m-62.48m Clay 62.48m-63.70m Clay 63.70m-65.84m Clay 65.84m-74.07m Clay 74.07m-74.37m Clay 74.37m-74.39m Sand	1842m	East
10017408	0.00m-0.61m Subsoil 0.61m-5.79m Clay 5.79m-9.75m Sand 9.75m-14.63m Clay 14.63m-15.85m Sand 15.85m-16.15m Clay 16.15m-20.73m Clay 20.73m-21.79m Clay 21.79m-22.25m Sand 22.25m-25.60m Clay 25.60m-28.04m Clay 28.04m-32.92m Clay 32.92m-35.81m Clay 35.81m-39.01m Clay 39.01m-42.21m Clay 42.21m-43.28m Clay 43.28m-43.30m Sand	1980m	South East
10091685	0.00m-21.00m clay 21.00m-25.00m silt 25.00m-70.50m clay 70.50m-72.00m sand 72.00m-73.00m silt	1983m	South East

Geology

1836 Mabins Well Road, Moonbria, NSW 2710



Geology

1836 Mabins Well Road, Moonbria, NSW 2710

Geological Units

What are the Geological Units within the dataset buffer?

Unit Code	Unit Name	Description	Unit Stratigraphy	Age	Dominant Lithology	Distance
CZ_af	Alluvial floodplain deposits	Silt, very fine- to medium-grained lithic to quartz-rich sand, clay.	/Alluvium//Alluvial floodplain deposits//	Cenozoic (base) to Now (top)	Silt	0m
Q_af	Alluvial floodplain deposits	Silt, very fine- to medium-grained lithic to quartz-rich sand, clay.	/Alluvium//Alluvial floodplain deposits//	Quaternary (base) to Now (top)	Clastic sediment	0m
Q_acm	Alluvial channel deposits - meander-plain facies	Unconsolidated grey humic, clayey very fine-grained sand, typically overlying light brown clayey silt.	/Alluvium//Alluvial channel deposits/Alluvial channel deposits - meander-plain facies/	Quaternary (base) to Now (top)	Clastic sediment	0m
Q_a	Alluvium	Unconsolidated grey to brown to beige humic (±)micaceous silty clay, quartz-(±)lithic silt, fine- to medium-grained quartz-rich to quartz-lithic sand, polymictic pebble to cobble gravel (as sporadic lenses); sporadic palaeosol horizons.	/Alluvium////	Quaternary (base) to Now (top)	Clastic sediment	0m
Q_ds	Aeolian sand plain	Flat to low undulating or hummocky fossil sand plain, red-brown to brown and humic, clayey, silty to fine-grained sand, silty clay at depth; abundant regolithic & pedogenic carbonate, extensively modified by pedogenesis.	/Aeolian deposits//Aeolian sand plain//	Upper Pleistocene (base) to Now (top)	Sand	0m
Q_lp	Playa lake deposits	Friable to plastic, finely laminated grey clay, silty clay, humic clay, grey paleosols; locally includes medium- to fine-grained sand; gypsiferous (kopi) surficial deposits, selenite beds sub-surface.	/Claypan and lacustrine deposits//Playa lake deposits//	Quaternary (base) to Now (top)	Clastic sediment	0m
Q_dds	Source-bordering dunes	Red-brown to light-brown, poorly sorted to bi-modal, very fine- to medium-grained feldspathic quartz sand.	/Aeolian deposits//Aeolian dune/Source-bordering dunes/	Quaternary (base) to Now (top)	Sand	0m
Q_l	Claypan and lacustrine deposits	Friable to plastic, finely laminated grey clay, silty clay, humic clay, grey paleosols; locally includes medium- to fine-grained sand.	/Claypan and lacustrine deposits////	Quaternary (base) to Now (top)	Clay	4m

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

1836 Mabins Well Road, Moonbria, NSW 2710

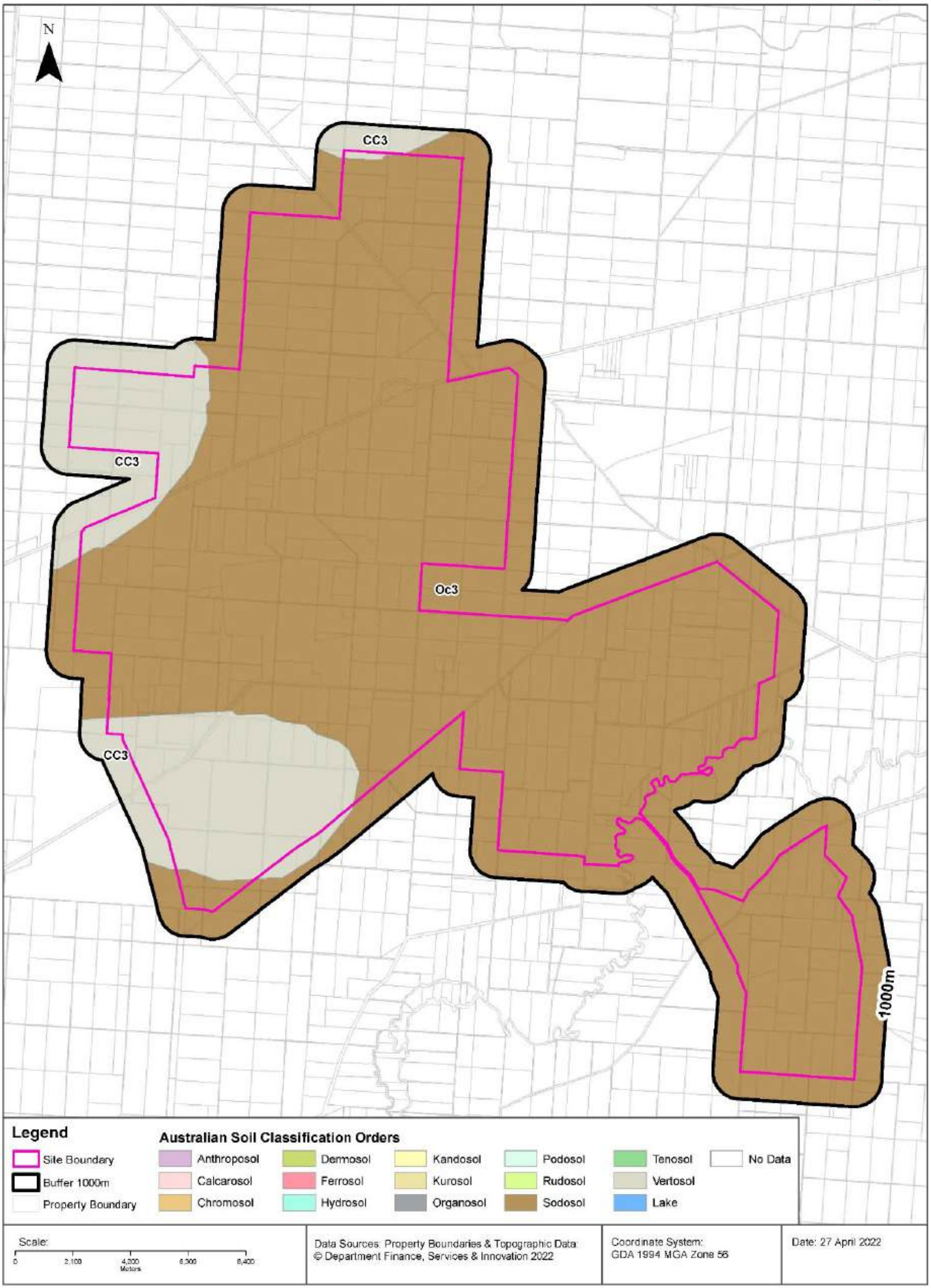
Naturally Occurring Asbestos Potential

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

1836 Mabins Well Road, Moonbria, NSW 2710



Soils

1836 Mabins Well Road, Moonbria, NSW 2710

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
Oc3	Sodosol	Plains with domes, lunettes, and swampy depressions, and divided by continuous or discontinuous low river ridges associated with prior stream systems--the whole traversed by present stream valleys; layered soil or sedimentary materials common at fairly shallow depths: chief soils are hard alkaline red soils (Dr2.33), grey and brown cracking clays, commonly (Ug5.24) and (Ug5.35), and other (D) soils in a complex soil pattern with the following general features: (i) well-drained to moderately drained plains of (Dr2.33) with (Db1.33 and Db1.43), often with thin A horizons (<4 in. thick); (ii) moderately to poorly drained gilgai plains subject to some seasonal flooding of (Ug5.3), (Dr2.33), (Db1.43), (Dy2.33 and Dy2.43), and (Ug5.2) soils; (iii) poorly drained gilgai plains subject to frequent seasonal flooding of (Ug5.2), (Ug5.3), (Db1.43), (Dy2.43), (Dd1.33 and Dd1.43), and (Ug5.4) soils; (iv) swampy depressions of (Dd1.33 and Dd1.43), (Db1.43), (Dy2.43), (Dy3.43), and (Ug5) soils; (v) domes and/or lunettes on the plains of (Dr2.33), (Gn2.13), (Dy5.33), or (DrS.33) soils; (vi) river ridges of moderate relief have (Dr2.33), (Dr2.43), ?(Dr2.23), and in some places (Gn2.13) soils; (vii) sandy river ridges and sand-hills have (Uc1.2), (Dy5.33), and (DrS.33) soils; (viii) prior stream beds have various "welldrained" soils; (ix) present stream valleys have flood-plains and terraces of (Dy3.4), (Gn), and (Um) soils. As mapped, areas of unit CC3 may be included.	0m	On-site
CC3	Vertosol	Plains: gilgai plains of cracking grey clays (Ug5.2) with small areas of cracking brown clays (Ug5.3); and very small areas of hard alkaline red soils (Dr2.33) and hard alkaline brown soils (Db1.33) on low rises.	0m	On-site

Acid Sulfate Soils

1836 Mabins Well Road, Moonbria, NSW 2710

Environmental Planning Instrument - Acid Sulfate Soils

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

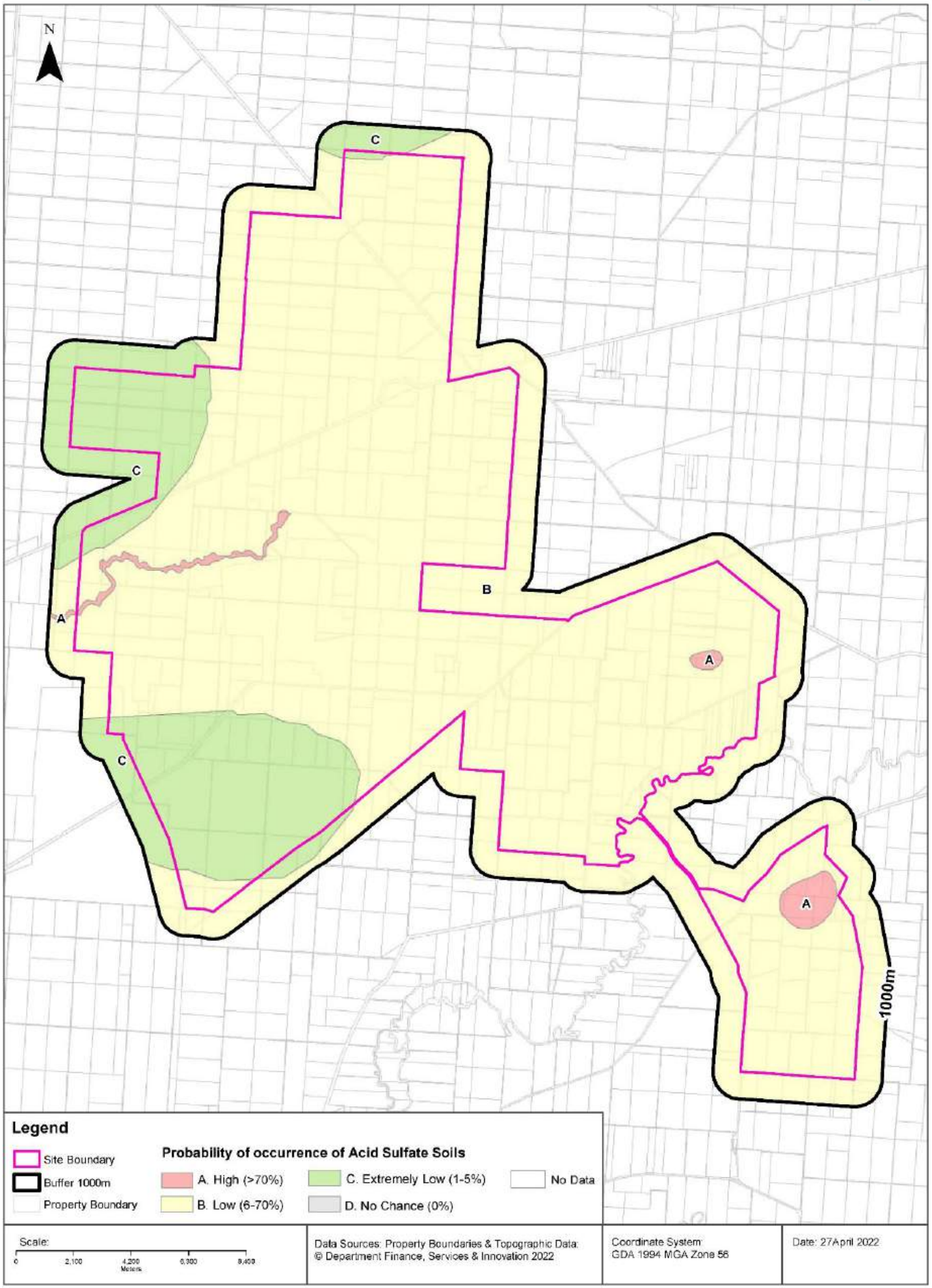
Soil Class	Description	EPI Name
N/A		

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

1836 Mabins Well Road, Moonbria, NSW 2710



Acid Sulfate Soils

1836 Mabins Well Road, Moonbria, NSW 2710

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
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m	On-site
A	High Probability of occurrence. >70% chance of occurrence.	0m	On-site

Dryland Salinity

1836 Mabins Well Road, Moonbria, NSW 2710

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

1836 Mabins Well Road, Moonbria, NSW 2710

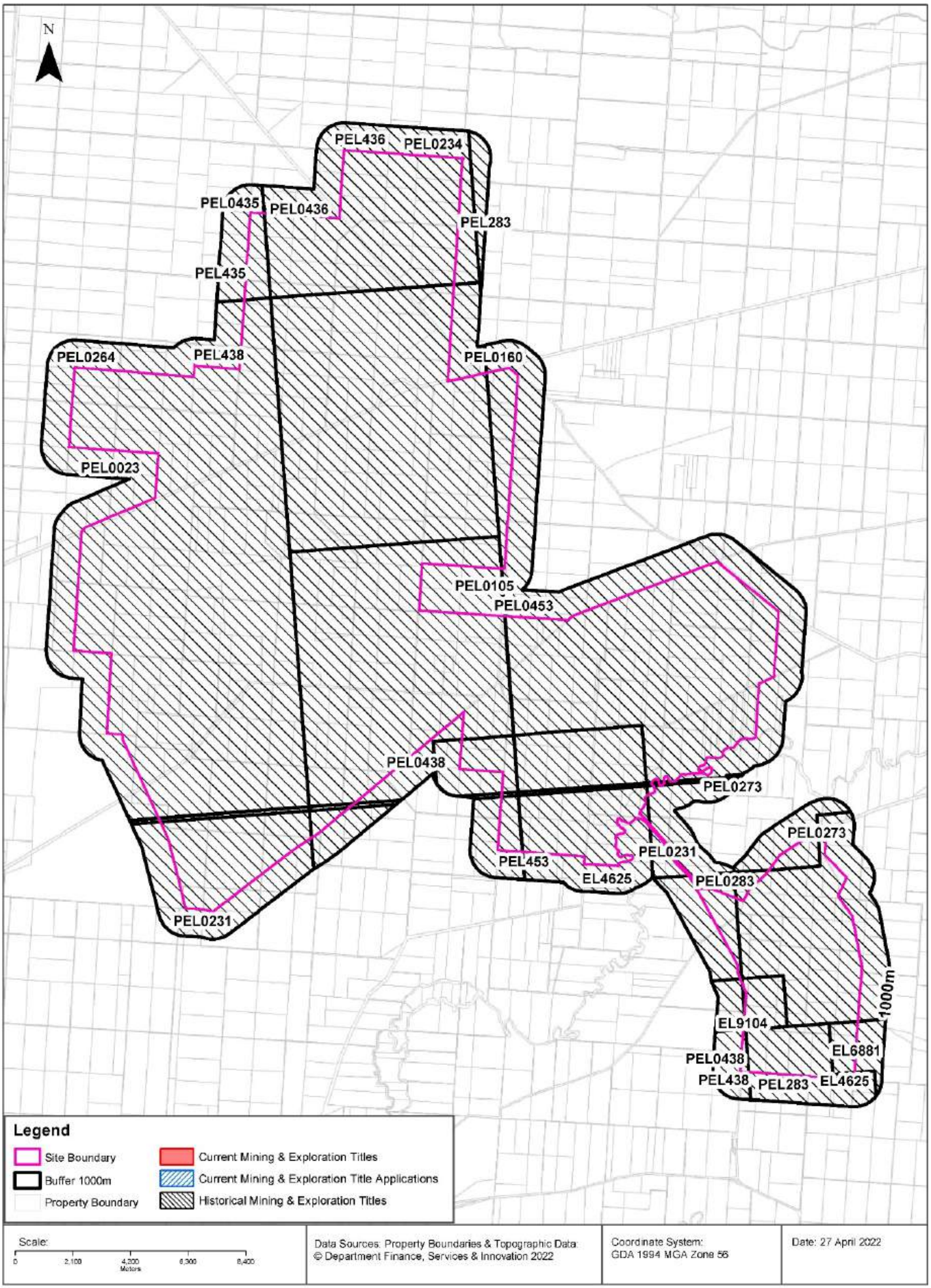
Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

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

Mining & Exploration Titles

1836 Mabins Well Road, Moonbria, NSW 2710



Mining

1836 Mabins Well Road, Moonbria, NSW 2710

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

1836 Mabins Well Road, Moonbria, NSW 2710

Historical Mining & Exploration Titles

Historical Mining & Exploration Titles within the dataset buffer:

Title Ref	Holder	Start Date	End Date	Resource	Minerals	Dist	Dir
PEL436	AUSTRALIAN COALBED METHANE PTY LIMITED			MINERALS		0m	On-site
PEL435	AUSTRALIAN COALBED METHANE PTY LIMITED			MINERALS		0m	On-site
PEL0435	AUSTRALIAN COALBED METHANE PTY LTD	19/03/2001	10/10/2006	PETROLEUM	Petroleum	0m	On-site
PEL0436	AUSTRALIAN COALBED METHANE PTY LTD	19/03/2001	18/03/2004	PETROLEUM	Petroleum	0m	On-site
EL4625	NORTH MINING LIMITED	08 Dec 1993	07 Dec 1995	MINERALS	Au Cu Pb Zn Ag	0m	On-site
PEL438	APPLEGATE EXPLORATION, LLC,PANNONIAN INTERNATIONAL LTD			MINERALS		0m	On-site
PEL453	GREENBASE OIL AND GAS PTY LTD			MINERALS		0m	On-site
PEL283	QUEENSLAND GAS COMPANY LIMITED,TYERS INVESTMENTS PTY LIMITED			MINERALS		0m	On-site
EL6881	HIGHLAKE RESOURCES PTY LTD	22 Aug 2007	30 Jun 2009	MINERALS	Au Cu	0m	On-site
EL9104	VIEWMONT GOLD PTY LTD			MINERALS		0m	On-site
PEL0105	AUSTRALIAN OIL AND GAS CORPORATION LTD			PETROLEUM	Petroleum	0m	On-site
PEL0264	BALHOIL NOMINEES PTY LTD		10/10/1983	PETROLEUM	Petroleum	0m	On-site
PEL0023	AUSTRALIAN OIL AND GAS CORPORATION LTD			PETROLEUM	Petroleum	0m	On-site
PEL0160	PLANET EXPLORATION COMPANY PTY LTD			PETROLEUM	Petroleum	0m	On-site
PEL0273	MEEKATHARRA MINERALS (AUST) PTY LTD	20/08/1985	19/08/1987	PETROLEUM	Petroleum	0m	On-site
PEL0283	QUEENSLAND GAS CO LTD, TYERS PETROLEUM PTY LTD, CAPITAL ENERGY NL; BANNERBLOCK PL, GOLVOM PTY LTD	10/04/1992	31/10/2001	PETROLEUM	Petroleum	0m	On-site
PEL0231	MEEKATHARRA MINERALS LTD		10/09/1984	PETROLEUM	Petroleum	0m	On-site
PEL0234	COMSERV NO 779 PTY LTD			PETROLEUM	Petroleum	0m	On-site
PEL0438	PANNONIAN INTERNATIONAL LTD	21/08/2001	28/10/2004	PETROLEUM	Petroleum	0m	On-site
PEL0453	GREENBASE OIL AND GAS PTY LTD	17/01/2007	5/12/2008	PETROLEUM	Petroleum	0m	On-site

State Environmental Planning Policy

1836 Mabins Well Road, Moonbria, NSW 2710

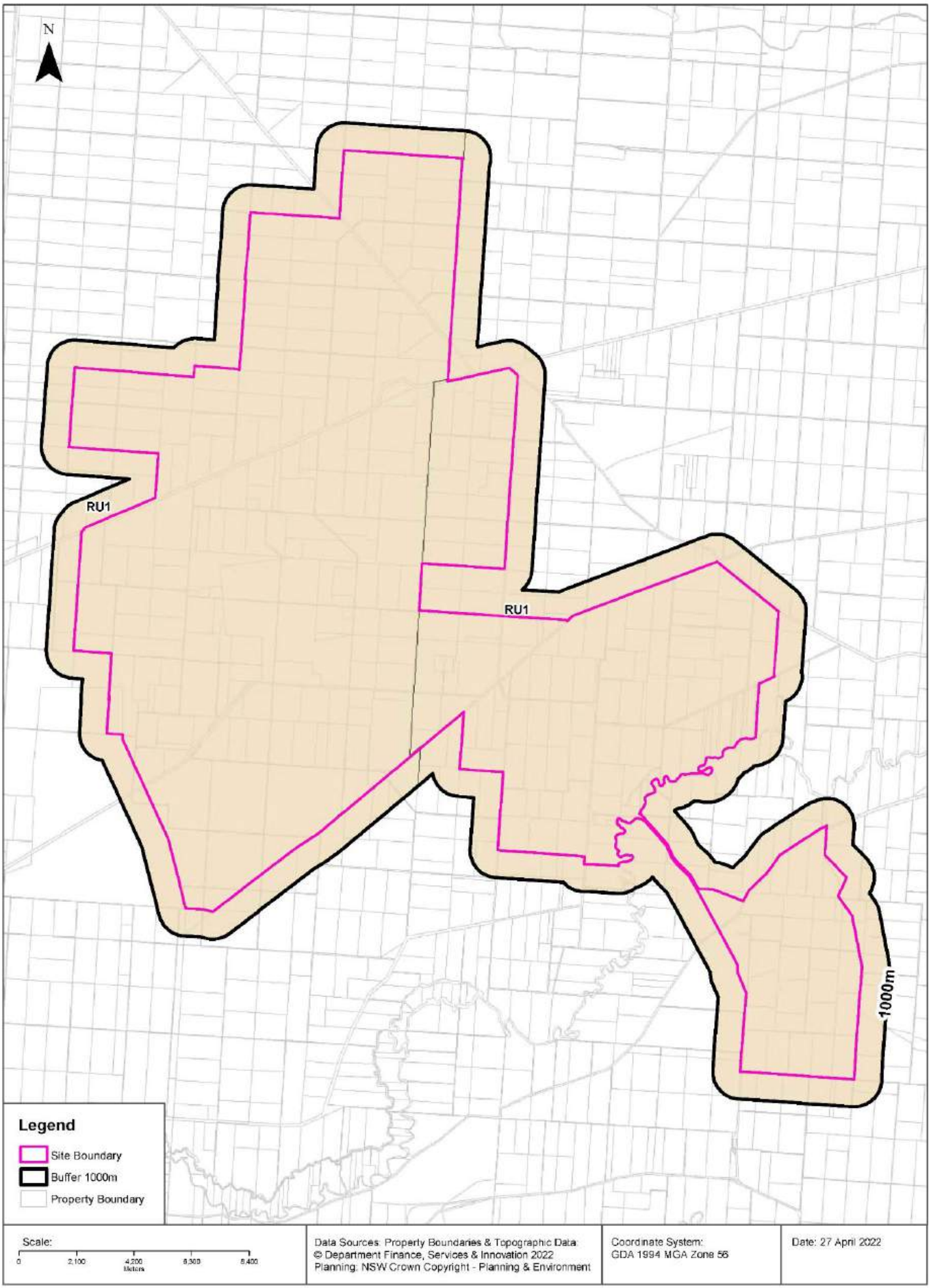
State Significant Precincts

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

1836 Mabins Well Road, Moonbria, NSW 2710



Environmental Planning Instrument

1836 Mabins Well Road, Moonbria, NSW 2710

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
RU1	Primary Production		Conargo Local Environmental Plan 2013	23/08/2013	23/08/2013	19/10/2014		0m	On-site
RU1	Primary Production		Jerilderie Local Environmental Plan 2012	22/06/2012	22/06/2012	22/06/2012		0m	On-site

Heritage

1836 Mabins Well Road, Moonbria, NSW 2710

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

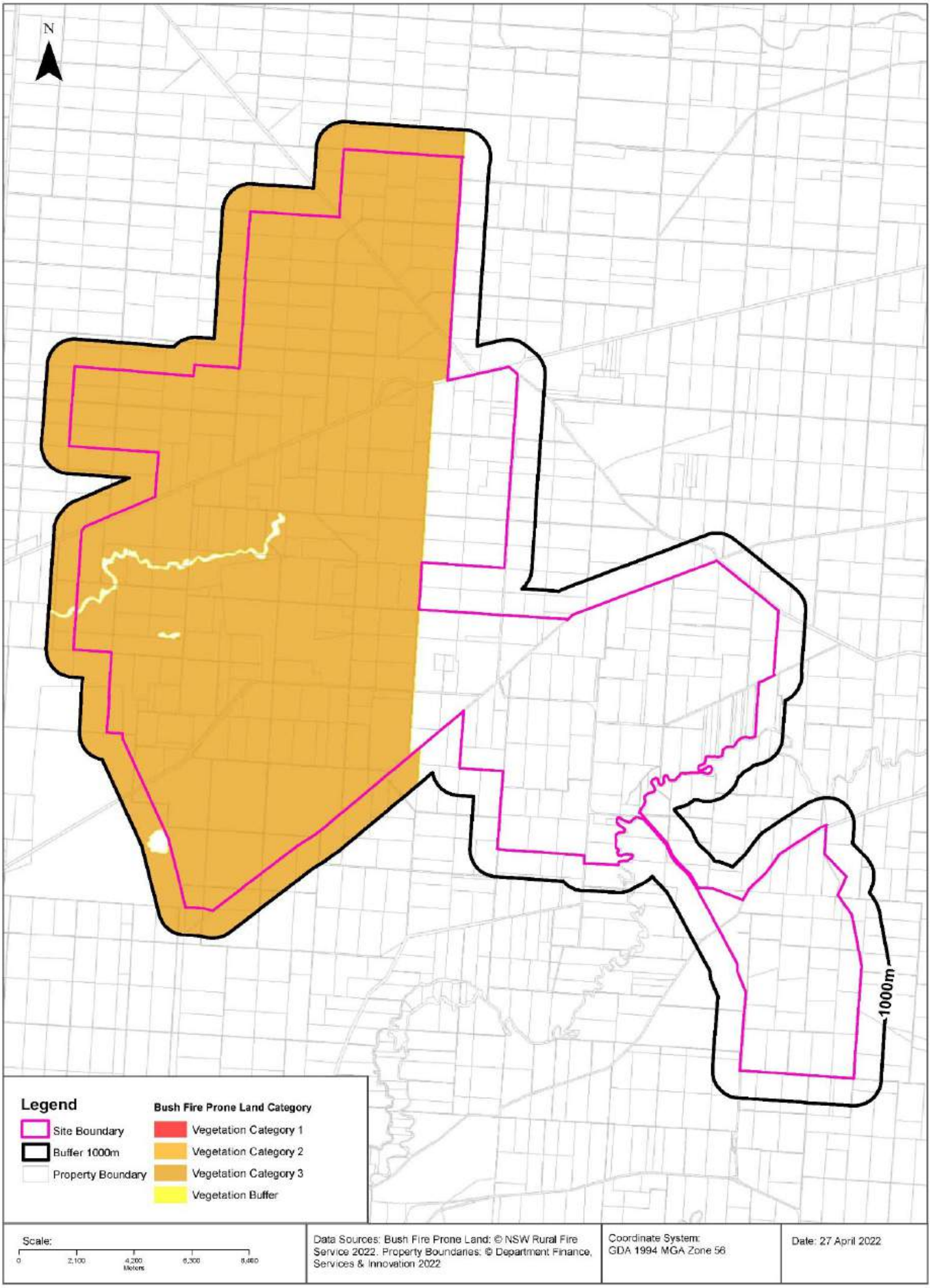
What are the EPI Heritage Items located within the dataset buffer?

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

1836 Mabins Well Road, Moonbria, NSW 2710



Natural Hazards

1836 Mabins Well Road, Moonbria, NSW 2710

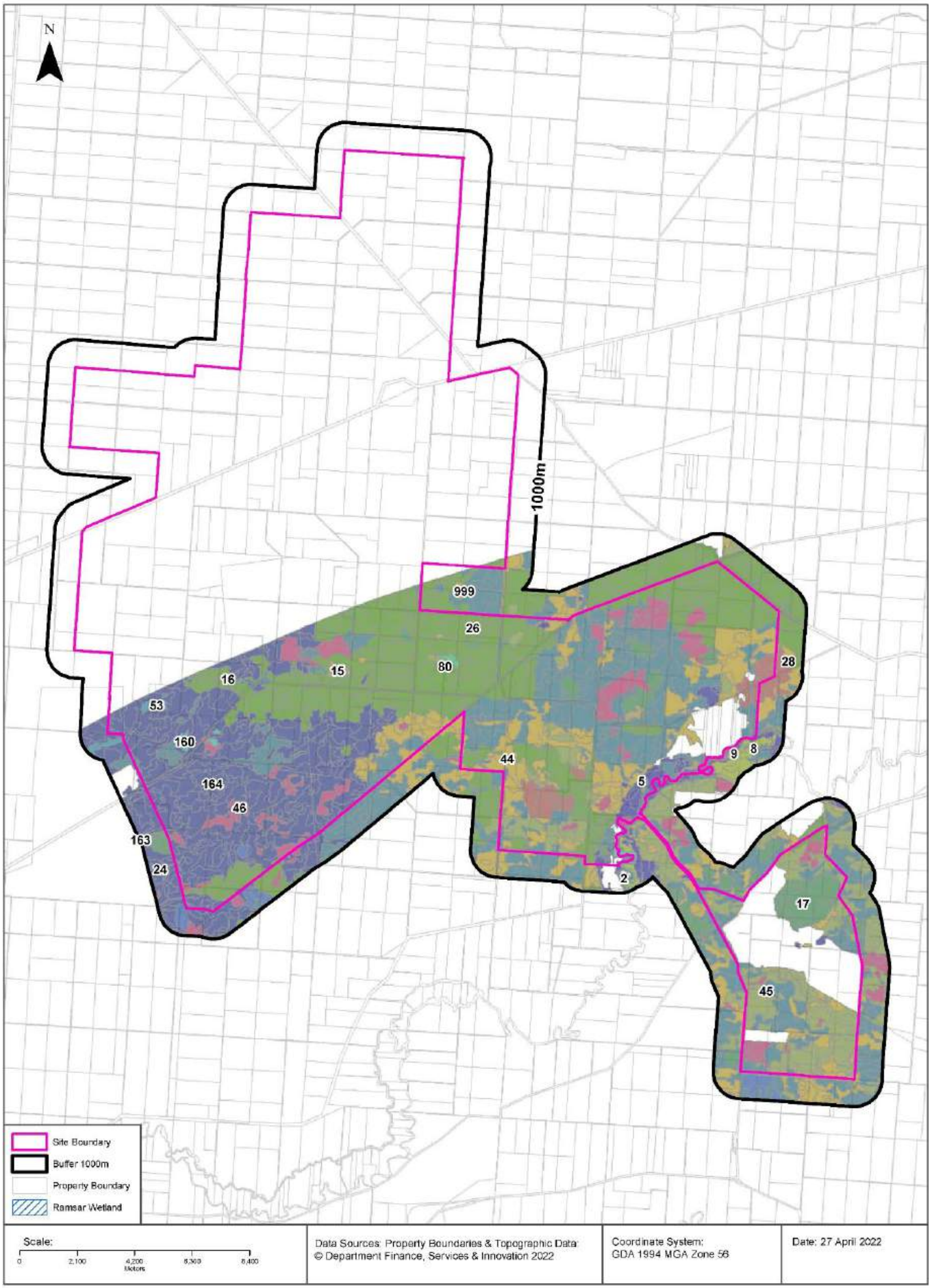
Bush Fire Prone Land

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 - Vegetation & Ramsar Wetlands

1836 Mabins Well Road, Moonbria, NSW 2710



Ecological Constraints

1836 Mabins Well Road, Moonbria, NSW 2710

Native Vegetation of the Murray Catchment Management Authority

What Native Vegetation of the Murray Catchment Management Authority exists within the dataset buffer?

Veg Code	NVMP	Dominant	APIClass	Scientific	Trees	Shrubs	Distance	Direction
164	ALP019	Chenopod Shrublands	Boree/Myall	Maireana aphylla / Sclerolaena tricuspis - Calocephalus sonderi - Rhodanthe corymbiflora - Austrodanthonia caespitosa	None or rare -	Maireana aphylla - Nitraria billardierei - Sclerolaena muricata sens lat. - Atriplex vesicaria sens lat. - Muehlenbeckia florulenta - Rhagodia spinesc	0m	On-site
164	ALP029	Chenopod Shrublands	Grassland - Plain	Maireana aphylla / Sclerolaena tricuspis - Calocephalus sonderi - Rhodanthe corymbiflora - Austrodanthonia caespitosa	None or rare -	Maireana aphylla - Nitraria billardierei - Sclerolaena muricata sens lat. - Atriplex vesicaria sens lat. - Muehlenbeckia florulenta - Rhagodia spinesc	0m	On-site
164		Chenopod Shrublands		Maireana aphylla / Sclerolaena tricuspis - Calocephalus sonderi - Rhodanthe corymbiflora - Austrodanthonia caespitosa	None or rare -	Maireana aphylla - Nitraria billardierei - Sclerolaena muricata sens lat. - Atriplex vesicaria sens lat. - Muehlenbeckia florulenta - Rhagodia spinesc	0m	On-site
46		Riverine Grassland Complex		Enteropogon ramosus - Austrostipa nodosa - Austrodanthonia eriantha- Austrodanthonia fulva / Rhodanthe corymbiflora - Sida corrugata - Atriplex leptocarpa	Generally absent -	Maireana excavata - Maireana aphylla - Maireana pentagona -	0m	On-site
999	ALP020	Riverine Grassland Complex	Nitre Goosefoot	Riverine Grassland Complex	Riverine Grassland Complex	Riverine Grassland Complex	0m	On-site
26	ALP029	Weeping Myall open woodland	Cottonbush	Acacia pendula - Casuarina cristata / Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum; Amyema quandang var. quandang / Austrodanthonia caespitosa - Atriplex semibaccata - Einadia nutans subsp. nutans - Rhodanthe corymbiflora	Acacia pendula - Casuarina cristata - Casuarina pauper - Eucalyptus largiflorens - Eucalyptus camaldulensis subsp. camaldulensis - Eucalyptus melliodora -	Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum - Amyema quandang var. quandang - Atriplex nummularia - Maireana aphylla - Mairean	0m	On-site

Veg Code	NVMP	Dominant	APIClass	Scientific	Trees	Shrubs	Distance	Direction
164	ALP030	Chenopod Shrublands	Grassland - Plain	Maireana aphylla / Sclerolaena tricuspis - Calocephalus sonderi - Rhodanthe corymbiflora - Austrodanthonia caespitosa	None or rare -	Maireana aphylla - Nitraria billardierei - Sclerolaena muricata sens lat. - Atriplex vesicaria sens lat. - Muehlenbeckia florulenta - Rhagodia spinesc	0m	On-site
26		Weeping Myall open woodland		Acacia pendula - Casuarina cristata / Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum; Amyema quandang var. quandang / Austrodanthonia caespitosa - Atriplex semibaccata - Einadia nutans subsp. nutans - Rhodanthe corymbiflora	Acacia pendula - Casuarina cristata - Casuarina pauper - Eucalyptus largiflorens - Eucalyptus camaldulensis subsp. camaldulensis - Eucalyptus melliodora -	Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum - Amyema quandang var. quandang - Atriplex nummularia - Maireana aphylla - Mairean	0m	On-site
26	ALP020	Weeping Myall open woodland	Nitre Goosefoot	Acacia pendula - Casuarina cristata / Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum; Amyema quandang var. quandang / Austrodanthonia caespitosa - Atriplex semibaccata - Einadia nutans subsp. nutans - Rhodanthe corymbiflora	Acacia pendula - Casuarina cristata - Casuarina pauper - Eucalyptus largiflorens - Eucalyptus camaldulensis subsp. camaldulensis - Eucalyptus melliodora -	Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum - Amyema quandang var. quandang - Atriplex nummularia - Maireana aphylla - Mairean	0m	On-site
26	ALP029	Weeping Myall open woodland	Bare Ground	Acacia pendula - Casuarina cristata / Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum; Amyema quandang var. quandang / Austrodanthonia caespitosa - Atriplex semibaccata - Einadia nutans subsp. nutans - Rhodanthe corymbiflora	Acacia pendula - Casuarina cristata - Casuarina pauper - Eucalyptus largiflorens - Eucalyptus camaldulensis subsp. camaldulensis - Eucalyptus melliodora -	Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum - Amyema quandang var. quandang - Atriplex nummularia - Maireana aphylla - Mairean	0m	On-site
53	ALP029	Wetland Complex	Cottonbush	Muehlenbeckia florulenta - Acacia stenophylla / Panicum decompositum - Paspalidium jubiflorum - Juncus aridicola / Eleocharis pallens - Eleocharis plana - Marsilea drummondii - Alternanthera denticulata	Eucalyptus camaldulensis - Casuarina cristata -	Muehlenbeckia florulenta - Acacia stenophylla - Eremophila bignoniiflora	0m	On-site

Veg Code	NVMP	Dominant	APIClass	Scientific	Trees	Shrubs	Distance	Direction
46	ALP020	Riverine Grassland Complex	Lignum/Nitre Goosefoot	Enteropogon ramosus - Austrostipa nodosa - Austrodanthonia eriantha- Austrodanthonia fulva / Rhodanthe corymbiflora - Sida corrugata - Atriplex leptocarpa	Generally absent -	Maireana excavata - Maireana aphylla - Maireana pentagona -	0m	On-site
46	ALP020	Riverine Grassland Complex	Nitre Goosefoot	Enteropogon ramosus - Austrostipa nodosa - Austrodanthonia eriantha- Austrodanthonia fulva / Rhodanthe corymbiflora - Sida corrugata - Atriplex leptocarpa	Generally absent -	Maireana excavata - Maireana aphylla - Maireana pentagona -	0m	On-site
15		Black Box open woodland		Eucalyptus largiflorens / Chenopodium nitrariaceum - Maireana pyramidata / Einadia nutans subsp. nutans - Sclerolaena divaricata - Atriplex semibaccata	Eucalyptus largiflorens -	Maireana pyramidata - Chenopodium nitrariaceum - Atriplex vesicaria - Atriplex nummularia - Maireana decalvans - Maireana enchylaenoides - Maireana br	0m	On-site
26	ALP029	Weeping Myall open woodland	Grassland - Plain	Acacia pendula - Casuarina cristata / Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum; Amyema quandang var. quandang / Austrodanthonia caespitosa - Atriplex semibaccata - Einadia nutans subsp. nutans - Rhodanthe corymbiflora	Acacia pendula - Casuarina cristata - Casuarina pauper - Eucalyptus largiflorens - Eucalyptus camaldulensis subsp. camaldulensis - Eucalyptus melliodora -	Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum - Amyema quandang var. quandang - Atriplex nummularia - Maireana aphylla - Mairean	0m	On-site
80		Inland Grey Box tall grassy woodland		Eucalyptus microcarpa - Callitris glaucophylla - Allocasuarina luehmannii / Maireana microphylla - Acacia deanei subsp. deanei / Austrostipa scabra subsp. scabra - Austrodanthonia setacea - Calotis cuneifolia	Eucalyptus microcarpa - Callitris glaucophylla - Eucalyptus melliodora - Allocasuarina luehmannii - Pittosporum angustifolium - Brachychiton populneus subsp. populneus - Eucalyptus blakelyi -	Maireana microphylla - Acacia deanei subsp. deanei - Dodonaea viscosa subsp. cuneata - Acacia hakeoides - Myoporum desertii - Senna artemisioides sens	0m	On-site
999	ALP020	Riverine Grassland Complex	Lignum/Nitre Goosefoot	Riverine Grassland Complex	Riverine Grassland Complex	Riverine Grassland Complex	0m	On-site
24	ALP029	Wetland Complex	Cottonbush	Eragrostis australasica - Muehlenbeckia florulenta - Sclerostegia tenuis / Chloris truncata - Disphyma crassifolium subsp. clavellatum - Eragrostis setifolia - Marsilea drummondii	Eucalyptus largiflorens -	Eragrostis australasica - Muehlenbeckia florulenta - Sclerostegia tenuis - Chenopodium nitrariaceum - Atriplex holocarpa - Sclerolaena muricata var. m	0m	On-site

Veg Code	NVMP	Dominant	APIClass	Scientific	Trees	Shrubs	Distance	Direction
26	ALP030	Weeping Myall open woodland	Grassland - Plain	Acacia pendula - Casuarina cristata / Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum; Amyema quandang var. quandang / Austrodanthonia caespitosa - Atriplex semibaccata - Einadia nutans subsp. nutans - Rhodanthe corymbiflora	Acacia pendula - Casuarina cristata - Casuarina pauper - Eucalyptus largiflorens - Eucalyptus camaldulensis subsp. camaldulensis - Eucalyptus melliodora -	Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum - Amyema quandang var. quandang - Atriplex nummularia - Maireana aphylla - Mairean	0m	On-site
164	ALP020	Chenopod Shrublands	Lignum/Nitre Goosefoot	Maireana aphylla / Sclerolaena tricuspis - Calocephalus sonderi - Rhodanthe corymbiflora - Austrodanthonia caespitosa	None or rare -	Maireana aphylla - Nitraria billardierei - Sclerolaena muricata sens lat. - Atriplex vesicaria sens lat. - Muehlenbeckia florulenta - Rhagodia spinesc	0m	On-site
46	ALP029	Riverine Grassland Complex	Cottonbush	Enteropogon ramosus - Austrostipa nodosa - Austrodanthonia eriantha- Austrodanthonia fulva / Rhodanthe corymbiflora - Sida corrugata - Atriplex leptocarpa	Generally absent -	Maireana excavata - Maireana aphylla - Maireana pentagona -	0m	On-site
44		Riverine Grassland Complex		Austrostipa nodosa - Chloris truncata - Austrodanthonia caespitosa / Rhodanthe corymbiflora - Maireana pentagona - Chrysocephalum apiculatum - Calotis scabiosifolia var. scabiosifolia	Generally absent -	Maireana pentagona - Maireana excavata -	0m	On-site
28		White Cypress Pine open woodland		Callitris glaucophylla / Hakea leucoptera subsp. leucoptera - Pittosporum angustifolium - Maireana pyramidata - Maireana enchylaenoides / Enchylaena tomentosa - Dissocarpus paradoxus - Austrostipa scabra subsp. scabra - Tribulis terrestris -	Callitris glaucophylla - Myoporum platycarpum subsp. platycarpum - Allocasuarina luehmannii - Alectryon oleifolius subsp. canescens -	Hakea leucoptera subsp. leucoptera - Pittosporum angustifolium - Maireana pyramidata - Maireana enchylaenoides - Rhagodia spinescens - Geijera parvifl	0m	On-site
46	ALP029	Riverine Grassland Complex	Grassland - Plain	Enteropogon ramosus - Austrostipa nodosa - Austrodanthonia eriantha- Austrodanthonia fulva / Rhodanthe corymbiflora - Sida corrugata - Atriplex leptocarpa	Generally absent -	Maireana excavata - Maireana aphylla - Maireana pentagona -	0m	On-site
999		Riverine Grassland Complex		Riverine Grassland Complex	Riverine Grassland Complex	Riverine Grassland Complex	0m	On-site

Veg Code	NVMP	Dominant	APIClass	Scientific	Trees	Shrubs	Distance	Direction
999	ALP029	Riverine Grassland Complex	Cottonbush	Riverine Grassland Complex	Riverine Grassland Complex	Riverine Grassland Complex	0m	On-site
164	ALP029	Chenopod Shrublands	Cottonbush	Maireana aphylla / Sclerolaena tricuspis - Calocephalus sonderi - Rhodanthe corymbiflora - Austrodanthonia caespitosa	None or rare -	Maireana aphylla - Nitraria billardierei - Sclerolaena muricata sens lat. - Atriplex vesicaria sens lat. - Muehlenbeckia florulenta - Rhagodia spinesc	0m	On-site
2		River Red Gum riparian tall forest and woodlands		Eucalyptus camaldulensis subsp. camaldulensis / Eleocharis acuta-Centipeda cunninghamii-Ranunculus inundatus-Pseudoraphis spinescens	Eucalyptus camaldulensis subsp. camaldulensis -	Acacia stenophylla - Amyema miquelii -	0m	On-site
5		River Red Gum riparian tall forest and woodlands		Eucalyptus camaldulensis subsp. camaldulensis / Acacia dealbata / Poa labillardierei var. labillardierei - Carex tereticaulis - Lachnagrostis filiformis-Hemarthria uncinata var. uncinata	Eucalyptus camaldulensis subsp. camaldulensis -	Acacia dealbata - Exocarpos strictus - Amyema miquelii -	0m	On-site
17		Wetland Complex		Muehlenbeckia florulenta - Chenopodium nitrariaceum / Sclerolaena tricuspis / Senecio cunninghamii var. cunninghamii - Einadia nutans subsp. nutans	Eucalyptus largiflorens -	Muehlenbeckia florulenta - Chenopodium nitrariaceum - Acacia salicina - Acacia stenophylla - Nitraria billardierei - Atriplex vesicaria subsp. vesicar	0m	On-site
8		River Red Gum riparian tall forest and woodlands		Eucalyptus camaldulensis subsp. camaldulensis / Paspalidium jubiflorum - Cynodon dactylon - Wahlenbergia fluminalis - Centipeda cunninghamii	Eucalyptus camaldulensis subsp. camaldulensis -	Acacia stenophylla - Muehlenbeckia florulenta - Maireana brevifolia -	0m	On-site
160	ALP020	Chenopod Shrublands	Lignum/Nitre Goosefoot	Chenopodium nitrariaceum / Sclerolaena muricata sens lat. - Sclerolaena stelligera - Malacocera tricornis	Eucalyptus largiflorens -	Chenopodium nitrariaceum - Muehlenbeckia florulenta - Chenopodium auricomiforme - Eragrostis australasica - Lycium australe - Acacia stenophylla - Aca	0m	On-site
45		Riverine Grassland Complex		Austrostipa aristiglumis - Walwhalleya proluta - Sporobolus caroli - Austrodanthonia duttoniana / Marsilea drummondii - Eleocharis pallens - Wurmbea dioica subsp. dioica	Generally absent -	Muehlenbeckia florulenta - Sclerolaena muricata var. muricata -	0m	On-site

Veg Code	NVMP	Dominant	APIClass	Scientific	Trees	Shrubs	Distance	Direction
17	ALP020	Wetland Complex	Lignum/Nitre Goosefoot	Muehlenbeckia florulenta - Chenopodium nitrariaceum / Sclerolaena tricuspis / Senecio cunninghamii var. cunninghamii - Einadia nutans subsp. nutans	Eucalyptus largiflorens -	Muehlenbeckia florulenta - Chenopodium nitrariaceum - Acacia salicina - Acacia stenophylla - Nitraria billardierei - Atriplex vesicaria subsp. vesicar	0m	On-site
999	ALP029	Riverine Grassland Complex	Grassland - Plain	Riverine Grassland Complex	Riverine Grassland Complex	Riverine Grassland Complex	0m	On-site
9		River Red Gum riparian tall forest and woodlands		Eucalyptus camaldulensis subsp. camaldulensis / Austrodanthonia caespitosa - Juncus flavidus - Carex inversa	Eucalyptus camaldulensis subsp. camaldulensis -	Amyema miquelii -	0m	On-site
999	ALP030	Riverine Grassland Complex	Grassland - Plain	Riverine Grassland Complex	Riverine Grassland Complex	Riverine Grassland Complex	0m	On-site
16	ALP029	Black Box open woodland	Bare Ground	Eucalyptus largiflorens / Enchylaena tomentosa - Atriplex semibaccata - Hordeum leporinum - Schismus barbatus	Eucalyptus largiflorens -	Rhagodia spinescens - Amyema miquelii -	0m	On-site
26	ALP019	Weeping Myall open woodland	Boree/Myall	Acacia pendula - Casuarina cristata / Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum; Amyema quandang var. quandang / Austrodanthonia caespitosa - Atriplex semibaccata - Einadia nutans subsp. nutans - Rhodanthe corymbiflora	Acacia pendula - Casuarina cristata - Casuarina pauper - Eucalyptus largiflorens - Eucalyptus camaldulensis subsp. camaldulensis - Eucalyptus melliodora -	Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum - Amyema quandang var. quandang - Atriplex nummularia - Maireana aphylla - Mairean	0m	On-site
164	ALP020	Chenopod Shrublands	Nitre Goosefoot	Maireana aphylla / Sclerolaena tricuspis - Calocephalus sonderi - Rhodanthe corymbiflora - Austrodanthonia caespitosa	None or rare -	Maireana aphylla - Nitraria billardierei - Sclerolaena muricata sens lat. - Atriplex vesicaria sens lat. - Muehlenbeckia florulenta - Rhagodia spinesc	0m	On-site
24		Wetland Complex		Eragrostis australasica - Muehlenbeckia florulenta - Sclerostegia tenuis / Chloris truncata - Disphyma crassifolium subsp. clavellatum - Eragrostis setifolia - Marsilea drummondii	Eucalyptus largiflorens -	Eragrostis australasica - Muehlenbeckia florulenta - Sclerostegia tenuis - Chenopodium nitrariaceum - Atriplex holocarpa - Sclerolaena muricata var. m	50m	South East

Veg Code	NVMP	Dominant	APIClass	Scientific	Trees	Shrubs	Distance	Direction
24	ALP020	Wetland Complex	Lignum/Nitre Goosefoot	Eragrostis australasica - Muehlenbeckia florulenta - Sclerostegia tenuis / Chloris truncata - Disphyma crassifolium subsp. clavellatum - Eragrostis setifolia - Marsilea drummondii	Eucalyptus largiflorens -	Eragrostis australasica - Muehlenbeckia florulenta - Sclerostegia tenuis - Chenopodium nitrariaceum - Atriplex holocarpa - Sclerolaena muricata var. m	51m	South West
163	ALP029	Chenopod Shrublands	Cottonbush	Nitraria billardierei - Rhagodia spinescens / Sclerolaena tricuspis - Austrodanthonia setacea - Austrostipa scabra subsp. scabra	None -	Nitraria billardierei - Rhagodia spinescens - Maireana aphylla - Atriplex vesicaria sens lat. - Sclerolaena muricata sens lat. - Chenopodium curvispic	818m	South West
164	ALP029	Chenopod Shrublands	Bare Ground	Maireana aphylla / Sclerolaena tricuspis - Calocephalus sonderi - Rhodanthe corymbiflora - Austrodanthonia caespitosa	None or rare -	Maireana aphylla - Nitraria billardierei - Sclerolaena muricata sens lat. - Atriplex vesicaria sens lat. - Muehlenbeckia florulenta - Rhagodia spinesc	837m	South West
26	ALP020	Weeping Myall open woodland	Lignum/Nitre Goosefoot	Acacia pendula - Casuarina cristata / Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum; Amyema quandang var. quandang / Austrodanthonia caespitosa - Atriplex semibaccata - Einadia nutans subsp. nutans - Rhodanthe corymbiflora	Acacia pendula - Casuarina cristata - Casuarina pauper - Eucalyptus largiflorens - Eucalyptus camaldulensis subsp. camaldulensis - Eucalyptus melliodora -	Rhagodia spinescens - Maireana decalvans - Chenopodium nitrariaceum - Amyema quandang var. quandang - Atriplex nummularia - Maireana aphylla - Mairean	840m	South West

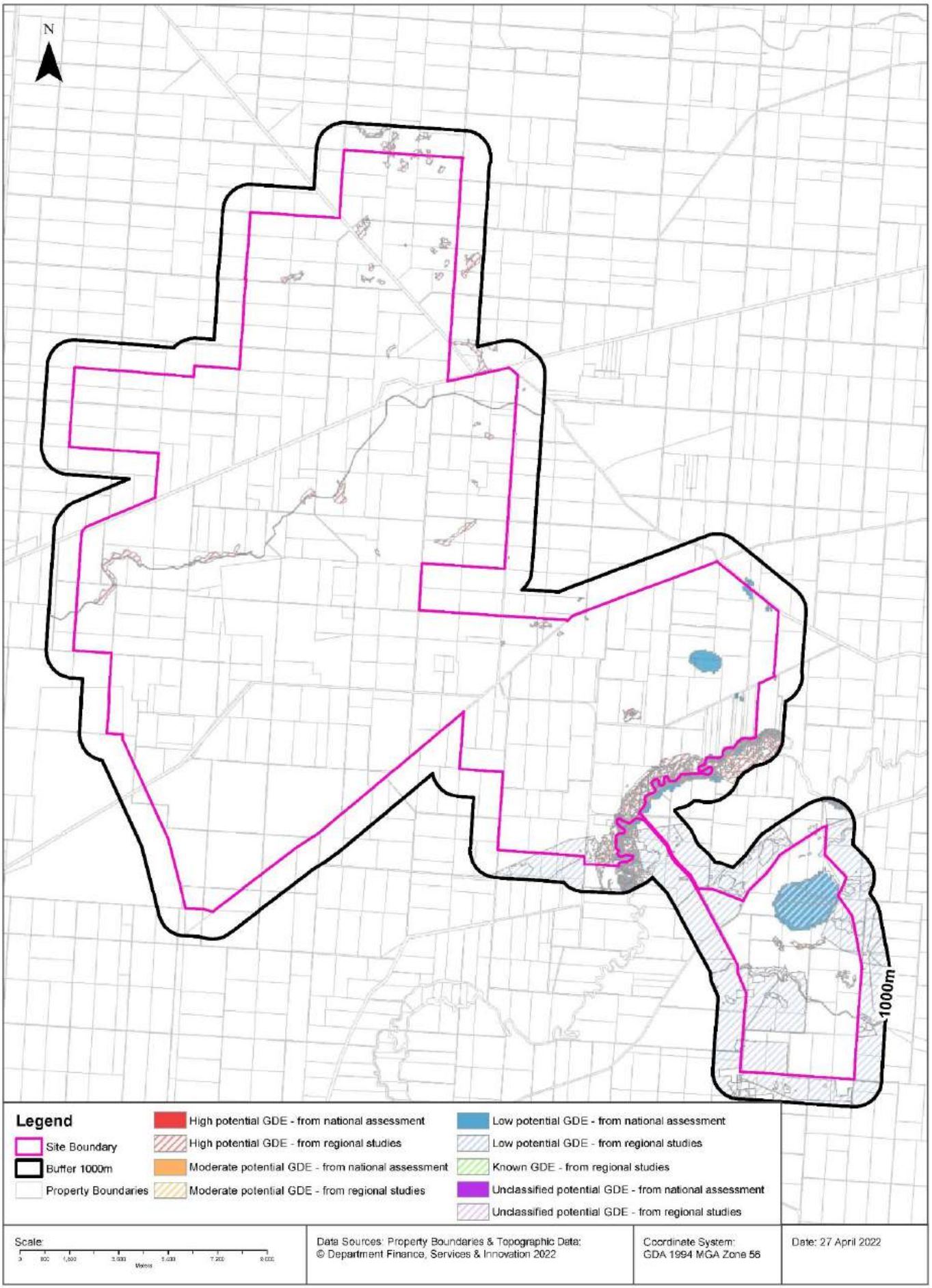
Ramsar Wetlands

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					

Ecological Constraints - Groundwater Dependent Ecosystems Atla

1836 Mabins Well Road, Moonbria, NSW 2710



0 900

Ecological Constraints

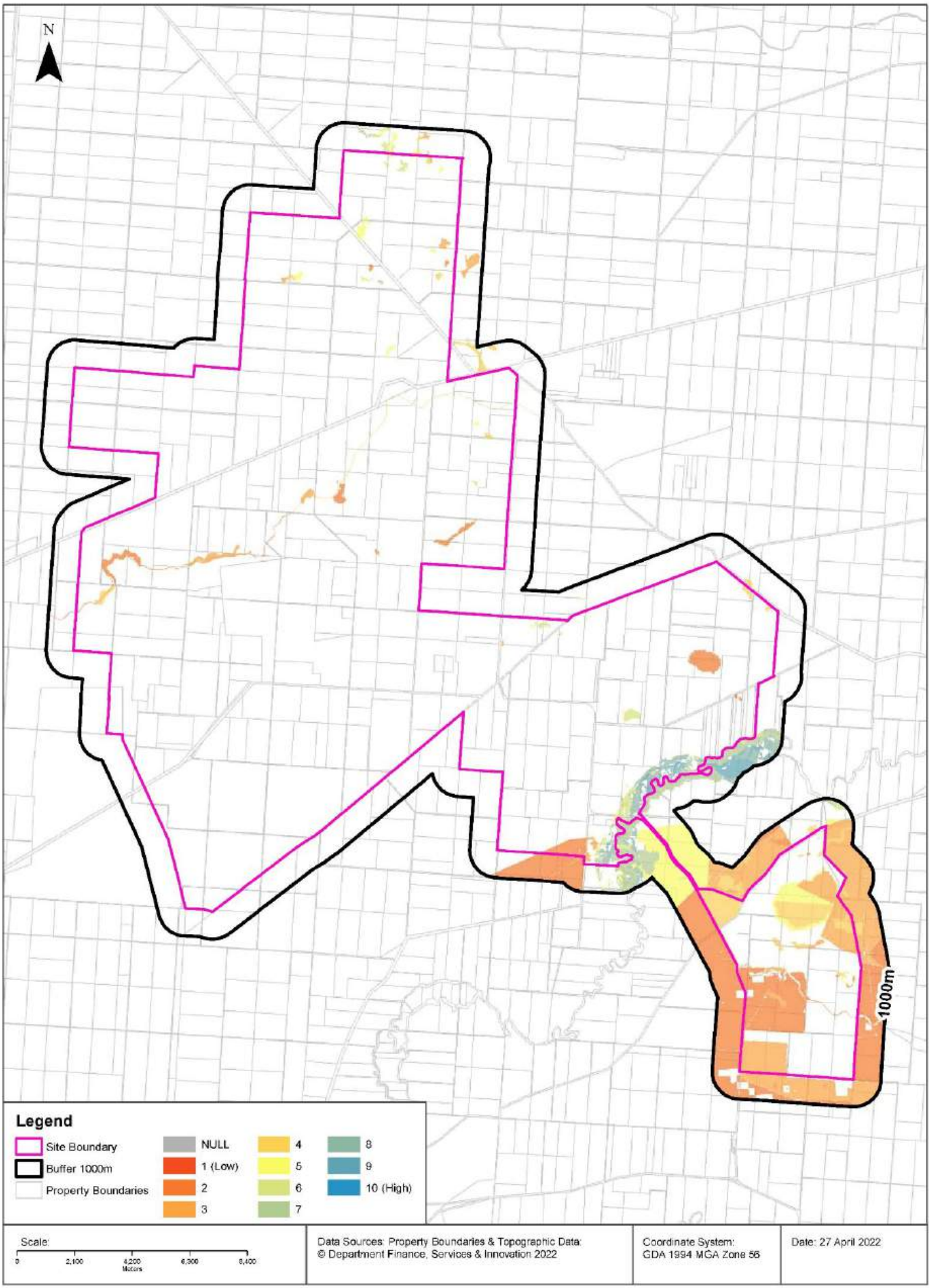
1836 Mabins Well Road, Moonbria, NSW 2710

Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Aquatic	Low potential GDE - from national assessment	Alluvial plain.	Wetland		0m	On-site
Aquatic	Low potential GDE - from national assessment	Alluvial plain.	River		0m	On-site
Terrestrial	High potential GDE - from regional studies	Alluvial plain.	Vegetation		0m	On-site
Terrestrial	Low potential GDE - from regional studies	Alluvial plain.	Vegetation		0m	On-site

Ecological Constraints - Inflow Dependent Ecosystems Likelihood

1836 Mabins Well Road, Moonbria, NSW 2710



Ecological Constraints

1836 Mabins Well Road, Moonbria, NSW 2710

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance	Direction
Aquatic	5	Alluvial plain.	Wetland		0m	On-site
Terrestrial	4	Alluvial plain.	Vegetation		0m	On-site
Aquatic	7	Alluvial plain.	Wetland		0m	On-site
Aquatic	4	Alluvial plain.	River		0m	On-site
Terrestrial	2	Alluvial plain.	Vegetation		0m	On-site
Aquatic	6	Alluvial plain.	River		0m	On-site
Aquatic	2	Alluvial plain.	River		0m	On-site
Aquatic	4	Alluvial plain.	Wetland		0m	On-site
Aquatic	6	Alluvial plain.	Wetland		0m	On-site
Aquatic	3	Alluvial plain.	River		0m	On-site
Aquatic	2	Alluvial plain.	Wetland		0m	On-site
Terrestrial	3	Alluvial plain.	Vegetation		0m	On-site
Terrestrial	9	Alluvial plain.	Vegetation		0m	On-site
Terrestrial	8	Alluvial plain.	Vegetation		0m	On-site
Aquatic	8	Alluvial plain.	River		0m	On-site
Terrestrial	6	Alluvial plain.	Vegetation		0m	On-site
Terrestrial	7	Alluvial plain.	Vegetation		0m	On-site
Terrestrial	5	Alluvial plain.	Vegetation		0m	On-site
Terrestrial	10	Alluvial plain.	Vegetation		0m	On-site

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology

Ecological Constraints

1836 Mabins Well Road, Moonbria, NSW 2710

NSW BioNet Atlas

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

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Burhinus grallarius	Bush Stone-curlew	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Certhionyx variegatus	Pied Honeyeater	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Circus assimilis	Spotted Harrier	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Epthianura albifrons	White-fronted Chat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Falco subniger	Black Falcon	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Grantiella picta	Painted Honeyeater	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Grus rubicunda	Brolga	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	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pedionomus torquatus	Plains-wanderer	Endangered	Not Sensitive	Critically Endangered	
Animalia	Aves	Petroica phoenicea	Flame Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Polytelis swainsonii	Superb Parrot	Vulnerable	Category 3	Vulnerable	
Animalia	Aves	Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Tyto novaehollandiae	Masked Owl	Vulnerable	Category 3	Not Listed	
Animalia	Mammalia	Phascolarctos cinereus	Koala	Vulnerable	Not Sensitive	Endangered	
Plantae	Flora	Brachyscome papillosa	Mossgiel Daisy	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Pilularia novae-hollandiae	Austral Pillwort	Endangered	Category 3	Not Listed	
Plantae	Flora	Sclerolaena napiformis	Turnip Copperburr	Endangered	Not Sensitive	Endangered	
Plantae	Flora	Swainsona murrayana	Slender Darling Pea	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Swainsona plagiotropis	Red Darling Pea	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Swainsona sericea	Silky Swainson-pea	Vulnerable	Not Sensitive	Not Listed	

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

USE OF REPORT - APPLICABLE TERMS

The following terms apply to any person (End User) who is given the Report by the person who purchased the Report from Lotsearch Pty Ltd (ABN: 89 600 168 018) (Lotsearch) or who otherwise has access to the Report (Terms). The contract terms that apply between Lotsearch and the purchaser of the Report are specified in the order form pursuant to which the Report was ordered and the terms set out below are of no effect as between Lotsearch and the purchaser of the Report.

1. End User acknowledges and agrees that:
   (a) the Report is compiled from or using content (**Third Party Content**) which is comprised of:
      (i) content provided to Lotsearch by third party content suppliers with whom Lotsearch has contractual arrangements or content which is freely available or methodologies licensed to Lotsearch by third parties with whom Lotsearch has contractual arrangements (**Third Party Content Suppliers**); and
      (ii) content which is derived from content described in paragraph (i);
   (b) Neither Lotsearch nor Third Party Content Suppliers takes any responsibility for or give any warranty in relation to the accuracy or completeness of any Third Party Content included in the Report including any contaminated land assessment or other assessment included as part of a Report;
   (c) the Third Party Content Suppliers do not constitute an exhaustive set of all repositories or sources of information available in relation to the property which is the subject of the Report (**Property**) and accordingly neither Lotsearch nor Third Party Content Suppliers gives any warranty in relation to the accuracy or completeness of the Third Party Content incorporated into the report including any contaminated land assessment or other assessment included as part of a Report;
   (d) Reports are generated at a point in time (as specified by the date/time stamp appearing on the Report) and accordingly the Report is based on the information available at that point in time and Lotsearch is not obliged to undertake any additional reporting to take into consideration any information that may become available between the point in time specified by the date/time stamp and the date on which the Report was provided by Lotsearch to the purchaser of the Report;
   (e) Reports must be used or reproduced in their entirety and End User must not reproduce or make available to other persons only parts of the Report;
   (f) Lotsearch has not undertaken any physical inspection of the property;
   (g) neither Lotsearch nor Third Party Content Suppliers warrants that all land uses or features whether past or current are identified in the Report;
   (h) the Report does not include any information relating to the actual state or condition of the Property;
   (i) the Report should not be used or taken to indicate or exclude actual fitness or unfitness of Land or Property for any particular purpose
   (j) the Report should not be relied upon for determining saleability or value or making any other decisions in relation to the Property and in particular should not be taken to be a rating or assessment of the desirability or market value of the property or its features; and
   (k) the End User should undertake its own inspections of the Land or Property to satisfy itself that there are no defects or failures
2. The End User may not make the Report or any copies or extracts of the report or any part of it available to any other person. If End User wishes to provide the Report to any other person or make extracts or copies of the Report, it must contact the purchaser of the Report before doing so to ensure the proposed use is consistent with the contract terms between Lotsearch and the purchaser.
3. Neither Lotsearch (nor any of its officers, employees or agents) nor any of its Third Party Content Suppliers will have any liability to End User or any person to whom End User provides the Report and End User must not represent that Lotsearch or any of its Third Party Content Suppliers accepts liability to any such person or make any other representation to any such person on behalf of Lotsearch or any Third Party Content Supplier.
4. The End User hereby to the maximum extent permitted by law:
   (a) acknowledges that the Lotsearch (nor any of its officers, employees or agents), nor any of its Third Party Content Supplier have any liability to it under or in connection with the

Report or these Terms;

(b) waives any right it may have to claim against Third Party Content Supplier in connection with the Report, or the negotiation of, entry into, performance of, or termination of these Terms; and

(c) releases each Third Party Content Supplier from any claim it may have otherwise had in connection with the Report, or the negotiation of, entry into, performance of, or termination of these Terms.

5. The End User acknowledges that any Third Party Supplier shall be entitled to plead the benefits conferred on it under clause 4, despite not being a party to these terms.
6. End User must not remove any copyright notices, trade marks, digital rights management information, other embedded information, disclaimers or limitations from the Report or authorise any person to do so.
7. End User acknowledges and agrees that Lotsearch and Third Party Content Suppliers retain ownership of all copyright, patent, design right (registered or unregistered), trade marks (registered or unregistered), database right or other data right, moral right or know how or any other intellectual property right in any Report or any other item, information or data included in or provided as part of a Report.
8. To the extent permitted by law and subject to paragraph 9, all implied terms, representations and warranties whether statutory or otherwise relating to the subject matter of these Terms other than as expressly set out in these Terms are excluded.
9. Subject to paragraph 6, Lotsearch excludes liability to End User for loss or damage of any kind, however caused, due to Lotsearch's negligence, breach of contract, breach of any law, in equity, under indemnities or otherwise, arising out of all acts, omissions and events whenever occurring.
10. Lotsearch acknowledges that if, under applicable State, Territory or Commonwealth law, End User is a consumer certain rights may be conferred on End User which cannot be excluded, restricted or modified. If so, and if that law applies to Lotsearch, then, Lotsearch's liability is limited to the greater of an amount equal to the cost of resupplying the Report and the maximum extent permitted under applicable laws.
11. Subject to paragraph 9, neither Lotsearch nor the End User is liable to the other for:
    (a) any indirect, incidental, consequential, special or exemplary damages arising out of or in relation to the Report or these Terms; or
    (b) any loss of profit, loss of revenue, loss of interest, loss of data, loss of goodwill or loss of business opportunities, business interruption arising directly or indirectly out of or in relation to the Report or these Terms,

    irrespective of how that liability arises including in contract or tort, liability under indemnity or for any other common law, equitable or statutory cause of action or otherwise.
12. These Terms are subject to New South Wales law.