

# APPENDIX G

## PRELIMINARY SITE ASSESSMENT (CLM)

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TRANSGRID

# ENERGYCONNECT (VICTORIAN SECTION)

## PHASE 1 PRELIMINARY SITE INVESTIGATION

APRIL 2021

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## EnergyConnect (Victorian Section) Phase 1 Preliminary Site Investigation

TransGrid

WSP




Level 15, 28 Freshwater Place  
Southbank VIC 3006

Tel: +61 3 9861 1111

Fax: +61 3 9861 1144

wsp.com

REV	DATE	DETAILS
Final	30/04/2021	Final for land owner consent

	NAME	DATE	SIGNATURE
Prepared by:	Euneace Teoh	30/04/2021	
Reviewed by:	Graham Smith	30/04/2021	
Approved by:	Will Parker	30/04/2021	

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# GLOSSARY

CEMP	Construction Environmental Management Plan
EnergyConnect	EnergyConnect is a proposed new electricity interconnector between Wagga Wagga in New South Wales and Robertstown in South Australia, with an additional connection to Red Cliffs in north-west Victoria. EnergyConnect is a joint project between TransGrid and ElectraNet, who operate the transmission networks in New South Wales (NSW) and South Australia (SA), respectively.
HV	high voltage
LGA	Local government area
NSW	New South Wales
Operational footprint	<p>Refers to the areas where the physical infrastructure would be located and the areas where the operational activities would occur. This includes all proposed infrastructure elements such as the proposed transmission line (overhead) and structures, any new substation infrastructure or permanent access tracks.</p> <p>This also includes the corridor containing the transmission line which would require vegetation maintenance (50 metres in width).</p>
(the) proponent	<p>The proposal is proposed to be undertaken by NSW Electricity Networks Operations Pty Ltd as a trustee for NSW Electricity Operations Trust (referred to as TransGrid). TransGrid is the operator and manager of the main high voltage (HV) transmission network in NSW and the Australian Capital Territory (ACT), and is the Authorised Network Operator (ANO) for the purpose of an electricity transmission or distribution network under the provisions of the <i>Electricity Network Assets (Authorised Transactions) Act 2015</i> (NSW).</p> <p>TransGrid's network enables more than three million homes and businesses to access a safe, reliable and affordable supply of electricity. The network comprises more than 100 substations and more than 13,000 km of high voltage transmission lines, underground cables, and interconnections with Queensland and Victoria. As a result, the network is instrumental to the electricity system and, therefore, the economy and facilitates energy trading across the National Electricity Market (NEM). Further information on TransGrid can be found at <a href="http://www.transgrid.com.au">www.transgrid.com.au</a>.</p>
(the) proposal	<p>The proposal is known as '<i>EnergyConnect (Victoria)</i>'</p> <p>The proposal involves the following key features:</p> <ul style="list-style-type: none"> <li>— construction of about 1.3 kilometres of new double circuit 220 kV transmission line, with four new transmission line pole locations. At two of these locations, two poles would be installed. At the remaining locations only a single pole would be installed</li> <li>— the decommissioning and removal of the existing transmission line and towers</li> <li>— the establishment of a formal 50 metre wide corridor for the new transmission line</li> <li>— upgrade of access tracks for use during construction and operation</li> <li>— establishment of small sections of new access tracks.</li> </ul> <p>The description of the proposal as presented in the reports is indicative and based on the current level of design. The proposal would continue to be refined during detailed design.</p>

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proposal footprint	Refers to the area that would be directly impacted by both construction and operation (including the areas that would be impacted by maintenance activities) of the proposal including all proposal infrastructure elements (including the proposed transmission line alignment, i.e. the operational footprint) as well as locations for currently proposed construction elements such as access tracks, laydown and staging areas, brake/winch sites.
proposal study area	<p>The proposal study area for the assessments in this report, generally comprises a 200 m wide corridor between NSW/Victoria border at Monak and the Red Cliffs substation facility. It also encompasses the Red Cliffs substation facility and access track off Woomera Avenue into the proposal area.</p> <p>The proposal would be located within the proposal study area, however the entirety of the proposal study area would not be subject to direct impacts arising from the proposal.</p> <p>Some technical assessments will have an additional study area specific to the methodologies of the assessment (e.g. for database searches, or areas of influence due to nature of the impacts. Such areas, where required, have been clearly defined in the specific report.</p>
REZ	Renewable Energy Zone
SA	South Australia
Transmission line corridor	A corridor of up to 50 metres in width surrounding and including the transmission lines and other infrastructure in which TransGrid has rights to enter to access and maintain infrastructure and vegetation.

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# EXECUTIVE SUMMARY

WSP has been commissioned on behalf of TransGrid (Client) to prepare a Phase 1 Preliminary Site Investigation (PSI) to support the regulatory and environmental planning approvals for the construction and operation of a new High Voltage (HV) interconnector between NSW and SA, with an additional connection to Red Cliffs in north-west Victoria. Collectively, the proposed interconnector is known as EnergyConnect. The proposal is located in the Kings Billabong Park, Red Cliffs, in the Sunraysia region within the Mildura Local Government Area and approximately 16 kilometres from Mildura and 544 kilometres from Melbourne respectively.

The proposal comprises the upgrade of an existing TransGrid 220 kV single circuit transmission line between the NSW/Victorian border and the Red Cliffs substation to a 220 kV double circuit transmission line. Specifically this comprises:

- construction of about 1.3 kilometres of new double circuit 220 kV transmission line, with four new transmission line pole locations. At two of these locations, two poles would be installed. At the remaining locations only a single pole would be installed
- the decommissioning and removal of the existing transmission line and towers
- the establishment of a formal 50 metre wide corridor for the new transmission line
- upgrade of access tracks for use during construction and operation
- establishment of small sections of new access tracks
- the connection of the new transmission line to the Red Cliffs substation and disconnection of existing transmission line, would be undertaken as a separate scope of works by AusNet.

The purpose of the investigation is to identify potential contamination risks to human health and the environment, including any contamination management requirements during the construction of the proposal.

Based on a review of the available current and site history data, WSP concluded the following:

- the potential for contamination to be present as a result of past/present land use activities
- the potential importation of contaminated fill material (of unknown origin) may have been used mainly at the southwest portion (substation infrastructure)
- the potential for lateral migration of dissolved phase impacts within the groundwater is unknown as previous assessment of groundwater beneath the site has not been identified
- the identified potential receptors include: commercial/industrial workers, intrusive maintenance workers, residents, recreational users and ecosystem and terrestrial receptors.

An intrusive soil assessment should be undertaken prior to the planned construction works, so that any potential human health and/or environmental risk can be assessed and managed accordingly. In addition, soil testing should be undertaken for waste classification purposes in the event that soils are excavated during the planned construction works that require offsite disposal.

The mitigation measures would likely be preparation of a Health and Safety Plan (HSP) and Construction Environmental Management Plan (CEMP).

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# 1 INTRODUCTION

TransGrid (electricity transmission operator in New South Wales (NSW)) and ElectraNet (electricity transmission operator in South Australia (SA)) are seeking regulatory and environmental planning approval for the construction and operation of a new High Voltage (HV) interconnector between NSW and SA, with an additional connection to Red Cliffs in north-west Victoria. Collectively, the proposed interconnector is known as EnergyConnect.

EnergyConnect comprises several components or ‘sections’ (shown on Figure 1.1). The Victorian Section (referred to as ‘the proposal’) is the subject of this report.

EnergyConnect aims to secure increased electricity transmission between SA, NSW and Victoria in the near term, while facilitating the longer-term transition of the energy sector across the National Electricity Market (NEM) to low emission energy sources.

EnergyConnect has been identified as an immediate priority project in the Australian Energy Market Operator (AEMO) 2018 *Integrated System Plan* (ISP) and a ‘no regret’ actionable project in the 2020 ISP (AEMO, 2020). This is due to its ability to ‘increase transfer capacity between SA and NSW by 750 MW, achieve fuel cost savings and unlock already stranded renewable investments’ within the REZs in western NSW, SA and north-west Victoria (AEMO, 2020).

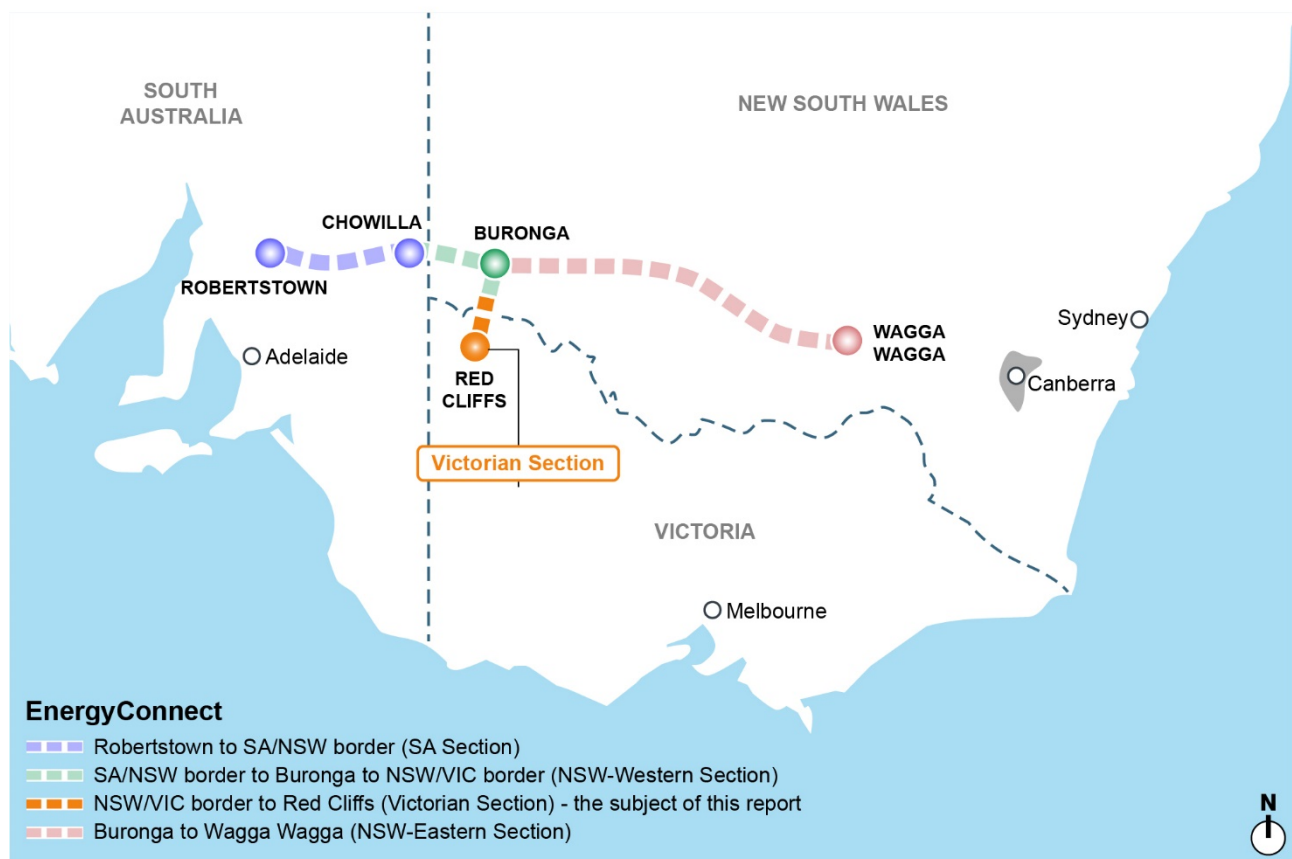


Figure 1.1 Overview of EnergyConnect

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## 1.1 THE PROPOSAL

### 1.1.1 APPROVALS PATHWAY

TransGrid are seeking approval from Mildura Rural City Council for the upgrade of an existing TransGrid 220 kV single circuit transmission line to a 220 kV double circuit transmission line within a 50-metre-wide corridor that extends for approximately 1.3 kilometres. The proposal is located within a Public Conservation and Resource Zone (PCRZ).

The proposal requires primary State planning, environmental and aboriginal heritage approvals under the *Planning and Environment Act 1987*, and *Aboriginal Heritage Act 2006*. The proposal seeks to lodge planning and environmental approvals through a planning permit to the Mildura Rural City Council and a Cultural Heritage Management Plan to the First People of Millewa Mallee Aboriginal Corporation for assessment.

### 1.1.2 KEY FEATURES OF THE PROPOSAL

The proposal comprises the upgrade of an existing TransGrid 220 kV single circuit transmission line between the NSW/Victorian border and the Red Cliffs substation to a 220 kV double circuit transmission line. Specifically this comprises:

- site establishment works including vegetation clearance, minor access track improvements and construction of tower pad and laydown areas
- construction of about 1.3 kilometres of new double circuit 220 kV transmission line, with four new transmission line pole locations. At two of the four locations, a double arrangement (i.e. two poles) would be installed. At the remaining locations only a single pole structure would be installed
- the decommissioning and removal of the existing 220 kV single circuit transmission line and towers once the new line is operational. Decommissioning activities would include removal of all existing towers, fittings and conductors from the corridor. Some sub surface footings would be left in place to minimise excavation and disturbance
- the establishment of a formal 50 metre wide corridor for the new transmission line and poles
- vegetation removal required to maintain appropriate clearances between ground vegetation and transmission lines. Vegetation above 4-metres in height, within a 50-metre corridor below transmission lines would require ongoing maintenance throughout the operation to ensure electrical safety clearances and protection zones are maintained. The required clearance of vegetation within the corridor would be undertaken in accordance with TransGrid maintenance guides
- upgrade of access tracks for use during construction and operation
- establishment of small sections of new access tracks.

The connection of the new transmission line to the Red Cliffs substation and disconnection of existing transmission line, would be undertaken as a separate scope of works by AusNet.

An overview of the proposal is provided in (Figure 1.2). The final location of transmission poles and transmission line corridor would be confirmed during detailed design.

Construction of the proposal would commence in late-2021. Construction timeframes for the proposal are subject to approvals, and the final program would be confirmed during detailed design.





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### 1.1.3 PROPOSAL LOCATION AND STUDY AREA

The proposal is located in the Kings Billabong Park, Red Cliffs, in the Sunraysia region within the Mildura Local Government Area and approximately 16 kilometres from Mildura and 544 kilometres from Melbourne respectively.

The proposal study area comprises of a 200 metre wide corridor that extends for about 1.3 kilometres and extends from the Red Cliffs substation to the north-east where it meets the Victorian/NSW border at the Murray River. The proposal study area comprises approximately 33.15 hectares of land and follows the existing 220 kV transmission line corridor and also encompasses the Red Cliffs substation facility and access track into the proposal study area (Figure 1.2).

The bulk of the proposal study area is classified as Crown Reserve with the remainder typically freehold land.

### 1.1.4 PROPOSAL NEED

The proposal would increase transfer capacity between the state markets of Victoria and NSW and would support the establishment of the missing transmission link between the SA and NSW transmission networks. The upgrade to the existing transmission line between Buronga and Red Cliffs would relieve system constraints and allow for Victorian, NSW and SA consumers to benefit from expanded access to low-cost, large-scale solar generation in north-west Victoria and south-west NSW.

---

## 1.2 THE PROPONENT

The proposal would be carried out by NSW Electricity Networks Operations Pty Ltd as a trustee for NSW Electricity Operations Trust (referred to as TransGrid). TransGrid is the operator and manager of the main high voltage transmission network in NSW and the Australian Capital Territory (ACT) and is the Authorised Network Operator (ANO) for the purpose of an electricity transmission or distribution network under the provisions of the *Electricity Network Assets (Authorised Transactions) Act 2015* (NSW).

---

## 1.3 PURPOSE OF THIS TECHNICAL REPORT

WSP has been commissioned on behalf of TransGrid to prepare the Phase 1 Preliminary Site Investigation (PSI) to support the statutory planning approvals for the proposal. The purpose of the Phase 1 PSI report is to identify potential impacts and recommend potential appropriate management during the construction and operation of the proposal.

---

## 1.4 LIMITATIONS

The report statement of limitations related to the limitations and conclusions provided in Sections 6 and 8 of this report.

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## 1.5 VICTORIAN ENVIRONMENT PROTECTION AMENDMENT ACT 2018

This report has been prepared prior to the commencement of the amendments to the *Environment Protection Act 2017* (the 'Act') effected by the *Environment Protection Amendment Act 2018*. The amendments are expected to come into effect on 1 July 2021. The Act will have wide-ranging implications and obligations for the people and businesses of the state of Victoria. The Act will introduce stringent duties for reporting and managing contamination and serious penalties for individuals and companies that do not. The statements, opinions, facts, conclusions and/or recommendations provided in this report (conclusions) are based in whole, or in part on the regulatory framework in place in Victoria at the time of writing, including applicable legislation and guidance. The reader should note that the conclusions provided (and advice given) may not be fully aligned to the future requirements of the Act. The conclusions should be revisited and

reconsidered within the context of the new legislation and guidance, if this report is to be relied upon after the Act comes into effect.

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## 1.6 SCOPE OF WORK

The scope of works for the desktop review of Phase 1 PSI included the following:

- physical setting including topography, hydrogeology and geology
- groundwater database search
- EPA notices
- nearby completed environmental audit reports
- planning and zoning information
- cultural heritage overlays
- ecological constraints
- natural hazards
- historical aerial photographs
- acid sulfate soils
- waste management.

In order to support this desktop review, WSP commissioned Lotsearch to undertake searches of relevant databases of publicly available information regarding historical and current site uses, regional information and site setting details, aerial imagery and regulatory information (refer Appendix A).

---

## 1.7 LEGISLATIVE AND POLICY CONTEXT

The proposed approach, scope of works and methodology have been developed with reference to the following documents:

- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), Guideline on Investigation Levels for Soil and Groundwater (B1)
- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), Guideline on Site Characterisation (B2)
- *Victoria Environment Protection Act 1970*
- Victorian Government (2002), Victorian Gazette No. S95, State Environmental Protection Policy (Prevention and Management of Contamination of Land)
- Victorian Government (2018), Victorian Gazette No. S499, State Environmental Protection Policy (Waters).

A copy of the report limitations is provided within Section 8 of this report.

## 2 SITE SETTING

### 2.1 SITE DETAIL SUMMARY

A summary of the site setting is provided in Table 2.1 below and further details provided within Appendix A. The site is defined as the proposal study area extent.

Table 2.1 Summary of site details

PARAMETER	SITE DETAILS
Site address	Kings Billabong Park, Red Cliffs, Victoria and extends from the Red Cliffs substation, to the north east where it crosses the Murray River and additional access track entrance area to the south west
Title information	1\TP12019, 2227\PP3102 and 138F-F\PP3102
Land area	Approximately 325,565 m <sup>2</sup>
Zoning and overlays	<ul style="list-style-type: none"><li>— Public conservation and resource zone (PCRZ)</li><li>— Special Use Zone – Schedule 5 (SUZ5)</li></ul> Overlays: <ul style="list-style-type: none"><li>— Environmental Significance Overlay – Schedule 1 (ESO1)</li><li>— Land Subject to Inundation Overlay (LSIO)</li><li>— Environmental Audit Overlay (EAO) (existing substations)</li><li>— Heritage Overlay (HO168) (existing substations).</li></ul>
Current site use(s)	<ul style="list-style-type: none"><li>— Transmission line</li><li>— Existing substations (southwest portion) Bushland Crown Reserve (northeast) of approximately 1.5 km.</li></ul>
Proposed site use	The existing Red Cliffs substation is to remain. The upgrade of an existing TransGrid 220 kV single circuit transmission line between the NSW/Victorian border and the Red Cliffs substation to a 220 kV double circuit transmission line along the Crown Reserve. An operational footprint would be established to incorporate the new transmission line.
Surrounding land uses	<ul style="list-style-type: none"><li>— <b>North:</b> Murray River</li><li>— <b>East:</b> Undeveloped bushland/Murray River</li><li>— <b>South:</b> Commercial/Residential/Agricultural</li><li>— <b>West:</b> Residential/Undeveloped</li></ul>

### 2.2 LOCAL AND REGIONAL SETTING

The site is located in the Kings Billabong Park, Red Cliffs, in the Sunraysia region within the Rural City of Mildura and approximately 16 kilometres from Mildura and 544 kilometres from Melbourne respectively.

---

## 2.3 SURROUNDING LAND USES

Surrounding land uses identified within 150 metres of the site comprise:

- Murray River to the east of the site
- recreational areas (Red Cliffs Boat Ramp Camping Area) to the east of the site along the Murray River
- commercial/industrial to the south of the site
- residential to the south of the site
- agricultural to the southwest of the site.

---

## 2.4 TOPOGRAPHY

The site is generally higher in the southwest and lower in the north and west, with the surface elevation varying between 42 metres Australian height datum (AHD) in the southwest to 30 metres AHD to the north and east.

---

## 2.5 ECOLOGICAL CONSTRAINTS

No RAMSAR wetlands exist are reported to be present onsite or in the vicinity of the site. Native vegetation (Ecological Vegetation Classes (EVC)) are modelled to be present onsite as follows:

- Semi-arid Woodland
- Semi-arid Chenopod Woodland
- Low Chenopod Shrubland
- Riverine Chenopod Woodland
- Lignum Shrubland
- Intermittent Swampy Woodland
- Tall Marsh.

High and moderate groundwater, and inflow dependent ecosystem are present onsite.

---

## 2.6 CULTURAL HERITAGE SENSITIVITY

The site and immediate properties are not in the Commonwealth, National and Victorian Heritage registers sourced from State Government Victoria – Department of Environment, Land, Water & Planning. However, the majority of the site lies within the Cultural Heritage Sensitivity Area defined by the Aboriginal Cultural Heritage Register and Information System (ACHRIS).

---

## 2.7 NATURAL HAZARDS

The site and adjoining properties are classified as within a designated bushfire prone area and Land Subject to Inundation Overlay (LSIO) under the Mildura Planning Scheme. One bushfire incident occurred in September 2001 was recorded at the site and immediately west of the site.

---

## 2.8 REGIONAL GEOLOGY

The site lies within geological deposits of:

- Alluvium (Qa1): Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits within the northern portion of the site
- Woorinen Formation (Qxw): Dune deposits, unconsolidated; mainly red-brown siliceous silty sand, red calcareous silty clay, and sand clay within the southern portion of the site.

---

## 2.9 POTENTIAL ACID SULFATE SOIL

Based on the Australian Soil Resource Information System website ([www.asris.csiro.au](http://www.asris.csiro.au)) accessed on 11 August 2020, the site has extremely low probability of occurrence of acid sulfate soil.

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## 2.10 REGIONAL HYDROGEOLOGY

Based on data obtained from Lotsearch report (refer Appendix A) depth to the water table at the site is inferred to be five to 10 metres below ground level (mBGL) and salinity is between 13,000 to 35,000 mg/L. The aquifer at the site is described to be porous, extensive of low to moderate productivity.

---

## 2.11 GROUNDWATER DATABASE SEARCH

No registered groundwater bores are identified within 1000 metre of the site boundary, the closest bores are located 1050 metres away to the west of the site and listed for observation/investigation purposes.

## 3 SITE HISTORY

### 3.1 HISTORICAL AERIAL PHOTOGRAPHS

A review of historical aerial photography sourced by Lotsearch (Appendix A), covering the site and surrounding area was completed, with a summary of the observed land use changes described in Table 3.1.

Table 3.1 Historical aerial imagery summary

YEAR	SITE	SURROUNDING LAND
1946	The site appeared to be majority bushland and vacant land with several unsealed roads.	The surrounding land appeared to be majority bushland and vacant land with several commercial/ industrial uses (i.e. Red Cliffs Main Pumping Station) to the south. Agricultural and residential uses were observed to the southwest.
1953	The site appeared unchanged with the exception of potential fill material assumed to be associated with site development.	The surrounding land to the north remains as bushland.
1964	The site appeared unchanged with the exception of the southwest portion which appeared to be paved with substation as part of the power station.	The surrounding land to the north remains as bushland and additional industrial structures appeared to the southeast.
1968–1972	The site appeared mainly unchanged, several industrial structures appeared at the southwest portion.	The surrounding land to the north remains as bushland.
1980	The site appeared unchanged, a track and some vegetation clearance (e.g. likely associated with transmission line installation) were visible from the substation to the Murray River.	The surrounding land to the north remains as bushland.
1987	The site appeared unchanged.	The surrounding land to the north remains as bushland and additional residential development appeared to the southwest.
1993–2020	The site appeared unchanged.	The surrounding land to the north remains as bushland.

### 3.2 HISTORICAL BUSINESS SEARCH

No historical business including dry cleaners, motor garages and service stations exist on site or in the vicinity of the site.

### 3.3 PREVIOUS ASSESSMENTS

No known environmental audit assessments were identified to have been completed by others.

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### 3.4 SUMMARY OF SITE HISTORY INVESTIGATION

Based on the results of the review of historical information, the site appeared to be mostly bushland and vacant land with several unsealed roads since 1946. Since 1964, the southwest portion of the site was developed with substation infrastructure as part of the power station (Red Cliffs Terminal Station). The surrounding land appeared to have been undeveloped and remained as bushland, and to the south for farming/agricultural with residential and commercial/industrial activities since 1946. Kings Billabong Park has remained as bushland based on the review of all aerial photographs. Potentially contaminating historical activities (i.e. installation of current transmission infrastructure since 1964 and transmission line between 1972 to 1980) have been identified to be present in areas surrounding the site and are discussed in further detail in Section 5.

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## 4 REGULATORY INFORMATION

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### 4.1 CURRENT EPA PRIORITY SITES REGISTER

A search of the EPA Priority Sites Register in September 2020 reported that no current EPA priority site exist on site or in the vicinity of the site.

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### 4.2 FORMER EPA PRIORITY SITES AND OTHER POLLUTION NOTICES

A search of the EPA Priority Sites Register in September 2020 reported that no former EPA priority site and other pollution notices exist on the site or in the vicinity of the site.

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### 4.3 EPA PER- AND POLYFLUORINATED ALKYL SUBSTANCES (PFAS) INVESTIGATION AND MANAGEMENT PROGRAMS

A search of the EPA Per- and Polyfluorinated Alkyl Substances (PFAS) Register in September 2020 reported no EPA and Defence PFAS site investigation, and Airservices Australia National PFAS management program exist on site or in the vicinity of the site.

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### 4.4 EPA ENVIRONMENTAL AUDITS

While no environmental audits have been undertaken at the site, two Environmental Audits (CARMS No 40575-1 and 40575-2) have been completed immediately southwest of the site, associated with the Red Cliffs Main Pumping Station. The audits were conducted during the rezoning for divestment and post-demolition works at the property. A statement of Environmental Audit was issued due to the presence of heavy metals (copper, nickel and zinc), benzo(a)pyrene (BaP), polycyclic aromatic hydrocarbons (PAH) and coal fragments in soil. Asbestos removal was conducted during the demolition works.

A copy of the search results for surrounding current and historical audit sites is provided within the Lotsearch report (refer Appendix A).

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### 4.5 EPA GROUNDWATER ZONES WITH RESTRICTED USES

No Groundwater Quality Restricted Use Zones (GQRUZ) were identified at or in the vicinity of the site.

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### 4.6 EPA LICENCED ACTIVITIES

A search of the current and former EPA Licensed activities and works approval sites was undertaken in September 2020 and found there to be no EPA licenced activities within the 500 metres of the site.



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## 4.7 EPA WORKS APPROVALS

A search of the EPA records in September 2020 indicated no EPA works approvals at the site or within 500 metres of the site.

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## 4.8 NATIONAL WASTE MANAGEMENT SITE DATABASE

A search of the National Waste Management Site Database in September 2020 indicated the site is not listed as a waste management site, nor is there a facility on the National Waste Management Site Database within 500 metres of the site.

---

## 4.9 STATEWIDE WASTE AND RESOURCE RECOVERY INFRASTRUCTURE PLAN FACILITIES

A search of the Statewide Waste and Resource Recovery Infrastructure Plan Facilities in September 2020 indicated the site is not a plan facility – nor is there a facility within 500 metres of the site.

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## 4.10 EPA PRESCRIBED INDUSTRIAL WASTE

A search of the EPA Prescribed Industrial Waste sites in September 2020 indicated the site is not a prescribed industrial waste facility.

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## 4.11 EPA WASTE DISPOSAL SITES

A search of the Former Waste Disposal sites in September 2020 indicated the site is not a former waste disposal facility.

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## 4.12 FORMER GASWORKS

A search of the historical sources in September 2020 indicated the site is not a former gasworks, nor is there a historical gasworks site within 500 metres of the site.

# 5 POTENTIAL SOURCES OF CONTAMINATION

## 5.1 POTENTIAL SOURCES AND CHEMICALS OF POTENTIAL CONCERN (COPC)

Based on the identified current and historical on-site and surrounding site uses, several potentially contaminating activities were identified to exist. The potentially contaminating activities and associated chemicals of potential concern (COPC) are summarised below.

Table 5.1 Potentially nearby contaminating activities and associated COPC

ACTIVITY	SITE USES	COPC
Red Cliffs Main Pumping Station (immediate to the south of the site)	<ul style="list-style-type: none"> <li>— Importation of fill for use as building material during construction</li> <li>— Associated chemicals used during operations</li> </ul>	<ul style="list-style-type: none"> <li>— Asbestos containing material (ACM)</li> <li>— Polychlorinated biphenyl (PCB)</li> <li>— PAHs</li> <li>— Metals</li> <li>— Coal fragments</li> </ul>
Agricultural land (further southwest of the site)	<ul style="list-style-type: none"> <li>— Potential application of pesticides and herbicides</li> </ul>	<ul style="list-style-type: none"> <li>— Organochlorine and organophosphate pesticides (OCPs and OPPs)</li> <li>— Herbicides</li> <li>— Metals and metalloids</li> </ul>
Bushland (onsite and surrounding land)	<ul style="list-style-type: none"> <li>— Camping activities</li> <li>— Bush fire</li> <li>— Miscellaneous waste dumping (building rubble etc)</li> </ul>	<ul style="list-style-type: none"> <li>— Total Recoverable Hydrocarbon (TRH)</li> <li>— Benzene, toluene, ethylbenzene and xylene (BTEX)</li> <li>— PAHs</li> <li>— Per- and Polyfluorinated Alkyl Substances (PFAS)</li> <li>— ACM</li> </ul>
Substation (onsite)	<ul style="list-style-type: none"> <li>— Importation of fill for use as building material during construction</li> <li>— Associated chemicals used during operations</li> <li>— Site maintenance (weed management)</li> </ul>	<ul style="list-style-type: none"> <li>— ACM</li> <li>— PCB</li> <li>— PAHs</li> <li>— Metals</li> <li>— Herbicides</li> </ul>

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## 5.2 POTENTIAL SOURCES OF PER- AND POLYFLUORINATED ALKYL SUBSTANCES

Based on the identified current and historical activities on-site and surrounding site uses, the likelihood of any potential PFAS contamination within shallow soils at the site is considered low as there was potential for foams containing PFAS have been used in the bushfire incident occurred in September 2001 immediately west of the site.

---

## 5.3 POTENTIAL EXPOSURE PATHWAYS

Based on key features of the proposal and likely construction activities listed in Section 1.1.2, the anticipated transport media for the migration of contaminants identified were:

- dermal contact and incidental ingestion of soil
  - air inhalation of vapour and dust
  - migration of vapours through soils, underground service trenches and/or pits
  - surface run-off and entry into stormwater drainage system(s) in the event of subsurface spillage
  - lateral migration of dissolved phase impacts within the groundwater, typically in the direction of the local hydraulic gradient expected to be towards the Murray River.
- 

## 5.4 POTENTIAL RECEPTORS OF CONCERN

Identified receptors include:

- on-site construction and maintenance/utility workers during construction works
- on- and off-site ecosystem and terrestrial receptors (e.g. Murray River)
- off-site commercial occupants (e.g. to the south of the site)
- off-site recreational users (e.g. Red Cliffs Boat Ramp Camping Area) to the east of the site along the Murray River)
- adjacent off-site maintenance/utility workers
- adjacent off-site residents (e.g. to the south of the site)
- native vegetation and groundwater dependent ecosystem.

## 5.5 SOURCE-PATHWAY-RECEPTOR LINKAGE

Table 5.2 below presents a preliminary conceptual site model (CSM), showing the potential source-pathway-receptor linkage maybe realised during the construction and operation of new High Voltage (HV) network infrastructure.

Table 5.2 Sources-Pathway-Receptor linkage

POTENTIAL SOURCES	POTENTIALLY AFFECTED MEDIA	POTENTIAL EXPOSURE PATHWAY	IDENTIFIED POTENTIAL RECEPTOR
Red Cliffs Main Pumping Station (immediate to the south of the site) Agricultural land (further southwest of the site) Bushland (onsite and surrounding land) Substation (onsite)	Soils, dust and vapour	Dermal contact and incidental ingestion of soil  Air inhalation of vapour and dust  Migration of vapours through soils, underground service trenches and/or pits	Construction and maintenance/utility workers during construction works
			Commercial occupants
			Recreational users
			Residents
	Surface water	Surface run-off and entry into stormwater drainage system(s) in the event of subsurface spillage	Ecosystem and terrestrial receptors (Native vegetation and groundwater dependent ecosystem)
			Construction and maintenance/utility workers during construction works
	Groundwater	Lateral migration of dissolved phase impacts within the groundwater, typically in the direction of the local hydraulic gradient expected to be towards the Murray River.	Commercial occupants
			Ecosystem and terrestrial receptors (Native vegetation and groundwater dependent ecosystem)
			Recreational users

No extractive uses of groundwater were identified in the immediate vicinity of the site (less than 500 metre) and as a result these are not identified as a potential exposure pathway of concern.

A potential risk is considered to exist when a source-pathway-receptor linkage is identified. The proposal and related construction activities (e.g. earthworks for construction of transmission tower footings) have the potential to impact on sensitive receptors (i.e. human health and ecological) that may encounter potentially contaminated soil.

## 6 CONCLUSION

A preliminary site investigation (PSI) was undertaken for the proposal study area, which comprises of a 200 metre wide corridor that extends for about 1.3 kilometres from the Red Cliffs substation, to the north east where it meets the Victorian/NSW border at the Murray River. The proposal study area comprises an approximately 32 ha area of land and follows an existing transmission line corridor.

The site appeared to be mostly bushland and vacant land with several unsealed roads since 1946. The southwest portion of the site has been developed with substation infrastructure as part of the Red Cliffs Terminal Station since 1964. The surrounding land appears to have been undeveloped and remained as bushland, and to the south for a mixture of farming/agricultural, residential and commercial/industrial activities since 1946.

The site is currently zoned as Public Conservation and Resource Zone (PCRZ) and Special Use Zone – Schedule 5 (SUZ5) with Environmental Significance Overlay (ESO1) (part), Land Subject to Inundation Overlay (LSIO) (part), Environmental Audit Overlay (EAO) (part, being the existing substation) and Heritage Overlay (HO168) (part, being the substation).

The site is underlain by Alluvium (Qa1): Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits within the northern portion of the site, and Woorinen Formation (Qxw): Dune deposits, unconsolidated; mainly red-brown siliceous silty sand, red calcareous silty clay, and sand clay within the southern portion.

The depth to the groundwater is inferred to be five to 10 meters below ground level and salinity is between 13,000 to 35,000 mg/L. The aquifer at the site is described to be porous, extensive of low to moderate productivity.

A search of the EPA Priority Sites Register was conducted in September 2020 (undertaken by Lotsearch) and shows no EPA priority sites exist on site or in the vicinity of the site.

Native vegetation (Ecological Vegetation Classes (EVC)), groundwater, and inflow dependent ecosystem are modelled to be present onsite.

Potentially nearby contaminating activities were identified during the desktop study. This included:

- Red Cliffs Main Pumping Station immediate south of the site
- agricultural land (further southwest of the site)
- bushland (onsite and surrounding land)
- substation (adjacent to proposed work area which would only be outside substation fence line).

From the identified potentially contaminating activities, it is considered that the potential key contaminants of concern derived from current and/or historical uses are:

- Asbestos containing material (ACM)
- Polychlorinated biphenyl (PCB)
- Coal fragments (PAHs)
- Metals and metalloids
- Petroleum hydrocarbons (TPH and BTEX)
- Per and poly-fluoroalkyl substances (PFAS)
- Pesticides and herbicides (OCPs/OPPs).

Based on a review of the available current and site history data, WSP concluded the following:

- the potential for contamination to be present as a result of past/present land use activities
- the potential importation of contaminated fill material (of unknown origin) may have occurred mainly at the southwest portion (substation infrastructure)
- the potential for lateral migration of dissolved phase impacts within the groundwater is unknown as previous assessment of groundwater beneath the site has not been identified
- the identified potential receptors include: commercial/industrial workers, intrusive maintenance workers, residents, recreational users and ecosystem and terrestrial receptors.

An intrusive soil assessment should be undertaken prior to the planned construction works, so that any potential human health and/or environmental risk can be assessed and managed accordingly. In addition, soil testing should be undertaken for waste classification purposes in the event that soils are excavated during the planned construction works that require offsite disposal.

The mitigation measures would likely be preparation of a Health and Safety Plan (HSP) and Construction Environmental Management Plan (CEMP).

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## 7 REFERENCE

NEPC, 2013 National Environmental Protection (Assessment of Site Contamination) Measure (NEPM). Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater, 2013.

Vic EPA, State Environment Protection Policy – Prevention and Management of Contaminated Land, June 2000.

Vic EPA, Former Priority Sites & other Pollution Notices, EPA Environment Audit Reports and EPA Prescribed Industrial Waste.

Victorian Government Gazette, 1997. State Environment Protection Policy (SEPP), Groundwaters of Victoria, No. S160, 17 December 1997.

State Government Victoria – Department of Environment and Primary Industries (DEPI), Water Measurement Information System (WMIS), Groundwater Boreholes.

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# 8 LIMITATIONS

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## 8.1 SCOPE OF SERVICES

This preliminary site investigation report (the report) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and WSP (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

---

## 8.2 RELIANCE ON DATA

In preparing the report, WSP has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, WSP has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WSP will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

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## 8.3 ENVIRONMENTAL CONCLUSIONS

In accordance with the scope of services, WSP has relied upon the data and has not conducted any environmental field monitoring or testing in the preparation of the report. The conclusions are based upon the data and visual observations and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Within the limitations imposed by the scope of services, the assessment of the site and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

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## 8.4 REPORT FOR BENEFIT OF CLIENT

The report has been prepared for the benefit of the client and no other party. WSP assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of WSP or for any loss or damage suffered by any other party in relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

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## 8.5 OTHER LIMITATIONS

WSP will not be liable to update or revise the report to take into account any events, emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to nor ownership of the properties, buildings and structures referred to in the report, nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

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# APPENDIX A

## LOTSEARCH REPORT

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# LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

**Address: Red Cliffs, Mildura, VIC 3496**

**Date: 01 Sep 2020 14:46:09**

**Reference: LS014487 EP**

**Disclaimer:**

The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features.

You should obtain independent advice before you make any decision based on the information within the report.

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Lotsearch Pty Ltd ABN 89 600 168 018

## Dataset Listing

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

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features in Buffer
Topographic and Cadastre data	State Government Victoria - Department of Environment, Land, Water & Planning	12/08/2020	12/08/2020	Monthly	-	-	-	-
Current EPA Priority Sites	Environment Protection Authority (Vic)	31/08/2020	31/07/2020	Monthly	1000	0	0	0
Former EPA Priority Sites & other Remedial Notices	Environment Protection Authority (Vic)	04/11/2019	04/11/2019	Monthly	1000	0	0	0
EPA PFAS Site Investigations	Environment Protection Authority (Vic)	03/08/2020	10/10/2019	Monthly	2000	0	0	0
Defence PFAS Investigation & Management Program - Investigation Sites	Department of Defence	11/08/2020	11/08/2020	Monthly	2000	0	0	0
Defence PFAS Investigation & Management Program - Management Sites	Department of Defence	11/08/2020	11/08/2020	Monthly	2000	0	0	0
Airservices Australia National PFAS Management Program	Airservices Australia	28/08/2020	28/08/2020	Monthly	2000	0	0	0
Defence 3 Year Regional Contamination Investigation Program	Department of Defence	17/08/2020	17/08/2020	Monthly	2000	0	0	0
EPA Environmental Audit Reports	Environment Protection Authority (Vic)	28/08/2020	28/08/2020	Monthly	1000	0	2	2
EPA Groundwater Zones with Restricted Uses	Environment Protection Authority (Vic)	28/08/2020	28/08/2020	Monthly	1000	0	0	0
Current EPA Licensed Activities	Environment Protection Authority (Vic)	28/08/2020	28/08/2020	Monthly	1000	0	0	0
Former EPA Licensed Activities	Environment Protection Authority (Vic)	28/08/2020	28/08/2020	Monthly	1000	0	0	0
EPA Works Approvals	Environment Protection Authority (Vic)	31/08/2020	31/08/2020	Monthly	1000	0	0	0
National Waste Management Facilities Database	Geoscience Australia	15/05/2020	07/03/2017	Quarterly	1000	0	0	0
Statewide Waste and Resource Recovery Infrastructure Plan Facilities	State Government Victoria - Department of Sustainability	27/11/2014	31/12/2012	None planned	1000	0	0	0
EPA Prescribed Industrial Waste	Environment Protection Authority (Vic)	12/08/2020	12/08/2020	Quarterly	1000	0	0	0
EPA Victorian Landfill Register	Environment Protection Authority (Vic)	15/07/2020	15/07/2020	Quarterly	1000	0	0	0
Former Gasworks	Various historical sources collated by Lotsearch	15/08/2017	15/08/2017	Not required	1000	0	0	0
National Liquid Fuel Facilities	Geoscience Australia	12/08/2020	15/03/2012	Quarterly	1000	0	0	0
Historical Business Directories (Premise & Intersection Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	150	0	0	0
Historical Business Directories (Road & Area Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	150	-	0	0
Historical Business Directory Dry Cleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	500	0	0	0
Historical Business Directory Dry Cleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant; Sands & McDougall, State Library Victoria			Not required	500	-	0	0
Features of Interest	State Government Victoria - Department of Environment, Land, Water & Planning	28/08/2020	28/08/2020	Quarterly	1000	9	11	14
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000	1	1	1
Groundwater Salinity	State Government Victoria - Department of Environment, Land, Water & Planning	14/08/2015	29/08/2012	Unknown	0	2	-	-
Groundwater Salinity	State Government Victoria - Department of Environment, Land, Water & Planning	14/08/2015	29/08/2012	Unknown	0	2	-	-

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Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features in Buffer
Surface Elevation	State Government Victoria - Department of Environment, Land, Water & Planning	14/08/2015	23/09/2013	Unknown	0	1	-	-
Basement Elevation	State Government Victoria - Department of Environment, Land, Water & Planning	14/08/2015	23/09/2013	Unknown	0	1	-	-
Groundwater Boreholes WMIS	State Government Victoria - Department of Environment, Land, Water & Planning	14/07/2020	14/07/2020	Quarterly	2000	0	0	17
Groundwater Boreholes Earth Resources Database	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	27/07/2018	17/02/2010	As required	2000	0	0	13
Groundwater Boreholes Fed Uni	Federation University Australia	21/12/2017	07/01/2014	As required	2000	0	0	0
Historical Mining Activity - Shafts	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	18/10/2018	20/07/2018	As required	1000	0	0	0
Geological Units 1:250,000	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	13/01/2015	24/06/2014	Unknown	1000	2	-	2
Geological Structures 1:250,000	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	13/01/2015	24/06/2014	Unknown	1000	0	-	0
Shear zones 250k	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	13/01/2015	24/06/2014	Unknown	1000	0	-	0
Atlas of Australian Soils	ABARES	19/05/2017	17/02/2011	As required	1000	1	1	1
Victorian Soil Type Mapping	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	24/08/2017	21/03/2016	Unknown	1000	2	3	5
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000	1	2	2
Coastal Acid Sulfate Soils	State Government Victoria - Department of Economic Development, Jobs, Transport and Resources	28/03/2017	30/03/2011	None planned	1000	0	0	0
Planning Scheme Zones	State Government Victoria - Department of Environment, Land, Water & Planning	01/09/2020	26/08/2020	Monthly	1000	2	3	7
Planning Scheme Overlay	State Government Victoria - Department of Environment, Land, Water & Planning	01/09/2020	26/08/2020	Monthly	1000	4	5	5
Commonwealth Heritage List	Australian Government Department of the Environment and Energy - Heritage Branch	18/08/2020	20/11/2019	Quarterly	1000	0	0	0
National Heritage List	Australian Government Department of the Environment and Energy - Heritage Branch	18/08/2020	20/11/2019	Quarterly	1000	0	0	0
Victorian Heritage Register	State Government Victoria - Department of Environment, Land, Water & Planning	19/05/2020	19/05/2020	Quarterly	1000	0	0	0
Cultural Heritage Sensitivity	State Government Victoria - Department of Premier and Cabinet	01/09/2020	06/08/2020	Quarterly	1000	5	5	12
Bushfire Prone Area	State Government Victoria - Department of Transport, Planning and Local Infrastructure	24/07/2020	24/07/2020	Quarterly	1000	1	1	1
Fire History	State Government Victoria - Department of Environment, Land, Water & Planning	01/09/2020	18/08/2020	Quarterly	1000	1	1	1
Flood - 1 in 100 Year Modelled Flood Extent	State Government Victoria - Department of Environment, Land, Water & Planning	19/05/2020	31/12/2014	Quarterly	1000	1	1	1
Victorian Coastal Inundation Sea Level Rise	State Government Victoria - Department of Environment, Land, Water & Planning	10/04/2018	24/10/2017	Unknown	1000	0	0	0
Native Vegetation (Modelled 2005 Ecological Vegetation Classes)	State Government Victoria - Department of Environment, Land, Water & Planning	13/01/2015	31/12/2005	None planned	1000	7	7	12
Ramsar Wetland Areas in Victoria	State Government Victoria - Department of Environment, Land, Water & Planning	28/03/2017	24/06/2013	None planned	1000	0	0	0
Groundwater Dependent Ecosystems Atlas	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	2	4	6
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	1	3	6

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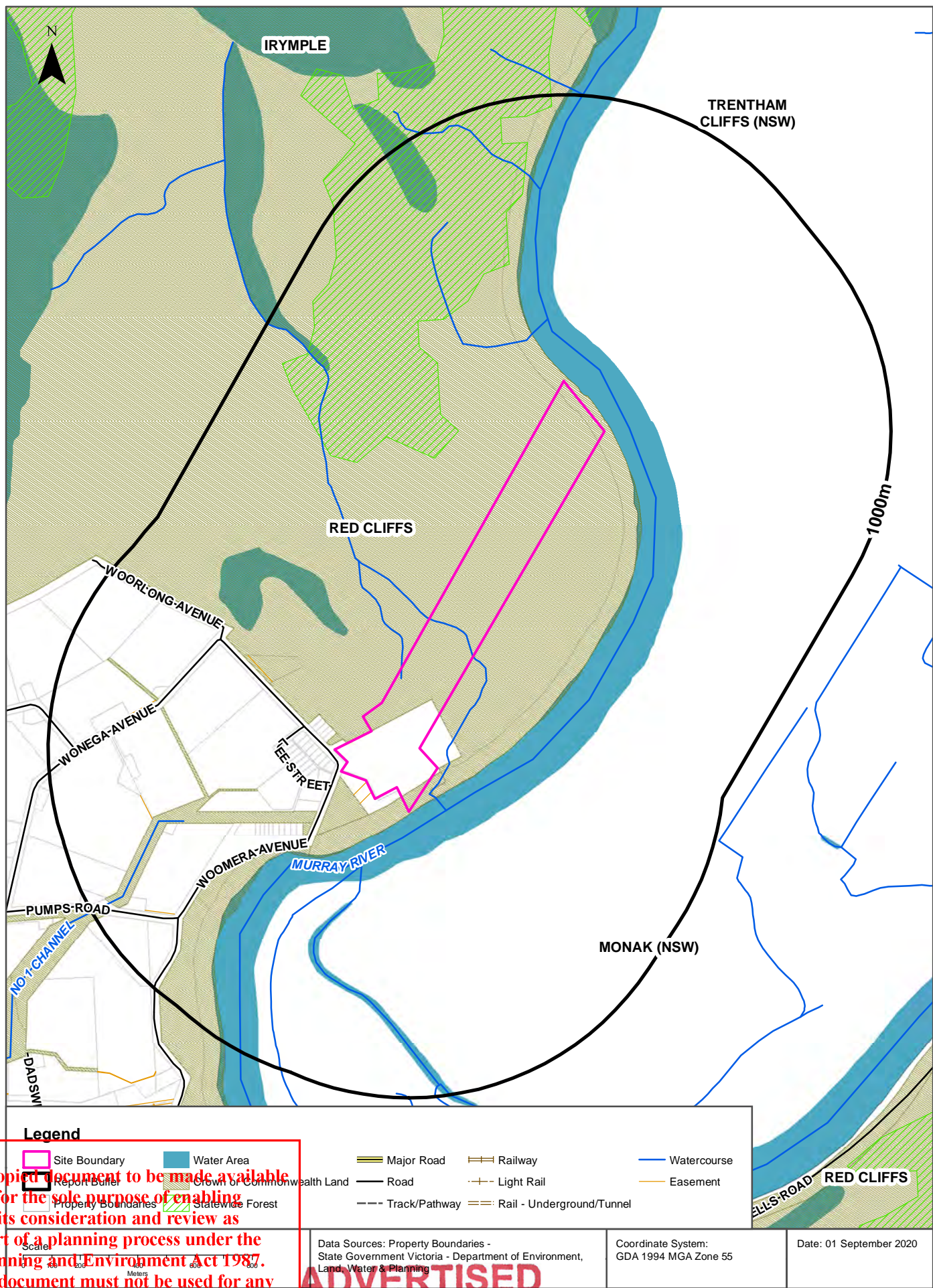


<b>Legend</b> <div><div></div> Site Boundary</div> <div><div></div> Internal Parcel</div>	<b>Total Area:</b> 325565m <sup>2</sup> <b>Total Perimeter:</b> 3807m <small>Disclaimers: Measurements are approximate only and may have been simplified or smaller lengths removed for readability. Parcels that make up a small percentage of the total site area have not been labelled for increased readability.</small>	<b>Scale:</b> 0 25 50 100 150 200 250 Meters <b>Data Sources:</b> Aerial Imagery © Aerometrex Pty Ltd <b>Coordinate System:</b> GDA 1994 MGA Zone 55 <b>Date:</b> 01 September 2020
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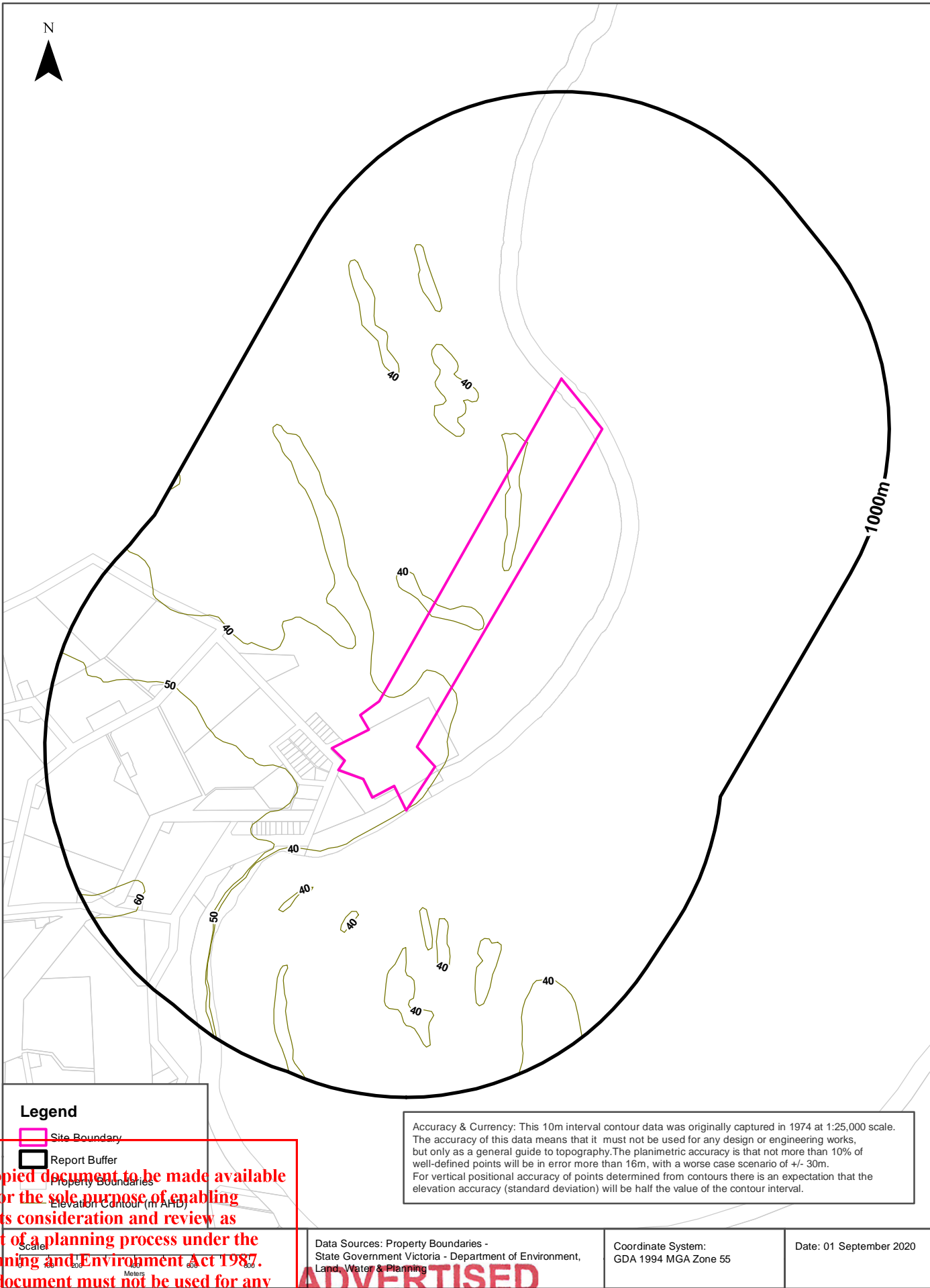
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Elevation Contours (m AHD) 10m Interval at 1:25,000  
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## EPA Priority Sites & Pollution Notices

Red Cliffs, Mildura, VIC 3496

### Current EPA Priority Sites Register

Sites on the current EPA priority sites register that exist within the dataset buffer:

Notice No	Address	Suburb	Issue	Loc Conf	Dist (m)	Direction
N/A	No records in buffer					

Priority Sites Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

### Former EPA Priority Sites & Other Pollution Notices

Sites within the dataset buffer that have been issued a Pollution Notice:

**Note. Due to pollution notices being revoked and removed from published lists this is not an exhaustive list of all past pollution notices.**

Notice No	Notice Type	Company	Address	Suburb	Status	Issue	Date Issued	Loc Conf	Dist	Dir
N/A	No records in buffer									

Pollution Notice Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

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# PFAS Investigation & Management Programs

Red Cliffs, Mildura, VIC 3496

## EPA PFAS Site Investigations

Sites being investigated by the EPA for PFAS contamination within the dataset buffer:

Map ID	Site Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

EPA PFAS Site Investigations Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

## Defence PFAS Investigation & Management Program Investigation Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

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

## Defence PFAS Investigation & Management Program Management Sites

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

Map ID	Base Name	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

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

## Airservices Australia National PFAS Management Program

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

Map ID	Site Name	Impacts	Location Confidence	Distance	Direction
N/A	No records in buffer				

Airservices Australia National PFAS Management Program Data Custodian: Airservices Australia

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## Defence Sites

Red Cliffs, Mildura, VIC 3496

### 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:

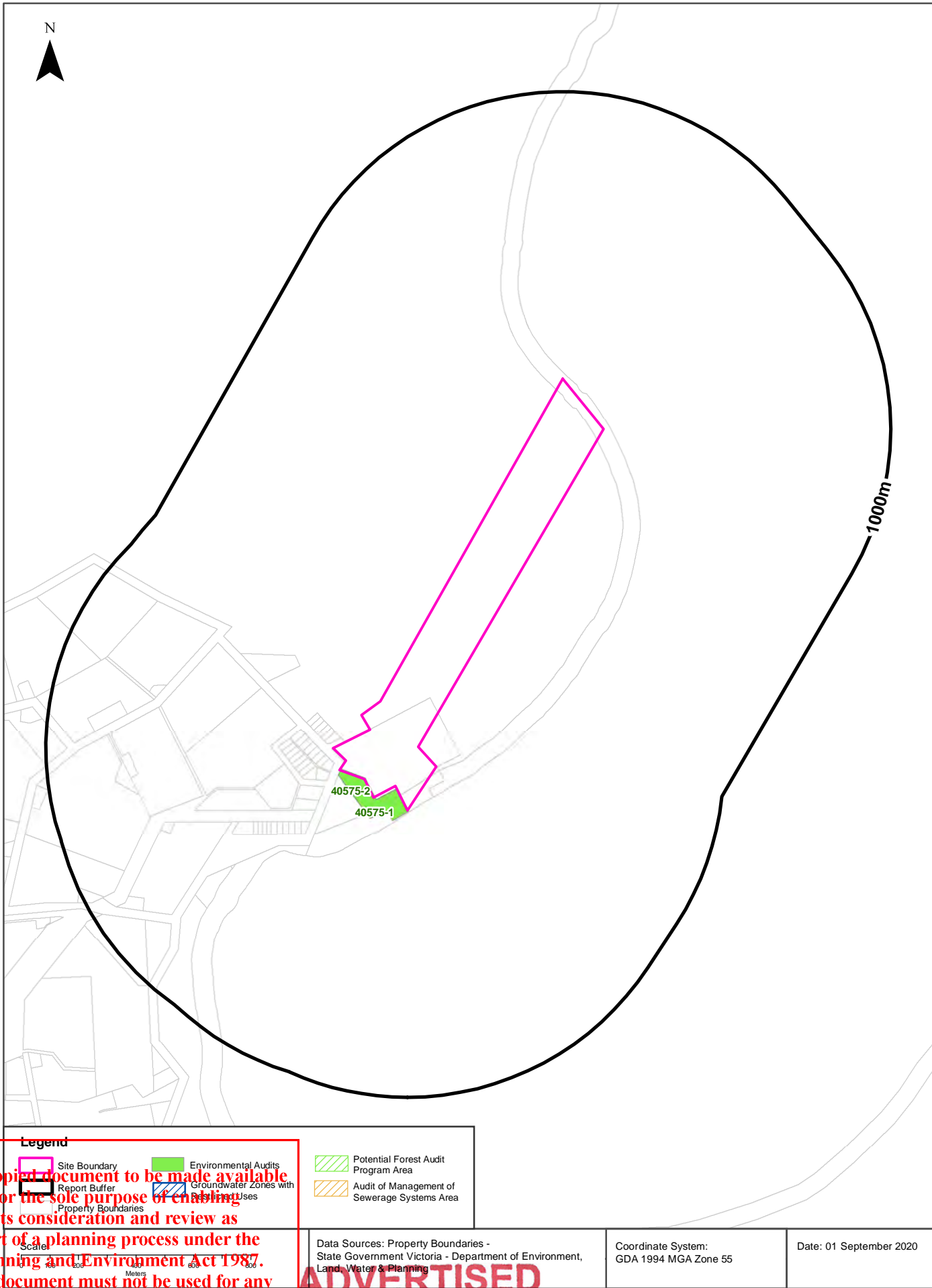
Property ID	Base Name	Address	Known Contamination	Loc Conf	Dist	Dir
N/A	No records in buffer					

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

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## EPA Records

Red Cliffs, Mildura, VIC 3496

## EPA Environmental Audits

EPA environmental audit records that exist within the dataset buffer:

Note. Please click on CARMS No. to activate a hyperlink to online documentation. If link does not work, documentation may still be accessible via the EPA Interaction Portal.

CARMS No	Transaction No	Site	Address	Suburb	Date Complete	Audit Category	Loc Conf	Distance	Direction
40575-1	8001105	RED CLIFFS POWER STATION WOOMERA AV	RED CLIFFS POWER STATION WOOMERA AV	RED CLIFFS	05/06/2000	53X Statement	Premise Match	0m	South West
40575-2	8001106	RED CLIFFS POWER STATION WOOMERA AV	WOOMERA AV, RED CLIFFS VIC 3496 718 WOOMERA AV	RED CLIFFS	14/03/2001	53X Statement	Premise Match	0m	South West

Environmental Audit Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

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## EPA Records

Red Cliffs, Mildura, VIC 3496

### EPA Groundwater Zones with Restricted Uses

EPA GQRUZ records that exist within the dataset buffer:

Note. Please click on CARMS No. to activate a hyperlink to online documentation.

CARMS No	EPA Id	Site History	Site Address	Restricted Uses	Status	Loc Conf	Distance	Direction
N/A	No records in buffer							

Environmental GQRUZ Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

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## EPA Activities

Red Cliffs, Mildura, VIC 3496

## EPA Licensed Activities

EPA licensed activities that exist within the dataset buffer:

Trans No	Licence No	Licence Type	Organisation	Premise Ref	Premise Address 1	Premise Address 2	Activities	Loc Conf	Dist (m)	Direction
N/A	No records in buffer									

Licensed Activity Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

## Former EPA Licensed Activities

Former EPA licensed activities that exist within the dataset buffer:

Licence No	Organisation	Premise Address	Suburb	Activities	Loc Conf	Dist (m)	Direction
N/A	No records in buffer						

Former Licensed Activity Data Custodian: State Government Victoria - Environmental Protection Authority (EPA)

## EPA Works Approvals

EPA works approvals that exist within the dataset buffer:

Transaction No	Status	Approval No	Organisation	Premise Address	Suburb	Scheduled Categories	Loc Conf	Dist (m)	Direction
N/A	No records in buffer								

Works Approvals Data Custodian: State Government Victoria - Environment Protection Authority (EPA)

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## Waste Management Facilities & Landfills

Red Cliffs, Mildura, VIC 3496

### National Waste Management Site Database

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

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

Waste Management Facilities Data Source: Australian Government Geoscience Australia

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### Statewide Waste and Resource Recovery Infrastructure Plan Facilities

Statewide Waste and Resource Recovery Infrastructure Plan Facilities within the dataset buffer:

Map Id	Owner	Site Name	Address	Suburb	Category	Sub Category	Loc Conf	Distance	Direction
N/A	No records in buffer								

SWRRIPF Data Source: State Government Victoria - Department of Sustainability

### EPA Prescribed Industrial Waste

EPA Prescribed Industrial Waste treaters, disposers and permitted transporters within the dataset buffer:

Map Id	Company Name	Address	Suburb	Treatment /Disposal	Transport	Accredited Agent	EPA List Status	Loc Conf	Dist' (m)	Direct
N/A	No records in buffer									

Prescribed Industrial Waste Data Source: State Government Victoria - Environment Protection Authority (EPA)

### EPA Victorian Landfill Register

EPA Victorian Landfill Register sites within the dataset buffer:

Landfill Register No.	Site	Address	Operating Status	Est. Year Of Closure	Waste type	Loc Conf	Dist' (m)	Direction
No records in buffer								

EPA Victorian Landfill Register Data Source: State Government Victoria - Environment Protection Authority (EPA)

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## Former Gasworks and Liquid Fuel Facilities

Red Cliffs, Mildura, VIC 3496

### Former Gasworks

Former Gasworks identified from various historical sources within the dataset buffer:

Note - As this is a dataset collated from various historical sources, it is not an exhaustive list of all former Gasworks

Map Id	Site Name	Date Opened	Year Closed	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Collated from various historical sources

### National Liquid Fuel Facilities

National Liquid Fuel Facilities within the dataset buffer:

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

National Liquid Fuel Facilities Data Source: Geoscience Australia

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## Historical Business Directories

Red Cliffs, Mildura, VIC 3496

### Business Directory Records 1905-1991 Premise or Road Intersection Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
	No records in buffer						

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## Business Directory Records 1905-1991 Road or Area Matches

Universal Business Directory and Sands & McDougall Directory records, from years 1991, 1980, 1970, 1960, 1950, 1945, 1925 & 1905, 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
	No records in buffer					

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## Historical Business Directories

Red Cliffs, Mildura, VIC 3496

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

Dry Cleaners, Motor Garages & Service Stations from Sands & McDougall's Directories and 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
	No records in buffer						

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

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories and Sands & McDougall's 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
	No records in buffer					

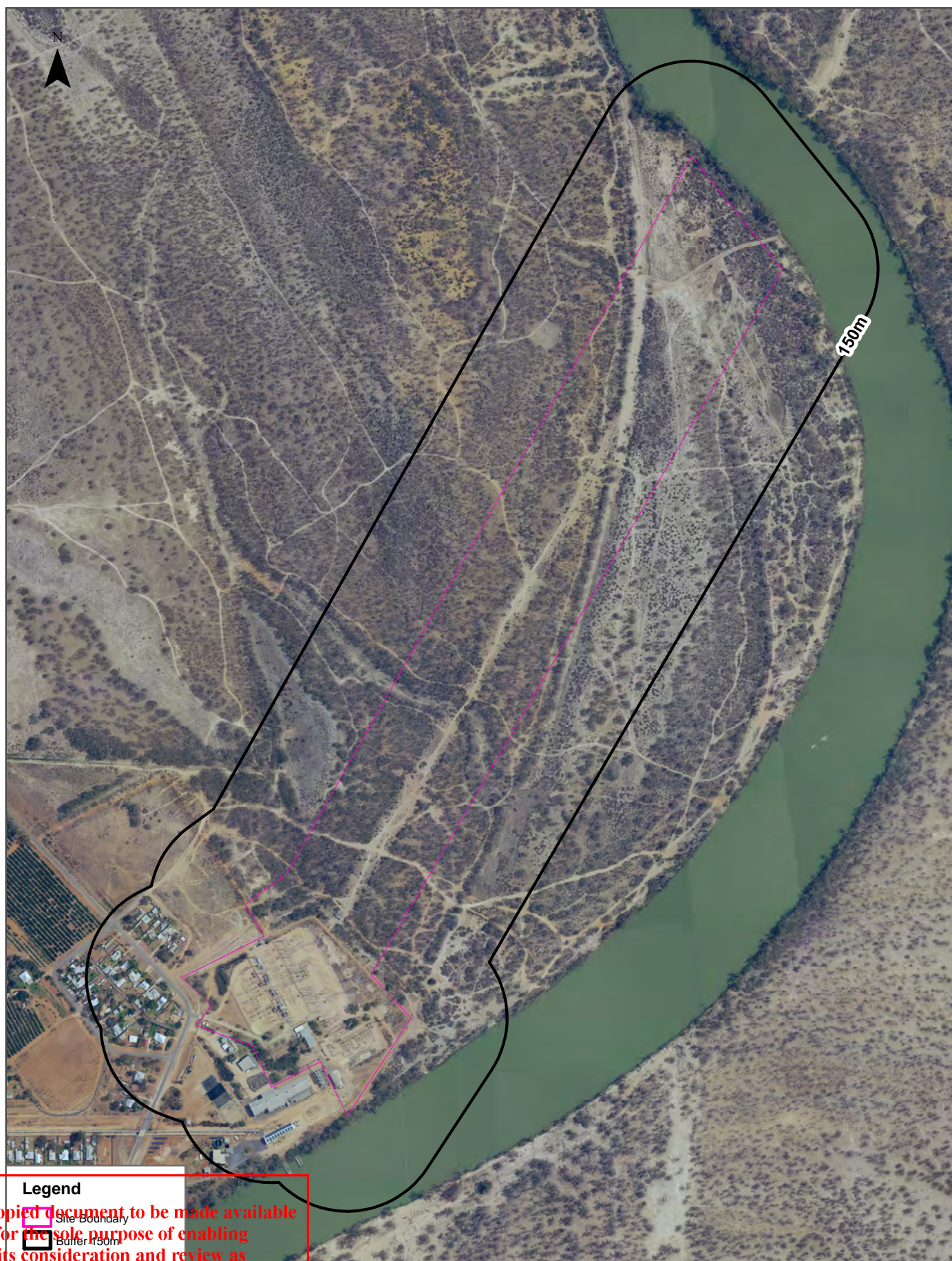
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**Legend**

- Site Boundary
- Buffer 150m

Scale

Meters

Data Sources: Aerial Imagery © Aerometrex Pty Ltd

Coordinate System:  
GDA 1994 MGA Zone 55

Date: 01 September 2020

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Aerial Imagery 2015

Red Cliffs, Mildura, VIC 3496



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Aerial Imagery 2010

Red Cliffs, Mildura, VIC 3496



Legend	
	Site Boundary
	Buffer 150m

Data Source Aerial Imagery: © 2020 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 55	Date: 01 September, 2020
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Aerial Imagery 2005

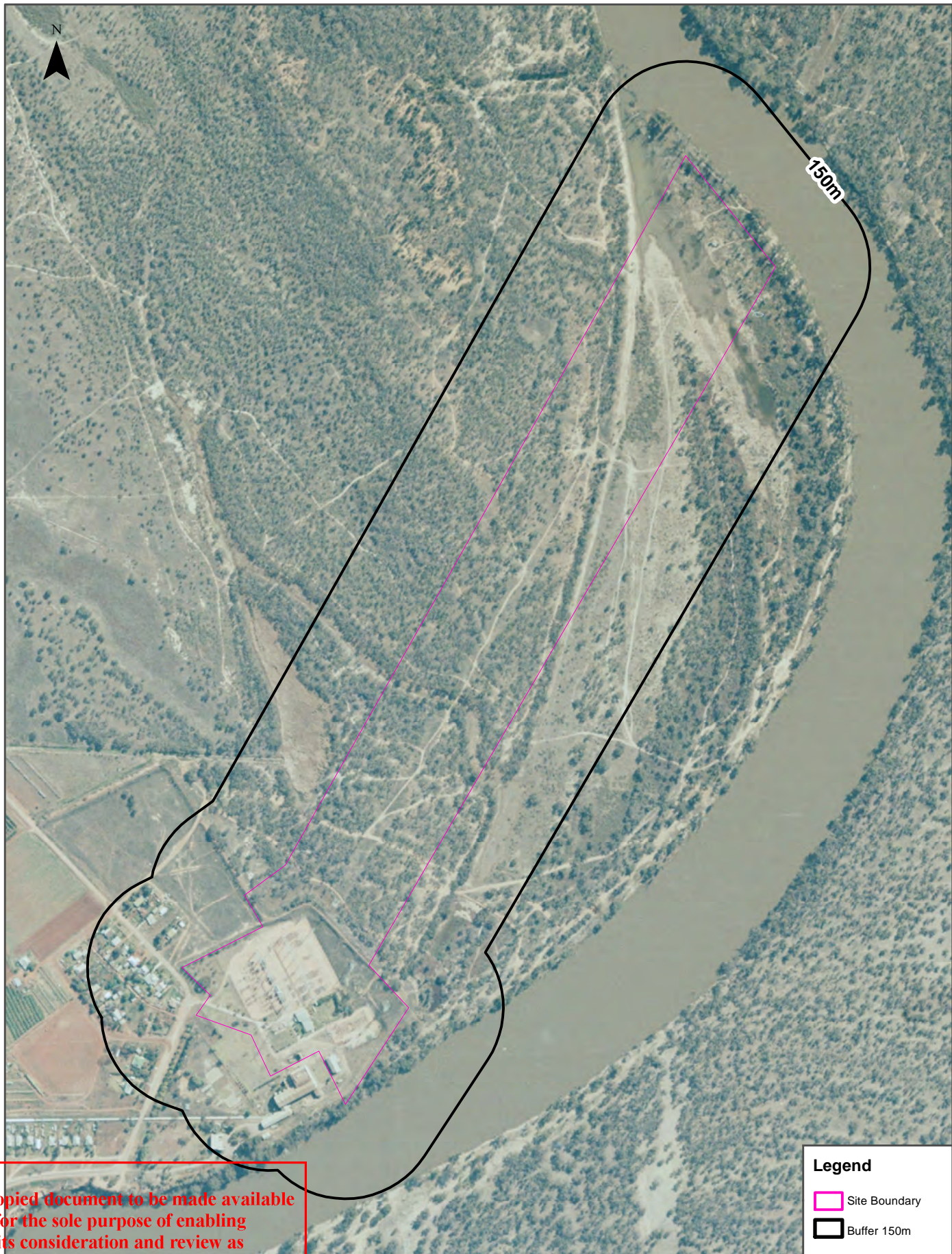
Red Cliffs, Mildura, VIC 3496





Aerial Imagery 1993

Red Cliffs, Mildura, VIC 3496



Legend	
	Site Boundary
	Buffer 150m

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Scale 0 50 100 Meters	Data Source Aerial Imagery: © NSW Department of Customer Service	Coordinate System: GDA 1994 MGA Zone 55	Date: 04 September 2020
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Aerial Imagery 1987

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Data Source Aerial Imagery:  
© Department of Environment, Land, Water and Planning  
(Vicmap Topographic Mapping Program)

Coordinate System:  
GDA 1994 MGA Zone 55

Legend  
Site Boundary  
Buffer 150m  
Date: 01 September, 2020



Aerial Imagery 1980

Red Cliffs, Mildura, VIC 3496



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Legend	
	Site Boundary
	Buffer 150m
Date: 01 September, 2020	

Scale: 1:50,000 Meters	Data Source Aerial Imagery: © Department of Environment, Land, Water and Planning (Vicmap Topographic Mapping Program)	Coordinate System: GDA 1994 MGA Zone 55
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# Aerial Imagery 1980

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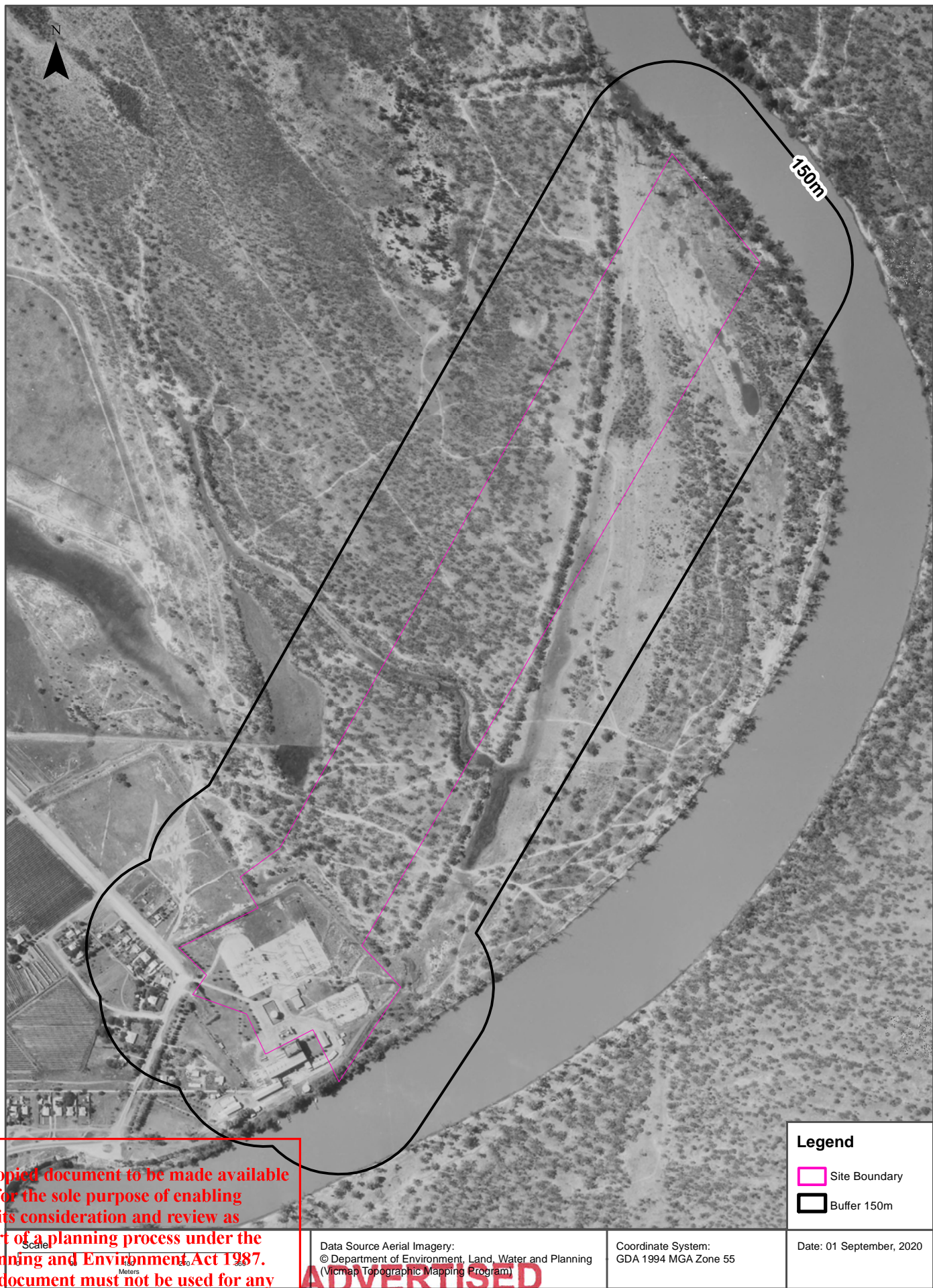
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Aerial Imagery 1972

Red Cliffs, Mildura, VIC 3496



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Aerial Imagery 1968

Red Cliffs, Mildura, VIC 3496



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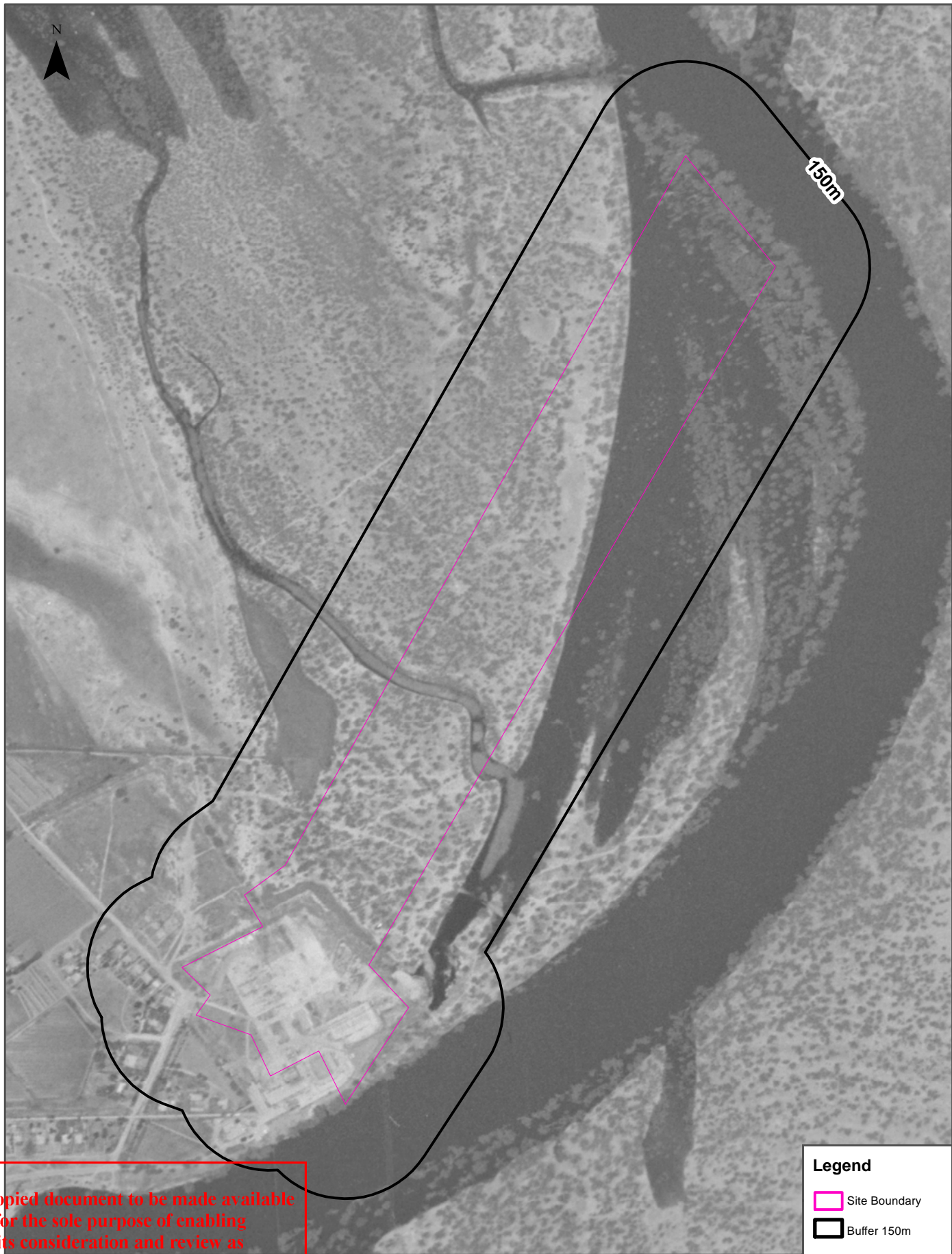
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Aerial Imagery 1964

Red Cliffs, Mildura, VIC 3496



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Scale 0 100 200 Meters	Data Source Aerial Imagery: ©2020 Geoscience Australia	Coordinate System: GDA 1994 MGA Zone 55	Date: 01 September, 2020
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# Aerial Imagery 1953

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Aerial Imagery 1946

Red Cliffs, Mildura, VIC 3496





Historical Map 1977

Red Cliffs, Mildura, VIC 3496



Scale Meters	Data Sources: NATMAP 1:100,000 Topographic Maps Geoscience Australia	Coordinate System: GDA 1994 MGA Zone 55	Date: 01 September 2020
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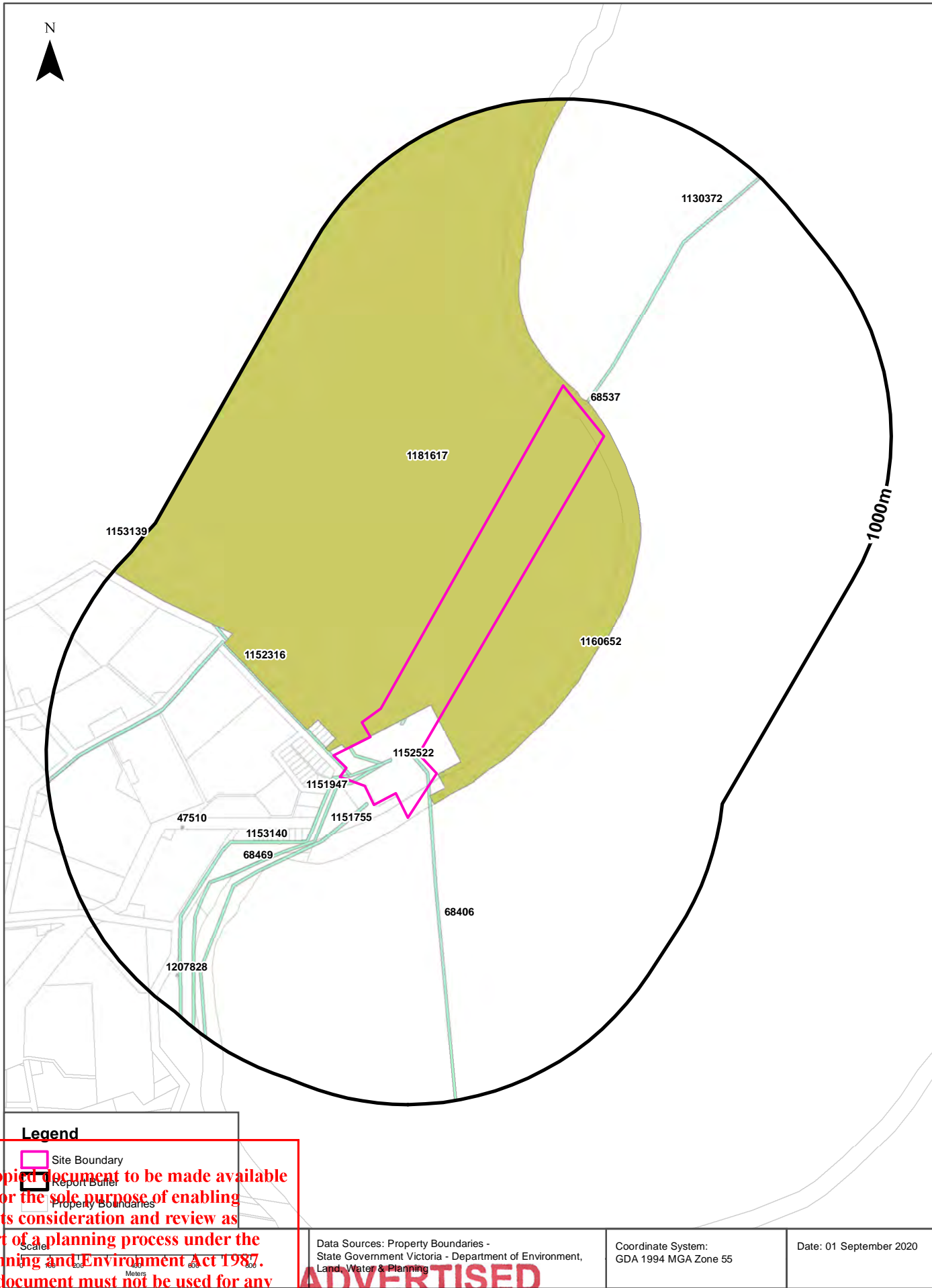
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Features of Interest

Red Cliffs, Mildura, VIC 3496



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## Features of Interest

Red Cliffs, Mildura, VIC 3496

## Features of Interest

Features of Interest within the dataset buffer:

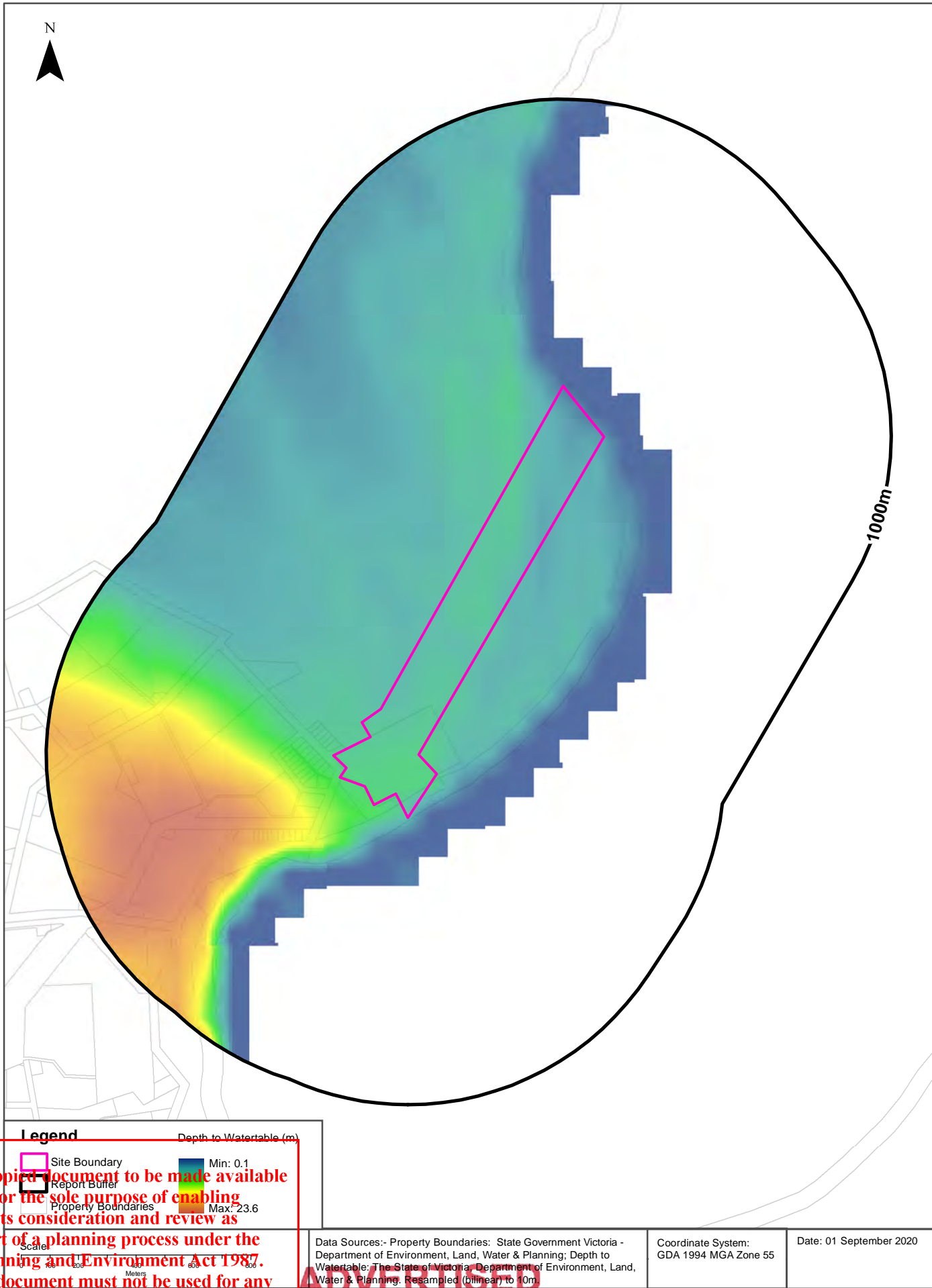
Feature Id	Feature Type	Feature Sub Type	Name	Distance	Direction
68406	power line	power transmission	Kerang-Redcliffs	0m	Onsite
68537	power line	power transmission		0m	Onsite
1151755	power line	power sub transmission		0m	Onsite
1151947	power line	power sub transmission		0m	Onsite
1152316	power line	power sub transmission		0m	Onsite
1152522	power line	power sub transmission		0m	Onsite
1153139	power line	power sub transmission		0m	Onsite
1153140	power line	power sub transmission		0m	Onsite
1181617	reserve	national park	Kings Billabong Park	0m	Onsite
68469	power line	power transmission	Redcliffs-Horsham	17m	South
1130372	power line	power transmission		27m	North East
1160652	community space	camp ground	Red Cliffs Boat Ramp Camping Area	332m	East
47510	excavation site	adit		572m	South West
1207828	landmark	lookout	Red Cliffs Lookout	891m	South West

Features of Interest Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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# Hydrogeology & Groundwater

Red Cliffs, Mildura, VIC 3496

## Hydrogeology

Description of aquifers within the dataset buffer:

Description	Distance	Direction
Porous, extensive aquifers of low to moderate productivity	0m	Onsite

Hydrogeology Map of Australia: Commonwealth of Australia (Geoscience Australia)  
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## Groundwater Salinity

On-site Groundwater Salinity:

Groundwater Salinity	Percent Of Site Area
13,000 - 35,000 mg/l	96
7,000 - 13,000 mg/l	4

## Depth to Watertable

On-site Depth to Watertable:

Depth to Watertable	Percent Of Site Area
5 to 10 metres	75
Less than 5 metres	25

## Surface Elevation

Approximate on-site Surface Elevation:

Surface Elevation
30 AHDm to 42 AHDm

## Basement Elevation

Approximate on-site Basement Elevation:

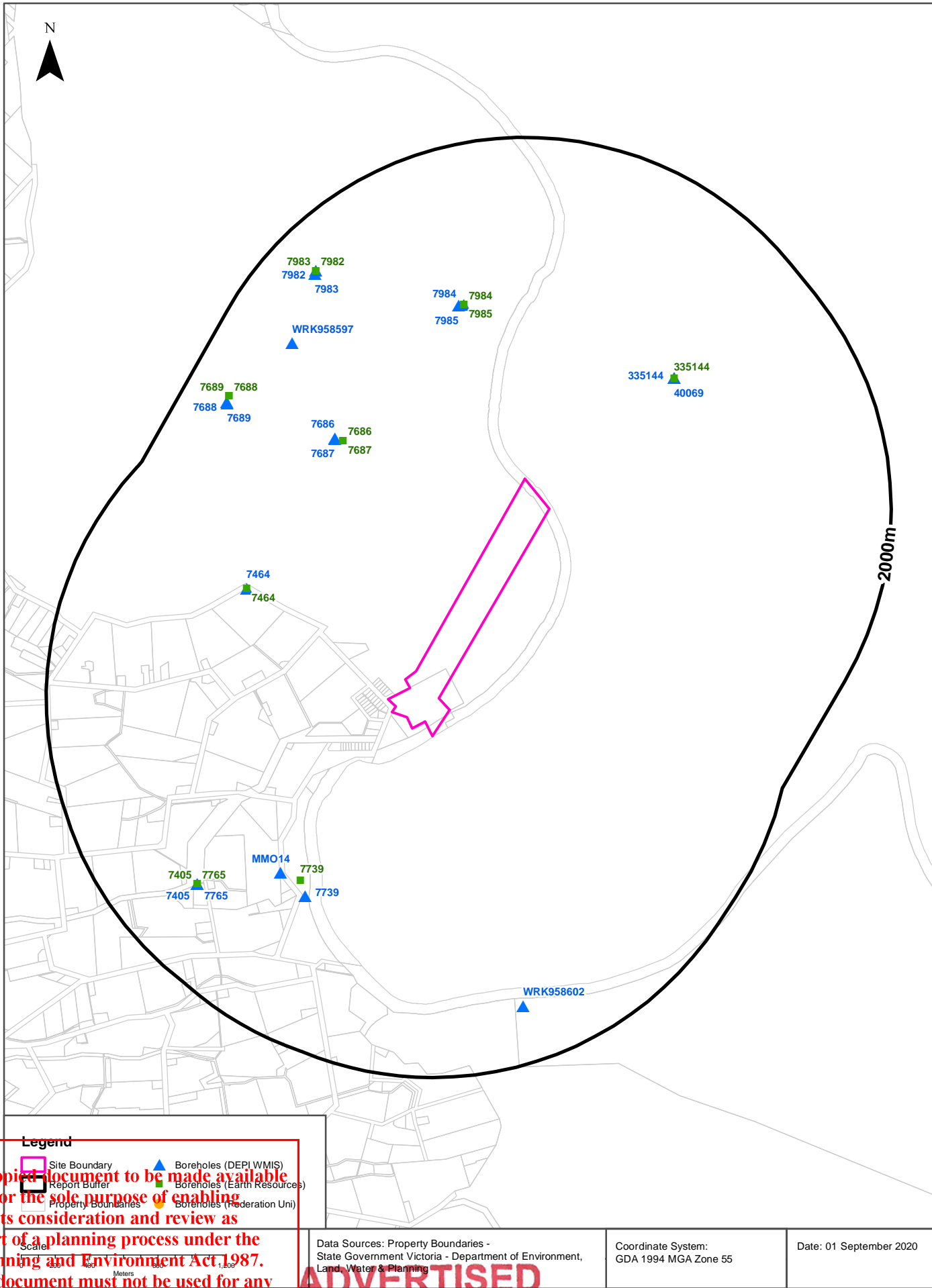
<b>Basement Elevation - Basement Rocks comprise Lower Palaeozoic basement rocks that form the highlands and the crystalline basement; and Mesozoic rocks of the Otway and Gippsland basins both outcropping and subsurface</b>
-351 AHDm to -328 AHDm

Groundwater Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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# Groundwater Boreholes

Red Cliffs, Mildura, VIC 3496

## Boreholes (DELWP WMIS)

Boreholes from the Department of Environment, Land, Water & Planning's Water Measurement Information System, within the dataset buffer:

Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
7464	Groundwater Investigation, Observation	0.00m-2.00m S/C BR HARD PLASTIC 2.00m-3.00m S/C R HARD PLASTIC 3.00m-5.00m S/C BR 4 3.61 SOFT PLASTIC 5.00m-6.00m Z/S/C R/GY/BR SOFT PLASTIC 6.00m-7.00m Z/S/C BR/GY SOFT PLASTIC		Date/time: 2020-01-09 1404 Quality: 43 WLMP: 5.61m DBNS: RWL:		1973-06-06	1050	West
40069	Groundwater Investigation, Observation			Date/time: 1986-07-11 0000 Quality: 47 WLMP: 4.03m DBNS: 3.83m RWL: 34.49mAH		1973-07-09	1050	North East
335144	Non Groundwater					1973-07-09	1050	North East
7984	Groundwater Investigation, Observation	0.00m-0.50m GREY ZC DRY 0.50m-1.50m YELL BRN ZC MOIST 1.50m-4.00m BROWN ZC MOIST 4.00m-4.50m ORANGE FSZC MOIST 4.50m-5.00m GRY BRN FSC WET 5.00m-8.00m GREY FINES WET 8.00m-9.00m GREEN GRY MEDS WET 9.00m-10.00m YELL GREEN CS WET 10.00m-11.00m YELL FINES WET 11.00m-13.00m LIGHT YELL CS WET 13.00m-18.00m GREY FINES WET 18.00m-23.00m GREY YELL FINES WET 23.00m-24.00m LIGHT BRN FINES WET 24.00m-26.00m LIGHT RED FINES WET 26.00m-28.00m PURPLE FINES WET 28.00m-30.00m GREEN FINES WET	0.00m-28.51m INNER LINING - CASING = Pvc Class 9 28.51m-30.51m INNER LINING - SCREEN = Pvc Class 9 0.00m-0.00m OUTER LINING - GRAVEL = Cement	Date/time: 2012-06-04 1111 Quality: 47 WLMP: 2.60m DBNS: 2.32m RWL: 34.57mAH	28.51m-30.51m Sand	1986-02-14	1080	North
7687	Groundwater Investigation, Observation		0.00m-10.20m INNER LINING - CASING = Pvc 10.20m-10.70m INNER LINING - SCREEN = Pvc 0.00m-0.00m OUTER LINING - GRAVEL = Cement	Date/time: 2020-01-09 1051 Quality: 43 WLMP: 4.95m DBNS: RWL:		1981-03-20	1082	North West
7985	Groundwater Investigation, Observation		0.00m-4.66m INNER LINING - CASING = Pvc Class 9 4.66m-6.66m INNER LINING - SCREEN = Pvc Class 9 0.00m-0.00m OUTER LINING - GRAVEL = Cement	Date/time: 2020-04-15 1201 Quality: 43 WLMP: 3.01m DBNS: RWL:		1986-02-15	1084	North
7686	Groundwater Investigation, Observation	0.00m-1.00m LIGHT GRY FSZC DRY 1.00m-1.50m YELL BR FSZC DRY 1.50m-3.00m YELL BR/GRY FSZC MOIST 3.00m-5.50m LIGHT/DR BR FSC MOIST 5.50m-7.00m YELL BR S FINE 7.00m-13.00m GRY S MEDIUM 13.00m-17.50m BR S FINE & MED 17.50m-28.50m RED BR S FINE 28.50m-30.00m GRY FSZC MOIST	0.00m-28.50m INNER LINING - CASING = Pvc 28.50m-29.00m INNER LINING - SCREEN = Pvc	Date/time: 2020-01-09 1037 Quality: 43 WLMP: 5.00m DBNS: RWL:	28.50m-29.00m Sand	1981-03-20	1085	North West

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Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
MMO14	Observation	0.00m-2.00m CLAY, RED BROWN, VERY SOFT CLAY, FINE CEMENTED SANDS 2.00m-5.00m SANDY CLAY, RED BROWN, SOFT SANDY CLAY, 40% GRAIN CONTENT, FINE CEMENTED SANDS 5.00m-9.00m CLAY, RED BROWN, VERY SOFT CLAY, MINOR CEMENTED SANDS 9.00m-13.00m CLAY, GREY, VERY SOFT CLAY, LOW PLASTICITY, MINOR CEMENTED SANDS 13.00m-20.00m CLAY, RED BROWN, VERY SOFT CLAY, MINOR CEMENTED SANDS 20.00m-22.00m CLAYEY SAND, BROWN TO RED, FINE TO MEDIUM GRAINED QUARTZ SAND, POORLY SORTED, SUB ROUNDED 22.00m-25.00m SAND, DARK GREY, FINE TO MEDIUM GRAINED QUARTZ SAND, SUB ROUNDED 25.00m-29.00m SAND, BROWN, SUB ROUNDED, MEDIUM GRAINED QUARTZ SAND, WELL SORTED	0.00m-23.50m INNER LINING - CASING = Pvc Class 12 23.50m-26.50m INNER LINING - SCREEN = Pvc Class 12 26.50m-27.50m INNER LINING - CASING = Pvc Class 12	Date/time: 2020-04-14 1507 Quality: 43 WLMP: 22.05m DBNS: RWL:		2008-04-24	1142	South West
7739	Groundwater Investigation, Observation	0.00m-0.50m BR ZS FINE 0.50m-1.00m YELL BR ZS FINE 1.00m-1.50m LIGHT BR ZS FINE 1.50m-2.00m GRY BR ZS FINE 2.00m-5.00m BR ZS FINE 5.00m-8.50m BR FSC DRY 8.50m-9.00m GRY BR ZS MEDIUM 9.00m-12.00m YELL BR S MEDIUM 12.00m-13.50m LIGHT GRY S MEDIUM 13.50m-14.50m YELL BR S MEDIUM 14.50m-15.50m LIGHT GRY S MEDIUM 15.50m-16.00m YELL BR S MEDIUM 16.00m-19.50m BR/YELL BR MSC 19.50m-23.00m YELL BR S MEDIUM 23.00m-24.50m GRY S MEDIUM 24.50m-30.00m YELL BR S COARSE	0.00m-29.70m INNER LINING - CASING = Pvc 29.70m-30.20m INNER LINING - SCREEN = Pvc	Date/time: 1987-09-08 0000 Quality: 47 WLMP: 23.71m DBNS: 23.48m RWL: 36.05m AHD	29.70m-30.20m Sand	1981-09-02	1163	South West
7405	Groundwater Investigation, Observation	0.00m-0.50m R LOAM SOFT PLASTIC 0.50m-4.50m LT/BR C/S SOFT PLASTIC 4.50m-7.50m R C/S SOFT PLASTIC 7.50m-9.00m R C HARD PLASTIC 9.00m-10.00m R/BR C/S FIRM PLASTIC 10.00m-10.50m LT/BR/Y C/S FIRM PLASTIC 10.50m-12.50m Y S DRY FINE SAND 12.50m-13.50m LT/Y S DRY FINE SAND 13.50m-14.00m DR/Y C/S SOFT PLASTIC 14.00m-15.50m GY/R/BR C/S HARD PLASTIC 15.50m-16.50m BR C/S SOFT PLASTIC 16.50m-19.50m R C HARD PLASTIC PEICES SAND STONE 19.50m-21.00m R/BR/LT/Y C/S SOFT PLASTIC		Date/time: 1988-07-28 0000 Quality: 47 WLMP: 1.55m DBNS: 1.34m RWL: 59.43m AHD		1974-04-03	1520	South West
7765	Groundwater Investigation, Observation			Date/time: 2000-02-17 1400 Quality: 47 WLMP: 0.41m DBNS: -0.37m RWL: 61.14m AHD		1960-01-01	1520	South West
WRK958597	Observation	0.00m-0.50m GREY CLAY AND SAND 0.50m-1.50m YELLOW SAND AND CLAY 1.50m-6.50m YELLOW SAND		Date/time: 2007-06-08 1623 Quality: 47 WLMP: 4.92m DBNS: 4.42m RWL: 35.78m AHD		1997-02-14	1575	North West

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Bore Id	Use Type	Drillers Log	Construction	Latest Water Levels	Geology	Completed Date	Dist (m)	Dir
WRK958602	Observation	0.00m-0.50m YELLOW SAND AND CLAY 0.50m-1.50m GREY CLAY 1.50m-4.50m YELLOW CLAY 4.50m-6.50m GREY CLAY AND SOME SAND 6.50m-9.00m YELLOW AND GREY SANDY CLAY		Date/time: 2007-06-08 1638 Quality: 47 WLMP: 4.35m DBNS: 3.85m RWL: 33.76mAHD		1997-05-22	1665	South
7983	Groundwater Investigation, Observation		0.00m-5.00m INNER LINING - CASING = Pvc Class 9 5.00m-7.00m INNER LINING - SCREEN = Pvc Class 9	Date/time: 2020-01-09 0941 Quality: 43 WLMP: 4.90m DBNS: RWL:		1986-02-13	1715	North West
7982	Groundwater Investigation, Observation	0.00m-0.50m GRY BRN ZC MOIST 0.50m-1.50m YELL BR. ZC WITH LIME STONE 1.50m-2.50m GRY BRN ZC MOIST 2.50m-6.00m LI YELLOW BRN FSZC DAMP 6.00m-8.00m YELLOW BRN MED S WET 8.00m-9.00m GRY GRN MED S WET 9.00m-11.00m GREY MED S WET 11.00m-13.00m GREY C/S WET 13.00m-16.00m GREY FINE S WET 16.00m-19.00m GREY MED S WET 19.00m-21.00m YELL MED S WET 21.00m-23.00m GREY FINE S WET 23.00m-26.00m LIGHT YELL FINE S WET 26.00m-27.00m RED FINE S WET 27.00m-29.00m LIGHT PURPLE FINE S WET 29.00m-30.00m GREY/RED FINE S WET	0.00m-29.18m INNER LINING - CASING = Pvc Class 9 29.18m-31.18m INNER LINING - SCREEN = Pvc Class 9 0.00m-0.00m OUTER LINING - GRAVEL = Cement	Date/time: 2007-06-10 1118 Quality: 47 WLMP: 4.49m DBNS: 4.31m RWL: 34.42mAHD		1986-02-13	1726	North West
7689	Groundwater Investigation, Observation		0.00m-10.10m INNER LINING - CASING = Pvc 10.10m-10.60m INNER LINING - SCREEN = Pvc	Date/time: 2020-04-08 1332 Quality: 43 WLMP: 3.06m DBNS: RWL:		1981-03-24	1732	North West
7688	Groundwater Investigation, Observation	0.00m-0.50m LIGHT GRY FSZC DRY 0.50m-1.00m YELL BR/LIGHT FSZC DRY 1.00m-2.50m LIGHT/YELL BR FSC MOIST 2.50m-3.00m YELL BR/LI GRY FSC WET 3.00m-9.00m YELL BR S MEDIUM 9.00m-16.50m GRY S MEDIUM 16.50m-18.50m YELL BR S FINE 18.50m-23.50m BR S FINE 23.50m-25.50m YELL BR S FINE 25.50m-29.00m BR S FINE 29.00m-30.00m GRY S FINE	0.00m-29.70m INNER LINING - CASING = Pvc 29.70m-30.20m INNER LINING - SCREEN = Pvc 0.00m-0.00m OUTER LINING - GRAVEL = Cement	Date/time: 2020-01-09 1010 Quality: 43 WLMP: 3.01m DBNS: RWL:	29.70m-30.20m Sand	1981-03-24	1736	North West

Boreholes WMIS Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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## Groundwater Boreholes

Red Cliffs, Mildura, VIC 3496

### Boreholes (Earth Resources Database)

Boreholes from the Earth Resources dataset, within the dataset buffer:

Bore Id	Bore Type	Company	Usage	Method	Status	Drill Date	Depth	Elevation	Accuracy (m)	Dist (m)	Direct
7686		Rural Water Commission	Groundwater Investigation			20/03/1981	28.50	38.45	300	1036	North West
7687		Rural Water Commission	Groundwater Investigation			20/03/1981	10.50	38.46	300	1036	North West
335144		Victorian Government	Groundwater Investigation			09/07/1973	7.00	38.32	300	1050	North East
7464		Rural Water Commission	Groundwater Investigation			06/06/1973	7.00	39.73	100	1050	West
7984		Rural Water Commission	Groundwater Investigation			01/01/1950		36.88	300	1081	North
7985		Rural Water Commission	Groundwater Investigation			15/02/1986	6.66	36.88	300	1081	North
7739		Rural Water Commission	Groundwater Investigation			02/09/1981	30.20	59.53	300	1101	South West
7765		Rural Water Commission	Groundwater Investigation			01/01/1960		60.77	100	1518	South West
7405		Rural Water Commission	Groundwater Investigation			30/04/1974	2.00	60.77	100	1518	South West
7982		Rural Water Commission	Groundwater Investigation			01/01/1950		38.73	300	1727	North West
7983		Rural Water Commission	Groundwater Investigation			13/02/1986	6.51	38.73	300	1727	North West
7688		Rural Water Commission	Groundwater Investigation			24/03/1981	30.20	37.34	300	1747	North West
7689		Rural Water Commission	Groundwater Investigation			24/03/1981	10.60	37.35	300	1747	North West

Boreholes Earth Resources Data Source: © The State of Victoria, Department of Economic Development, Jobs, Transport and Resources 2015. Creative Commons Attribution 3.0 Australia

### Boreholes (Federation University)

Boreholes from the Federation University Australia dataset, within the dataset buffer:

Bore Id	Authority	Type	Uses	Initial TD	Log	Dist (m)	Direct
N/A	No records within buffer						

Boreholes FedUni Data Source: © Federation University Australia

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## Historical Mining Activity - Shafts

Red Cliffs, Mildura, VIC 3496

### Historical Mining Activity - Shafts

Mine Shaft Locations were collected by a variety of methods from 1869 in some areas of the state, mainly concentrating in Ballarat and Bendigo. In places a shaft may be recorded multiple times with a different source. In cases where several shaft locations are shown close together (generally with separations less than stated position errors) and they have different sources, it is possible that one shaft has been mapped several times. In cases where several shaft locations are shown close together but they have the same information source, it is possible that each shaft location represents a different shaft on the ground.

Historical Mine Shafts within the dataset buffer:

Map Id	Name	Source	Depth (m)	Collar (ft)	Fill/Cap Method	Location Desc	Location Accuracy	Distance	Direction
N/A	No records in buffer								

Historical Mining Activity Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources

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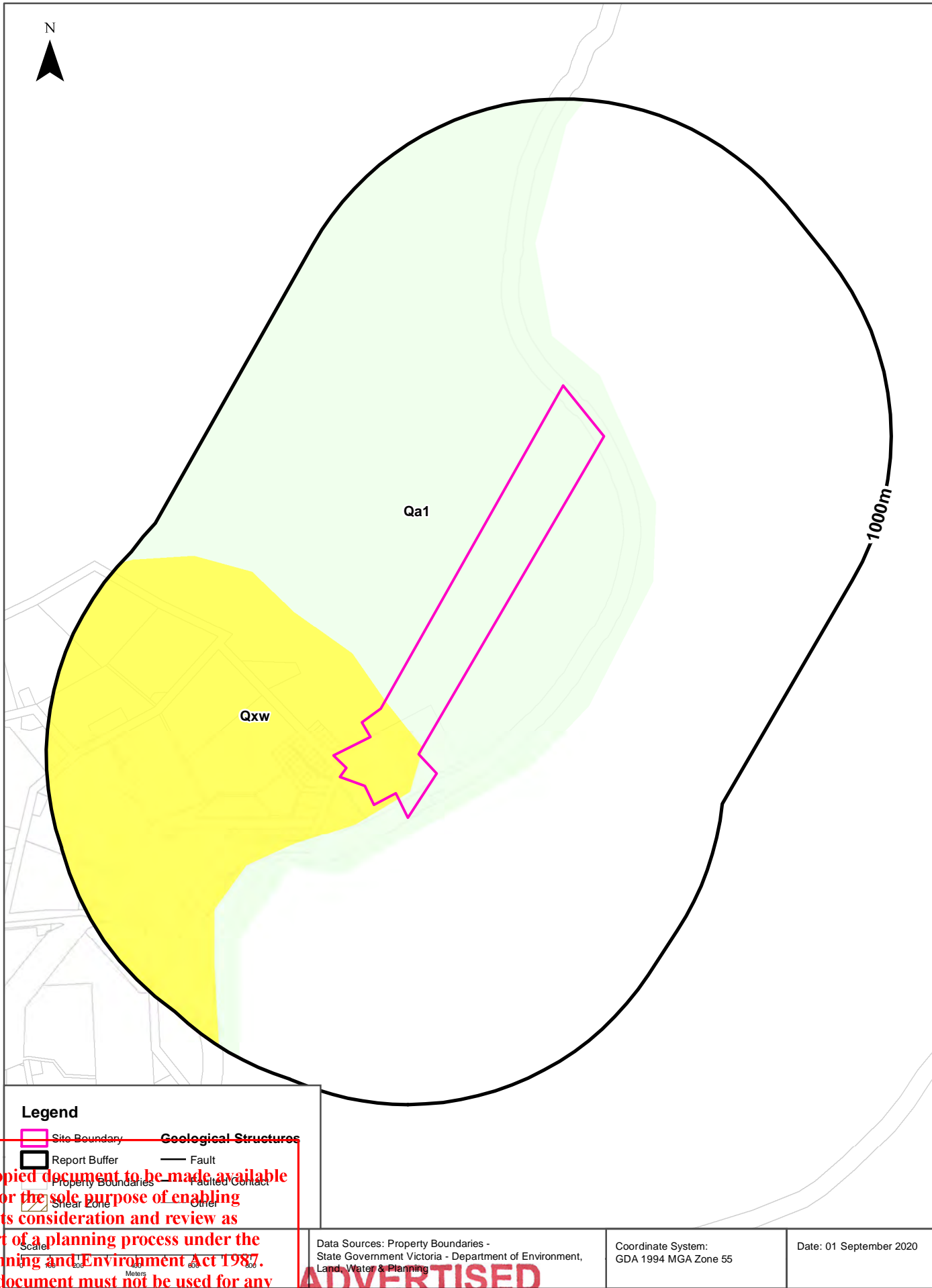
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Geology 1:250,000

Red Cliffs, Mildura, VIC 3496



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# Geology

Red Cliffs, Mildura, VIC 3496

## Geological Units

What are the Geological Units onsite?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Qa1	alluvium( Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	1:250,000
Qxw	Woorinen Formation (Qxw): Generic	Dune deposits, unconsolidated; mainly red-brown siliceous silty sand, red calcareous silty clay, and sandy clay; calcareous nodules and palaeosols common; uppermost unit is mainly sand without calcareous nodules and clay matrix. Forms discontinuous chain	Pleistocene to Holocene	fine sand (major proportion); carbonate rock (minor proportion); sand (minor proportion); clay lithology (minor proportion)	1:250,000

What are the Geological Units within the dataset buffer?

Symbol	Name	Description	Geological Age	Lithology	Dataset
Qa1	alluvium( Qa1): generic	Gravel, sand, silt: variably sorted and rounded; generally unconsolidated; includes deposits of low terraces; alluvial floodplain deposits	Pleistocene to Holocene	gravel material (significant); sand (significant); silt material (significant)	1:250,000
Qxw	Woorinen Formation (Qxw): Generic	Dune deposits, unconsolidated; mainly red-brown siliceous silty sand, red calcareous silty clay, and sandy clay; calcareous nodules and palaeosols common; uppermost unit is mainly sand without calcareous nodules and clay matrix. Forms discontinuous chain	Pleistocene to Holocene	fine sand (major proportion); carbonate rock (minor proportion); sand (minor proportion); clay lithology (minor proportion)	1:250,000

Geology Data Custodian: State Government Victoria - Dept of Economic Development, Jobs, Transport & Resources  
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## Geology

Red Cliffs, Mildura, VIC 3496

### Geological Structures

What are the Geological Faults or Faulted Contacts onsite?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:250,000

What are the Dykes, Marker Beds and Veins onsite?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No Data Coverage					

What are the Shear Zones onsite (1:250,000 scale)?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000

What are the Geological Faults or Faulted Contacts within the dataset buffer?

Map Id	Type	Name	Contact	Positional Accuracy	Dataset
No features					1:250,000

What are the Dykes, Marker Beds and Veins within the dataset buffer?

Map Id	Type	Name	Description	Positional Accuracy	Dataset
No Data Coverage					

What are the Shear Zones within the dataset buffer (1:250,000 scale)?

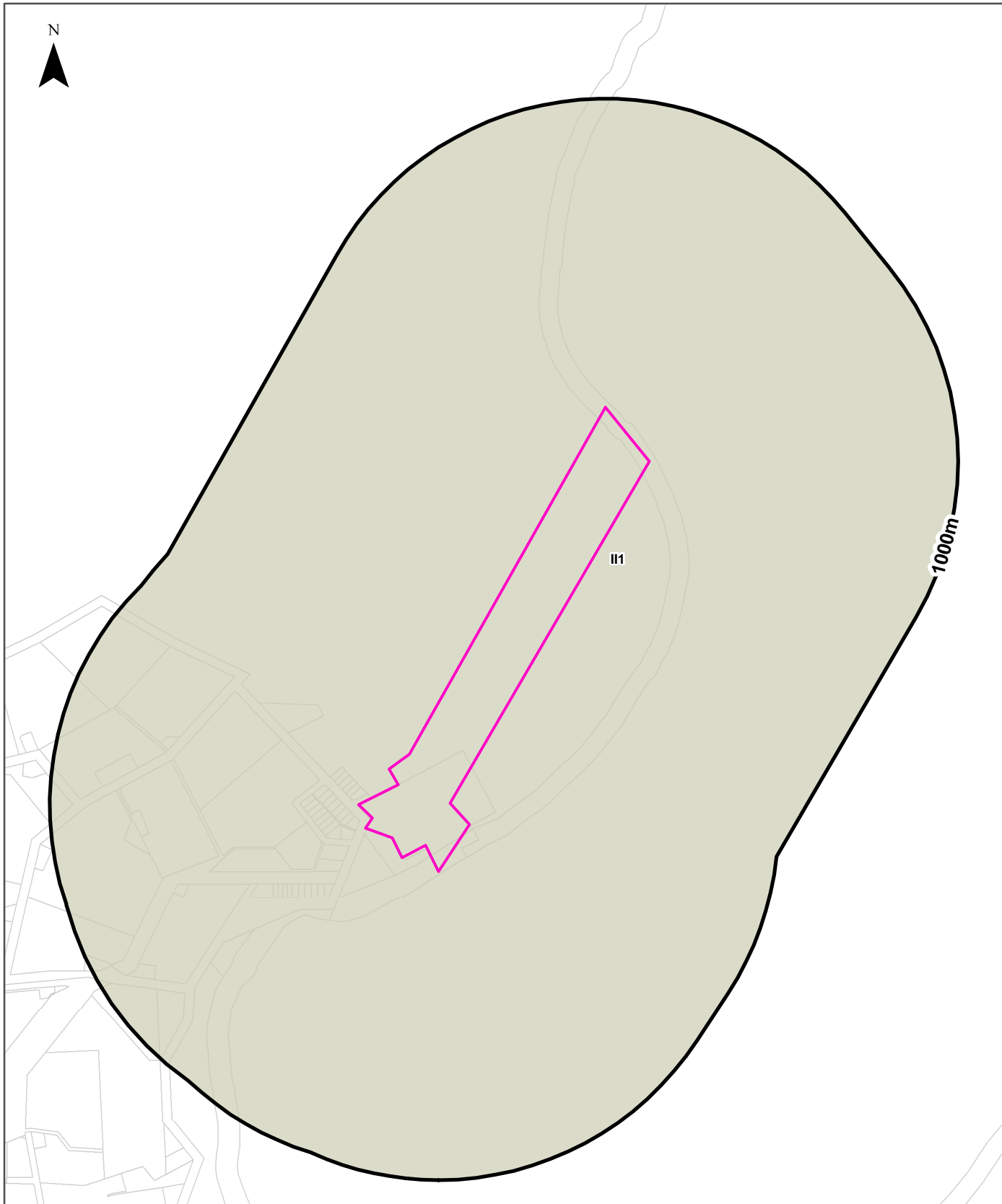
Map Id	Type	Name	Description	Positional Accuracy	Dataset
No features					1:250,000





















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Legend		Australian Soil Classification Orders											
	Site Boundary		Anthrosol		Dermosol		Kandosol		Podosol		Tenosol		No Data
	Report Buffer		Calcarosol		Ferrosol		Kurosol		Rudosol		Vertosol		
	Property Boundary		Chromosol		Hydrosol		Organosol		Sodosol		Lake		
Scale		Data Sources: Property Boundaries - State Government Victoria - Department of Environment, Land, Water & Planning						Coordinate System: GDA 1994 MGA Zone 55		Date: 01 September 2020			
													

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## Soil Landscapes

Red Cliffs, Mildura, VIC 3496

## Atlas of Australian Soils

Australian soil types within the dataset buffer:

Symbol	Soil Order	Map Unit Description	Distance
II1	Vertosol	Flood-plains, terraces, residual islands, lakes: flood-plains, lake bottoms, and some terraces of cracking yellow-grey clays (Ug5.28). Associated are undulating to hillocky areas along former, and present, drainage- ways of (Ug5.28) and various unclassified and mostly undescribed (Uf) and (Um) soils; "islands" of dunes and sand sheets of brown sands (Uc5.13); and residual islands of brown calcareous earths (Gc1) (e.g. of unit DD3) and/or crusty loamy soils (Dr1.33) (e.g. of unit Nb4). The above description is slightly expanded from that given in Sheet 1, but data remain limited.	0m

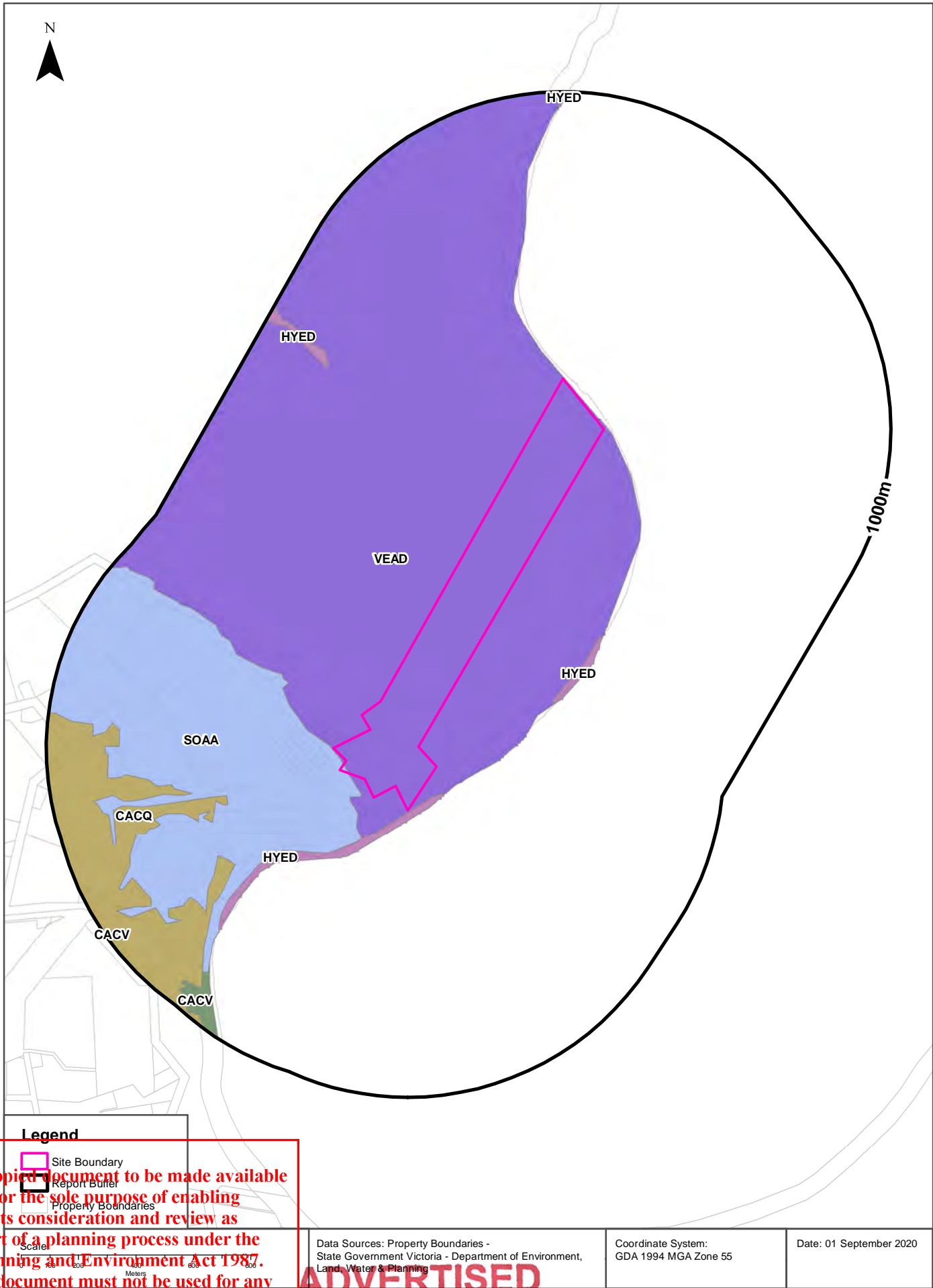
Atlas of Australian Soils: CSIRO

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## Soils Landscapes

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### Victorian Soil Type Mapping

Victorian Soil Types within the dataset buffer:

Symbol	Description	Distance
SOAA	Red Sodosols	0m
VEAD	Grey Vertosols	0m
HYED	Redoxic Hydrosols	3m
CACQ	Hypercalcic Calcarosols	404m
CACV	Hypocalcic Calcarosols	816m









Victorian Soil Type Mapping Data Source: Department of Economic Development, Jobs, Transport and Resources  
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Legend			
 Site Boundary  Report Buffer  Property Boundary	<b>Probability of occurrence of Acid Sulfate Soils</b>		
	 A. High (>70%)	 C. Extremely Low (1-5%)	 No Data
	 B. Low (6-70%)	 D. No Chance (0%)	
Scale 0 200 400 600 800 Meters	Data Sources: Property Boundaries & Topographic Data: State of Victoria - Department of Environment and Primary Industries		Coordinate System: GDA 1994 MGA Zone 55
			Date: 01 September 2020

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## Acid Sulfate Soils

Red Cliffs, Mildura, VIC 3496

### Atlas of Australian Acid Sulfate Soils

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

PROBCLASS	Description	Distance
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m
A	High Probability of occurrence. >70% chance of occurrence.	36m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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## Acid Sulfate Soils

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### Coastal Acid Sulfate Soils

What are the on-site Coastal Acid Sulfate Soil types?

Coastal Acid Sulfate Soil Types
There are no Acid Sulfate areas onsite

What are the Coastal Acid Sulfate Soil types within the dataset buffer?

Coastal Acid Sulfate Soil Types	Distance	Direction
There are no Acid Sulfate areas within the report buffer		

Coastal Acid Sulfate Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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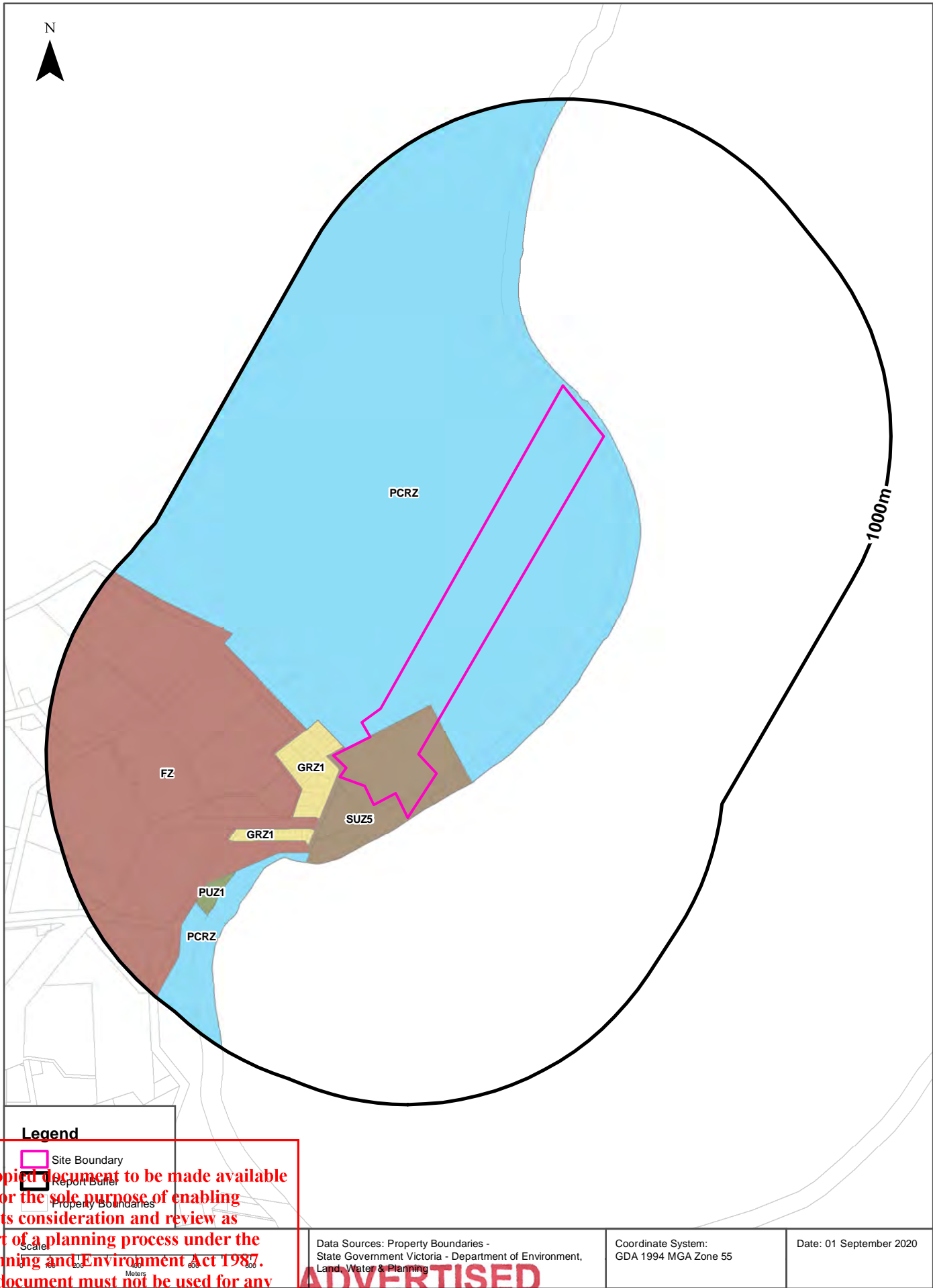
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Planning Zones

Red Cliffs, Mildura, VIC 3496



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## Planning

Red Cliffs, Mildura, VIC 3496

### Planning Zones

Planning zones within the dataset buffer:

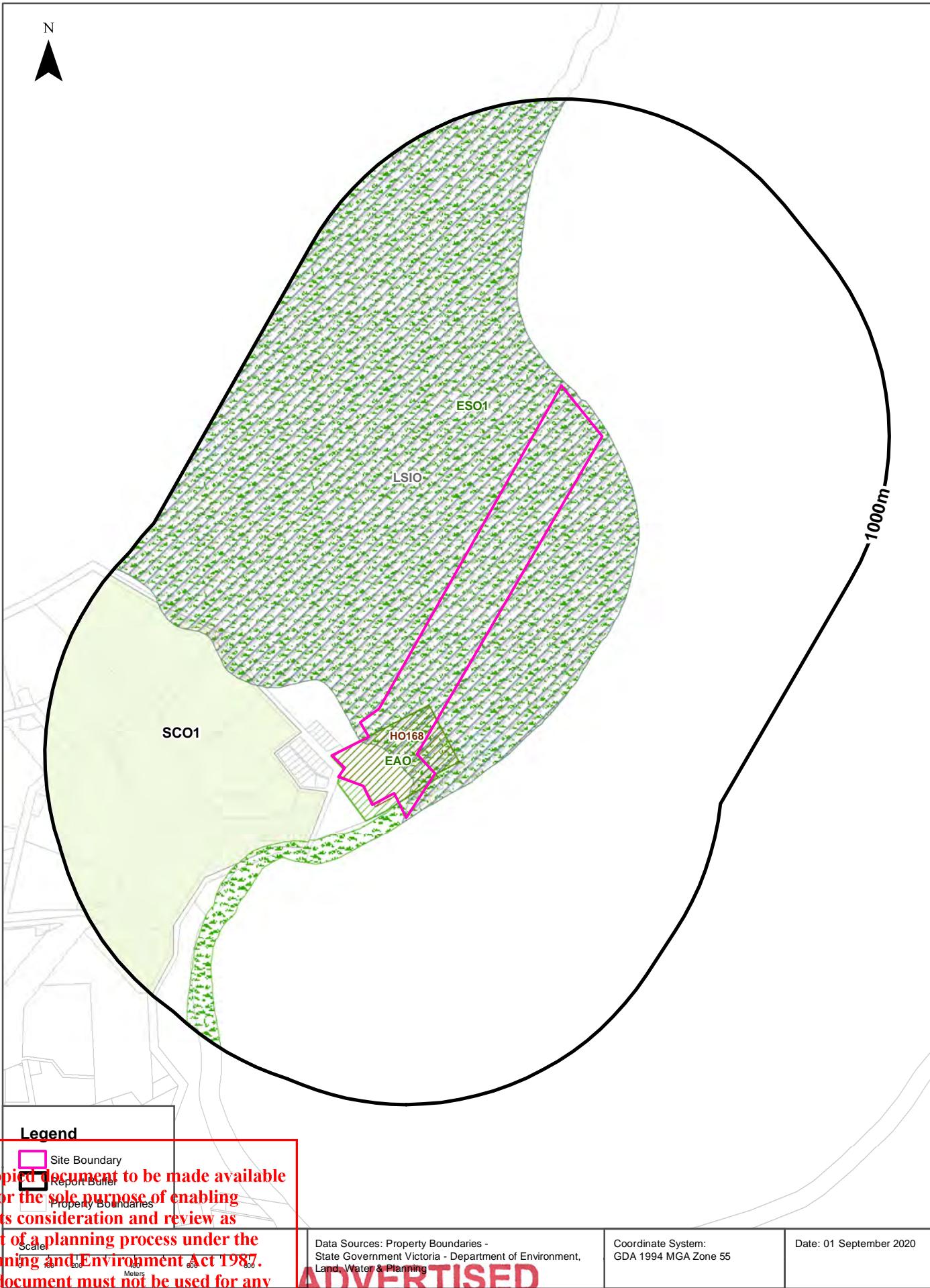
Zone Code	Description	Distance	Direction
PCRZ	PUBLIC CONSERVATION AND RESOURCE ZONE	0m	Onsite
SUZ5	SPECIAL USE ZONE - SCHEDULE 5	0m	Onsite
GRZ1	GENERAL RESIDENTIAL ZONE - SCHEDULE 1	10m	South West
FZ	FARMING ZONE	129m	North West
GRZ1	GENERAL RESIDENTIAL ZONE - SCHEDULE 1	206m	South West
PCRZ	PUBLIC CONSERVATION AND RESOURCE ZONE	279m	South East
PUZ1	PUBLIC USE ZONE - SERVICE AND UTILITY	485m	South West

Planning Zone Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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# Planning

Red Cliffs, Mildura, VIC 3496

## Planning Overlays

Planning overlays within the dataset buffer:

Zone Code	Description	Distance	Direction
ESO1	ENVIRONMENTAL SIGNIFICANCE OVERLAY - SCHEDULE 1	0m	Onsite
LSIO	LAND SUBJECT TO INUNDATION OVERLAY	0m	Onsite
EAO	ENVIRONMENTAL AUDIT OVERLAY	0m	Onsite
HO168	HERITAGE OVERLAY (HO168)	0m	Onsite
SCO1	SPECIFIC CONTROLS OVERLAY - SCHEDULE 1	62m	West

Planning Overlay Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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## Heritage

Red Cliffs, Mildura, VIC 3496

### Commonwealth Heritage List

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

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

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

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

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

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

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

What are the Victorian Heritage Register items located within the dataset buffer?:

VHR Number	Description	Distance	Direction
N/A	No records within buffer		

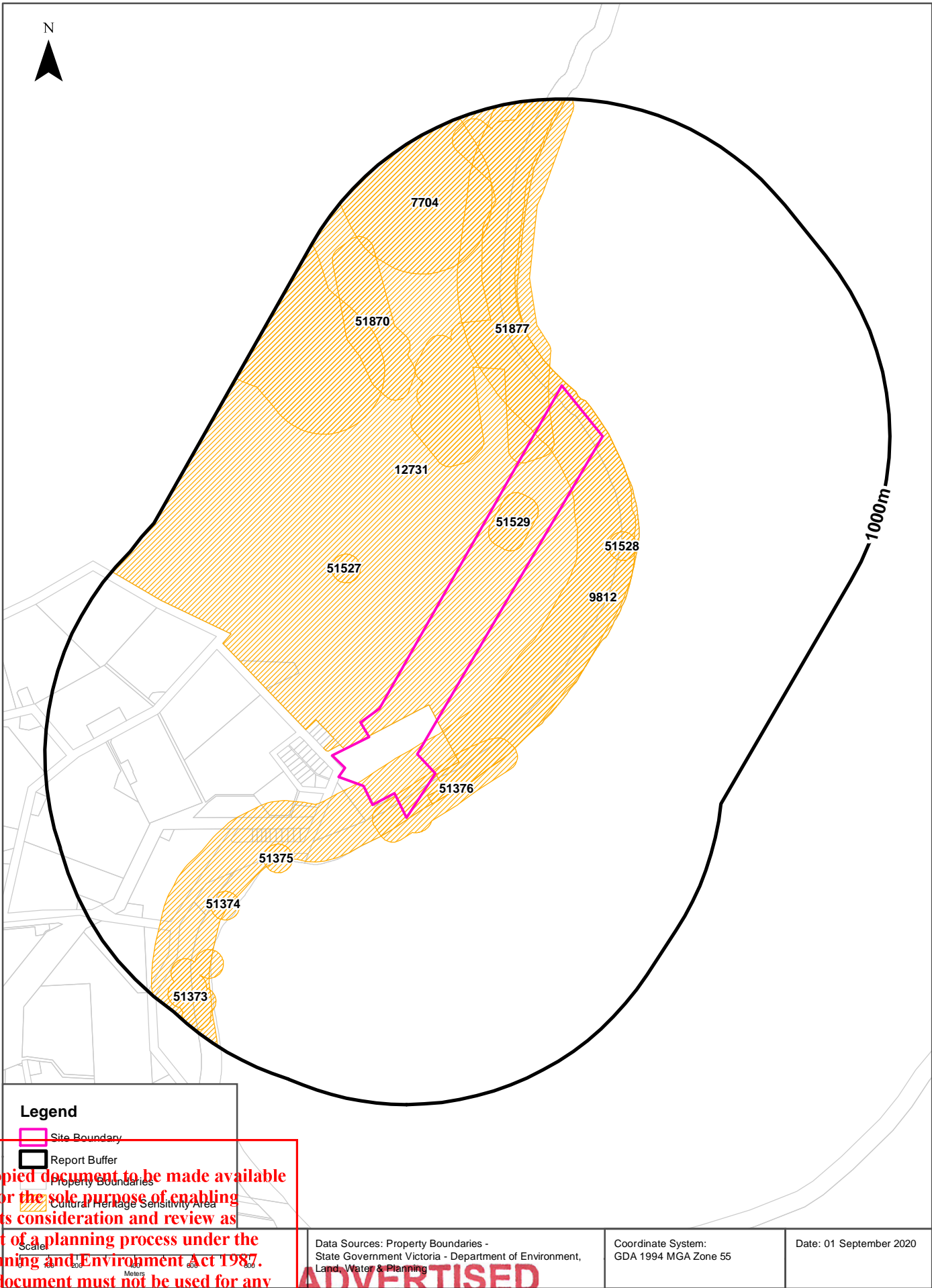
Victorian Heritage Register Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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## Heritage

Red Cliffs, Mildura, VIC 3496

### Cultural Heritage Sensitivity

Areas of Cultural Heritage Sensitivity as specified in Division 3 of Part 2 in the Victorian Aboriginal Heritage Regulations 2018, within the dataset buffer:

Map Id	Distance	Direction
12731	0m	Onsite
9812	0m	Onsite
51529	0m	Onsite
51877	0m	Onsite
51376	0m	Onsite
51528	203m	East
51527	291m	West
51375	303m	South West
51870	453m	North
7704	532m	North
51374	547m	South West
51373	742m	South West

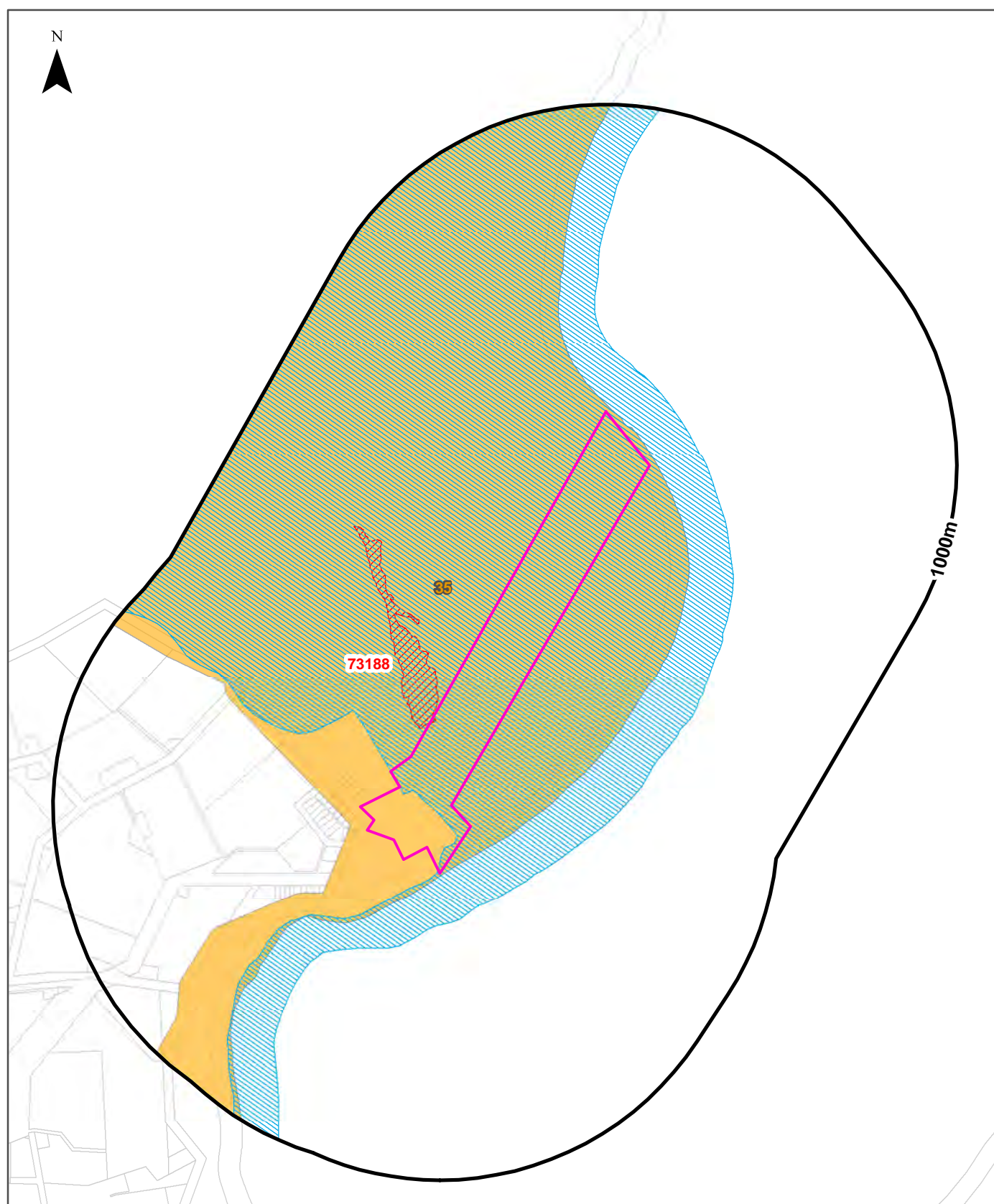
Cultural Heritage Sensitivity Data Custodian: State Government Victoria - Department of Premier and Cabinet  
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## Red Cliffs, Mildura, VIC 3496



 Site Boundary
  Flood 1 in 100 Year Extent

 Report Buffer
  The History Records

 Property Boundaries
  Designated Shire Prone Area

	Sea Level 0cm (2009)		Sea Level 47cm (2070)
	1 in 100 Year Storm Tide (2009)		1 in 100 Year Storm Tide (2070)
	Sea Level 20cm (2040)		Sea Level 82cm (2100)
	1 in 100 Year Storm Tide (2040)		1 in 100 Year Storm Tide (2100)

Data Sources: Property Boundaries -  
State Government Victoria - Department of Environment,  
Land, Water & Planning

Coordinate System:  
GDA 1994 MGA Zone 55

Date: 01 September 2020

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State Government Victoria - Department of Environment, Land, Water & Planning

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## Natural Hazards

Red Cliffs, Mildura, VIC 3496

### Bushfire Prone Areas

What are the designated bushfire prone areas within the dataset buffer?

Map ID	Feature	Plan No	LGA	Gazetted Date	Distance	Direction
35	Designated Bushfire Prone Area	LEGL./13-195	MILDURA	08/08/2013	0m	Onsite

Bushfire Prone Area Data Custodian: State Government Victoria - Dept of Transport, Planning & Local Infrastructure  
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### Fire History

What are the fire history records of fires primarily on public land, within the dataset buffer?

Map Id	Fire Type	Fire Key	Season	Fire No	Fire Name	Treatment	Fire Cover	Start Date	Dist (m)	Direction
73188	BUSHFIRE	W2002078	2002	8		FIRE	90-100	22/09/2001	0m	Onsite

Fire History Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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### Flood - 1 in 100 year modelled flood extent

What 1 in 100 year flood extent features exist within the dataset buffer?

Feature	Source	Method	Scale	Modified Date	Distance	Direction
100 Year Flood Outline	Unknown	No contours & some flood info		01/01/2000	0m	Onsite

Flood Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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# Natural Hazards

Red Cliffs, Mildura, VIC 3496

## Victorian Coastal Inundation Sea Level Rise

What coastal inundation sea level rise features exist within the dataset buffer?

Description	Distance	Direction
No records within buffer		

Victorian Coastal Inundation Sea Level Rise Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning

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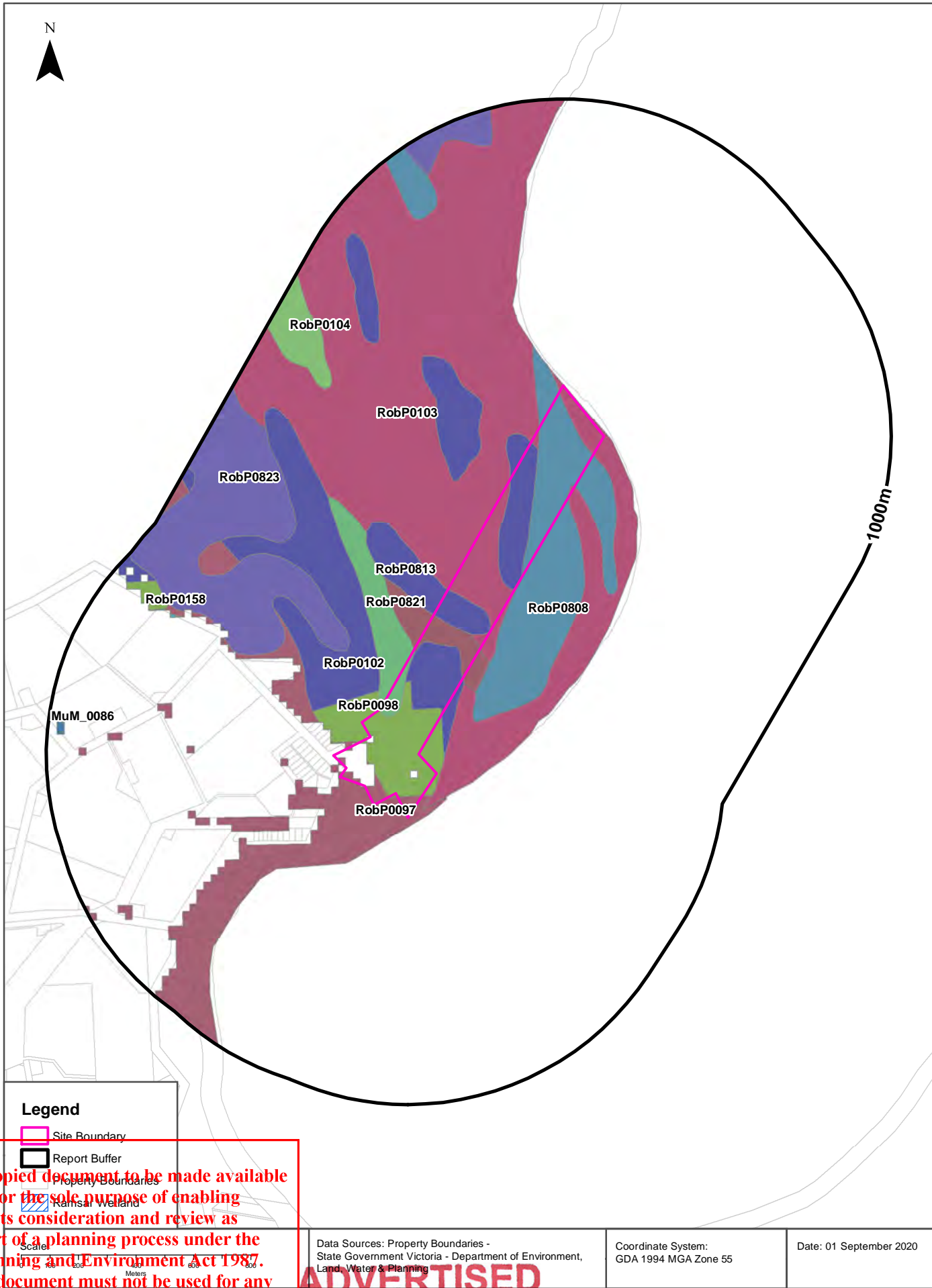
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Ecological Constraints - Native Vegetation 2005 & Ramsar Wetlands

Red Cliffs, Mildura, VIC 3496



## Ecological Constraints

Red Cliffs, Mildura, VIC 3496

### Native Vegetation (Modelled 2005 Ecological Vegetation Classes)

What native vegetation exists within the dataset buffer?

Veg Code	EVC Name	EVCode	Group	Subgroup	Bioregion	Conservation Status	Geographic Occurance	Distance
RobP0097	Semi-arid Woodland	0097	Plains Woodlands or Forests	Semi-arid(non-Eucalypt)	Robinvale Plains	Vulnerable	Naturally Restricted	0m
RobP0098	Semi-arid Chenopod Woodland	0098	Plains Woodlands or Forests	Semi-arid(non-Eucalypt)	Robinvale Plains	Vulnerable	Naturally Restricted	0m
RobP0102	Low Chenopod Shrubland	0102	Plains Grasslands and Chenopod Shrublands	Clay soils	Robinvale Plains	Depleted	Minor	0m
RobP0103	Riverine Chenopod Woodland	0103	Riverine Grassy Woodlands or Forests	Broader plain	Robinvale Plains	Depleted	Common	0m
RobP0808	Lignum Shrubland	0808	Riverine Grassy Woodlands or Forests	Creekline and/or swampy	Robinvale Plains	Least Concern	Naturally Restricted	0m
RobP0813	Intermittent Swampy Woodland	0813	Riverine Grassy Woodlands or Forests	Creekline and/or swampy	Robinvale Plains	Depleted	Naturally Restricted	0m
RobP0821	Tall Marsh	0821	Wetlands	Freshwater	Robinvale Plains	Depleted	Rare	0m
RobP0823	Lignum Swampy Woodland	0823	Riverine Grassy Woodlands or Forests	Creekline and/or swampy	Robinvale Plains	Depleted	Naturally Restricted	202m
RobP0104	Lignum Swamp	0104	Wetlands	Freshwater	Robinvale Plains	Vulnerable	Naturally Restricted	705m
RobP0158	Chenopod Mallee	0158	Mallee	Calcareous dunefields	Robinvale Plains	Vulnerable	Minor	730m
MuM_0086	Woorinen Sands Mallee	0086	Mallee	Calcareous dunefields	Murray Mallee	Depleted	Common	939m
MuM_0097	Semi-arid Woodland	0097	Plains Woodlands or Forests	Semi-arid(non-Eucalypt)	Murray Mallee	Vulnerable	Common	943m

Native Vegetation Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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### Ramsar Wetlands

What Ramsar wetland areas exist within the dataset buffer?

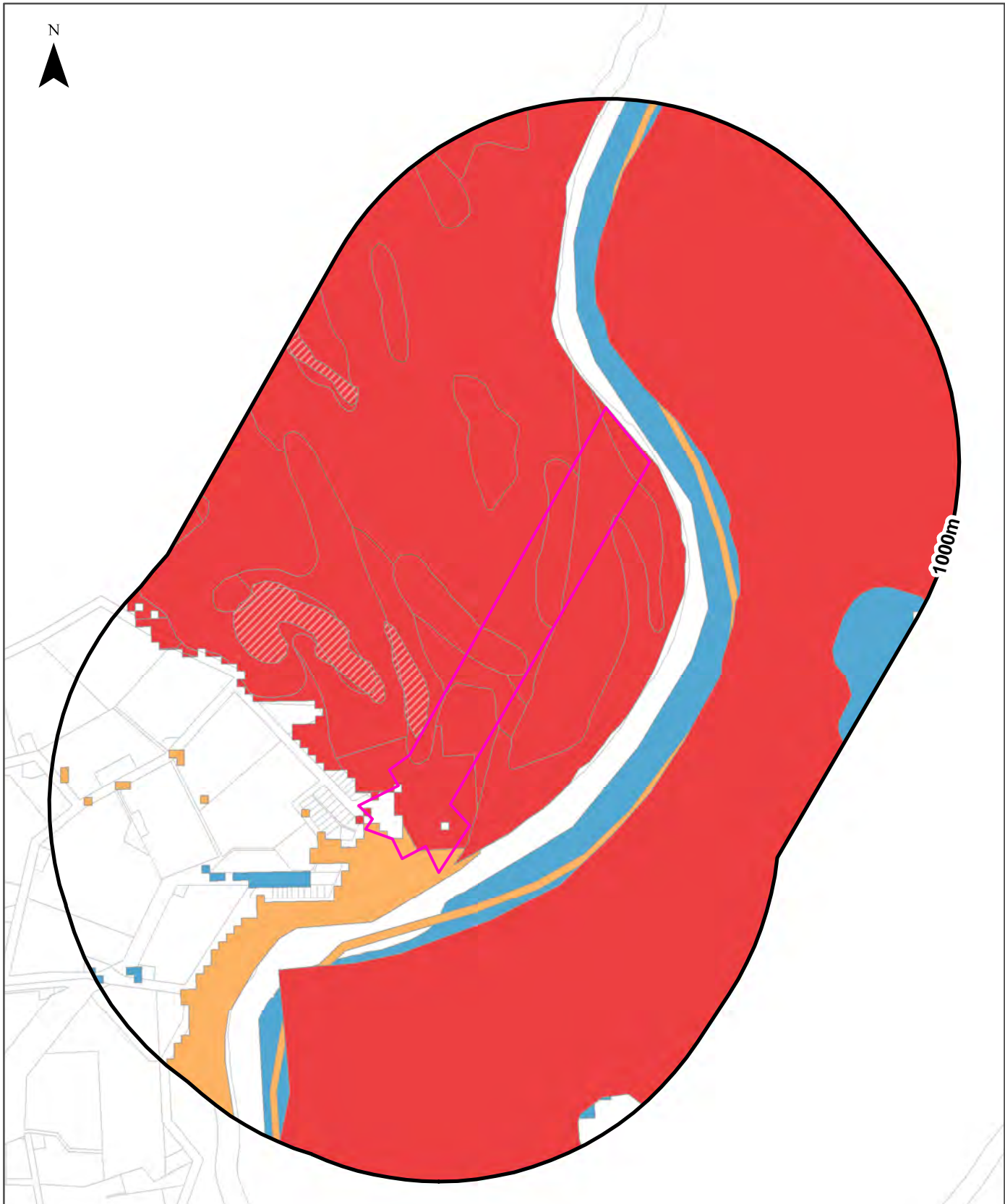
Map ID	Site Name	Lake Name	Distance	Direction
N/A	No records within buffer			

Ramsar Wetland Area Data Custodian: State Government Victoria - Dept of Environment, Land, Water & Planning  
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**Legend**

- |   |  |  |
|---|--|--|
| Site Boundary                                     | High potential GDE - from national assessment      | Low potential GDE - from national assessment |
| Report Buffer                                     | High potential GDE - from regional studies         | Low potential GDE - from regional studies    |
| Moderate potential GDE - from national assessment | Moderate potential GDE - from regional studies     | Known GDE - from regional studies            |
| Moderate potential GDE - from regional studies    | Unclassified potential GDE - from regional studies |  |

Scale

0 100 200 300 400 500  
Meters

Data Sources: Property Boundaries -  
State Government Victoria - Department of Environment,  
Land, Water & Planning

Coordinate System:  
GDA 1994 MGA Zone 55

Date: 01 September 2020

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## Ecological Constraints

Red Cliffs, Mildura, VIC 3496

### Groundwater Dependent Ecosystems Atlas

What GDEs exist within the dataset buffer?

GDE Type	Name	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial		High potential GDE - from national assessment	Fixed west-east calcareous longitudinal dunes.	Vegetation		0m
Terrestrial		Moderate potential GDE - from national assessment	Fixed west-east calcareous longitudinal dunes.	Vegetation		0m
Aquatic	Power Station Wetland	High potential GDE - from regional studies	Fixed west-east calcareous longitudinal dunes.	Wetland		3m
Aquatic		Low potential GDE - from national assessment	Fixed west-east calcareous longitudinal dunes.	Wetland		35m
Aquatic	MURRAY RIVER	Moderate potential GDE - from national assessment	Fixed west-east calcareous longitudinal dunes.	River		113m
Terrestrial		Low potential GDE - from national assessment	Fixed west-east calcareous longitudinal dunes.	Vegetation		224m

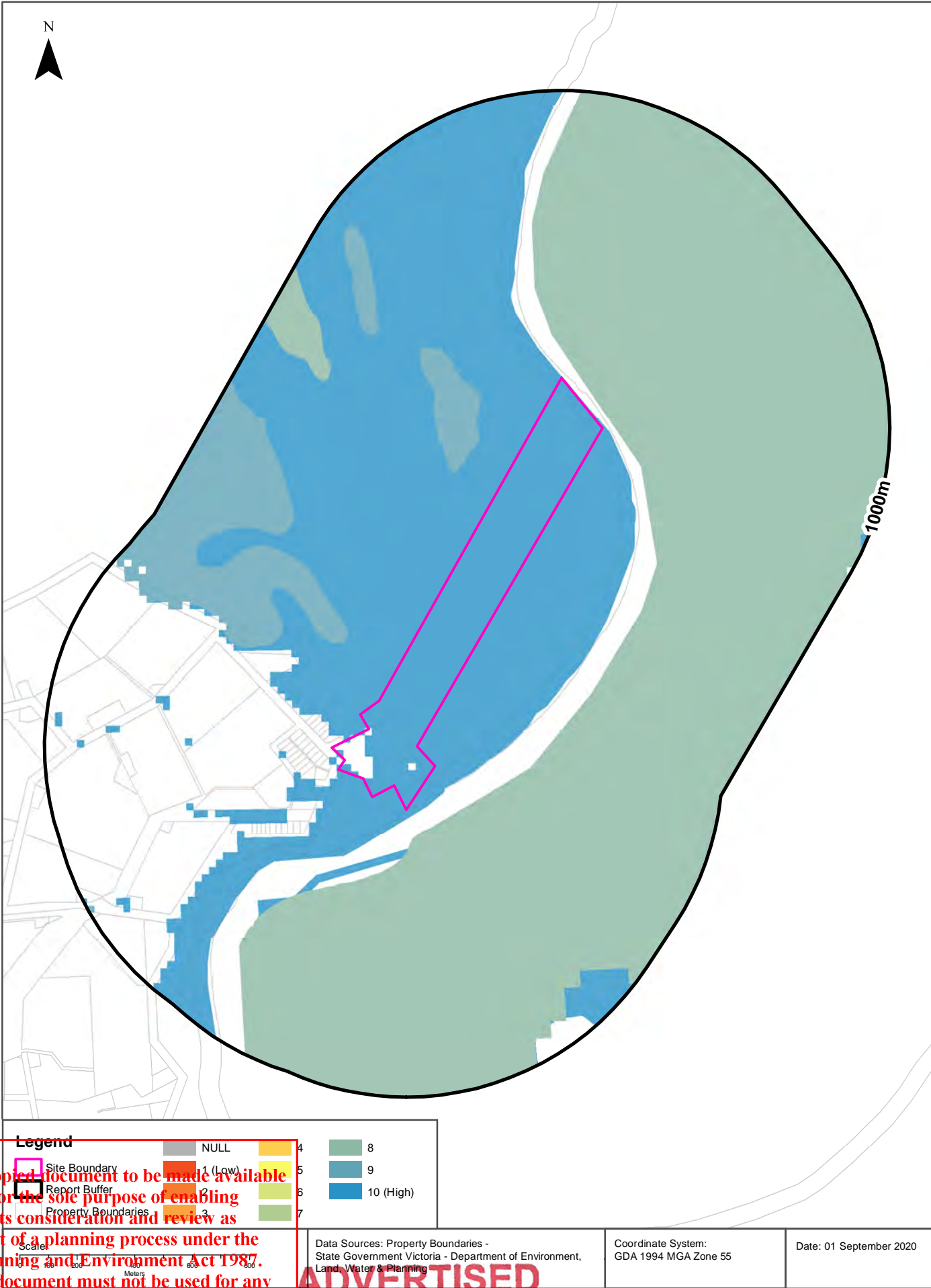
Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology

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## Ecological Constraints

Red Cliffs, Mildura, VIC 3496

### Inflow Dependent Ecosystems Likelihood

What IDEs exist within the dataset buffer?

GDE Type	Name	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial		10	Fixed west-east calcareous longitudinal dunes.	Vegetation		0m
Aquatic	Power Station Wetland	10	Fixed west-east calcareous longitudinal dunes.	Wetland		3m
Aquatic		8	Fixed west-east calcareous longitudinal dunes.	Wetland		35m
Terrestrial		9	Fixed west-east calcareous longitudinal dunes.	Vegetation		140m
Terrestrial		8	Fixed west-east calcareous longitudinal dunes.	Vegetation		705m
Aquatic	Psyche Runner	9	Fixed west-east calcareous longitudinal dunes.	Wetland		710m

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology  
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LC Code	Location Confidence
Premise match	Georeferenced to the site location / premise or part of site
General area or suburb match	Georeferenced with the confidence of the general/approximate area
Road match	Georeferenced to the road or rail
Road intersection	Georeferenced to the road intersection
Feature is a buffered point	Feature is a buffered point
Land adjacent to geocoded site	Land adjacent to Georeferenced Site
Network of features	Georeferenced to a network of features

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