

Macedon BESS

Macedon BESS – Hydrology Assessment

Macedon BESS Development Pty Ltd

Reference: 527802

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2026-06-12

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Executive Summary

Aurecon Australasia Pty Ltd (Aurecon) has been engaged by Macedon BESS Development Pty Ltd to facilitate the environmental and planning assessments and approvals for the Macedon Battery Energy Storage System (BESS). The proposed Site is located on 7 ha in the Macedon Ranges Shire Council, approximately 59 km north-west from Melbourne's CBD.

A surface water and groundwater assessment was completed to support the approval of Macedon BESS Development. This assessment comprised desktop review of the surface water and groundwater characteristics of the Project Area to identify the potential impacts on surface water and shallow groundwater. An impact assessment was completed using the information acquired from the desktop assessment to identify potential impacts and mitigation measures associated with the Project construction and operation.

The Project Area is located in the upper Jacksons Creek catchment, with tributaries running to the west and east of the Project Area. There are two Declared Water Supply Catchments to the west and north east – Rosslynne Reservoir (Jacksons Creek) and Rosslynne Reservoir (Riddles Creek). Surface water has the potential to be impacted by the Project due to increased surface runoff and sedimentation associated with increased impermeable surfaces and changes in topography. Two minor unnamed waterways flow from the north western corner of the site towards Salty Creek and from the western boundary of the site towards Riddles Creek. A site inspection was undertaken and there was no surficial evidence of a waterway along the western boundary (i.e. channel, changes in topography or vegetation). As part of the Construction Environmental Management Plan (CEMP), a stormwater management plan is recommended to mitigate any localised impacts and design of the site drainage infrastructure should accommodate overland flow paths.

The geology beneath the Project Area is comprised of bedrock, and Quaternary alluvial sediments are present in valleys. The depth to groundwater is relatively deep, with the watertable 15-20 m bgl so the risk of intersecting the watertable during construction is low, however groundwater could be shallower near the unnamed waterways. Groundwater salinity is also slightly brackish and consequently groundwater use is limited.

Potential impacts to surface and groundwater are generally considered to be low and key impact mitigation measures can be incorporated into a CEMP to manage drainage on site.

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Abbreviations

Term	Definition
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Guidelines for Fresh and Marine Water Quality
Aurecon	Aurecon Australasia Pty Ltd.
BESS	Battery Energy Storage System
bgl	Below Ground Level
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CMA	Catchment Management Authority
EE Act	<i>Environment Effects Act 1978</i>
EES	Environment Effects Statement
EIS	Environmental Impact Statement
EPA	Environmental Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
GDE	Groundwater Dependent Ecosystem
km	kilometres
kV	Kilovolt
LGA	Local Government Area
m	metre
MNES	Matter of National Environmental Significance
mS/cm	MilliSeimens per centimetre
The Project	Macedon Battery Energy Storage System
The Proponent	South Energy
WMIS	Water Measurement Information System
°C	Degrees Celsius

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1 Introduction

1.1 Purpose and Scope

Aurecon Pty Ltd (Aurecon) has been engaged by South Energy Pty Ltd on behalf of Macedon BESS Development Pty Ltd to prepare this Surface Water Assessment for the Macedon Battery Energy Storage System (BESS) (the Project). The purpose of this surface water assessment is to describe the regional and local hydrology for the Project, including an assessment of any potential impacts to nearby receptors. Matters required to be considered under Clause 35.06-5 of the applicable Planning Scheme (where a permit is required for earthworks which change the rate of flow or the discharge point of water across a property boundary, or increase the discharge of saline groundwater) are identified and addressed in this report.

A desktop review of the surface water and groundwater characteristics of the site is required to determine if there were any matters that would impact on the final location of the BESS and if a potential impact is expected as a result of the proposed work and recommend mitigation measures (if required).

The scope of the surface water assessment includes:

- Review current legislative requirements and guidelines.
- A desktop review of existing surface water and groundwater conditions in the Project Area.
- Assess potential impacts to surface water including:
 - Drainage
 - Flooding
 - Groundwater
 - Sensitive Water Environments
- High-level mitigation measures to address any identified impacts
- Conclusions and recommendations for further work.

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1.2 Project Site and Surrounds

The proposed Site is located on Black Forest Drive (also referred to as Macedon-Woodend Road), Macedon and is formally known as Lot 2 on Plan of Subdivision 444155 (refer to Figure 1-1). The Site's area is approximately 7 ha and is located in the Macedon Ranges Shire Council, approximately 59 km north-west from Melbourne's CBD. The Site is bordered by Alison Lane to the north, Black Forest Drive/ Macedon-Woodend Road to the east, the Gisborne Substation to the south and the Calder Freeway to the west.

The Site is situated in a rural setting and away from established neighbourhoods. The Site surrounds are largely characterised by cleared, vacant land on the south side of Calder Freeway and agricultural land on north side of Black Forest Drive/Macedon-Woodend Road. Low density rural residences are visible within the broader landscape to the north with the nearest dwelling being opposite Macedon-Woodend Road at approximately 65m to the east. The closest township is New Gisborne, approximately 2.3 km to the south-east of the Site and is within the Macedon Ranges Shire Council.

The Registered Aboriginal Party (RAP) associated with the Site is Wurundjeri Woi-wurrung Cultural Heritage Aboriginal Corporation (WWCHAC).

The central portion of the Site comprises flat topography, with small patches of mature canopy trees and understorey vegetation. Mature vegetation surrounds the Site's boundaries.

Based on Department of Transport and Planning's mapping, there appears to be an unnamed waterway that flows in a southerly direction along the western boundary of the Site.



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Legend

- Railways
- Watercourse
- Local government area
- Project Boundary
- Water Body

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Basemap: Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

Data source: Aurecon (2025), DELWP (2025)

Date: 24/03/2026

Version: 2

Macedon BESS

Topography



A3 scale: 1:17,000
0 200 400 Metres

Job No: P27802
Coordinate System: GDA 1994 MGA Zone 55

Figure 1-1 Project Site

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1.2.1 Project Description

The following section provides a summary of the proposal and should be read in conjunction with the accompanying Concept Design prepared by EHV Consulting and Design on 27 October 2025.

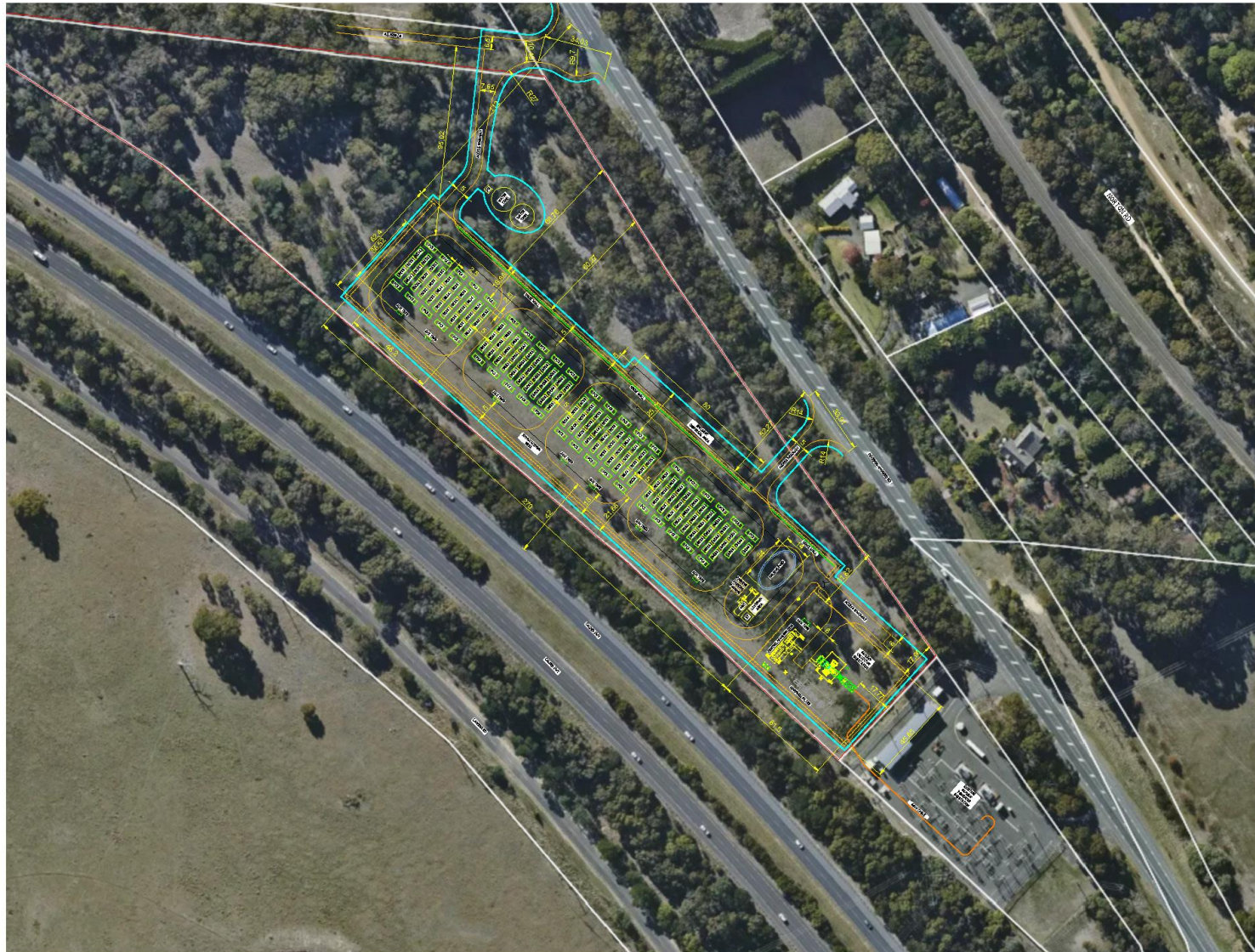
The Project will comprise the following:

- A 188.6MW/501MWh Battery Energy Storage System (BESS)
- On-site (66/33kV) collector substation including associated infrastructure:
 - harmonic filter
 - switchgear and control room
 - connection cabling to the existing (66/22kV) Gisborne Zone Substation
- Internal access roads including two (2) new accessways
- One (1) Operations and Maintenance (O&M) Building
- Three (3) permanent parking spaces
- Effluent dispersal area
- 4m high noise wall
- One (1) pump house and one (1) septic tank
- Lighting equipment including:
 - Nineteen (19) mounted lights on fence up to 10.6 m in height
 - Seven (7) light poles
- Construction of two (2) lightning masts up to 21.4m in height adjacent to the collector substation
- Fire risk mitigation infrastructure including:
 - Two (2) 335 kilolitre (kL) round water tanks with a 12m diameter
 - One (1) fire holding pond/stormwater detention basin
- Fencing around the perimeter of the BESS and substation facility
- Installation of one (1) business identification sign located at site access point on Allison Lane

The proposed site layout is shown in Figure 1-2, below.

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 3. THE SURVEY HAS BEEN CONDUCTED USING AERIAL IMAGING. ACCURACY IS +/- 50mm VERTICAL IN OPEN, HARD FLAT AREAS AND +/- 100mm ON GROUND FEATURES IN OPEN, HARD FLAT AREAS.
 4. SERVICES SHOWN ARE INDICATIVE ONLY. POSITIONS ARE BASED ON SURFACE INDICATORS LOCATED DURING FIELD SURVEY. CONFIRMATION OF THE EXACT POSITION SHOULD BE MADE TO THE RELEVANT AUTHORITIES PRIOR TO ANY EXCAVATION WORK. OTHER SERVICES MAY EXIST WHICH ARE NOT SHOWN.
 5. BUILDINGS HAVE BEEN PLOTTED FOR DIAGRAMMATIC PURPOSES ONLY.
 6. MAPPING SYSTEM IS MGA/2020-55 (ZONE 55, MGA 2020).
 7. THE FIRE HYDRANT SYSTEM TO BE CONFERRED WITH THE PROGRESS OF THE DESIGN.
 8. THE ROAD DESIGN TO BE CONFERRED WITH THE PROGRESS OF THE DESIGN.
 9. REFER TO DRAWING EHV-MBESS-EL-DR-0102 FOR DETAILS.

- LEGEND**
- BESS - BATTERY ENERGY STORAGE SYSTEM CONTAINERS
 - PCS - INVERTER AND HV TRF
 - PH - PUMP HOUSE
 - O&M - OPERATION AND MAINTENANCE FACILITY
 - LP - LIGHT POLE & FLOOD LIGHTS
 - HY - FIRE HYDRANT
 - AUX TRF - AUXILIARY TRANSFORMER
 - ST - SEPTIC TANK

- EQUIPMENT COLORS**
- BUILDINGS: SURPAST OR WOODLAND GREY
 - SOUNDWALLS: SURPAST OR WOODLAND GREY
 - CHAINWIRE FENCE: GALVANIZED SILVER/GREY
 - WATERTANK: SURPAST OR WOODLAND GREY

PRELIMINARY ISSUE

1:1000
20 0 20 40 60 80 100m
FULLSIZE

REVISIONS				REFERENCES			
No.	DESCRIPTION	DRAWN	CHKD	APPROV	DATE	DESCRIPTION	REFERENCES
1	ISSUED FOR REVIEW	O.L.S.	K.R.D.	P.N.	27/10/2025	CADASTRAL OVERLAY	EHV-MBESS-EL-DR-005
2	ISSUED FOR REVIEW	O.L.S.	K.R.D.	P.N.	27/10/2025	PROPOSED BESS & COLLECTOR STATION LAYOUT	EHV-MBESS-EL-DR-002

DESIGNER: O.L.SMITH		DRAWN: O.L.SMITH		DATE: 27/10/2025	
AT SCALE: 1:1000		DWG FILE: EHV-MBESS-EL-DR-0100		PROJECT: MBESS	
DRAWING NUMBER: EHV-MBESS-EL-DR-0100		SHEET NUMBER: 1		OF: 1	
				APP: B	

DRAWING TITLE: MACEDON BESS 188.6MW (50.1MWh) AND 66/33kV COLLECTOR STATION PROPOSED SITE LAYOUT	
--	--

SOUTH ENERGY	
Telephone: +61 3 9887 2075 Email: enquiries@se.com.au Web: www.southenergy.com.au	

Figure 1-2 Proposed Site Layout Plan

2 Legislative and policy context

The follow sections detail the legislation and policies applicable to this report.

2.1 Planning and Environment Act 1987

The *Planning and Environment Act 1987* (P&E Act) establishes a framework for planning the use, development and protection of land in Victoria. Planning schemes are subordinate legislation to the P&E Act and set out how land may be used and developed. The planning schemes set out the relevant planning controls that determine whether planning approval is required for the use and/or development of land. These controls include zones, overlays, particular and general provisions. This report is supporting a planning application that is being submitted under the P&E Act. The Planning Policy Framework recognises the impacts of natural hazard hazards, including flood, and sets strategies for development to be located away from flood areas.

An assessment of the *Planning and Environment Act 1987* triggers as they relate to water can be found in the Land Use Assessment Report prepared as part of this feasibility stage of investigations. Matters required to be considered under the Clause 35.06-5 Planning Schemes include a permit is required to change the rate of flow or the discharge point of water across a property boundary or increase the discharge of saline groundwater.

2.2 Environment Protection Act 2017 (EP Act)

The EP Act creates the legislative framework to protect the environment and came into effect on 1 July 2021. The Environment Protection Authority (EPA) Victoria has implemented a broad range of statutory instruments and policies, subordinate legislation and tools under the EP Act. This includes the Environmental Reference Standard, which sets environmental values for water, land and air, and mechanisms for regulation of the discharges to these elements of the environment.

The EP Act aims to prevent and minimise the risks of harm to human health and the environment from pollution and waste, by setting environmental objectives and establishing programs to meet them. The EP Act establishes the powers, duties and functions of the EPA Victoria. These include the administration of the EP Act and any regulations and orders made pursuant to it, issuing works approvals, licences, permits, pollution abatement notices and implementing National Environment Protection Measures.

Furthermore, under the General Environmental Duty (GED) all organisations have a responsibility to reduce risk to human health and the environment. It states that you must manage your activities to reduce the risk of harm:

- to human health and the environment.
- from pollution or waste.

2.3 Water Act 1989

The *Water Act 1989* provides the legal framework for water management and use across Victoria, including the issuing and allocation of water entitlements and the provision of water services by state-owned water corporations and catchment management authorities.

Under the *Water Act 1989*, the designated waterways, regional drainage and floodplain management authority for the Project area is the Port Phillip and Westernport Catchment Management Area (CMA) (a part of Melbourne Water) who is the caretaker of river health and carries out works to protect and enhance the quality of water and condition of rivers.

Works on waterways will require a permit and approval from Melbourne Water.

2.4 National Water Quality Management Strategy (NWQMS)

The objective of the NWQMS is to achieve sustainable use of water resources, by protecting and enhancing their quality, while maintaining economic and social development. The NWQMS provides a framework for the development and implementation of management plans for catchment, aquifer, coastal waters and other water bodies, by community and government. The NWQMS includes a number of guidelines covering water quality benchmarks, groundwater management, diffuse and point sources, sewerage systems, effluent management, and water recycling. The guidelines relevant to the Project include:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).
- Australian Drinking Water Guidelines (2011, updated 2024).
- Australian Guidelines for Water Quality Monitoring and Reporting (2000)
- Guidelines for groundwater quality protection in Australia (2013).

2.5 Waterway Corridor Guidelines for Greenfield Development

Melbourne Water's Waterway Corridor Guidelines (2013) define minimum standards for waterway corridor widths, vegetation quality and infrastructure and activities permitted within waterway corridors. A waterway corridor is defined as the waterway channel and its associated riparian zone and existing water ways a typically well-defined channels, which may flow permanently or only during wetter months.

These guidelines apply to greenfield development areas, which are defined as areas identified for urban development (residential, commercial or industrial) by state and/or local government, located on or beyond the boundaries of existing urban development. Streams with catchment areas less than 60 ha are generally the responsibility of the local government, however Melbourne Water recognises the important role these waterways play in the broader catchment and therefore may seek to intervene with the management of any waterway within the Port Phillip and Westernport Region.

Discussions with Melbourne Water would confirm if these guidelines apply in this area.

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3 Project Area

The Project Area is located on the southern slopes of the Macedon Ranges and is in headwaters of the Jacksons Creek Catchment area, which is overseen by Melbourne Water, Greater Western Water and Southern Rural Water.

The long-term rainfall data (2008-2025) for the closest weather station to the Project Area (087182 – Gisborne Rosslynne Reservoir, located 2 km from site) indicates that an average of 745 millimetres (mm) of rainfall falls each year based on data collected between 2008 and 2025. Periods of heaviest rainfall typically occur from June to November, as shown in Figure 3-1, below.

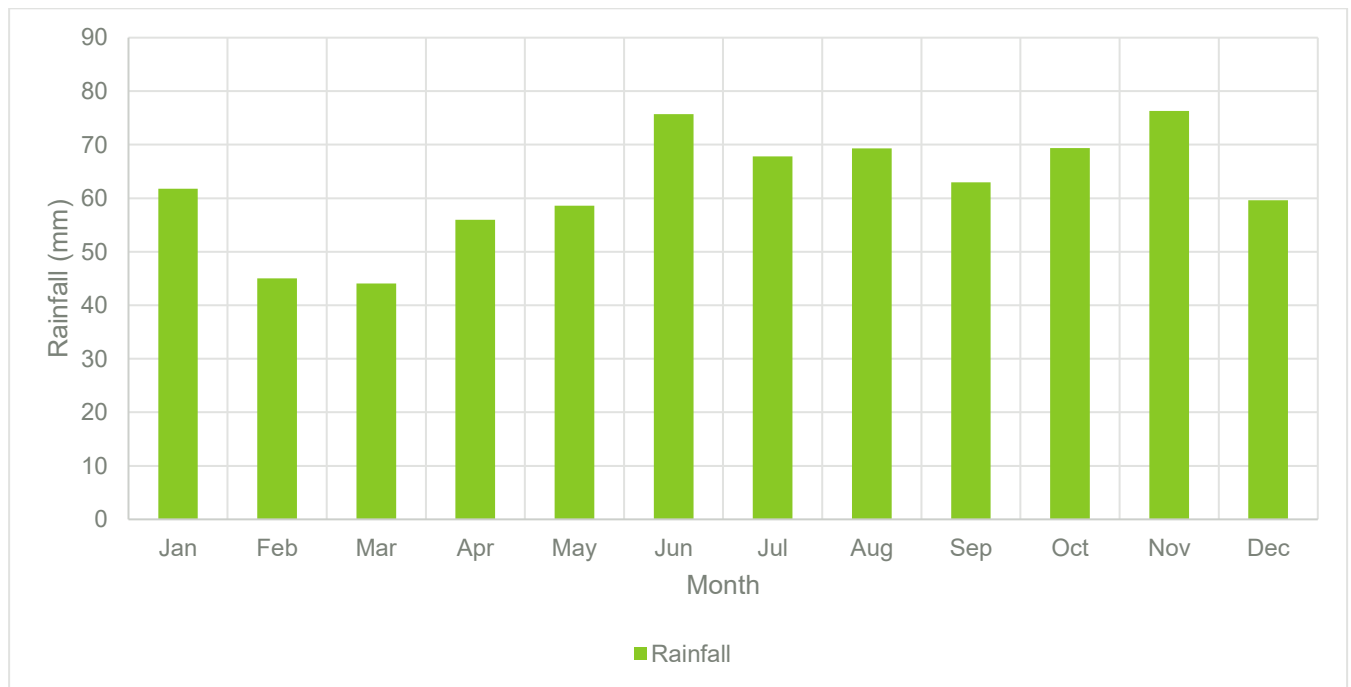


Figure 3-1 Average monthly rainfall.

The Project Area is located on a small ridge and topography slopes down to the east, south and west. Overland flow is likely to flow in all directions away from the site. Site topography is shown in Figure 3-2, below

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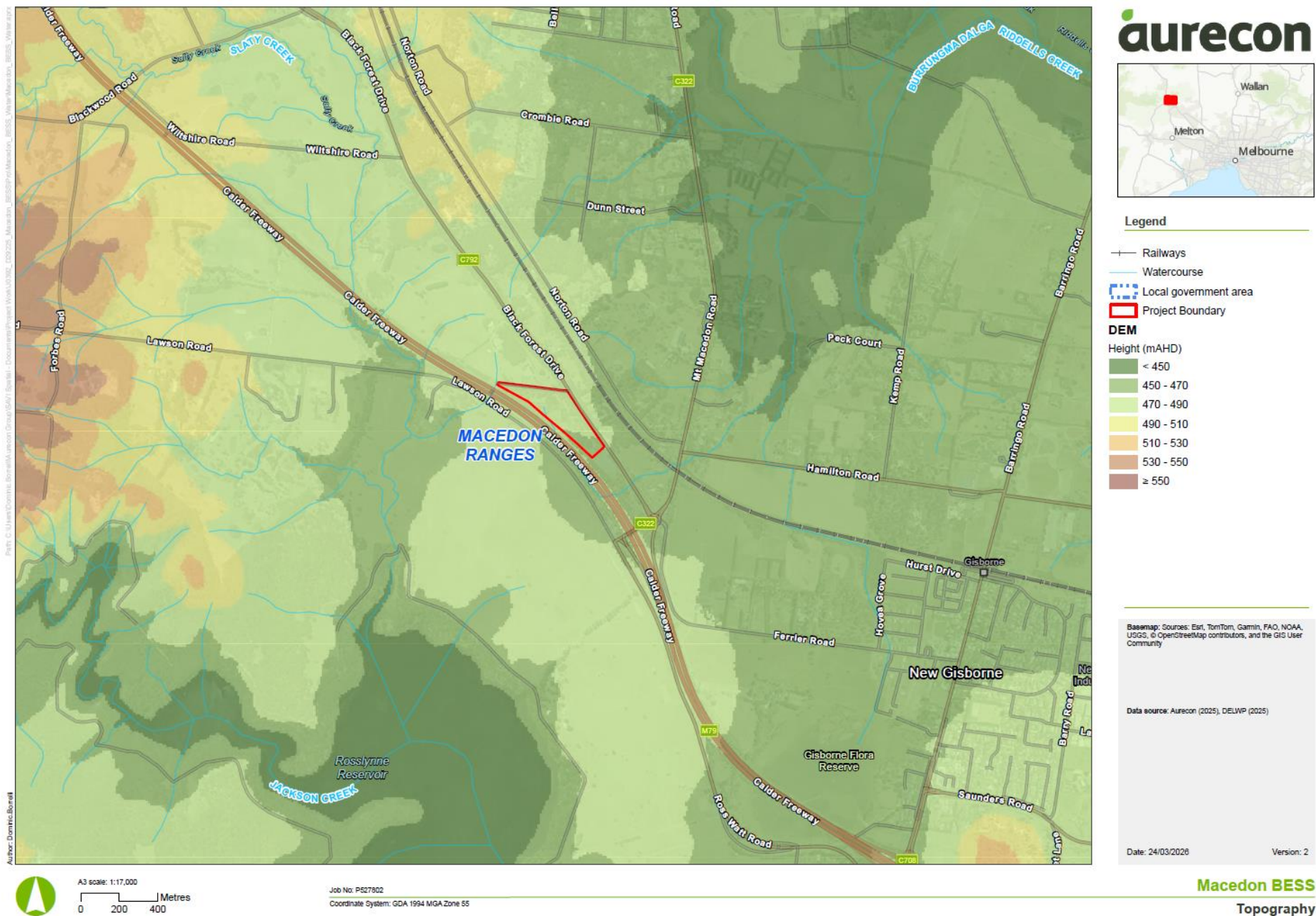


Figure 3-2 Site Topography Map

4 Surface Water Conditions

4.1 Regional Hydrology

The Project Area is located north east of the Rosslynne Reservoir, in the upper Jacksons Creek catchment, which is a tributary of the Maribyrnong River (see

Figure 4-2). The Project Area is located on a small ridgeline that extends between Riddles Creek to the north east and Salty Creek to the west, which are both tributaries of Jacksons Creek. Riddles Creek joins with Deep Creek at Keilor North to form the Maribyrnong River. Salty Creek flows into the Rosslynne Reservoir.

The Rosslynne Reservoir is in the upper reaches of Jacksons Creek near Gisborne, and is a major storage in the catchment. The reservoir is part of Melbourne's drinking water network and releases environmental flows to Jacksons Creeks. Jackson Creek flows east to the confluence with Riddles Creek and then flows south through Sunbury. These waterways play an essential role in the ecosystem, offering habitats for various species while also serving as popular locations for recreational pursuits such as walking, fishing, and birdwatching.

There are several Designative Water Supply Catchment Areas located around the Project Areas (see Figure 4-3). The Project Area sits mostly outside the boundary of the Rosslynne Reservoir (Jacksons Creek) Designated Water Supply Catchment, however the eastern boundary of the water supply catchment area crosses the north western portion of the site.

The Rosslynne Reservoir (Riddles Creek) Designated Water Supply Catchment is located to approximately 3 km to the northwest. While not immediately close to the site, there are unnamed waterways that flow from Project Area site to this catchment.

4.2 Local Hydrology

The Project Area is situated south of Mount Macedon within the upper Jacksons Creek catchment. Figure 4-4 shows an unnamed waterway flows along the western boundary in a south easterly direction and then flows north east to joins Riddles Creek. Given the proximity of this waterway to the proposed road and fenceline, the location and condition of the waterway was ground truthed through a site inspection on 16th March 2026. Photos taken along the waterway are shown in Figure 4-1, which show there is no evidence (ie channel, topographic depression or riparian vegetation) of a waterway in this area.

Another unnamed waterway is located to the northwest of the Project Area and this flows in a south western direction into Salty Creek, which feeds into the Rosslynne Reservoir.

4.2.1 Existing Flood Risk

Waterways on the southern slopes of the Macedon Ranges is governed by Melbourne Water. There are no flood planning controls in the vicinity of the Project Area.

4.2.2 Sensitive Receiving Environments

As previously identified, the site is within the upper Jacksons Creek Catchment, and Jacksons creek flows through numerous parklands, reserves, the Gisborne botanical gardens and then into the Maribyrnong River. Jacksons creek is a popular attraction for walkers, runners and picnickers. The Wurundjeri Woi-wurrung have been custodians of biik wurrdha Jacksons Creeks for thousands of years and is culturally significant. The Jackson Creek parklands support diverse range of flora and fauna with planned conservation areas for nature conservation and the Growling Grass Frog.

The Rosslynne Reservoir is used as an Urban supply for Greater Western Water and is closed off for public use for this reason. The reservoir provides additional water supplies for the townships of Sunbury and Gisborne, while

providing irrigation water to river diverters along the Maribyrnong River. There are several Designated Water Supply Catchment Areas, with one located immediately to the west and another 3km to the north east.

Environmental watering sites and the associated environmental values in the Maribyrnong basin are crucial for various aquatic species and habitats. Key elements include the populations of Australian grayling and the platypus in Jacksons Creek, as well as the upper Maribyrnong catchment, which hosts areas of intact streamside vegetation. This vegetation is vital for native fish species, including migratory short-finned eels, common and ornate galaxias, flathead gudgeon, tupong, and Australian smelt. Additionally, the presence of waterbug populations serves as a significant food source for the notable platypus population found in several reaches of the Maribyrnong system.

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Legend

- Photo Locations
- Project Area
- Watercourse

Notes:

All photos are taken in the South/Southeast direction, facing the watercourse

Basemap: Source: Esri, Vantor, Earthstar Geographics, and the GIS User Community, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community. We request attribution as © Commonwealth of Australia (Bureau of Meteorology) 2022

Other data: DELWP, Aurecon

Date: 23/06/2022

Version: 1



A3 scale: 1:500
0 0.01 0.03 Kilometers

Job No: P527802
Coordinate System: GDA2020 MGA Zone 54

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Mapped Waterway Site Photos

Figure 4-1 Photos taken along the marked waterway on the site

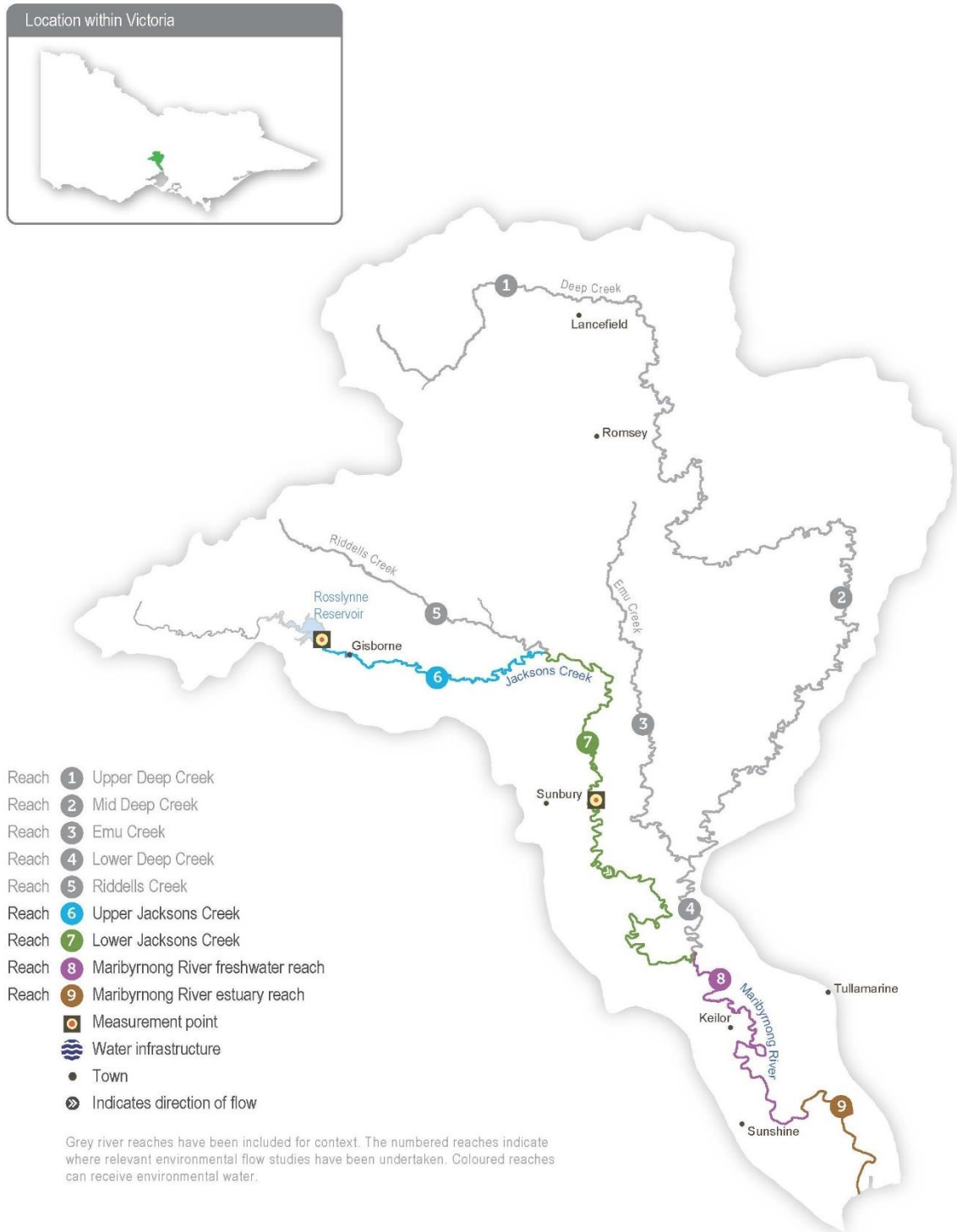


Figure 4-2 Maribyrnong system map (Victorian Water Holder, 2025)

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Figure 4-3: Designated Water Supply Protection Areas



Figure 4-4: Local waterways and flood extent in relation to the Project Area

5 Groundwater Conditions

5.1 Regional Geology and Hydrogeology

Figure 5-1 shows the surficial regional geology. This shows that the Project Area site is underlain by bedrock, which comprises Ordovician marine sandstone, siltstone and shale of the Castlemaine Subgroup (Occ) and the Chewtonian Formation (Och). To the south of the Project Area, the Quaternary Newer Volcanics outcrop, which comprises basalt and layers of clays and extends to the south and east. Quaternary Alluvial sediments are present in the valleys, associated with the waterways and comprise a mix of unconsolidated sand, silts and clays.

The outcropping bedrock beneath the site is a fractured rock aquifer, where groundwater flow is dominated fractures. The New Volcanics aquifer to the south is also a fractured rock aquifer. The Quaternary Alluvial aquifer is a shallow aquifer confined to the valleys. All aquifers are likely to be recharged from infiltration via rainfall.

Visualising Victoria's Groundwater (VVG) presents the statewide mapping of depth to watertable and groundwater salinity. Figure 5-2 shows that depth to groundwater across the Project Area is moderate, generally within 10-15 meters of the surface, and is deeper (20-30 m) to the north of the site. This is consistent with the Project Area's location on a ridgeline. The depth to watertable is shallower in the valleys, where the creeks and rivers are present.

Figure 5-3 shows that groundwater salinity in the Project Area is slightly brackish (1,000 – 3,500 mg/L total dissolved solids (TDS)). Groundwater salinity improves to the east of the site in the Riddles Creek catchment where the aquifer is likely to recharge the groundwater.

5.2 Local Hydrogeology

There are 17 observation boreholes within a 1.5 km buffer to the site (See Figure 5-4), none of which are located in the Project Area. Table 5-1 shows the majority of bores (10) are registered for domestic and stock purposes, 6 bores are registered as investigation and observation bores and the use of one bore is not known. Bores range between 10 and 150 m, with the majority of bores ranging between 35 and 60 m deep, which indicates the depth to watertable is relatively deep across the region.

Table 5-1: Boreholes surrounding the Project Area (Visualising Victoria's Groundwater, 2025).

Bore ID	Easting (m)	Northing (m)	Year drilled	Constructed Bore depth (m bgl)	Distance from site (m)	Purpose
111749	285533	5852904	1992	92	792	Domestic and stock
115166	285408	5850894	1990	42	1231	Investigation
142119	284513	5853384	2000	37	673	Domestic and stock
64547	286213	5852334	1973	52	883	Domestic and stock
64580	284774	5851748	1980	61	944	Domestic and stock
64604	285811	5853028	1983	59	741	Domestic and stock
64609	285263	5852784	1983	55	1007	Stock
64681	285333	5850804	1990	42	1331	Investigation
64682	285333	5850784	1990	37	1351	Investigation
64683	285253	5850804	1990	36	1349	Investigation
64684	285353	5850864	1990	45	1269	Investigation
WRK105635	285606	5851010	2018	47	1103	Domestic and Stock
WRK144334	285719	5852548	2024	81	457	Domestic and stock
WRK145918	286154	5850869	2024	10	1371	Observation

Bore ID	Easting (m)	Northing (m)	Year drilled	Constructed Bore depth (m bgl)	Distance from site (m)	Purpose
WRK977290	285891	5853585	2006	100	1482	Domestic and Stock
WRK985697	287038	5851861	2008	60	1466	Domestic and Stock
WRK990598	286292	5853598	-	150	1492	Not known

5.3 Groundwater Dependent Ecosystems

Salty Creek, located approximately 1 km east of the Project Area, has a high potential for groundwater dependent ecosystems (GDEs) interaction. This waterway supports Rosslynne Reservoir which is a tributary of Jacksons Creek. As previously mentioned, Jacksons Creek is a sensitive receiver the supports a lot of the environment and is a tributary of the Maribyrnong River. Jacksons creek is approximately 2 km from the site and also has a high potential for GDE interaction.

Riddles Creek, located approximately 1 km east of the Project Area, has a high potential for GDE interaction.

The Gisborne Nature Reserve located approximately 2 km east of the Project Area, has a moderate potential for groundwater dependent ecosystems interaction. This nature reserve straddles the Calder Freeway and includes wetlands, significant flora and fauna and the presence of items with Aboriginal heritage significance (Extent, 2019)

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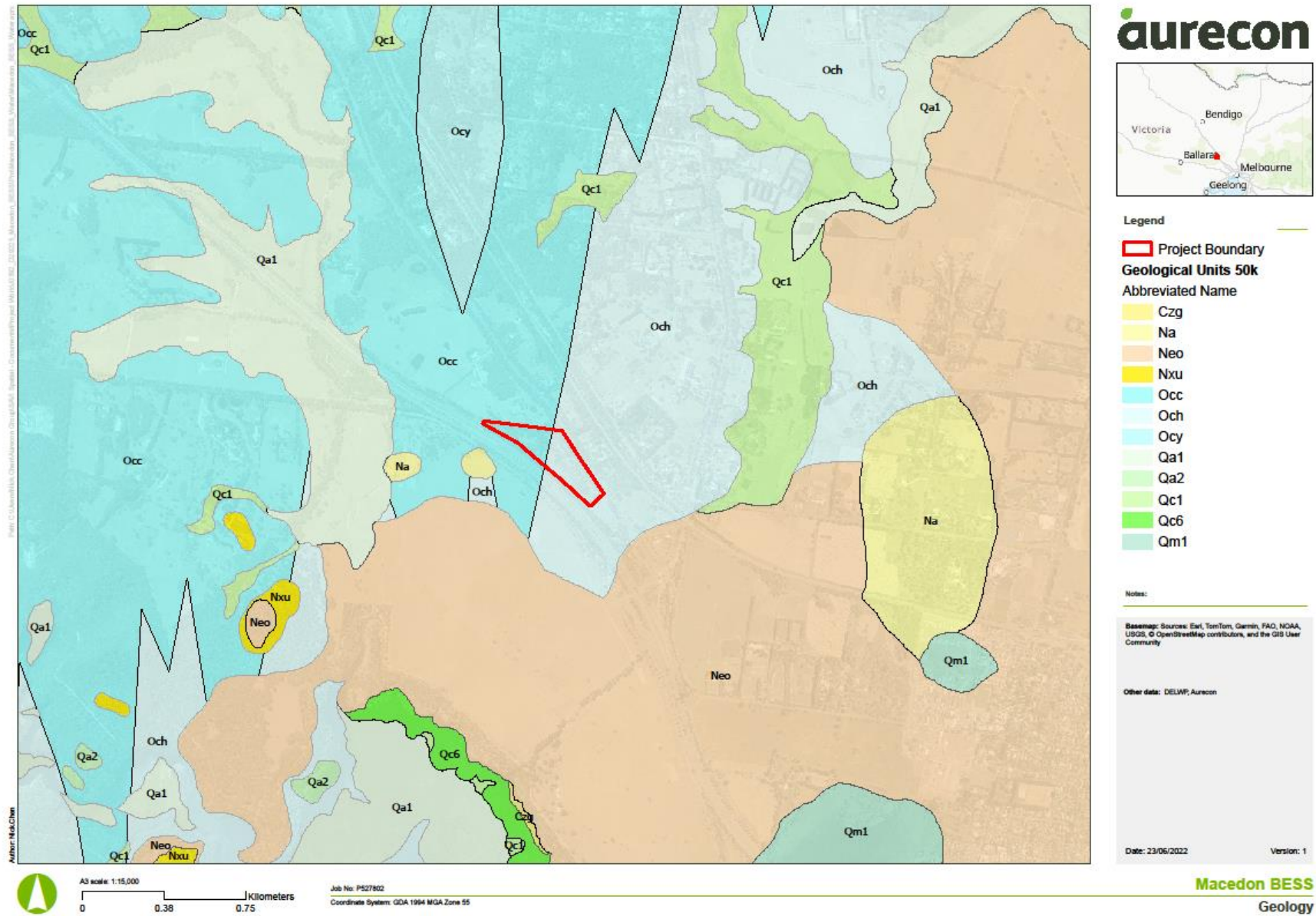


Figure 5-1 Geology surrounding the Macedon BESS Project Area

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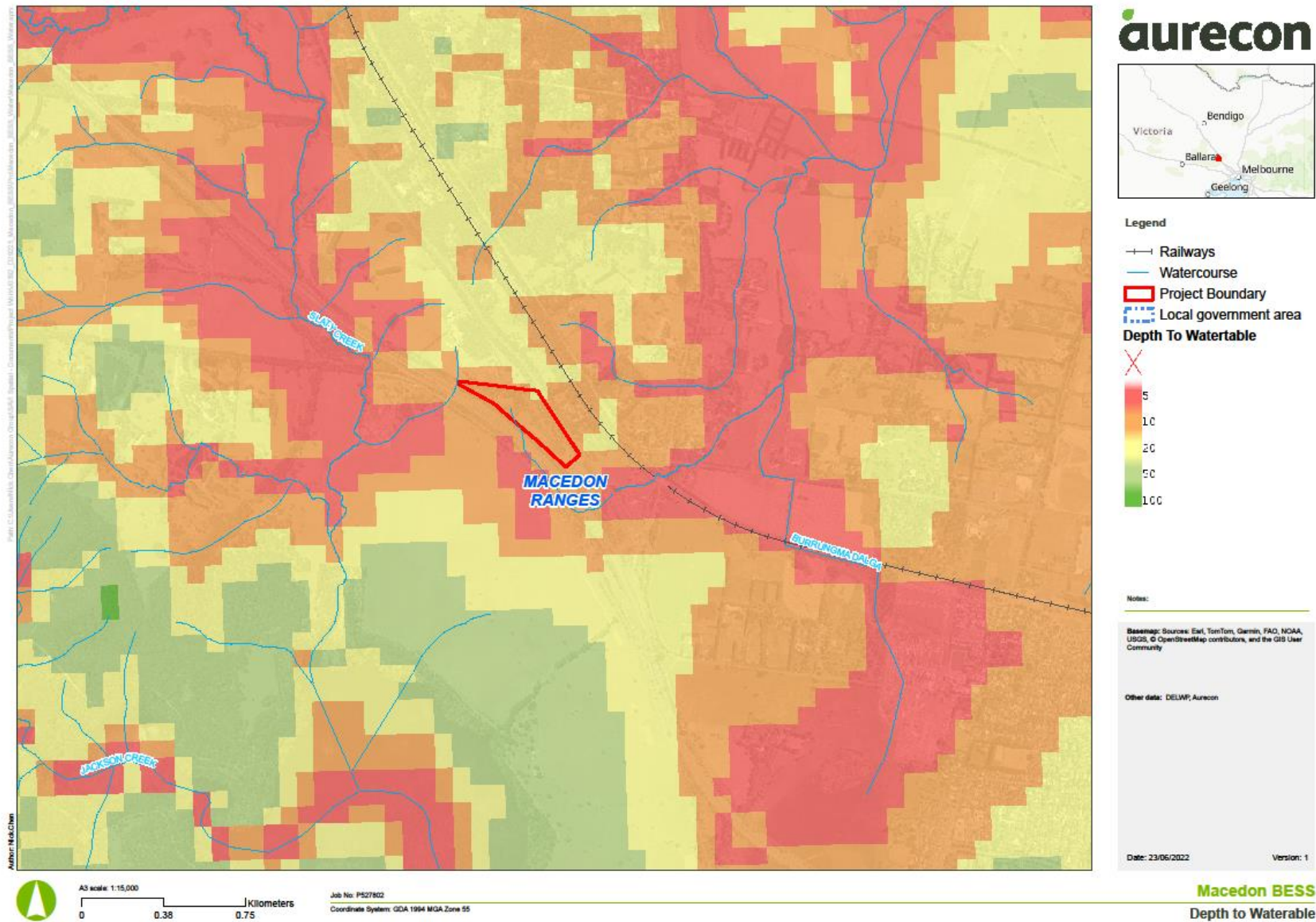


Figure 5-2: Watertable depth (m bgl) surrounding the Macedon BESS Project Area

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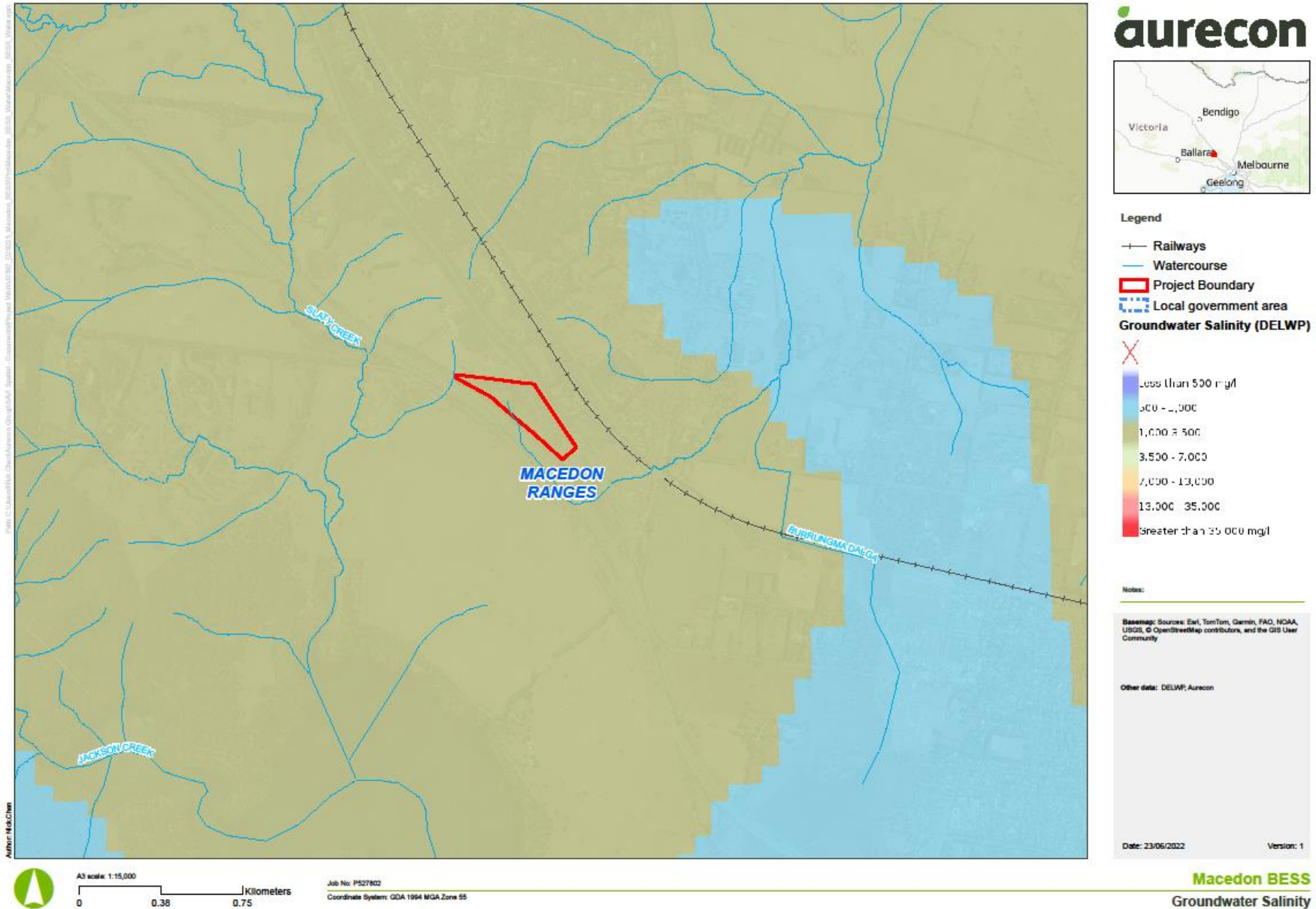


Figure 5-3: Groundwater Salinity (Total Dissolved Solids mg/L) surrounding the Macedon BESS Project Area

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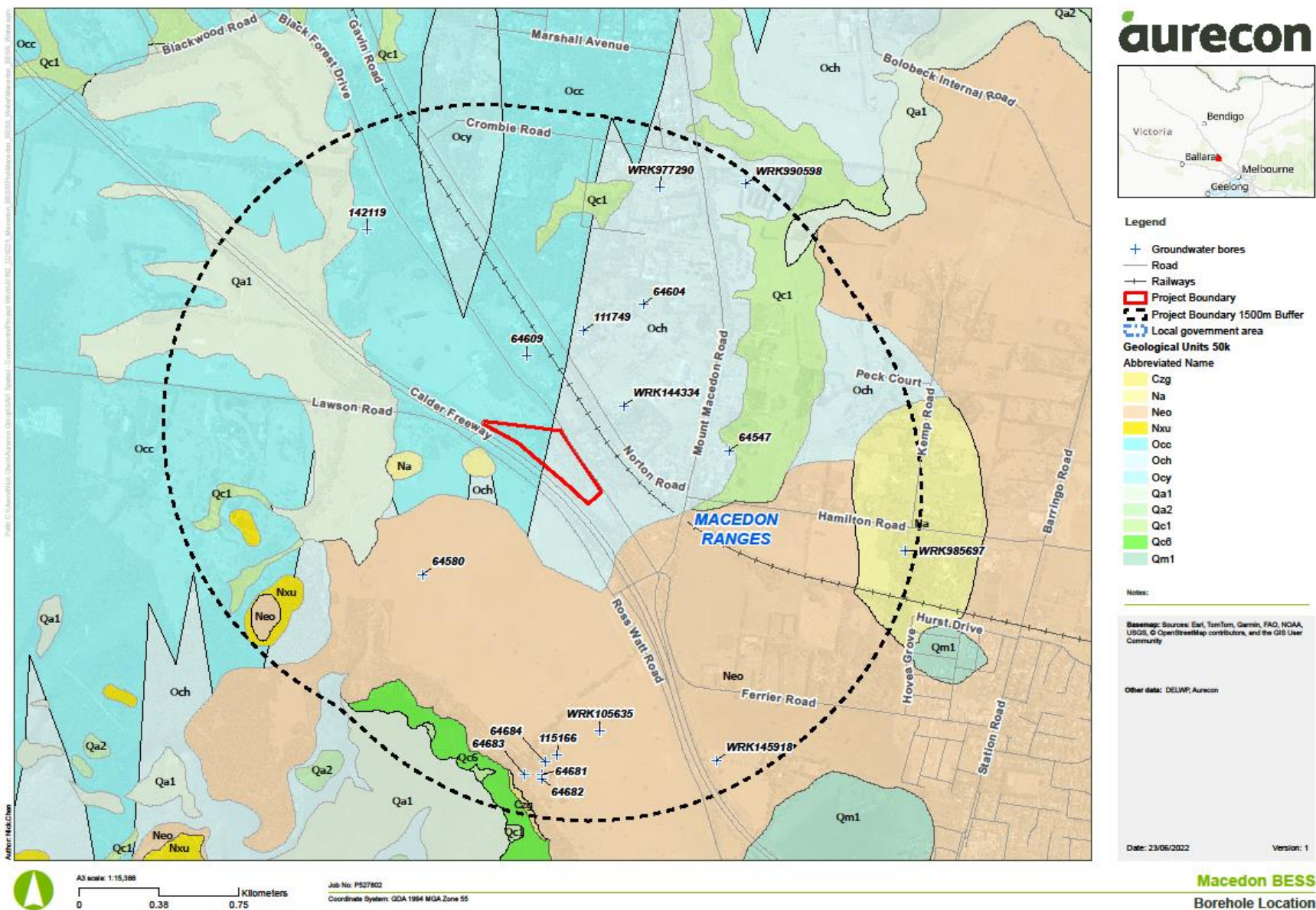


Figure 5-4: Boreholes surrounding the Macedon BESS Project Area

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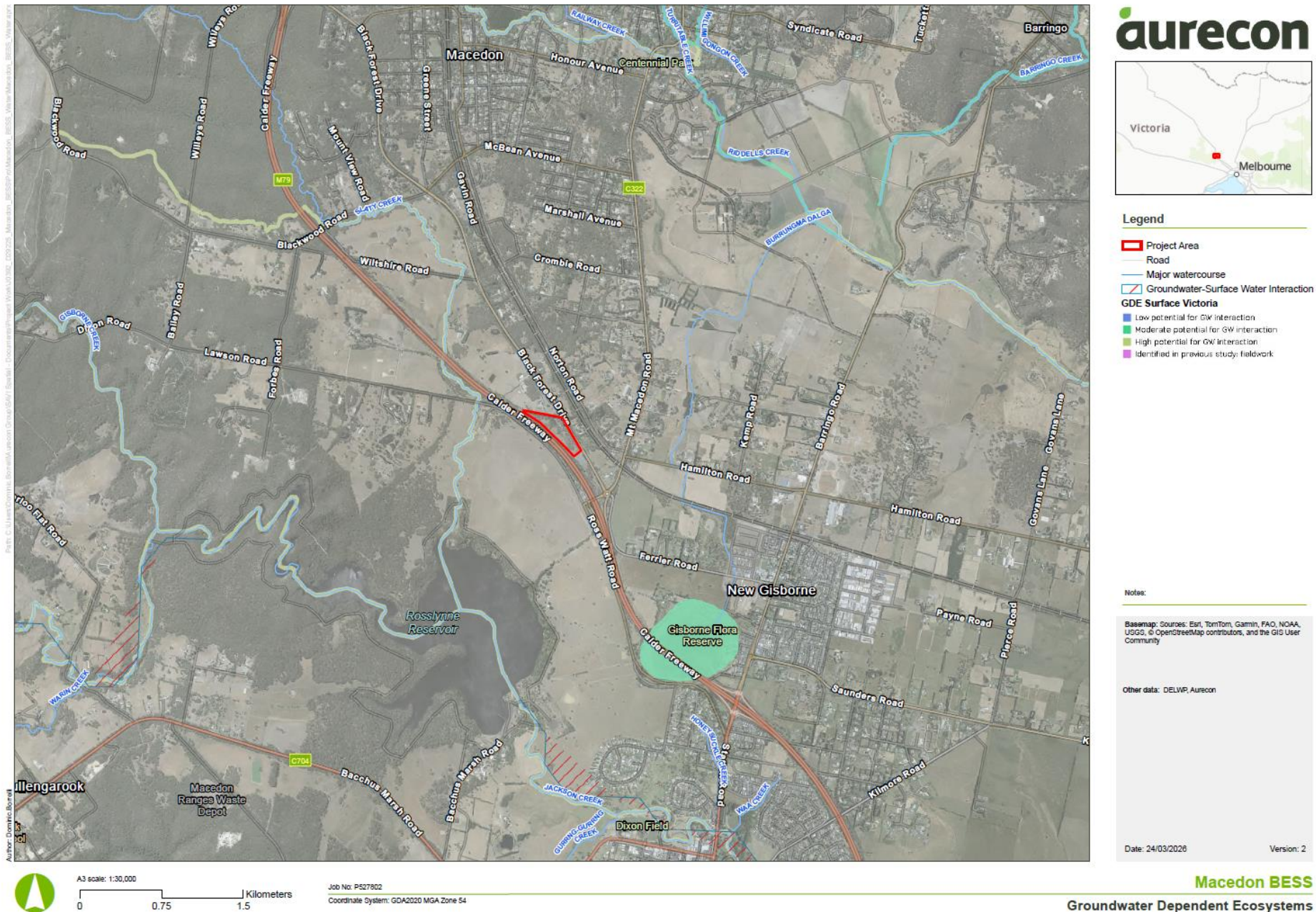


Figure 5-5 Ground Water Dependant Ecosystems surrounding the Macedon BESS Project Area

6 Impact Assessment

An impact assessment has been completed describing the potential impacts to drainage, groundwater and sensitive receiving environments. All potential impacts are considered to be low and key impact mitigation measures include a Construction Environmental Management Report (CEMP) to manage soils and waste on site and include a Stormwater Management Plan to manage drainage before and after construction

Impacts and mitigation measures are outlined in the following sections.

6.1 Drainage

Table 6-1: Drainage Impacts

Impact Code	Phase	Impact Description	Mitigation Measures	Residual risk rating
D01	Construction	Construction material / waste or sedimentation transported to drainage lines, impacting natural or existing drainage regimes by impeding drainage and reduction of environmental values such as visual amenity and aquatic ecosystem health.	Construction waste and material should be properly managed on site, to reduce the risk of such materials ending up in the minor drainage line that runs through the Project Area. A CEMP should be prepared to outline storage of materials and waste. Refer to EPA Publication 480 for further mitigation measures.	Low
D02	Construction	Stockpiles could obstruct localised overland flows. Stockpiles are susceptible to mobilisation of sediments which may be transported to drainage lines.	- Stockpile to be located away from overland flow pathways in the north (which flows westwards towards the Rosslynne Reservoir), and in the west and south, flowing eastwards towards Riddles Creek. - A Construction Environmental Management Report (CEMP) would be required to mitigate any risk regarding stockpiles. Minimising the number of stockpiles and the area / duration that the stockpiles are exposed would reduce risk. Locating stockpiles away from drainage lines and where they will be least susceptible to wind erosion. Refer to EPA Publication 1895 for further mitigation measures.	Low
D03	Construction / Operation	Changes to topography as a result of grading or levelling has the potential to create changes to local flow paths. It may also cause areas for water to pool and create localised waterlogging issues.	Changes to topography should be minimised as a result of construction and earthworks within the Project Area. As part of the CEMP, a stormwater management plan to mitigate any impacts to overland flow paths will be required to support any planning application. Design of the site drainage infrastructure should accommodate overland flow paths.	Low

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Impact Code	Phase	Impact Description	Mitigation Measures	Residual risk rating
D04	Operation	An increase of impervious surface area due to construction of the concrete foundations could increase surface runoff and increase the risk of local flooding / drainage impacts.	The design should consider stabilisation of the concentrated flow pathways off the impermeable hardstand to prevent erosion. Opportunities to intercept and retard peak stormwater flows should be investigated such as beneficial water reuse (vegetation planting / site amenities). As part of the CEMP, a stormwater management plan to mitigate any short-term / localised impacts as a result of increased runoff, will be required to support the planning application.	Low

6.2 Flooding

Table 6-2: Flooding Impacts

Impact Code	Phase	Impact Description	Mitigation Measures	Residual risk rating
F01	Operation	Increase of impervious surfaces has the potential to increase runoff to the surrounding area potentially increasing flooding risks.	The project is likely to cause change in annual runoff volume to the local unnamed waterway due to the increase of impervious surfaces in the area. However given there is limited flood risk in the immediate vicinity, the risk is considered to be low. As part of the CEMP, a stormwater management plan to mitigate any short-term / localised impacts as a result of increased runoff, will be required to support the planning application.	Low
F02	Operation	Construction of any Project infrastructure either within or immediately adjacent to waterways or ephemeral waterbodies increases the potential of the infrastructure being flooded during or following high rainfall events.	- Avoid locating Project infrastructure adjacent to waterways or within depressions across the site to avoid increasing flood levels or diverting flood flows. - Design of the site drainage infrastructure should accommodate overland flow paths to prevent any increase in flood levels against the newly constructed infrastructure. A stormwater management plan to mitigate any short-term / localised impacts as a result of increased runoff, will be required to support the planning application.	Low
F04	Operation	Effect of flooding of the region on the proposed Infrastructure.	Regional flooding is not expected to be a risk to the Project Area.	Low

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6.3 Groundwater

Table 6-3 Groundwater impacts associated with the Project

Impact Code	Phase	Impact Description	Mitigation Measures	Residual risk rating
G01	Operation	The Project will require some excavation works and there is the potential that excavations may intercept shallow groundwater potentially present close to unnamed waterways. If excavations result in groundwater interactions, there is potential for groundwater intrusion into works area.	- Depth to groundwater is deep (15-20 mbgl), however could be shallower in areas close to unnamed waterways. If construction works intersect groundwater in these areas, saline groundwater may be encountered. - If groundwater is encountered and dewatering is necessary, the Project should consider the disposal of saline groundwater. Depending on the volume of groundwater, disposal could occur via infiltration pits or reinjection into the groundwater.	Low
G02	Construction / Operation	The increase of impermeable surfaces for the construction of the BESS, access roads, hardstands and the operational and maintenance facility have the potential to increase runoff which may cause groundwater saturation in areas of shallow groundwater.	As the groundwater depth will likely be 15-20 m bgl, any runoff increases are unlikely to cause groundwater saturation. However, if shallow groundwater is identified during geotechnical site investigations, stormwater management and erosion control practices should be implemented during construction to stabilise soils and reduce runoff potential. The use of vegetated swales, detention basins, permeable pavements and infiltration trenches may be considered during design to reduce runoff and promote infiltration during heavy rainfall events.	Low

6.4 Sensitive Receiving Environments / Water Quality

Table 6-4: Water Quality Impacts

Impact Code	Phase	Impact Description	Mitigation Measures	Residual risk rating
WQ01	Construction	A key potential impact from construction work is an increase in sediment runoff from disturbed construction areas and exposed soil. Construction activities will result in soil disturbance with disturbed areas being more vulnerable to erosion and the generation of sediment during rainfall events. Any increase in sediment loads has the potential to impact on receiving waterways.	Implement appropriate sediment and erosion control measures to minimise the amounts of sediment entering the waterways. This should be done both throughout the construction period (where more rigorous sediment controls will need to be implemented due to high soil disturbances associated with excavation works) and operational period.	Low

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Impact Code	Phase	Impact Description	Mitigation Measures	Residual risk rating
			Prevent dust generation by applying dust suppression methods, to avoid increase in dust and soils entering waterways. In general, these measures can be achieved through compliance with all industry standard guidelines relating to construction, sediment and erosion control.	
WQ02	Construction / Operation	There is the potential for spillage of chemicals such as oils, fuels, and sprays associated with construction activities. Spills or leaks of liquids have the potential to impact water quality and aquatic biota in waterways within the Project Area and wetlands downstream. Spills and leaks can also collect on constructed hard surfaces, and wash into waterways with stormwater runoff	Implement appropriate spill control and bunding measures to control and contain spills, minimise the amount of fuels and chemicals stored on site and implement contingency plans to handle spills and document in CEMP.	Low
WQ03	Operation	An increase in the proportion of impervious surfaces in the Project Area could result in higher flow peaks and shorter flow durations during rainfall events. This can in turn result in an increase in pollutant and sediment transport to waterways, and can also create in-stream scour, generating additional sediment loads in receiving waterways.	- The Project should consider site planning and design to reduce the areas of impervious surfaces and to promote the infiltration of stormwater during rainfall events to reduce peak flows. - Stormwater management and erosion control practices should be implemented during construction to stabilise soils and reduce runoff potential. - The Project should consider the maintenance of riparian vegetation during operation, which will enhance natural infiltration of overland flow increased by impervious surfaces.	Low
SW04	Operation	Clearing of vegetation from the site could lead to increased erosion and sediment runoff. Loss of riparian or site vegetation can lead to a loss of natural nutrient buffer/filter capacity. This can result in greater concentrations of sediment and nutrients entering waterways in surface runoff	Avoid any instream or riparian works that could cause direct damage to waterways, including loss of riparian or instream vegetation, or construction or installation of instream barriers.	Low

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7 Conclusion and Recommendations

7.1 Surface Water

The Project Area is located in the upper Jacksons Creek catchment, with tributaries running to the west and east of the Project Area. There are two Declared Water Supply Catchments to the west and north east – Rosslynne Reservoir (Jacksons Creek) and Rosslynne Reservoir (Riddles Creek).

Surface water has the potential to be impacted by the Project due to increased surface runoff and sedimentation due to increased impermeable surfaces and changes in topography. Two minor unnamed waterways flow from the north western corner of the site towards Salty Creek and from the western boundary of the site towards Riddles Creek. A site inspection was undertaken and there was no surficial evidence of a waterway along the western boundary (i.e. channel, changes in topography or vegetation). As part of the Construction Environmental Management Plan (CEMP), a stormwater management plan is recommended to mitigate any localised impacts and design of the site drainage infrastructure should accommodate overland flow paths.

7.2 Groundwater

The geology beneath the Project Area is comprised of bedrock, and Quaternary alluvial sediments are present in valleys. The depth to groundwater is relatively deep, with the watertable 15-20 m bgl, so the risk of intersecting the watertable during construction is low (however groundwater could be shallower near the unnamed waterways). Groundwater salinity is also slightly brackish and consequently groundwater use is limited.

Potential impacts to surface and groundwater are generally considered to be low and key impact mitigation measures can be incorporated into a CEMP to manage drainage on site.

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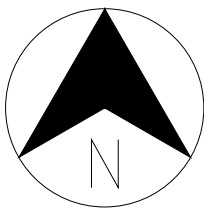
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 3. THE SURVEY HAS BEEN CONDUCTED USING AERIAL IMAGING. ACCURACY IS +/-50mm VERTICAL IN OPEN, HARD FLAT AREAS AND +/-150mm ON GROUND FEATURES IN OPEN, HARD FLAT AREAS.
 4. SERVICES SHOWN ARE INDICATIVE ONLY. POSITIONS ARE BASED ON SURFACE INDICATOR(S) LOCATED DURING FIELD SURVEY. CONFIRMATION OF THE EXACT POSITION SHOULD BE MADE TO THE RELEVANT AUTHORITIES PRIOR TO ANY EXCAVATION WORK. OTHER SERVICES MAY EXIST WHICH ARE NOT SHOWN.
 5. BUILDINGS HAVE BEEN PLOTTED FOR DIAGRAMMATIC PURPOSES ONLY.
 6. MAPPING SYSTEM IS MGA/20CD-55 (ZONE 55, MGA 2020)
 7. THE FIRE HYDRANT SYSTEM TO BE CONFIRMED WITH THE PROGRESS OF THE DESIGN
 8. THE ROAD DESIGN TO BE CONFIRMED WITH THE PROGRESS OF THE DESIGN
 8. REFER TO DRAWING EHV-MBESS-EL-DR-0102 FOR DETAILS.

- LEGEND
- BESS - BATTERY ENERGY STORAGE SYSTEM CONTAINERS
PCS - INVERTER AND MV TRFR
PH - PUMP HOUSE
O&M - OPERATION AND MAINTENANCE FACILITY
LP - LIGHT POLE & FLOOD LIGHTS
HY - FIRE HYDRANT
AUX TRFR - AUXILIARY TRANSFORMER
ST - SEPTIC TANK

- EQUIPMENT COLORS
- BUILDINGS: SURFMIST OR WOODLAND GREY
SOUNDWALLS: SURFMIST OR WOODLAND GREY
CHAINWIRE FENCE: GALVANIZED SILVER/GREY
WATERTANK: SURFMIST OR WOODLAND GREY

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DRAWING STATUS
PRELIMINARY ISSUE



-		-	-	-	-		
-		-	-	-	-		
-		-	-	-	-		
-		-	-	-	-		
B		ISSUED FOR REVIEW	G.L.S.	K.R.G.	P.N.	27/05/26	CADASTRAL OVERLAY
A		ISSUED FOR REVIEW	G.L.S.	K.R.G.	P.N.	27/10/25	PROPOSED BESS & COLLECTOR SUBSTATION LAYOUT
No		DESCRIPTION	DRAWN	CHKD	APPRD	DATE	DESCRIPTION
		REVISIONS					REFERENCES



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DRAWING TITLE
MACEDON BESS 188.6MW (501MWh)
AND 66/33kV COLLECTOR STATION
PROPOSED SITE LAYOUT

DESIGN	G.L.SMITH	DRAWN	G.L.SMITH	DATE	27/10/2025
A1 SCALE	1:1000	CAD FILE	EHV-MBESS-EL-DR-0109	FOLDER	MBESS
DRAWING NUMBER	EHV-MBESS-EL-DR-0109	SHEET NUMBER	1	OF	1
		REV			B