SQUADRON ENERGY

Gol Gol Wind Farm

Scoping Report

May 2024

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Prepared for Squadron Energy

May 2024

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Squadron Energy

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Executive Summary

Squadron Renewable Energy Developments Pty Ltd (Squadron Energy), 'the Applicant', proposes to develop the Gol Gol Wind Farm project (the project) approximately 10 kilometres (km) north east of Mildura in the local government area (LGA) of Wentworth in the Western Murray Region of New South Wales.

The project will consist of up to 120 wind turbine generators (WTGs), including transmission, ancillary and temporary infrastructure. The project will have an installed capacity of up to approximately 840 megawatts (MW).

The proposed location of this project is within the South West Renewable Energy Zone (REZ), one of the five REZs established by the NSW Government to encourage investment in renewable energy developments in these locations. Export of energy to the electricity network will be via Project EnergyConnect at the Buronga substation.

The project is located within eight freehold land parcels owned by a single landowner. These freehold parcels are termed the project investigation area. The project investigation area is approximately 48,000 hectares (ha), although a proposed development corridor of approximately 10,500 ha is proposed to site the Wind farm and infrastructure. This corridor will be subject to ongoing design refinement and the final development corridor will be presented in the Environmental Impact Statement (EIS).

The project is State significant development (SSD) pursuant to Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP), being electricity generating works with an estimated development cost (EDC) of more than $30 million. Accordingly, approval for the project is required under Part 4, Division 4.7 of the NSW Environmental Planning and Assessment Act 1979 (EP&A Act).

This scoping report supports a request to the NSW Department of Planning, Housing and Infrastructure (DPHI), for Secretary's Environmental Assessment Requirements (SEARs) for the project. This scoping report provides a high-level description of the project, including the site and its surroundings, the environmental planning pathway for approval and identifies key environmental issues potentially associated with the project. This scoping report has been prepared in accordance with State Significant Development Guidelines – Preparing a Scoping Report (DPIE 2022a).

The aspects identified as requiring detailed assessment in the EIS include biodiversity - terrestrial, Aboriginal heritage, amenity – visual, amenity – noise and vibration, social, and access – traffic. Aspects requiring standard assessment include, historic heritage, land, water, air, hazards and risks, biodiversity – aquatic, economic and built environment.

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1 Introduction

1.1 Background

Squadron Renewable Energy Developments Pty Ltd (Squadron Energy), 'the Applicant', proposes to develop the Gol Gol Wind Farm (the project) approximately 10 kilometres (km) north of Mildura in the local government area (LGA) of Wentworth in far Western Murray Region of New South Wales. The proposed project will be developed on freehold land that is predominantly used for agricultural activities.

The project will consist of up to 120 wind turbine generators (WTGs) as well as transmission, ancillary and temporary infrastructure. The project will have an installed capacity of up to approximately 840 megawatts (MW).

1.2 Project objective

The project is within the South West Renewable Energy Zone (South West REZ), which was formally declared by the NSW Minister for Energy under Section 19(1) of the *NSW Electricity Infrastructure Investment Act 2020* and published in the NSW Gazette on Friday 4 November 2022, and an updated NSW Gazette related to the access scheme published on 12 April 2024. The NSW Government intends that the South West REZ will have a generation capacity cap of 3.98 GW.

The project is consistent with NSW government energy policy framework for development of electricity infrastructure. It will assist in meeting NSWs energy generation requirements, as well as the NSW and Australian Government emissions reduction targets.

1.3 Project overview

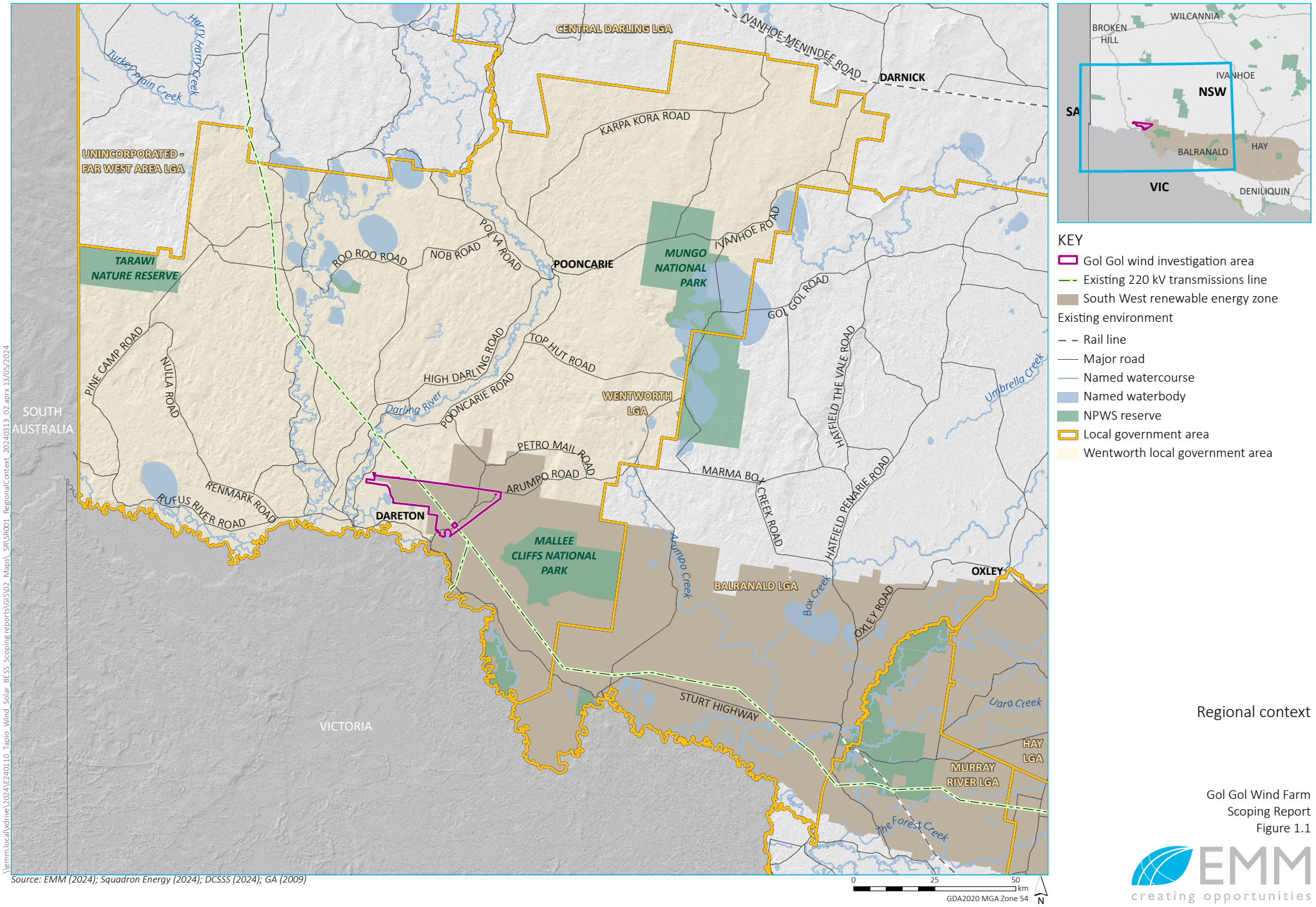
The key components of the project are:

- approximately 120 WTGs with a total height (tip height) of approximately 280 metres (m), with an installed generating capacity of up to 840 MW
- a network of underground and overhead powerlines will be installed across the development corridor and will connect the WTGs to up to three on-site collector substations and transmission connections to the Buronga substation
- infrastructure including private access roads, internal tracks, operations and maintenance facilities.

The project is made up of eight freehold land parcels (Appendix A) known as the project investigation area. The regional context shown in Figure 1.1. Within the project investigation area is the proposed development corridor, the land within which all elements of the Wind Farm are proposed to be located.

The identified development corridor is about 10,500 ha and will be subject to ongoing design refinement. The final development corridor will be presented in the Environmental Impact Statement (EIS). A description of the project is provided in Chapter 3.

The project is being developed through a comprehensive process that incorporates community and stakeholder feedback to maximise positive social, economic and environmental outcomes, while minimising adverse impacts. To date, Squadron Energy has engaged with the landowner, the wider local community, local business, a representative of the Murray Electorate Office (see Chapter 5) and the Wentworth Shire Council. Engagement will continue through the project planning and assessment process.



KEY

- Gol Gol wind investigation area
- Existing 220 kV transmissions line
- South West renewable energy zone

Existing environment

- Rail line
- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- Local government area
- Wentworth local government area

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); GA (2009)

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Regional context

Gol Gol Wind Farm
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Figure 1.1

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1.4 The Applicant

Squadron Renewable Energy Developments Pty Ltd is the applicant for the development and is part of the Squadron Energy and Tattarang Group of companies. For ease of reference, the proponent will be referred to as Squadron Energy.

Squadron Energy develops and operates energy generation and storage assets in Australia. Squadron Energy is an experienced project developer and asset operator, with the following portfolio of projects in Australia:

- Sapphire Wind Farm – operating
- Crudine Ridge Wind Farm – operating
- Bango Wind Farm – operating
- Murra Warra I and II Wind Farms – operating
- Uungula Wind Farm – approved and under construction
- Clarke Creek Wind Farm – approved and under construction
- Port Kembla Energy Terminal – approved and under construction
- Sapphire Solar Farm – approved
- Spicers Creek Wind Farm – submissions report submitted December 2023
- Jeremiah Wind Farm – EIS in preparation.

Currently Squadron Energy generates enough renewable energy to power 1.78 million homes, has avoided 7 million tonnes (t) of emissions, has created over 2,100 direct jobs and provided $350 million in regional investment.

Squadron Energy continues to use its unique extensive experience in developing projects, from inception through to operations and works closely with local communities to ensure that their projects provide significant community benefits, jobs and investment to the local and regional economy.

Applicant details are provided in Table 1.1.

Table 1.1 Summary of Applicant details

Requirement	Details
Applicant name	Squadron Renewable Energy Developments Pty Ltd
Postal address	171-173 Mounts Bay Road, Perth, WA, Australia, 6000
ABN	84 653 587 172

1.5 Purpose of this report

The project is State significant development (SSD) pursuant to Schedule 1 of the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP), being electricity generating works with an estimated development cost (EDC) of more than $30 million. Accordingly, approval for the project is required under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act).

An SSD application needs to be accompanied by an Environmental Impact Statement (EIS), that addresses the requirements of Part 8, Division 5, Section 190 and 192 of the NSW *Environmental Planning and Assessment Regulation 2012* (EP&A Regulation) and the Secretary's Environmental Assessment Requirements (SEARs) for the project.

This scoping report supports a request to the NSW Department of Planning, Housing and Infrastructure (DPHI), for SEARs for the project. The SEARs will identify the matters to be assessed in the EIS and the level of assessment required.

This scoping report provides a high-level description of the project, including the site and its surroundings, the environmental planning pathway for approval and identifies key environmental issues potentially associated with the project.

It has been prepared by EMM Consulting Pty Limited (EMM) on behalf of Squadron Energy in accordance with the following guidelines:

- State significant development guidelines - preparing a scoping report: Appendix A to the state significant development guidelines (DPIE 2022a) (Scoping Report Guidelines)
- Social Impact Assessment Guideline (DPE 2023a)
- Undertaking Engagement Guidelines for State Significant Projects (DPIE 2022b) (Engagement Guidelines)
- Cumulative Impact Assessment Guideline for State Significant Projects (DPIE 2022c)
- Wind Energy Guideline for State Significant Wind Energy Development (DPE 2016)
- Draft Wind Energy Guideline (DPE 2023b)

The project outlined in this scoping report will be refined during the preparation of the EIS, including in response to the findings of detailed environmental investigations and feedback from community and stakeholder engagement.

1.6 Related development

The only existing or approved development within the project investigation area is Project EnergyConnect, which includes the Buronga substation upgrade, located on Arumpo Rd approximately 8 km north of Buronga.

The project will ultimately connect to the Buronga Substation. The project is located on freehold land directly adjacent and surrounding the Buronga Substation lot. The final connection proposal would depend on the final capacity of the development and would be detailed in the EIS.

Squadron Energy is also proposing to develop separate Solar Farm (Gol Gol Solar Farm) and Battery Energy Storage System (Gol Gol BESS) projects on lands within the Wind Farm investigation area. These projects will be subject to separate SSD assessments. All potential cumulative impacts would be assessed during preparation of the EIS.

2 Strategic context

2.1 Regional context

The project investigation area is within the Wentworth Shire Council Local Government Area (LGA), approximately 700 km west of Sydney and 400 km north-east of Adelaide and 550 km north of Melbourne. The Wentworth Shire Council LGA encompass an area of approximately 26,000 square kilometres (km2) and forms part of the NSW Murray Region (Figure 1.1). The project is located approximately 10 km north east of Mildura and 8 km north of Gol Gol.

The region is one of the most productive farming regions in Australia producing citrus, grapes, almonds, and wine. The Sturt Highway and Silver City Highway, directly south of the project, intersect at Buronga and connects the region to major population centres in NSW, Victoria, and South Australia.

The development corridor accommodates the Wind Farm and is located within the South West REZ and directly adjacent to Project EnergyConnect, which includes the construction and operation of a new high voltage (HV) 330 kV interconnector between NSW and South Australia, with an additional 220 kV connection to north-west Victoria. The local context of the project, and the landholding in which it is located, is shown in Figure 2.1.

There are also a number of other SSD projects proposed within the South West REZ, the Wentworth LGA and the neighbouring Balranald LGA. Of note, the Mallee Solar Farm (SSD- 69576706) and Mallee Wind Farm (SSD-53293710), currently both preparing an EIS, are located east of the proposed project. These are detailed further in Section 2.2.2 and Figure 2.2.

2.1.1 Towns and population centres

The project is located approximately 10 km north from Mildura, a Victorian regional centre with a population of about 34,000. A range of services to the region are in Mildura including an airport, hospital and other health services and a university.

There are also small townships in the vicinity of the project in New South Wales. Gol Gol is approximately 8 km south of the project and has a population of around 1,959. Buronga is approximately 8 km south west of the project and has a population of around 1,252 people. Dareton is approximately 8 km south west of the project and has a population of around 456 people. Wentworth is approximately 10 km south west of the project and has a population of around 1,577 people. The townships are all located on the Sturt Highway and Silver City Highway near the Murray River.

2.2 Project investigation and surrounds

The Wind Farm is located on freehold land owned by a single landowner who undertakes agricultural operations within the land. The development corridor is a smaller subset of the project investigation area and consists both of land used for agricultural practices and native vegetation.

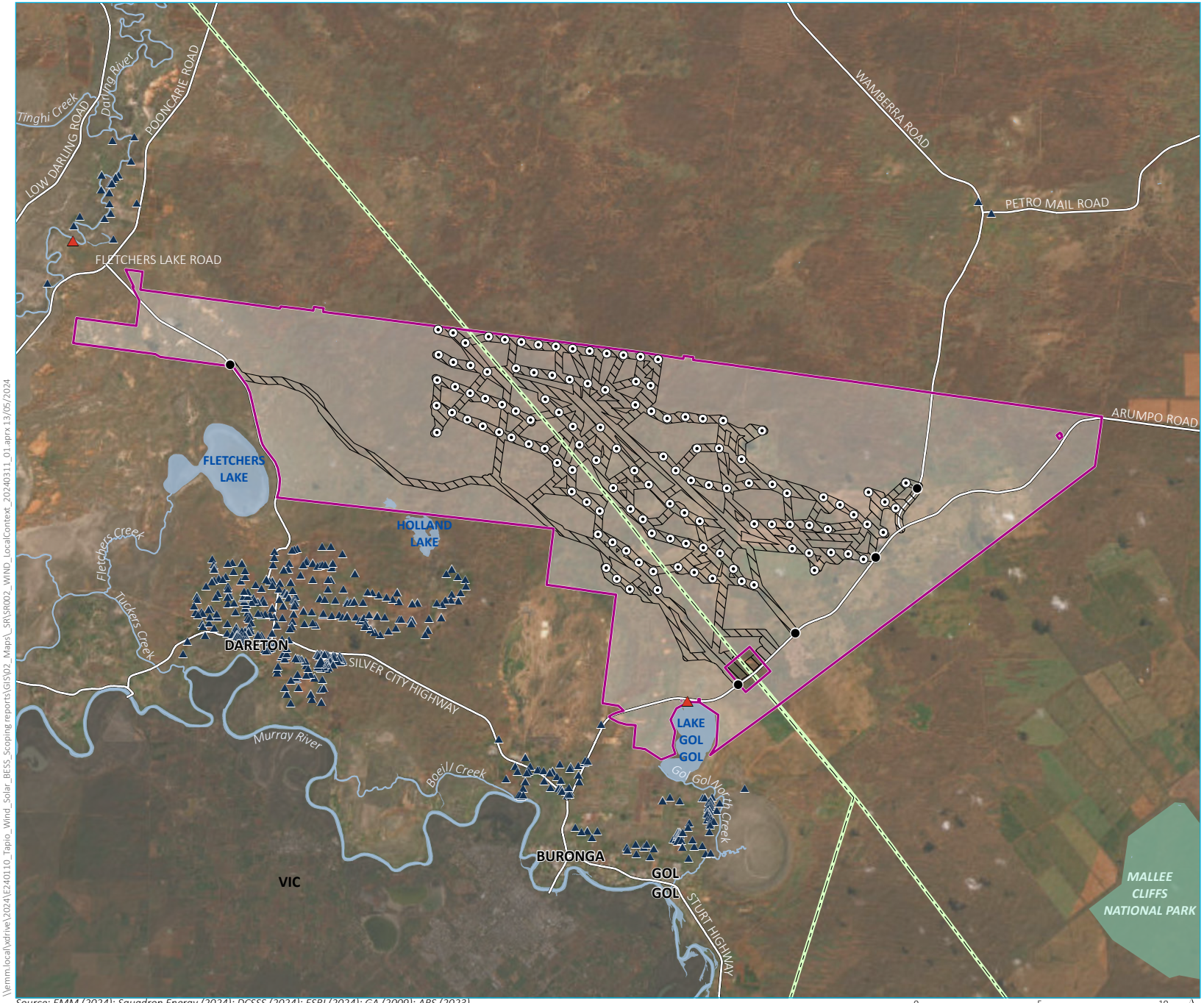
Site access will be via Arumpo Road (east) and Fletchers Lake Road (west) (Figure 2.1). Arumpo Road and Fletchers Lake Road are sealed roads, from which internal access tracks will be established to connect key infrastructure elements to the Silver City Highway. The internal tracks will serve both as access for servicing and maintaining project infrastructure.

The area surrounding the development corridor is sparsely populated, with one associated residence located along Arumpo Road near Lake Gol Gol. Outside of the development corridor, the population density increases towards the townships of Dareton, Buronga and Gol Gol.

A summary of the key features of the development corridor and surrounds is provided in Table 2.1.

Table 2.1 Key features of the development corridor and surrounds

Aspect	Description
LGA	The project investigation area is within the Wentworth Shire Council LGA.
Land zoning	The development corridor is zoned RU1 Primary Production under the Wentworth *Local Environment Plan 2011* (Wentworth LEP).
Nearby townships	Nearby townships and populations include: • Gol Gol - approximately 8 km south (population of approximately 1,959 (ABS 2021)) • Buronga - approximately 8 km south west (population of approximately 1,252 (ABS 2021)) • Dareton – approximately 8 km south west (population of approximately 456 (ABS 2021)) • Wentworth – approximately 10km south west (population of approximately 1,577 (ABS 2021))
Landscape	The majority of the investigation area is remnant vegetation with large patches of previously cleared land (Category 1) in the south-east. The south-western boundary of the investigation area encroaches onto the edge of a large salt marsh while a small wetland and a small lake, both unnamed, are located in the north-west.
Land use	Land use within the project investigation area includes agricultural operations (livestock grazing as well as discrete areas for cropping).
Land ownership	The project investigation area is on freehold land, comprising eight lots. The project has secured a land access agreement with the landowner.
Residences	No residential properties within the project investigation area
Nearby natural features	• Lake Gol Gol • Gol Gol swamp • Murray River • Various unnamed waterways • Lake Ranfurly and Kings Billabong Wetlands • Fletchers Lake, • Mallee Cliffs National Park
Nearby existing infrastructure	State Roads: Silver City Highway (B79) and Sturt Highway (A20), Local Roads: Arumpo Road, Wamberra Road, Mourquong Road, Fletchers Lake Road Energy infrastructure: 220kV transmission line Energy infrastructure under construction: Project EnergyConnect and Buronga Substation



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line
- Wind farm- turbine location
- Site access

Sensitive receiver

- Dwelling associated with the project
- Dwelling not associated with the project

Existing environment

- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- Victoria

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Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009); ABS (2023)

0 5 10 km

GDA2020 MGA Zone 54

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Local context

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Figure 2.1

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2.2.1 Property vegetation plan

Property vegetation plans (PVPs) have been identified within the project investigation area. The details of the PVPs will be investigated as part of the EIS and offset areas and areas not to be cleared will be accommodated within the development corridor.

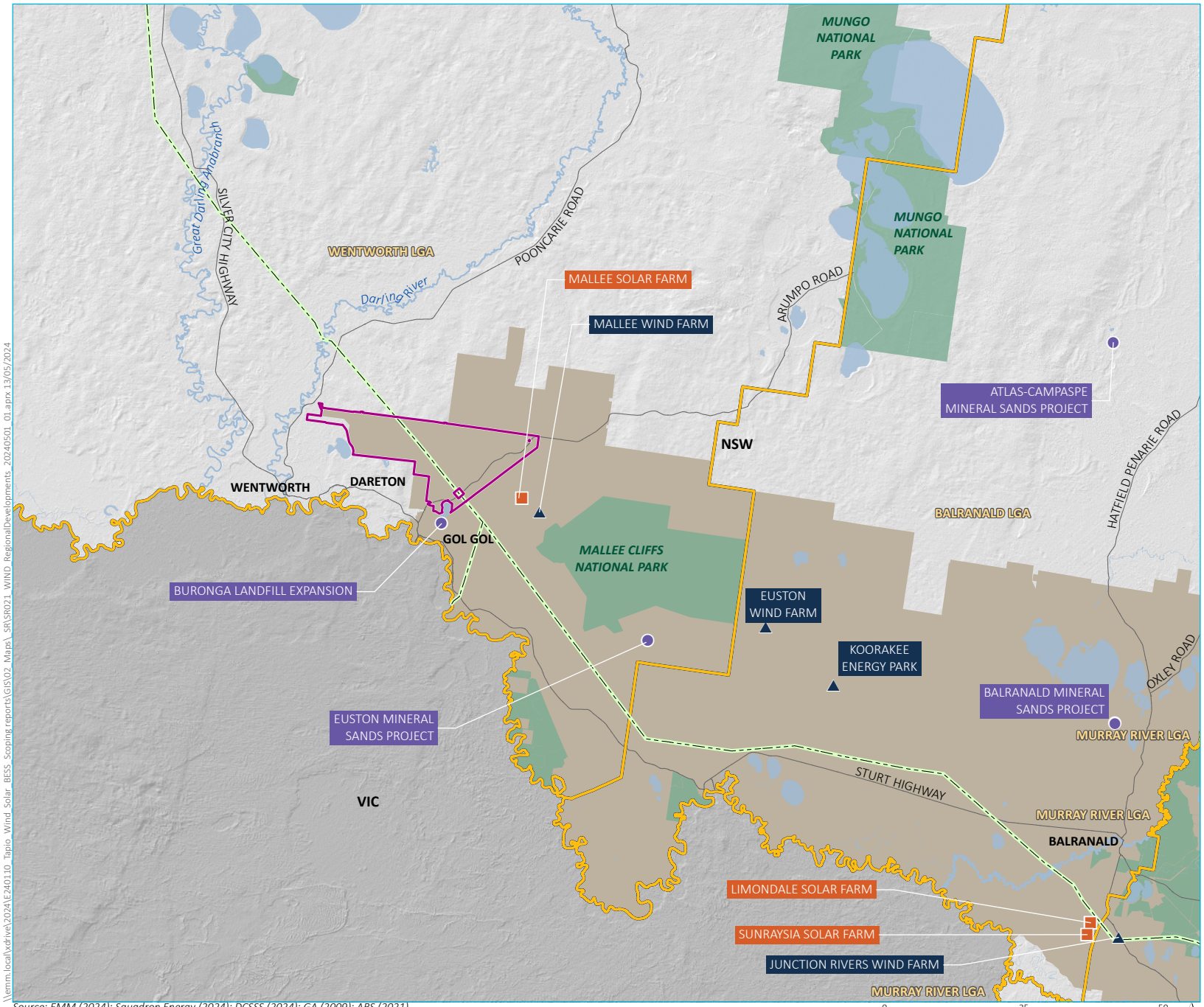
2.2.2 Renewable energy and other developments

The project is within the South West REZ, which has been identified as a key location in NSW for the delivery of renewable energy and energy storage infrastructure. There are operating, approved and proposed renewable energy developments in the vicinity of the project, as well as other infrastructure and mining projects. These are summarised in Table 2.2 and shown in Figure 2.2.

Table 2.2 Nearby renewable developments and major projects

Project	Development type	Status
Project EnergyConnect	Electricity transmission	Approved – under construction
Buronga Landfill Expansion	Landfill	Operational
Mallee Wind Farm	Wind farm	Proposed – EIS in preparation
Mallee Solar Farm	Solar farm	Proposed – SEARS application submitted
Euston Wind Farm	Wind farm	Proposed – EIS in preparation
Koorakee Energy Park	Wind farm, solar farm and Battery Energy Storage System	Proposed – SEARS application submitted
Junction Rivers Wind Farm (formerly Burrawong Wind Farm)	Wind farm	Proposed – EIS in preparation
Limondale Solar Farm	Solar farm	Operational
Sunraysia Solar Farm	Solar farm	Operational
Euston Mineral Sands mine	Mineral sands mine	Operational
Balranald Mineral Sands mine	Mineral sands mine	Operational
Atlas-Campaspe Mineral Sands mine	Mineral sands mine	Operational

Source: https://www.planningportal.nsw.gov.au/major-projects



KEY

- Gol Gol wind investigation area

Nearby SSD development

- Solar development
- Wind development
- Non-renewable project

Existing environment

- Major road
- Existing 220 kV transmissions line
- Named watercourse
- Named waterbody
- NPWS reserve
- Local government area
- South West renewable energy zone

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); GA (2009); ABS (2021)

0 25 50 km

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Renewable energy and other developments in the region

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Figure 2.2

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2.3 Planning framework

An overview of relevant key policies, plans and strategies, and how the project aligns with these, is provided in Table 2.3.

Table 2.3 Alignment with key strategic planning framework and policy contexts

Plan, policy or strategy	Description	Alignment with strategic framework
International context		
The Paris Agreement	The Paris Agreement is a legally binding international treaty on climate change adopted by 196 parties in 2015. As a signatory to the agreement, the Australian Government has committed to reduce greenhouse gas emissions by 26–28% on 2005 levels by 2030.	The project will contribute to meeting Australia's commitments under the Paris Agreement by reducing the National Electricity Market's (NEMs) annual greenhouse gas (GHG) emissions.
National context		
Climate Change Act 2022	The *Climate Change Act 2022* provides a policy framework for the implementation of Australia's net-zero commitments and outlines Australia's net 2030 and 2050 greenhouse gas emission reduction targets under the Paris Agreement.	The project will contribute to meeting Australia's net 2030 and 2050 commitments.
Large-scale Renewable Energy Target (Clean Energy Regulator 2021)	The Australian Government Clean Energy Regulator administers the large-scale renewable energy target which incentivises investment in renewable energy power stations such as wind farms. The large-scale renewable energy target of 33,000 GWh of additional renewable electricity generation was met at the end of January 2021 (Clean Energy Regulator 2021). The annual target will remain at 33,000 GWh until the scheme ends in 2030.	It is noted that the annual target has been met and will remain at 33,000 GWh until the scheme ends in 2030. Once operational, the project will contribute towards meeting the large-scale renewable energy target.
Integrated System Plan 2022 (AEMO 2022)	The Australia Energy Market Operator's *Integrated Systems Plan* (ISP) *2022* (AEMO 2022)) is an "Actionable roadmap for eastern Australia's power system to optimise consumer benefits through a transition period of great complexity and uncertainty". Renewable energy zones (REZs) are identified in the ISP as "high-quality resource areas where clusters of large-scale renewable energy projects can be developed using economies of scale". The ISP identifies that significant investment in the NEM requiring a nine-fold increase in utility-scale variable renewable energy (VRE) and that "much of this resource will be built in REZs that coordinate network and renewable investment, and foster a more holistic approach to regional employment, economic opportunity and community participation".	The project will contribute to the development of the South West REZ.
Draft Integrated System Plan 2024	The ISP is published every two years and shows where new transmission, generation and storage is needed across the National Electricity Market (NEM). The *Draft Integrated System Plan 2024* (Draft ISP) is currently up for public comment until 16 February	The Draft ISP highlights the urgent need for investment in new renewable energy generation, transmission, and storage projects to meet the NEM renewable electricity generation targets and deliver secure, reliable, and affordable energy.

Table 2.3 Alignment with key strategic planning framework and policy contexts

Plan, policy or strategy	Description	Alignment with strategic framework
	2024 before its finalisation and publication circa June 2024.	As the project is within the South West REZ and connects to the existing electricity supply networks, the project strategically aligns with the objectives of the Draft ISP.
Australia's Long-Term Emissions Reduction Plan (DCCEEW 2022)	The Australian Government's *Long Term Emissions Reduction Plan* (Australian Government 2021) is to achieve net zero emissions by 2050. The Plan aims at reaching a net zero economy through a technology-based approach, whilst protecting relevant industries, regions and jobs. It is part of an overarching strategy for emission reduction, based on a technology-led approach which includes a technology investment roadmap and its low emissions technology statements.	The project will reduce GHG emissions associated with energy generation over its operational life.
State context		
Net Zero Plan Stage 1 2020–2030 (DPIE 2020a)	The *Net Zero Plan Stage 1 2020–2030* (DPIE 2020a) outlines the NSW Government's plan to grow the economy and create jobs while helping the state to deliver a 35% cut in emissions compared to 2005 levels.	The project contributes to Priority 1 of the Net Zero Plan: "drive uptake of proven emissions reduction technologies that grow the economy, create new jobs or reduce the cost of living." The project will fall within the south West REZ. The region has been identified as an ideal location to play a key role in a renewable energy future for NSW due to its good renewable energy resources and opportunity to utilise electricity network infrastructure. The project will utilise these benefits to contribute to the NSW Net Zero Plan.
The Climate Change (Net Zero Future) Act 2023	*The Climate Change (Net Zero Future) Act 2023* enshrines whole-of-government climate action to delivery net zero by 2050 and legislates the NSW governments approach to addressing climate change. The Act legislates: • guiding principles for action to address climate change • emissions reduction targets • an objective for NSW to be climate resilient • establishment of an independent Neto Zero Commission expert.	The project is within the South West REZ and is ideally placed to assist in meeting the emissions reduction targets for NSW.
NSW Electricity Infrastructure Investment Roadmap (DPIE 2020b)	The *Electricity Infrastructure Roadmap* coordinates investment in transmission, generation, storage and firming infrastructure as ageing coal-fired generation plants retire. The roadmap includes actions that will deliver 'whole-of system' benefits. The roadmap sets out a plan to deliver the State's first five REZs in the Central-West Orana, New England, South West, Hunter-Central Coast, and Illawarra regions.	The project is within the South West REZ and is ideally placed to contribute to the success of the roadmap.

Table 2.3 Alignment with key strategic planning framework and policy contexts

Plan, policy or strategy	Description	Alignment with strategic framework
Wind Energy Guideline (DPE 2016a)	The *Wind Energy Guideline* provides the community, industry and regulators with guidance on the planning framework for the assessment of large-scale wind energy development proposals that are SSD and identifies the key planning considerations relevant to wind energy development in NSW.	Site selection and impact assessment considerations detailed in the guideline have been, and will continue to be, used to inform the project and will be considered in the EIS.
Draft Energy Policy Framework	The NSW DPHI recently put a *Draft Energy Policy Framework (*Draft Framework) out for public consultation until 29 January 2024. The framework is proposed to support faster and more consistent decision making and provide greater certainty communities and energy industries.	The Draft Framework includes updates and additional guidelines that detail how impacts of renewable energy and transmission projects will be assessed and managed. The *Wind Energy Guideline* updates also contain revised guidance for onshore wind energy projects including updated technical supplements for visual and noise impact assessment. The *Benefit-Sharing Guideline* contains guidance for benefit sharing with communities and planning agreements for wind energy development. Impact assessment and project description considerations will be considered within the EIS at the adoption of the amended guidelines.
NSW Electricity Strategy 2019 (DPIE 2019)	The *NSW Electricity Strategy* is the NSW Government's plan for a reliable, affordable and sustainable electricity future that supports a growing economy. Four of NSWs five remaining coal-fired generators are scheduled to close by 2035, starting with Liddell Power Station in 2023 (DPIE 2019). The strategy outlines a reliable energy system which meets NSWs energy requirements and emission reduction targets. The strategy and its enabling legislation, the *Electricity Infrastructure Investment Act 2020*, supports the rolling out of REZs and the establishment of the Energy Corporation of NSW (Energy Co) with the objectives of bringing together investors, conducting early planning and maximising benefits to local communities.	The project will contribute to the development of the South West REZ of NSW, will assist in meeting NSWs energy generation and storage requirements, and in meeting the NSW Government's GHG emissions reduction targets.
Local and regional context		

Table 2.3 Alignment with key strategic planning framework and policy contexts

Plan, policy or strategy	Description	Alignment with strategic framework
Wentworth Local Environmental Plan (LEP) 2011	The LEP provides the framework that guides land use and development within the local government area through zoning and development standards. The LEP also sets out objectives for each land use zone.	The project investigation area is located on landed zoned RU1 and C2 under the Wentworth LEP 2011. The wind farm development corridor comes in close proximity to but has been developed to avoid the environmental conservation zoning. The project is considered to be consistent with the objectives of the RU1 zone.
Far West Regional Plan 2036	The *Far West Regional Plan 2036* (DPIE 2017) guides land use planning priorities and decision making in the Far West region for the next two decades. The vision identifies the Far West region as a leader for sustainable and cost-effective electricity production, as well as looking to support the agricultural industry and expand the food processing sector.	The plan highlights the objectives of leading renewable energy technology and investment and leveraging new and upgraded infrastructure. The project is aligned with key objectives within the plan as it is a new renewable energy project.
Wentworth Shire Council Community Strategic Plan 2017 - 2027	The *Wentworth Shire Community Strategic Plan 2032* outlines the aspirations and long-term vision of the Wentworth LGA community. Specific focus is placed on growing the economy, delivering infrastructure, protecting the vulnerable, improving health, education, and public services. The community is concerned about a deteriorating economic base, reduced employment opportunities and achieving infrastructure required to support tourism.	The project contributes to the Wentworth *Shire Community Strategic Plan 2017 - 2027*, by providing the opportunity for employment and other indirect economic benefits to the local community throughout the life of the project.
Wentworth Shire Local Strategic Planning Statement	The *Wentworth Shire Council Local Strategic Planning Statement* sets the land use framework for Wentworth Shire's economic, social and environmental land use needs to 2040. It addresses the planning and development issues of strategic significance to the Council through planning priorities and actions, spatial land use direction and guidance.	The project will contribute towards achieving key planning priorities of the Wentworth Shire *Local Strategic Planning Statement* including: • Economy - Developments in renewable energy projects in the Shire provide opportunities to bolster the economies of Wentworth Shire townships. • Society – Wentworth Shire is well placed to take advantage of its wind endowments as well as its strategic location on the transmission network.

2.4 Project justification

The State's four existing coal fired power stations that currently provide around three quarters of NSW's electricity supply are closing progressively. The development of renewable energy projects aligns with State and federal government commitments to both increase renewable energy generation to replace fossil fuels that are currently meeting Australian energy needs and to reduce carbon emissions.

The proposed location of this project is within the South West REZ, one of the five REZs established by the NSW Government to encourage investment in renewable energy developments in these locations. The intended capacity of the project, being up to 840 MW, will contribute to renewable power being provided to households in NSW.

2.4.1 Project benefits

The project will contribute to meeting these government objectives and carries additional benefits including:

- job creation during the construction and operational phases
- indirect economic benefits to the local community throughout the life of the project
- supports Australia's transition towards clean and renewable sources of energy.

2.4.2 Site suitability

Key considerations for Squadron Energy's selection of the project investigation area are:

- availability of a suitable wind resource
- landholder agreeing to host the wind farm
- large separation distances to populated areas to minimise visual and amenity impacts
- positioning within the South West REZ
- flat topography and large land area available to position infrastructure and avoid constraints
- proximity directly to existing transmission and the approved Project EnergyConnect infrastructure including the Buronga Substation.

Project EnergyConnect includes the construction and operation of a new high voltage (HV) interconnector between NSW and South Australia, with an additional connection to north-west Victoria. Project EnergyConnect aims to reduce the cost of providing secure and reliable electricity transmission between NSW and South Australia 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. The positioning of the project adjacent to this important piece of planned energy infrastructure will reduce the need for extensive new transmission infrastructure.

3 Project description

3.1 Overview

The project includes the installation, operation and maintenance and decommissioning (or repowering) of approximately 120 WTGs and associated infrastructure (Figure 3.1). The project will have an installed capacity of up to 840 MW.

Project infrastructure will be contained within the development corridor, which has been sized with sufficient flexibility to accommodate design refinement during the preparation of the EIS. It is noted that the development corridor being investigated as part of the scoping phase is a conservative area for early assessment purposes and the proposed disturbance area will likely be significantly smaller, subject to further detailed assessment and design.

The final layout and capacity of the project will be selected based on environmental constraints identification, further landowner engagement, engineering assessment and detailed design of the project infrastructure. The development corridor is likely to be refined during the EIS phase.

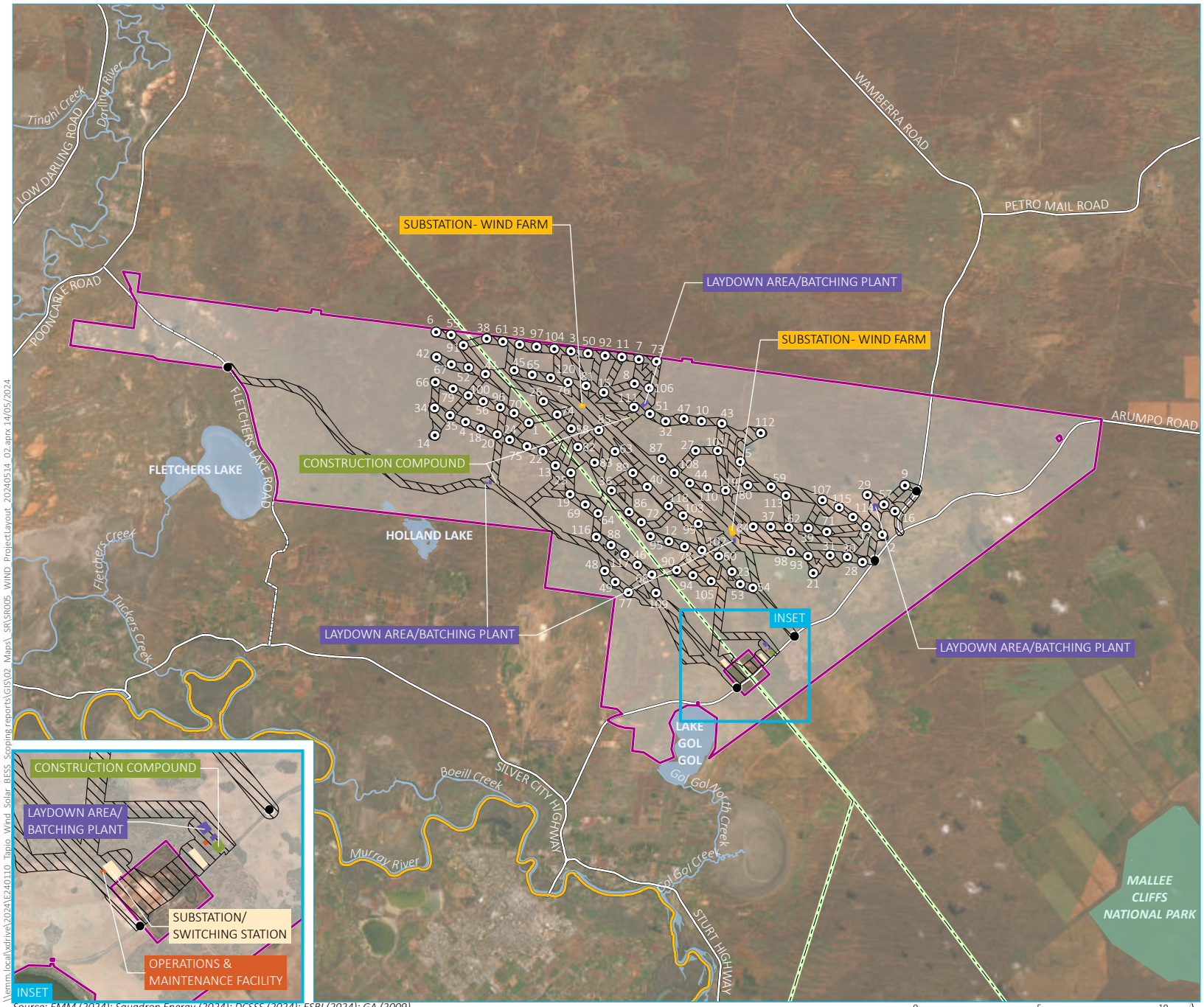
A summary of the project elements is provided in Table 3.1 and detailed in Figure 3.1, with further details provided in Sections 3.2 to 3.4.

Table 3.1 Indicative project summary

Project element	Details
Overview	
Investigation area	Approximately 48,000 ha
Development corridor	Approximately 10,500 ha (subject to further design refinement as the project progresses)
Land tenure	The project investigation area is on freehold land, comprising eight lots (Appendix A) owned by a single landowner.
Project capacity	Up to 840 MW
Wind	
WTGs	Up to 120 WTG's. 3 blade system
WTG height	Approximately 280 m
Rotor diameter	Approximately 200 m
Lowermost blade tip height above ground	40 m
Tower (hub) height	180 m
WTG foundations (excavation size)	Up to 120 and approximately 65 m diameter
Ancillary Infrastructure	
Substations	Three on-site collector substations and transmission connections to the Buronga substation
Operations and maintenance compounds	Up to 4 locations. Approximately 1 ha each

Table 3.1 Indicative project summary

Project element	Details
Transmission	Overhead and / or underground transmission lines will be constructed to connect the wind farm to the Buronga Substation or along the transmission line near the existing substation. The route and specifications of the transmission lines will be presented in the EIS.
Meteorological masts	Up to 4 locations. Approximately 160 m tall
Internal roads and drainage	Approximately 5 m wide unsealed private roads (excluding batters)
Temporary construction facilities	
Operations and maintenance facility	Up to two locations. Approximately 1ha each.
Laydown area / batching plants	Up to 7 locations ranging in size from approximately 3 ha – 10 ha
Roads	
Site access	Access to the development corridor will be primarily from Arumpo Road and Fletchers Lake Road. Arumpo Road and Fletchers Lake Road joins with the Silver City Highway to the south, which is the main high-capacity road in the area, adjoining the Sturt Highway at Buronga.
Intersection upgrades	Intersection upgrades may be required for over size over mass (OSOM) access. EnergyCo will work alongside TfNSW to upgrade the State's road network to help the transition to renewable energy under the 'Port to REZ' A Memorandum of Understanding (MOU) released in September 2023. Any upgrades to roads or intersections outside of NSW would be subject to relevant State based approvals
Construction	
Construction period	Approximately 24 to 36 months
Sources	Infrastructure components will be transported by heavy vehicles from ports either within NSW, Victoria, or South Australia. Construction materials will be sourced regionally and locally where possible.
Construction hours	Construction activities will generally be undertaken during standard day time construction hours (ie 7.00 am to 6.00 pm Monday to Friday and 8.00 am to 1.00 pm Saturday) with out of hours works required for key activities.
Construction workforce	Approximately 300-400 full-time equivalent (FTE)
Workforce accommodation	Nearest towns, including Wentworth Dareton, Buronga, Gol Gol, Mildura, and others (within approximately 50 km of the site). It is possible that local accommodation will not be sufficient, particularly with cumulative impacts of nearby projects, and an accommodation strategy will be developed as part of EIS.
Operations	
Operations and maintenance facilities	Centralised control room, incorporating staff amenities and ablutions
Operations hours	24 hours per day/7 days per week
Operations on-site workforce	Approximately 10-15 FTE
Project lifespan	Approximately 30 years, with the potential for repowering



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line
- Wind farm- turbine location
- Site access

Project infrastructure

- Construction Compound
- Batching plant and laydown area
- Operations and maintenance facility
- Substation
- Substation/switching station

Existing environment

- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- Local government area

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

0 5 10 km

GDA2020 MGA Zone 54

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Project layout

Gol Gol Wind Farm
Scoping Report
Figure 3.1

EMM
creating opportunities

3.2 Physical layout and design

3.2.1 Wind Turbines

A wind farm is proposed with a generation capacity of up to 840 MW. The project will include the installation of approximately 120 WTGs positioned to maximise the use of the available wind resource, whilst avoiding key constraints and responding to landowner and community inputs.

The indicative dimensions for the WTG components are detailed in Table 3.1. The WTGs will have three blades with the rotor and nacelle mounted on a tower with an internal ladder or lift.

The final number and proposed placement of WTGs will be determined as part of the final layout to be assessed in the EIS. WTGs will be installed at final locations within the development corridor and in accordance with the micro-siting restrictions identified in the EIS and will depend on a range of factors including WTG technology, available grid capacity, economies of scale, grid connection and environmental constraints.

3.2.2 Electrical collection system and substations

A network of underground and overhead powerlines will be installed across the development corridor and will connect the WTGs to the on-site collector substations. The final configuration of the cabling may be underground or aboveground depending on geotechnical conditions, but generally the high voltage cabling will be aboveground and the medium to low cabling underground.

The on-site collector substations will be constructed within the development corridor to convert the on-site AC reticulated electricity to 220 kV for export to the existing grid, or 330 kV to the future grid following Project EnergyConnect completion. Electricity generated by the project will then be exported to the grid via a high voltage overhead line network connection and grid connection points, near to the Buronga Substation.

The alignments for the cabling and substation infrastructure are included in the preliminary development corridor shown in Figure 3.1.

3.2.3 Supporting infrastructure

Temporary facilities will include site offices and compounds, laydown areas, concrete batching plant and minor construction access roads. All temporary facility sites will be rehabilitated once they are no longer required. Supporting infrastructure will be required for operations and will include:

- substations
- underground and overhead electricity transmission lines
- wind monitoring masts
- temporary meteorological masts
- an operation and maintenance facility
- hardstands
- internal roads.

Indicative details of construction and operational ancillary facilities are included in Table 3.1.

3.2.4 Site access

The development corridor would be accessed from Arumpo Road and Fletchers Lake Road, from which, multiple site access points are proposed. Access to Arumpo Road and Fletchers Lake Road would be via Silver City Highway and Sturt Highway, two arterial roads in the vicinity of the project (Figure 3.1). Both roads are sealed and accommodates one lane in each direction of travel.

Internal access tracks will also be established to connect the wind farm and other key infrastructure elements back to Arumpo Road, Fletchers lake Road and ultimately the Silver City Highway and Sturt Highway. The internal tracks will serve both as access for servicing and maintaining project infrastructure.

Over-size, over-mass (OSOM) vehicles may require access to the development corridor and the transport route will be confirmed through the EIS but is expected to comprise vehicle movements primarily originating from the Silver City Highway and Sturt Highway to the south of the project. It is expected that the Energy Corporation of NSW (EnergyCo), through its Memorandum of Understanding (MOU) with Transport for NSW (TfNSW) will be coordinating and facilitating necessary upgrades to State road infrastructure from NSW ports to REZs, where TfNSW is the roads authority.

If further construction planning identifies a preferred origination port for OSOM vehicles that is not within NSW, consultation on routes would be undertaken with the relevant State based roads authorities, and planning authorities as required.

3.3 Activities and uses

3.3.1 Construction

i Overview

Temporary infrastructure required during construction will include site offices and compounds, batching plant and laydown area and minor construction access roads.

Earthworks will be required for the preparation of the construction footprint, including turbine foundation excavation, hardstand and access track formation and drainage works. Where required, additional or improved drainage channels, sediment control ponds and dust control measures will be implemented.

Laydown areas, waste handling, fuel and chemical storage areas will be strategically placed to minimise potential environmental impacts during construction.

ii Construction hours and schedule

Construction of the project is expected to fit into standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday and 8.00 am to 1.00 pm Saturday). Any out of hours works required will be presented in the EIS.

The construction phase of the project is expected to take approximately 24-36 months.

iii Workforce

A workforce of approximately 300-400 full time equivalent (FTE) personnel will be required on-site during peak construction. The construction workforce will be sourced from the local area as far as practicable, noting the remote nature of the project and distance to key populated centres. There would likely be a requirement for non-local construction staff due to specialist skill requirements.

Wentworth Shire Council will be consulted throughout the development and assessment of the project regarding managing potential impacts and opportunities for accommodation of the project's construction workforce.

An accommodation strategy will be presented in the EIS to address workforce accommodation, including the use of available rental, motel and other accommodation in surrounding townships, regional centres and the consideration of alternative options, including temporary facilities onsite and offsite. Potential cumulative impacts on accommodation, public infrastructure, and essential and town services will be considered in the EIS as part of the social and economic impact assessment.

3.3.2 Operation

The operational lifespan of all project elements is expected to be in excess of 25–30 years, depending on the nature of WTG technology used and energy market demands.

Key activities during operations will be energy storage, requiring up to 10 – 15 full-time on-site employees, with project operations to be supported by contractor roles for selected maintenance activities.

Regular maintenance will be required throughout operations, including for internal roads, drainage, fencing and vegetation as well as service, repair or replacement of WTGs, inverters or substations. Light vehicle access will be required throughout operations and occasional heavy vehicle movements may also be required for minor and major maintenance works/campaigns.

Agricultural activities will continue throughout operations, with wind development underpinned by co-existence.

3.3.3 Decommissioning

Once the project reaches the end of its operational life, a decision will be made to either decommission or continue energy generation through repowering, subject to approval requirements. If the project is decommissioned, all aboveground structures built as part of the project will be removed and the site rehabilitated generally to its pre-existing land use, as far as practicable. Exceptions to decommissioning would be any road, power of other infrastructure that the landowner wishes to retain or to avoid environmental impacts. If re-powering is proposed, an appropriate stakeholder consultation process will be undertaken, and all necessary approvals will be sought.

3.4 Timing

Squadron Energy is proposing to prepare an EIS in 2025 with construction estimated to commence late 2028 and expected to take approximately 24 to 36 months.

Squadron Energy is also proposing to develop separate Solar Farm (Gol Gol Solar Farm) and BESS (Gol Gol BESS) projects within the project investigation area on lands adjacent to and partially overlapping the wind project investigation area. These projects will be subject to separate SSD applications. Further details on the timing of the wind farm, including in relation to other nearby projects, will be included in the EIS.

3.5 Alternatives considered

3.5.1 Alternative locations

Alternatives to the project investigation area were considered as part of the site identification process, including other potential sites in NSW. The primary constraint in considering locations elsewhere in NSW, including outside of the REZs, is the increasing distance from the transmission network – both existing and planned.

Alternatives which are further away from Project EnergyConnect need long transmission lines and easements to connect into the network, which come with additional environmental and social impacts. As such, the selected project investigation area is considered optimal for development of the project with any alternative not considered on par with current options having regard to environmental outcomes.

3.5.2 Alternative project layouts

Environmental and social constraints have, and will continue to be, a key consideration during the refinement of the project layout within the project layout. The preliminary development corridor and indicative project layout detailed in Figure 3.1 have been the subject of an iterative design process that has been informed by proximity to the Buronga substation future grid connection points, landowner and community consultation and preliminary environmental constraints information.

The final development corridor will be refined as part of the preparation of the EIS and will be informed by the outcomes of the key EIS technical assessments and outcomes of engagement with community and regulatory stakeholders.

As part of further design refinements, the following principles will be adopted:

- minimise vegetation clearing (areas of higher conservation value and/or native vegetation will be strategically avoided, where possible)
- maximise use of previously disturbed land (i.e. land previously modified by agricultural operations, including cleared areas, established access tracks and local roads)
- minimise disturbance (footprints for project infrastructure will be limited to the minimum area required for constructability and operational safeguards and maximum performance)
- protect significant Aboriginal cultural and historic heritage values (through the identification and evaluation of heritage sites as part of the preparation of the Aboriginal cultural and historic heritage assessments)
- a flexible approach to design (responding to identified environmental impacts and constraints) and micro-siting
- effective community engagement for developing enhancement or mitigation measures.

3.5.3 Do nothing

The 'do nothing' scenario would allow for the continued use of the project development corridor for agricultural production; however, it would also forego the project benefits listed in Section 2.4.1, which include contributions to the development of the South West REZ and supporting Australia's transition towards clean and renewable sources of energy. In addition, the local area and broader region would not realise the economic benefits to local and regional communities provided by direct employment opportunities, benefit sharing opportunities and flow-on effects.

4 Statutory context

The key relevant statutory requirements for the project, having regard to the EP&A Act, other NSW and Commonwealth legislation, and environmental planning instruments are summarised in Table 4.1. This table has been set out in accordance with the Scoping Report Guidelines and *State Significant Development - Preparing an Environmental Impact Statement Appendix B to the State Significant Development Guidelines* (DPIE 2022d) (EIS Guidelines), to cover the following:

- power to grant approval (i.e., approval pathway)
- permissibility
- consistent approvals
- Commonwealth approvals
- approvals not required (pursuant to Section 4.41 of the EP&A Act)
- mandatory matters for consideration.

Detailed consideration of relevant statutory requirements will be provided in the EIS.

Table 4.1 Statutory context

Approval	Requirement
Power to grant approval	
EP&A Act and SEPP (Planning Systems) 2021	Section 4.36(2) of the EP&A Act states that a: *...State environmental planning policy may declare any development, or any class or description of development, to be State significant development.* Section 2.6 of the Planning Systems SEPP states: *(1) Development is declared to be State significant development for the purposes of the Act if:* *(a) the development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the Act, and* *(b) the development is specified in Schedule 1 and 2.* Schedule 1 of the Planning Systems SEPP defines the following as SSD: *Electricity generating works and heat or co-generation* *Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, waste, hydro, wave, solar or wind power) that:* *(a) has a capital investment value of more than $30 million.* The Project is development for the purpose of electricity generation and will have an EDC of more than $30 million, so is SSD.
Permissibility	
State Environmental Planning Policy (Transport and Infrastructure) 2021	Under section 2.36 (1) of *State Environmental Planning Policy (Transport and Infrastructure) 2021*, development for the purpose of electricity generating works, such as the project, may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone. The project is within a rural land use zone, RU1 Primary Production. Development for the purpose of electricity generating works is therefore permissible with consent.

Table 4.1 Statutory context

Approval	Requirement
Electricity Infrastructure Investment Act 2020	The project is within a declared REZ under section 23 of the *Electricity Infrastructure Investment Act 2020.*
Consistent approvals	
Overview	Section 4.42 of the EP&A Act outlines that the approvals listed below cannot be refused if necessary for carrying out an approved SSD and are to be consistent with the terms of the development consent for the SSD.
An environment protection licence under Part 3 of the NSW *Protection of the Environment Operations Act 1997*	Section 48 of the *Protection of the Environment Operations Act 1997* (POEO Act) requires an environment protection licence (EPL) to undertake scheduled activities at any premises. Scheduled activities in schedule 1 Clause 17 of the POEO Act and include 'electricity works (wind farms)'. Accordingly, the project will require an EPL.
An approval under Section 138 of the NSW *Roads Act 1993*	Under Section 138 or Part 9, Division 3 of the *Roads Act 1993*, a person must not undertake any works that impact on a road, including connecting a road (whether public or private) to a classified road, without approval of the relevant authority, being either Transport for NSW or local council, depending upon the classification of the road. Road and/or intersection upgrades will be required as part of the project and approval(s) will be sought from the relevant authority.
Commonwealth approvals	
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The EPBC Act aims to protect matters of national environmental significance (MNES). If an action will, or is likely to, have a significant impact on any MNES, it is deemed to be a 'controlled action' and requires approval from the Commonwealth Environment Minister or the Minister's delegate. If the project is determined to be a controlled action, it is proposed that the project would be assessed under the bilateral agreement between the NSW and Commonwealth Government. The project will be referred to the Commonwealth Department of Climate Change, Energy, the Environment and Water (Commonwealth DCCEEW) under the EPBC Act.
Native Title Act 1993	The Commonwealth *Native Title Act 1993* recognises and protects native title rights in Australia. There are no current native title claims relevant to the project development corridor.
Civil Aviation Safety Regulation 1988 (CASR)	Part 139, subpart 139E 'obstacles and hazards' of the CASR require that the Civil Aviation Safety Authority (CASA) be informed of proposals to build a structure greater than 110 m above ground level. A detailed aviation assessment will be prepared as part of the EIS. This will include engagement with CASA, Airservices Australia (ASA), Aerial Agricultural Association of Australia (AAAA), the Royal Flying Doctors Service (RFDS), and NSW Rural Fire Service.
Heavy Vehicle National Law	Approvals will be required for the transport of wind turbines and associated infrastructure by oversize over mass (OSOM) vehicles. The requirements for such OSOM transport will be assessed via a route analysis study as part of the EIS.
Approvals not required	
Overview	Section 4.41 of the EP&A outlines the following approvals, permits etc are not required for an approved SSD if these are adequately assessed in the EIS and consent granted as part of the SSD approval pathway.

Table 4.1 Statutory context

Approval	Requirement
Fisheries Management Act 1994	A permit under the *Fisheries Management Act 1994* to block fish passage or dredge or carry out reclamation work on water land will not be required pursuant to Section 4.41 of the EP&A Act. The project will require work in water land to facilitate the upgrade of road watercourse crossings and/or to establish new crossings subject to traffic studies. These works will be undertaken in accordance with NSW DPI *Policies and Guidelines on Fish-Friendly Waterway Crossings* (undated), *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI 2013).
Heritage Act 1977	An approval under Part 4, or an excavation permit under Section 139, of *the Heritage Act 1977* will not be required pursuant to Section 4.41 of the EP&A Act. Notwithstanding, there are no listed heritage items within the development corridor.
National Parks and Wildlife Act 1979	An Aboriginal heritage impact permit under Section 90 of the *National Parks and Wildlife Act 1974* will not be required pursuant to Section 4.41 of the EP&A Act. There is potential for Aboriginal sites to occur within the development corridor. Any Aboriginal heritage sites will be avoided as far as practicable through the design process.
Rural Fires Act 1997	A bushfire safety authority under Section 100B of the *Rural Fires Act 1997* will not be required pursuant to Section 4.41 of the EP&A Act. A bushfire assessment will be prepared in accordance with NSW Rural Fire Service (2019) *Planning for Bushfire Protection* as part of the EIS.
Water Management Act 2000	A water use approval under Section 89, a water management work approval under Section 90 or a controlled activity approval (other than an aquifer interference approval) under Section 91 of the *Water Management Act 2000* pursuant to section 4.41 of the EP&A Act will not be required pursuant to section 4.41 of the EP&A Act. Construction work near or within watercourses within the development area will be required. These works will be carried out in accordance with the NSW *Guidelines for Controlled Activities*.
Pre-conditions to exercising the power to grant consent	
	An EIS will be prepared in accordance with relevant legislative requirements and guidelines. No pre-conditions to exercising the power to grant consent for the project are currently envisaged.
Mandatory consideration – Considerations under EP&A Act and EPA&A Regulation	
Section 1.3 of the EP&A Act	Relevant objects of the EP&A Act are: *a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,* *b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,* *c) to promote the orderly and economic use and development of land,* *d) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,* *e) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),* *f) to promote good design and amenity of the built environment,* *g) to provide increased opportunity for community participation in environmental planning and assessment.* The above will be considered in the EIS.

Table 4.1 Statutory context

Approval	Requirement
Section 4.15 of the EP&A Act	Pursuant to Section 4.15 of the EP&A Act, the consent authority must consider the following relevant matters for consideration: • relevant environmental planning instruments for the project including: – *State Environmental Planning Policy (Biodiversity and Conservation) 2021*; – *State Environmental Planning Policy (Resilience and Hazards) 2021*; – *State Environmental Planning Policy (Transport and Infrastructure) 2021*; and – other local environmental planning instruments; • relevant development control plans; • the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality; • the suitability of the site for the development; and • the public interest. The above will be considered in the EIS.
Mandatory consideration – Considerations under other legislation	
Biodiversity Conservation Act 2016 (BC Act)	Under the BC Act, biodiversity assessment in accordance with the Biodiversity Assessment Method (BAM) is required for any SSD project. The project (as SSD) triggers the need to prepare a Biodiversity Development Assessment Report (BDAR) in accordance with the BAM. A BDAR will be prepared as part of the EIS.
NSW Roads Act 1993 (Roads Act)	Relevant to the project, consent under section 138 of the Roads Act may be required for any site access intersection improvements (i.e. to connect the development corridor to the local road network), as well as any works within designated road corridors (e.g. proposed transmission line or road upgrades). Should the project obtain development consent, approval under the Roads Act cannot be refused and will be consistent with conditions of approval.
Local Land Services Act 2013 (LLS Act) *The Land Management (Native Vegetation) Code 2018* (the Code)	The Code supports landholders undertaking productive and sustainable farming practices, while managing environmental risk. A PVP is in effect on the freehold landholding. Offset areas and areas not to be cleared will be accommodated within the development corridor
Mandatory considerations – Environmental planning instruments	
State Environmental Planning Policy (Resilience and Hazards) 2021 – Section 3.7	The EIS will consider the following relevant departmental guidelines: • *Applying State Environmental Planning Policy No. 33 Hazardous and Offensive Development*; • Hazardous Industry Planning Advisory Papers (HIPAP) No. 3 – Risk Assessment; and • HIPAP No. 12 – Hazards.
State Environmental Planning Policy (Resilience and Hazards) 2021 – Section 4.6	The EIS will consider the potential for the project to impact on contaminated land.
Wentworth Local Environmental Plan (LEP) 2011	The development corridor is within land zoned RU1 under the Wenworth LEP. The EIS will consider the relevant objectives and land uses for RU1 zone under the Wentworth LEP.
Mandatory considerations Development control plans	
In accordance with Section 2.10 of the Planning Systems SEPP, development control plans do not apply to SSD and are not a relevant consideration for the project.	

5 Engagement

5.1 Community and stakeholder engagement objectives

A Stakeholder Engagement Plan for the Gol Gol Wind Farm has been developed and is available at the project website (www.golgolwindfarm.com.au).

Squadron Energy aims to engage with local community and key stakeholders in a way that is genuine and lasting. The objectives of community and stakeholder engagement during the project's scoping phase, are to:

- identify potentially affected people and groups, who may have interest in or be affected by the project's construction, operation or decommissioning
- establish transparent and accessible mechanisms for engaging with the local community and key stakeholders to build and maintain relationships
- enable early input from stakeholders to the project's scoping and planning activities.

Key stakeholders relevant to this phase include the host landowner and neighbours, broader community including First Nations community members, Wentworth Shire Council, State regulatory agencies and the State Elected Representative for Murray. Preliminary inputs from Squadron Energy's engagement program also informs the scoping phase of the Social Impact Assessment (SIA).

5.2 Community and stakeholder engagement

Squadron Energy has a high-level framework for the delivery of communication and engagement throughout the planning and assessment process for each stage of the project, which is dynamic and evolves based on stakeholder and community feedback. Squadron Energy has commenced and will continue to carry out engagement that is meaningful, proportionate, and tailored to the needs of the community, stakeholders, councils and government agencies.

Engagement for the project's scoping phase has included:

- face-to-face meetings and briefings
- phone calls and emails
- community newsletter distribution
- community open day
- a community survey
- project-specific website, email and phone contacts launched.

Further detail and findings from Squadron Energy's engagement activities are reported in the following sections.

5.2.1 Key stakeholder meetings

Table 5.1 provides an overview of the stakeholder meetings undertaken for the project to date, including the stakeholder type, number and timing of meetings.

Table 5.1 Stakeholder meetings

Stakeholder type	Number of meetings	Timeframe
Host landowner	6	August 2021 – March 2024
Neighbour/s	4	August 2021 – Ongoing
State MP	1	March 2024
Wentworth Shire Council General Manager	1	April 2024

Findings from community and stakeholder engagement undertaken during the project's scoping phase identified the following key themes:

- general project interest, together with Squadron Energy's proposed Gol Gol Solar Farm and BESS projects
- project workforce and accommodation arrangements
- noise impacts during construction (including traffic) and operations of the project
- community benefit sharing to be explored further during the development of the project's social impact assessment.

From September 2023 to March 2024, Squadron Energy also undertook phone calls with local stakeholders including the host landowner, nearby neighbours and local businesses. Issues discussed in these calls include general project update, questions about employment of business opportunities, land use and agreement negotiation.

5.2.2 Community open day

Squadron Energy delivered a Community Open Day at the Midway Centre in Buronga on 20 March 2024, from 2 pm to 7 pm. The event was promoted via the was promoted via distribution of flyers to PO/letter boxes and an ad in the Sunraysia Daily newspaper, which was subsequently shared to the local community Facebook page.

During this event, 26 visitors participated, comprising neighbours, local businesses, and local residents of the Wentworth LGA and surrounds. Local community members mainly included local residents of Buronga and Gol Gol.

The feedback received during this event was mostly neutral from local residents with general agreement that the energy transition was inevitable and that the selected site was ideal considering alternatives in the region. Local business owners felt mostly positive towards the project with consensus that it would be stimulating for the local economy and job opportunities.

Key matters of interest to and concern raised by the attendees included:

- benefits of renewable energy
- employment or business opportunities
- traffic and access impacts
- changes to visual amenity
- safety and security.

5.2.3 Community survey

A community survey was delivered via SurveyMonkey from 15 March to 2 April 2024, with hard copies also available and promoted at the Community Open Day. The purpose of the survey was to gain an understanding from the broader community on the potential social impacts and benefits of the project in order to help inform project design.

A total of 17 responses were received, with the majority of survey respondents comprising of local residents and nearby neighbours residing in Gol Gol and Buronga. Approximately 41% of survey respondents are aged 65 years or older.

Positive perceptions predominantly related to how the project will support the transition towards renewable energy generation and the associated benefits, such as the generation of other economic and employment opportunities.

Negative perceptions towards the project generally relate to impacts on traffic, rural lifestyle (including property devaluation) and existing agricultural operations.

When rating potential social impacts and benefits associated with the Wind Farm project, the two benefits with the highest positive rating were renewable energy generation and employment opportunities. In contrast, the potential impacts with the highest negative rating were visual amenity, waste management (particularly how and where components are recycled), bushfire risk, and groundwater/surface water impacts.

More than one survey respondent also noted unequal distribution of potential project impacts and benefits between regions hosting the project and where the energy generated would be supplied to, which is perceived to be cities along the coast. One respondent also conveyed frustrations due to the cumulative impact of multiple renewable energy projects in the area, with another stating concerns that the project may cause wildlife to migrate to agricultural areas.

A secondary survey specific to visual and landscape qualities of the locality was also made available from mid to late Apil 2024. The recipients included all attendees of the open day and participants of the community engagement events. There was one respondent, and details of the response are included in the PVIA (Appendix D).

5.2.4 Government and regulatory stakeholders

Squadron Energy met with DPHI in March 2024 to discuss the Gol Gol Solar Farm, Gol Gol Wind Farm and Gol Gol BESS projects. During this meeting, the main queries from DPHI pertaining to the wind farm included:

- visual impacts to nearby dwellings
- consideration of biodiversity impacts
- consideration of traffic related impacts (road upgrades and schedule of work).
- Squadron Energy will consult with all relevant government agencies during the preparation of the EIS.

5.3 EIS phase consultation

During the preparation of the EIS, Squadron Energy will continue to consult with relevant local, State and Commonwealth Government authorities, infrastructure and service providers, community groups, First Nations communities, neighbours and affected landowners/leaseholders. Squadron Energy is committed to genuine and consistent engagement with the local community and stakeholders to support the building of strong relationships with stakeholders, foster existing connections, and establishing a socially sustainable project. EIS phase

consultation will be undertaken in accordance with *Undertaking Engagement Guidelines for State Significant Projects* (DPIE 2022b).

First Nations stakeholders will be identified and consulted with during the preparation of the EIS in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a) and be continuous in nature.

Electricity infrastructure owners, including Transgrid, will be consulted with in relation to activities impacting the transmission network and connection requirements, also planning insights from their local community consultation.

Consultation during the development of the EIS will aim to:

- proactively inform, consult and involve stakeholders using clear and consistent key messages
- continue to collaborate with key stakeholders to identify potential issues, impacts, opportunities and benefits
- communicate the progress of the project and key findings or outcomes of assessments
- enable stakeholders to have input into the preparation of the EIS, project planning, investigate opportunities for visual treatment and identify opportunities for benefit sharing
- implement response and feedback strategies to address stakeholder concerns and use these to inform the evolution of the project.

A range of tools and methods will be used to communicate and engage with the community and other stakeholders during preparation of the EIS in accordance with the Stakeholder Engagement Plan.

6 Proposed assessment of impacts

6.1 Level of assessment required in the EIS

A preliminary environmental assessment has been carried out to identify matters requiring further assessment in the EIS and the level of assessment that should be carried out. In accordance with the *Scoping Report Guidelines*, the following factors have been considered in the identification of matters needing further assessment for the project:

- the scale and nature of the likely impact of the project and the sensitivity of the receiving environment
- whether the project is likely to generate cumulative impacts with other relevant future projects in the area
- the ability to avoid, minimise and/or offset project impacts, to the extent known at the scoping phase.

The following sections of this chapter present the identified matters requiring further assessment and the proposed approach to the respective assessments. In addition to the preliminary environmental assessment presented herein, preliminary technical studies have been carried out for biodiversity (Appendix C), visual impact (Appendix D) and noise (Appendix E).

These preliminary technical studies have been undertaken to ensure that the values of the project development corridor and surrounds are taken into consideration early in the planning and design of the project. Measures implemented through the scoping phase to avoid and minimise impacts are also described.

Matters have been considered as per the categories identified in the *Scoping Report Guidelines*. A scoping summary table is included in Appendix B and the level of assessment identified for each matter is presented in Table 6.1.

Table 6.1 Level of assessment required in EIS

Level of assessment	Aspect
Detailed	Biodiversity – Terrestrial flora and fauna, conservation areas
	Heritage - Aboriginal
	Amenity – Visual
	Amenity – Noise and vibration
	Social
	Traffic and Access
Standard	Heritage - Historic
	Land
	Water
	Air
	Hazards and risk
	Biodiversity – Aquatic flora and fauna
	Economic
	Built environment

6.2 Detailed assessment

The *Scoping Report Guidelines* state that detailed assessment is required where the project may result in significant impacts on the matter, including cumulative impacts. The matters identified as requiring detailed assessment are described in Sections 6.2.1 to 6.2.6, including details around the existing environment, potential impacts and the proposed assessment approach for the EIS.

6.2.1 Terrestrial biodiversity

A preliminary biodiversity assessment (PBA) (Appendix C) has been undertaken to inform the development of the project. Potential biodiversity constraints and development opportunities have been identified to assist Squadron Energy with preliminary project design, and DPHI in developing biodiversity related SEARs. The PBA has relied upon information from existing spatial data for the site and a desktop review. Detailed field survey will be required to validate this assessment to inform the future Biodiversity Development Assessment Report (BDAR).

i Existing environment

The project investigation area is located within the Riverina and Murray Darling Depression Interim Biogeographic Regionalisation for Australia (IBRA) and the South Olary Plain and Robinvale Plains IBRA subregions. It is situated 5 km north of the Murray River and 1.5 km east of the Darling River. Two nationally important wetlands, Lake Ranfurly and Kings Billabong Wetlands, are located 10 km south of the project investigation area, south of the Murray River. Several significant waterbodies, including Fletchers Lake, Lake Gol Gol and Gol Gol Swamp are located within a few kilometres of the project investigation area. Mallee Cliffs National Park is located approximately 15 km south-east of the project investigation area.

The surrounding landscape includes large tracts of remnant vegetation, cleared agricultural areas and the township of Mildura, approximately 10 km south west of the project. The project investigation area is remnant vegetation with large patches of previously cleared, Category 1 land in the south-east. The south-western boundary of the investigation area encroaches onto the edge of a large salt marsh while a small wetland and a small lake, both unnamed, are located in the north-west.

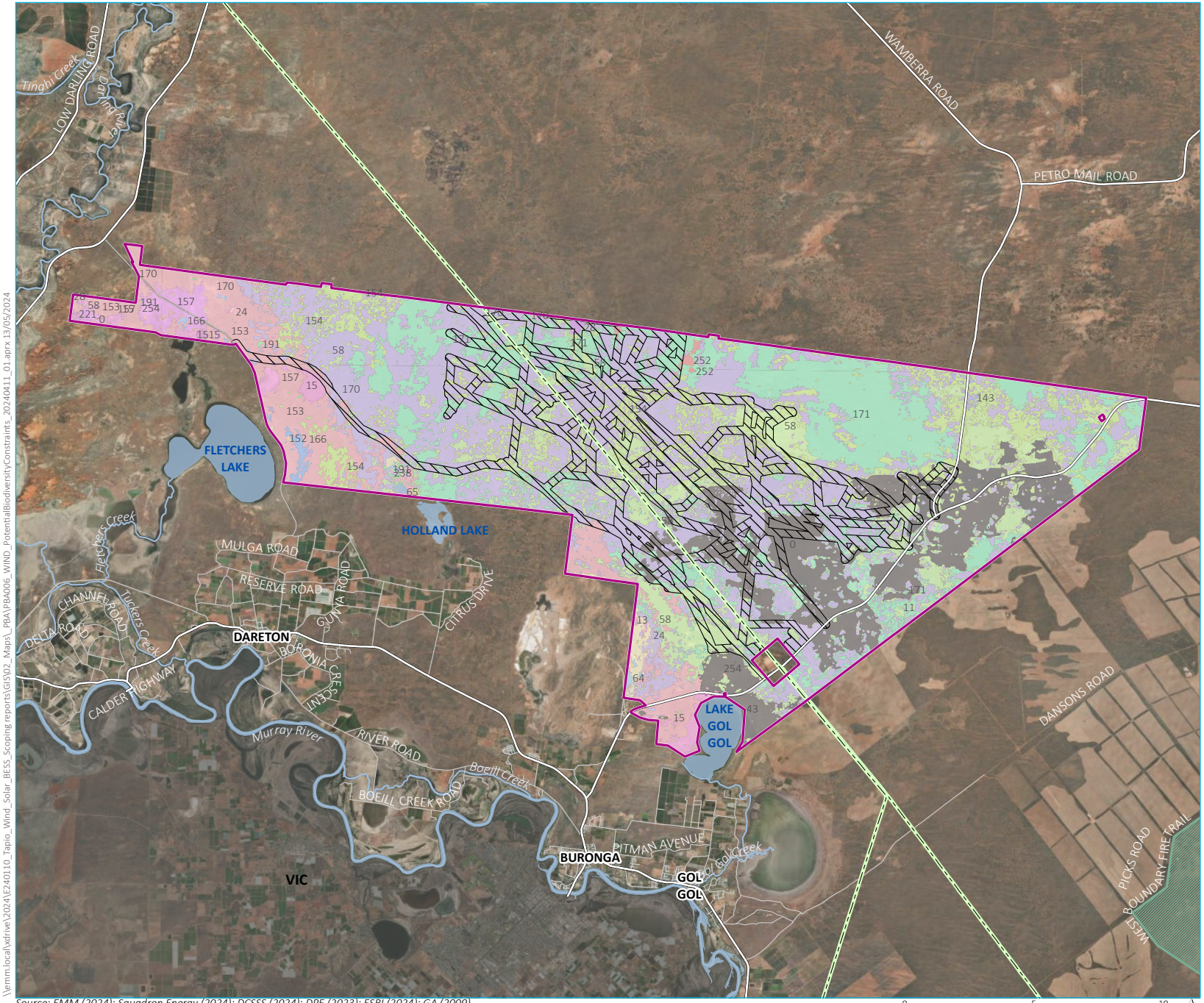
a Native vegetation

A total of 22 native Plant Community Types (PCTs) are predicted to occur in the project investigation area by the NSW State Vegetation Type Map (SVTM). The native PCTs within the project investigation area are:

- PCT 11 - River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- PCT 24 - Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains
- PCT 28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone
- PCT 43 - Mitchell Grass grassland - chenopod low open shrubland on floodplains in the semi-arid (hot) and arid zones

- PCT 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
- PCT 64 - Samphire - Water Weed - Sea-Heath shrubland saline wetland of depressions of the arid and semi-arid (warm) zones
- PCT 65 - Halosarcia lylei low, open shrubland saline wetland of arid and semi-arid regions
- PCT 143 - Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
- PCT 152 - Lunette chenopod shrubland mainly of the Murray Darling Depression Bioregion
- PCT 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones
- PCT 154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains
- PCT 157 - Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
- PCT 166 - Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
- PCT 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
- PCT 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
- PCT 191 - Snap and Rattle Mallee - Moonah open mallee shrubland in the Murray Darling Depression Bioregion
- PCT 221 - Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
- PCT 238 - Permanent and semi-permanent freshwater lakes wetland of the inland slopes and plains
- PCT 252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
- PCT 254 - Black Oak - Bladder Saltbush on light clays in the arid zone

There is also one non-native PCT (PCT 0). PCTs mapped within project investigation area are shown in Figure 6.1.



Plant community types

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); DPE (2023); ESRI (2024); GA (2009)

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Gol Gol Wind Farm
Scoping Report
Figure 6.1

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b Threatened ecological communities

Nine threatened ecological communities (TECs) listed under the BC or EPBC Act were identified with the potential to occur within the project investigation area. The likelihood of these TECs being present within the site are summarised in Table 6.2. Of these, six are considered with a moderate to high likelihood of occurring in the development corridor:

- *Acacia loderi* shrublands
- *Acacia melvillei* shrublands in the Riverina and Murray-Darling Depression bioregions
- Mallee Bird Community of the Murray Darling Depression Bioregion
- *Tecticornia lylei*, Wiry Glasswort, low open-shrubland in the Murray Darling Depression Bioregion
- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (*Allocasuarina luehmannii* Woodlands of the Riverina and Murray-Darling Depression Bioregions)
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South-Western Slopes bioregions.

Table 6.2 Threatened Ecological Communities – Likelihood of Occurrence

Threatened Ecological Community	BC Act	EPBC Act	Associated PCTs	Likelihood of occurrence
Acacia loderi shrublands	E	-	58, 143, 153, 154, 170	**High**
Acacia melvillei shrublands in the Riverina and Murray-Darling Depression bioregions	E	-	28,58, 170	**High**
Artesian Springs Ecological Community in the Great Artesian Basin	CE	-	24, 43, 238	**Nil**
Mallee Bird Community of the Murray Darling Depression Bioregion	-	E	170, 171, 191	**High**
Tecticornia lylei, Wiry Glasswort, low open-shrubland in the Murray Darling Depression Bioregion	E	-	65	**High**
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (*Allocasuarina luehmannii* Woodlands of the Riverina and Murray-Darling Depression Bioregions)	E	E	28	**Moderate**
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	-	CE	170	**Low**
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	CE	-	-	**Nil**
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	E	-	28	**High**

E = Endangered, CE = Critically Endangered

c Threatened and migratory species

In total, 105 threatened species listed under the BC or EPBC Act were identified with potential to occur in the project investigation area. Of these species, 49 are known to occur on or within 10 km of the project investigation area, and therefore have a higher likelihood of occurring in the project investigation area.

Details of all threatened and migratory species with potential to occur in the project investigation area, and that would require further assessment at a future project assessment and approval stage are detailed in Appendix C.

ii Potential impacts

Impacts on native vegetation, native fauna and terrestrial ecosystems may occur as a result of the project. The construction of project infrastructure, access roads and associated facilities will likely result in the direct loss of vegetation and reshaping of the topography and landscape.

Potential impacts on threatened and migratory species may also occur that would be assessed as part of the EIS and include:

- loss of hollow-bearing and mature trees
- loss of breeding, hunting and foraging habitat
- habitat fragmentation.

Potential operational impacts are primarily associated with the risk of turbine collision and barrier effects to threatened and protected bird and bat species. To assess potential wind turbine strike impacts upon threatened and migratory birds and bat species, a preliminary site characterisation was undertaken and is presented in Appendix C.

a Candidate entities for serious and irreversible impacts

Five candidate entities for serious and irreversible impacts (SAII) under the BC Act have been recorded within the locality and have potential to occur in the project investigation area. The likelihood of occurrence within the project investigation area and the justification is provided in Table 6.3.

Table 6.3 Potential SAII in project investigation area

Candidate entity		Likelihood of occurrence in project investigation area
Curlew Sandpiper	*Calidris ferruginea*	**Moderate**
Purple-wood Wattle	*Acacia carneorum*	**Moderate**
A spear-grass	*Austrostipa nullanulla*	**High**
A burr-daisy	*Calotis moorei*	**High**
Swamp She-oak	*Casuarina obesa*	**High**

b Impact on MNES

The potential MNES to be assessed in detail as part of the EIS are detailed in Table 6.4.

Table 6.4 Potential MNES to be assessed

MNES	Threatened biodiversity
Threatened ecological communities	Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions Mallee Bird Community of the Murray Darling Depression Bioregion Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions

Table 6.4 Potential MNES to be assessed

MNES	Threatened biodiversity
Threatened plants	Winged Pepper-cress (*Lepidium monoplocoides*), Yellow Swainson-pea (*Swainsona pyrophila*), Mossgiel Daisy (*Brachyscome papillosa*), Slender Darling-pea (*Swainsona murrayana*) and Menindee Nightshade (*Solanum karsense*)
Threatened birds	Plains-wanderer (*Pedionomus torquatus*), Swift Parrot (*Lathamus discolor*), Curlew Sandpiper (*Calidris ferruginea*), Murray Mallee Striated Grasswren (*Amytornis striatus howei*), Australian Painted Snipe (*Rostratula australis*), Black-eared Miner (*Manorina melanotis*), Hooded Robin (south-eastern) (*Melanodryas cucullata cucullata*), Greenshank (*Tringa nebularia*), Australasian Bittern (*Botaurus poiciloptilus*), Eastern Major Mitchell's Cockatoo (*Lophochroa leadbeateri leadbeateri*), Diamond Firetail (*Stagonopleura guttata*), Blue-winged Parrot (*Neophema chrysostoma*), Southern Whiteface (*Aphelocephala leucopsis*), Malleefowl (*Leipoa ocellata*), Regent Parrot (eastern) (*Polytelis anthopeplus monarchoides*), Sharp-tailed Sandpiper (*Calidris acuminata*), Latham's Snipe (*Gallinago hardwickii*), Grey Falcon (*Falco hypoleucos*), Painted Honeyeater (*Grantiella picta*)
Threatened microbats	Corben's Long-eared Bat (*Nyctophilus corbeni*)
Threatened amphibians	Southern Bell Frog (*Litoria raniformis*)

iii Assessment approach

As the project will be assessed under Part 4 Division 4.7 of the EP&A Act, an assessment in accordance with the Biodiversity Assessment Method (DPIE, 2020) and the preparation of a Biodiversity Development Assessment Report (BDAR) is required. The following key tasks would be completed during the BDAR:

- field validate and refine the State Vegetation Type Map, and delineate into vegetation zones
- conduct vegetation integrity plots
- conduct field-based threatened species habitat assessment
- conduct field-based threatened species habitat assessment
- generate a list of candidate species for further assessment, and conduct targeted surveys for those candidate 'species credit' species, where a habitat constraint and or suitable microhabitats are present
- conduct targeted surveys (if required) for MNES
- conduct BAM calculations and prepare BDAR for lodgement.

Given the potential for impacts on threatened bird and bat species, a Bird and Bat Utilisation Study (BBUS) and monitoring program will be required. The Biodiversity and Conservation Division (BCD) of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW, NSW) have advised that they require a 24 -month monitoring dataset, with multiple surveys per season. BCD have recently provided guidance documents to proponents working in the South West renewable energy zone, comprising:

- Draft Turbine Risk Assessment and Avoidance Guideline
- Suggested BBUS Method
- Draft BBAMP Framework 2023.

In 2023, the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) have also recently released an updated version of the Onshore Wind Farm Guidance. The aforementioned guidelines

would be considered when developing the monitoring program and when assessing prescribed impacts during the BDAR.

As the project has potential to impact MNES, a referral will be lodged with DCCEEW Commonwealth. The referral would address the MNES outlined above, and any other issues deemed relevant by DCCEEW Commonwealth.

6.2.2 Aboriginal heritage

i Existing environment

A desktop review was undertaken of the existing environment in the region that may provide context to the environment within the project investigation area. The landscape is characterised by extensive undulating dune fields and sandplains of brown calcareous soils. The Darling and Murray Rivers are the main hydrological systems in the bioregion. Lakes and lunettes are a major surface feature of the region and are routinely shown to contain past Aboriginal cultural materials.

The project investigation area abuts Fletchers Lake and Lake Gol Gol, within which significant cultural and ancestral remains have been recovered. The landscape within the project investigation area is predominantly characterized by the Mallee Cliffs Sandplains Mitchell Landscape (Mcs). This undulating sandplain is formed of Quaternary aeolian sands with east-west trending dunes that commonly form into lunettes (Eco Logical Australia 2008; Mitchell 2002).

The majority of the investigation area is remnant vegetation with large patches of previously cleared, Category 1 land in the south-east. The south-western boundary of the investigation area encroaches onto the edge of a large salt marsh while a small wetland and a small lake, both unnamed, are located in the north-west.

A search of previously documented cultural materials within the Aboriginal Heritage Information Management System (AHIMS) database (7 February 2024; Client Service ID: 862188 and 862190) revealed 192 Aboriginal sites in the region (Figure 6.2). This search area extended beyond the project investigation area to ensure that the types and numbers of the previously identified AHIMS sites were understood, to inform what may be expected to be found within the investigation area and development corridor. The numbers and types of sites identified are detailed in Table 6.5 and Figure 6.2.

The site types revealed in the search align closely with the broader regional study, dominated by stone artefact deposits, burials, middens, grinding stones and hearths, reflective of the domestic use of the surrounding lake systems in the past. There are seven registered Aboriginal sites in the wind farm project investigation area (#46-3-0086, #46-3-0092, #46-3-0093, #46-3-0116, #46-3-0118, #46-3-0202 and #46-3-0208) and an additional nine sites within 100 m of the project investigation area boundary (Figure 6.2). These include isolated artefacts, hearths, a low-density artefact scatter, a midden, and a hearth with low density artefact scatter and midden.

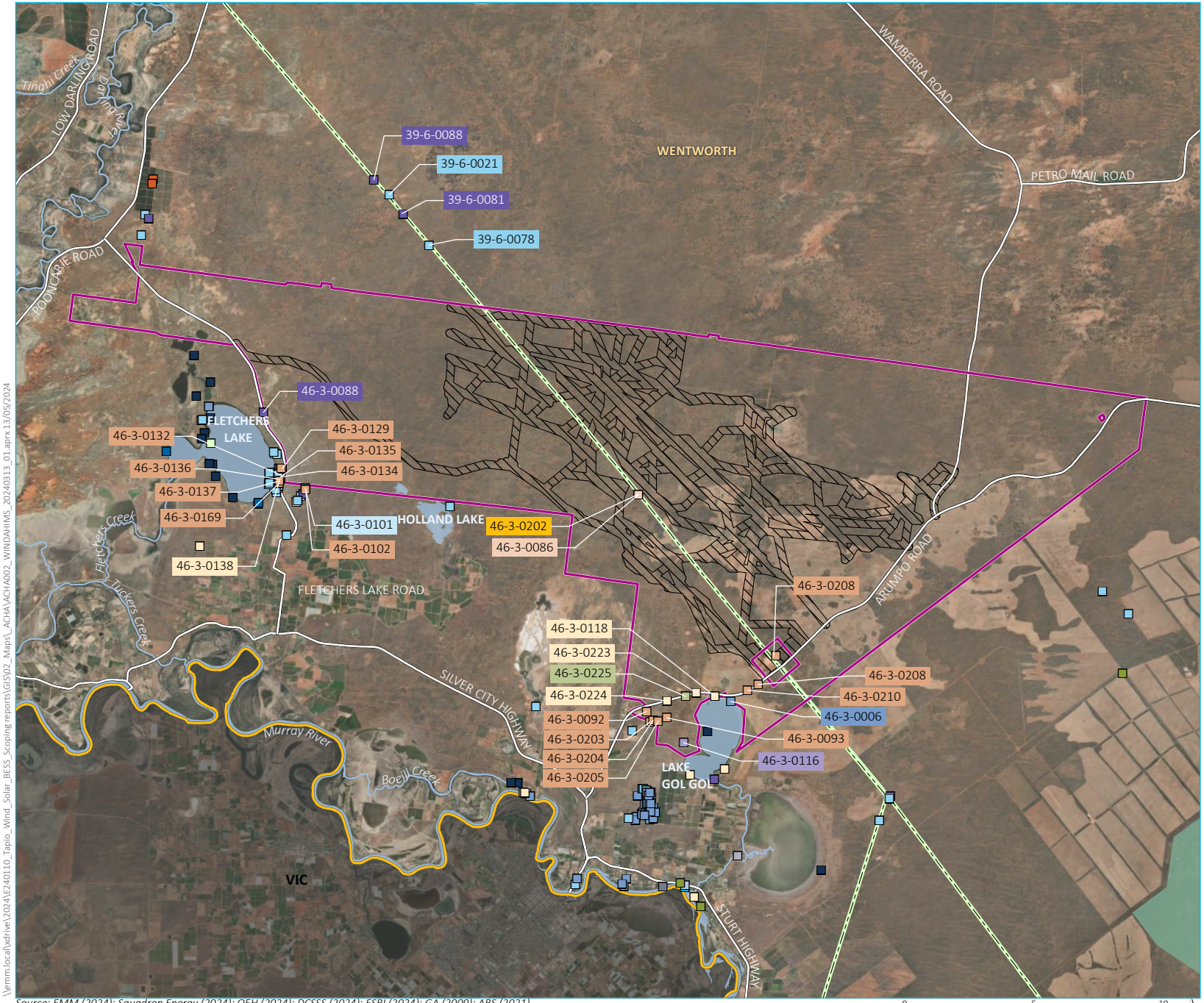
There are two registered AHIMS sites within the wind farm development corridor, including #46-3-0202 (low density artefact scatter) and #46-3-0086 (a single hearth feature). These sites are positioned on the western side of a dirt track next to a previously surveyed transmission line.

Table 6.5 Summary of AHIMS sites in the search area

Site type	Number of sites
Artefact	76
Isolated artefact	19
Isolated hearth artefact	1
Low density artefact scatter (<20 artefacts)	1

Table 6.5 Summary of AHIMS sites in the search area

Site type	Number of sites
Medium density artefact scatter (>20 artefacts)	1
Undefined artefact site	51
Burial	25
Burial with hearth, midden and undefined artefact site	1
Burial with hearth and undefined artefact site	1
Burial with midden	2
Burial with midden and undefined artefact site	1
Burial with undefined artefact site	2
Culturally modified tree	56
Earth mound	1
Hearth	14
Heart with low density artefact scatter	1
Hearth with midden	2
Hearth with undefined artefact site	3
Midden	14
Midden with undefined artefact site	3
Quarry	1
Potential archaeological deposit (PAD)	1
Destroyed	4
Not a site	2
Restricted	1
Total	**192**



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line

AHIMS (by site type)

- Burial
- Burial with midden
- Burial with midden and undefined artefact site
- Burial with undefined artefact site
- Culturally modified tree
- Earth mound
- Hearth
- Hearth with low density artefact scatter and midden
- Hearth with midden
- Hearth with undefined artefact site
- Isolated artefact
- Isolated hearth artefact
- Low density artefact scatter
- Medium density artefact scatter
- Midden
- Midden with undefined artefact site
- PAD
- Quarry
- Shell
- Undefined artefact site

Existing environment

- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- Local government area
- Victoria

AHIMS sites

Source: EMM (2024); Squadron Energy (2024); OEH (2024); DCSSS (2024); ESRI (2024); GA (2009); ABS (2021)

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Scoping Report
Figure 6.2

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ii Potential impacts

The project is situated within a known Aboriginal cultural landscape within which Aboriginal archaeological sites have been previously recorded. Available data suggests that such cultural materials are present near the project investigation area and/or found in close proximity.

Construction of the project has the potential to impact known and currently unidentified Aboriginal heritage sites through ground disturbance for the construction all project elements including WTGs, access tracks infrastructure and ancillary facilities.

Squadron Energy will seek to avoid impacts to Aboriginal heritage sites wherever possible. Due to the nature of Wind Farm infrastructure, impacts to Aboriginal heritage sites can often be avoided with careful consideration of project design post archaeological investigations (e.g. predictive modelling and survey).

iii Assessment approach

The development corridor requires further investigation to characterise and assess potential cultural materials and provide suitable management and mitigation as part of the EIS. This includes more detailed field survey, consultation with the local Aboriginal community and test excavation (if required).

As such, in accordance with Heritage NSW guidelines, further assessment would comprise of an Aboriginal cultural heritage assessment (ACHA). The ACHA will be prepared with general consideration to the following guidelines:

- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011)
- *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010a)
- *Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW* (DECCW, 2010b).

6.2.3 Amenity - Visual impact

A preliminary visual impact assessment (PVIA) has been undertaken to assess the potential visual impacts of the project on landscape features and visual settings. The PVIA is included in Appendix D. The visual assessment of a Wind Farm project is guided by the following guidelines:

- Wind Energy: Visual Assessment Bulletin AB 01 For State significant wind energy development (2016) (VA Bulletin) NSW Department of Planning and Environment.
- *Guidelines for Landscape and Visual Impact Assessment Third Edition* (2013) (the GLVIA), prepared by the Landscape Institute and Institute of Environmental Management and Assessment
- Guideline for landscape character and visual impact assessment (2020) Centre for Urban Design Transport for NSW.

i Existing environment

a Landscape character

The landscape within and surrounding the project can be described as low rolling terrain. Land within the investigation contains remnant vegetation and cleared areas used for grazing and cropping. The PVIA identified five landscape character units (LCUs) that will be refined and characterised in greater detail in the EIS stage of the project. The LCUs identified are detailed in Table 6.6.

Table 6.6 Landscape character units

LCU	Name	Description
LCU01	Grazing and Native Vegetation Paddocks	• Expansive, open land parcels primarily used for livestock grazing. • Comprises open plains with sparse or absent tree coverage, dominated by Chenopod Mallee and Shrubland. • Common land uses include grazing, dryland cropping, and both modified and irrigated pastures.
LCU02	Dry Lakes and Swamps	• Riverine vegetation along boundaries. • Significant features include Gol Gol Swamp, Gol Gol Creek, Lake Holland, Lake Fletcher, Gol Gol Lake. • Human influence evident through urban development along riverbanks. • Varying tree density observed across different areas, with native vegetation altered due to urbanisation. • Lakes or depressions are generally shallow with clay floors and remain dry through most of the year. • Predominant vegetation consists of Red Gum trees.
LCU03	Townships	• Rural urban development and notable human influence. • Buronga and Gol Gol serve as the nearest townships to the project, acting as vital town centres in the Riverina region. • Situated within the broader Sunraysia area along the Murray River, which sits outside and south of the project investigation area
LCU04	Mallee Woodlands and Shrublands	• Semi-arid landscapes within and around the project. • Dominated by low, multi-stemmed eucalyptus (Mallee) that rarely grow taller than 6 m.
LCU05	National Parks and Nature Reserves	• Mallee Cliffs National Park (MCNP) is situated 10 km southeast of the site. • MCNP includes nature reserves such as Banya, Wilddog and Gulthul, categorised as C1 - National Parks and Nature Reserves. • The park features low-relief landscapes typical of the Murray Darling Basin Bioregion. • Topography of the park is mostly flat and lacks natural streams or water bodies. • Vegetation in the park is characteristic of semi-arid environments, including dominant Mallee communities and scattered Belah-Rosewood woodlands • Public access and activities have been restricted due to access being available only via private roads.

b Identification of sensitive receivers and viewpoints

For the purposes of the preliminary assessment, there are two types of viewpoints, public and private. The study area for public and private viewpoints extends 8km from the outer perimeter of the proposed WTGs.

The preliminary assessment tools detailed in the VA bulletin require the analysis of two critical visual parameters, being visual magnitude and viewing of multiple wind turbines. The preliminary analysis using the above tools has been undertaken in the PVIA (Appendix D) and is the outcomes presented below.

Using the Visual Magnitude Tool, the PVIA has identified no further assessment of private dwellings is required. This is because no private dwellings, other than one associated dwelling, were found within 0 m – 5,500 m of the wind turbines.

Using the 2D Multiple Wind Turbine Tool, the PVIA identified 73 non-associated dwellings within 8,000 m of the nearest turbine. Among the 73 dwellings, 13 have turbines in three 60° sectors (up to 180°) that will require further assessment during the EIS.

In additional, a Zone of Visual Influence (ZVI) study was undertaken in the PVIA and identified that due to the flat terrain and anticipated turbine height (280 m), a significant number of wind turbines from the project would be visible within the study area. This ZVI assessment identified 73 non-associated dwellings within the visibility zone, with many in Buronga having a high potential to view the project. 22 public receptors within the 8 km study area, including users of Arumpo Road, the southern part of Wamberra Road, and parts of Fletchers Lake Road, were also identified as likely to view the project.

The viewpoints selected for the private and public (road) receivers for this assessment are shown within the 8 km study area in Figure 6.3 and further details on the locations and rationale for selection are provided in the PVIA in Appendix D.

ii Potential impacts

The PVIA identifies locations surrounding the project from which the relevant project infrastructure can be seen and that may have the potential for visual impacts. The PVIA then assessed, using the applicable guidance methodologies, whether a more detailed assessment would be required in the Landscape and Visual Impact Assessment (LVIA) at EIS stage for the identified receivers and viewpoints within the study area.

Based on the preliminary assessment results, 73 non-associated dwellings, many of which are in Buronga, have a high potential to view the project. Among the 73 dwellings, 13 have turbines in three 60° sectors (up to 180°) that require further assessment during the Environmental Impact Statement (EIS) phase. The locations of these dwellings are detailed in Appendix D.

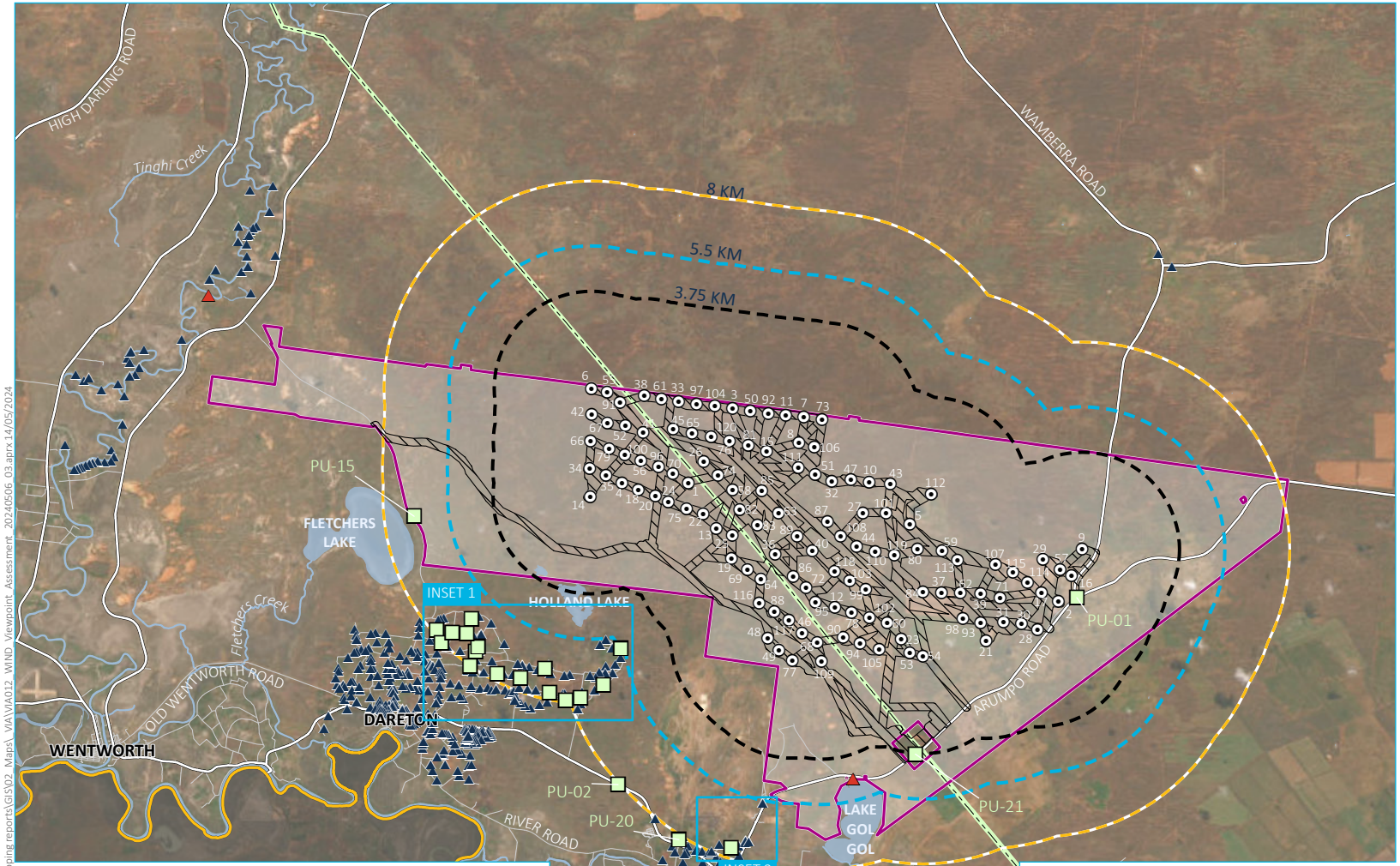
There are also 22 public receptors within 8 km of the project likely to view the project, including users of Arumpo Road, the southern part of Wamberra Road, and parts of Fletchers Lake Road. Further assessment of these receptors will be undertaken in the EIS.

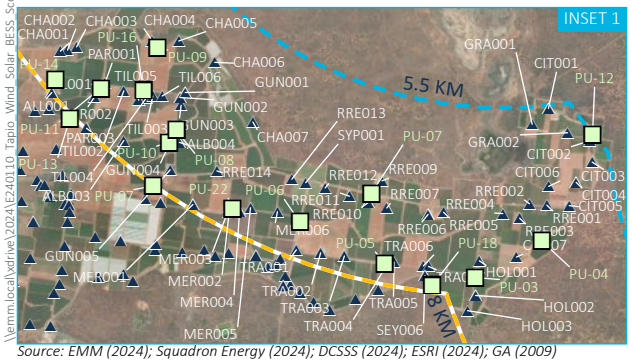
iii Assessment approach

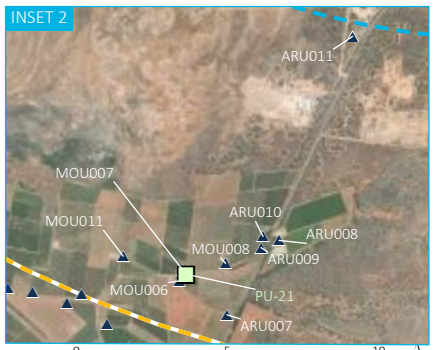
A LVIA will be prepared for the EIS that evaluates each receptor or group to determine how visual perceptions are influenced by for factors such as topography, vegetation coverage and other screening elements. The LVIA will be undertaken in accordance with the 2016 Wind Energy Bulletin (DPE 2016b) unless a new guideline is released by DPHI at the time of preparing the EIS.

The LVIA will include:

- landscape character assessment
- visual magnitude, sensitivity assessment, WTG shadow flicker and blade glint assessment
- preparation of visual study inputs, including consulting the community on aspects of the study and providing an overview of landscape values as identified by the community
- zone of visual influence figures, including further detailed assessment from areas identified as having potential visibility in the PVIA
- viewpoint analysis including detailed assessment and rating of key viewpoints within the visual catchment
- a cumulative visual impact assessment of the project and neighbouring renewable energy developments
- performance objectives and mitigation measures to reduce visual impacts.







KEY

- GoI GoI wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line

Visual assessment buffer

- 3.75 km
- 5.5 km
- 8 km
- Wind farm- turbine location
- Viewpoint assessment location

Sensitive receiver

- Dwelling associated with the project
- Dwelling not associated with the project

Existing environment

- Major road
- Minor road
- Named watercourse
- Named waterbody
- Local government area
- Victoria

Preliminary dwelling and viewpoint assessment locations: wind

Gol Gol Wind Farm
Scoping Report
Figure 6.3

0 5 10 km
GDA2020 MGA Zone 54

N

creating opportunities

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

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6.2.4 Amenity - Noise and vibration

A preliminary noise impact assessment has been undertaken to assess the potential operational impacts of the WTGs. The preliminary noise impact assessment is included in Appendix E.

i Existing environment

The project is situated in a location that is rural in nature with limited human activity. Background noise at nearby sensitive receptors is likely to be low and characterised by agricultural equipment and machinery associated with agricultural production activities, vehicle movements along the local roads and natural sounds (livestock, birds, insects, etc).

There are a number of potentially noise sensitive receivers surrounding the proposed site. The nearest receiver is approximately 2 km from wind farm infrastructure (substation) adjacent to the Buronga Substation. However, this receiver is associated with the development. The nearest non-associated receiver is greater than 5 km from the proposed wind farm development corridor.

ii Potential impacts

Noise impacts from the project during construction will include noise generated by preparatory earthworks, delivery and assembly of infrastructure, construction of the project components and operation of light and heavy vehicles.

Operational noise impacts will include the operation of the WTGs and on-site collector substations. The location of noise-generating infrastructure within the development corridor will be determined with consideration to noise impacts on surrounding residences.

The Bulletin provides a baseline noise criterion of 35 dB(A) at non-associated residences. At associated residences, the Bulletin enables an increase above the baseline noise criterion of 35 dB(A), subject to a formal agreement and ensuring that the landowner is appropriately informed and understands the agreed noise levels. The Guidelines suggest a level of 45 dB L_{Aeq} should be considered as a base criterion for associated residences. However, this level is not considered a limit, and noise levels at these properties would generally be controlled through commercial agreement between the wind farm developer and property owners.

a Non-associated receivers

The maximum calculation distance for assessment under ISO 9613 is 5 km and given that there are no non-associated receivers within this area, predicted noise levels for these receivers will be below 35 dB $L_{Aeq,10min}$ (Figure 6.4).

b Associated receivers

There is one associated receiver within 5 km of the proposed wind farm. The predicted noise levels are in Table 6.7, which provides the results for this associated receiver. Figure 6.4 shows the predicted noise contours from the proposed wind farm in relation to the associated receivers.

Table 6.7 Predicted noise levels at the non-associated receiver

Receiver ID	Easting	Northing	Distance to nearest turbine (m)	Predicted operational noise level
ARU012	613666	6224516	4668	12.9

Predicted noise levels at the associated receiver have been modelled and are predicted to comply with the recommended base criterion of 45 dBA.

iii Assessment approach

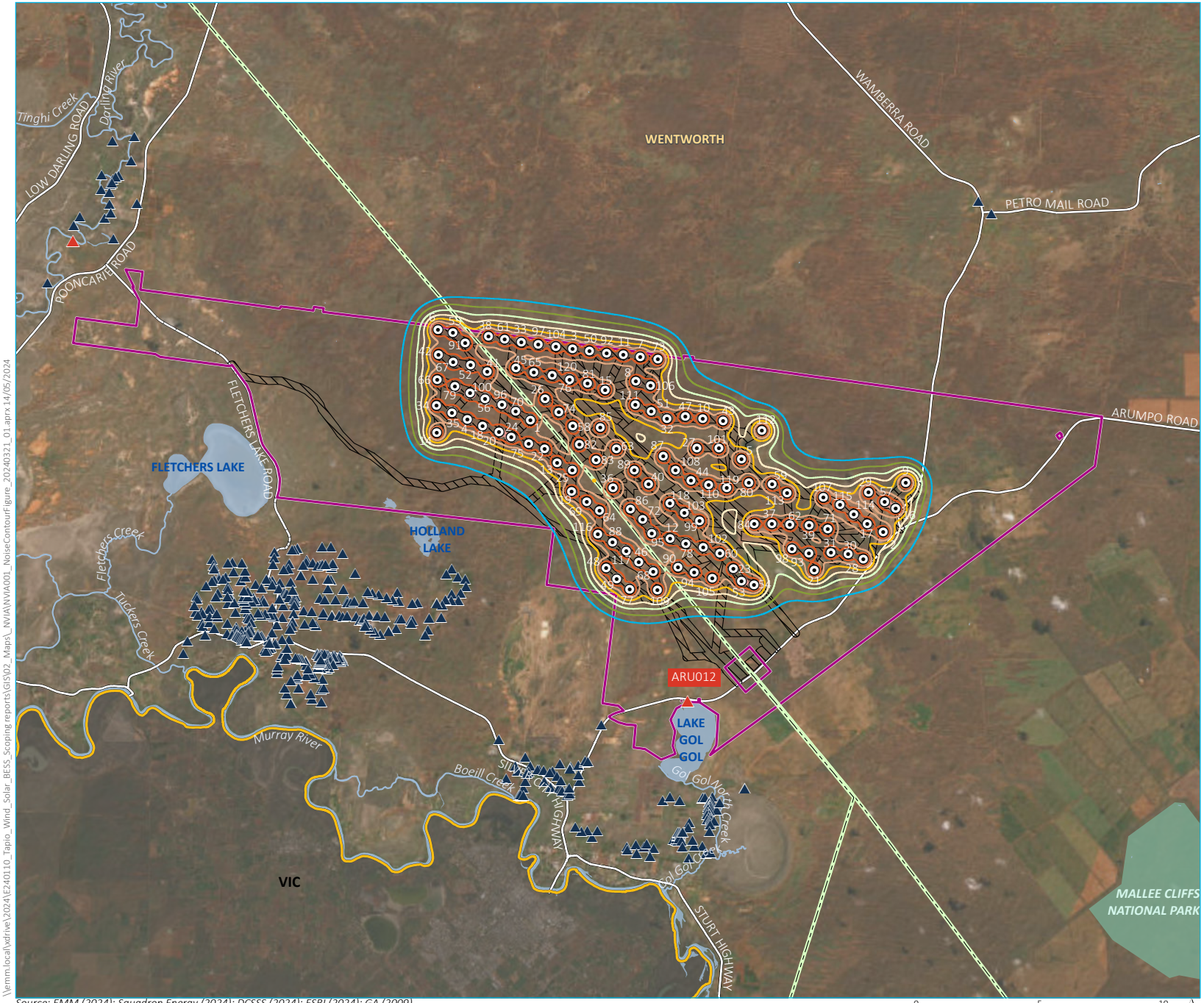
As part of the EIS for this project, a detailed noise and vibration impact assessment (NVIA) will be prepared. This assessment will focus on:

- construction noise and vibration
- traffic noise assessment due to construction traffic
- operational wind farm noise
- operational noise from ancillary equipment.

Construction noise and vibration impacts will be assessed against the ICNG and *Assessing vibration: a technical guideline* (DEC 2006) Once construction schedules are developed and traffic impacts understood, an assessment of road traffic noise arising from haul routes and construction worker traffic will be conducted against the *NSW Road Noise Policy* (EPA, 2011).

Ancillary equipment for the wind farm may include various size transformers and associated HVAC equipment, although at this stage, there is no firm design information to conduct a detailed assessment. A detailed assessment will be conducted against environmental noise requirements of the *NSW Noise Policy for Industry (NPFI) (EPA, 2017).*

For operational impacts, as more information becomes available during the design process, and turbine technology is selected, a detailed assessment at all hub height wind speeds will be conducted to confirm compliance with the NSW Noise Assessment Bulletin for the final design and selected technology. The results of these assessments will be incorporated into the Noise and Vibration Impact Assessment which will support the EIS for this project.



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line
- Wind farm- turbine location

Sensitive receiver

- Associated residence
- Non-associated residence

Operational noise contour (dB)

- 35 dB
- 37 dB
- 39 dB
- 41 dB
- 43 dB
- 45 dB
- 47 dB
- 49 dB
- 51 dB

Existing environment

- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- Local government area
- Victoria

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

0 5 10 km

GDA2020 MGA Zone 54

N

\\emm.local\xdrive\2024\E240110_Tapio_Wind_Solar_BESS_Scoping reports\GIS\02_Maps_NVIA\NVIA001_NoiseContourFigure_20240321_01.aprx 14/05/2024

Wind turbine generator operational noise contours

Gol Gol Wind Farm
Scoping Report
Figure 6.4

EMM
creating opportunities

6.2.5 Social

A social impact scoping and initial assessment has been undertaken to inform this scoping report, developed in accordance with the *Social Impact Assessment Guideline for State Significant Projects* (the 'SIA Guideline') (DPE, 2023a) and the *Technical Supplement: Social Impact Assessment Guideline for State Significant Projects* (the 'SIA Technical Supplement') (DPE, 2023b).

The SIA scoping worksheet is included in Appendix F.

i Social locality

Determination of the project's social locality was informed by consideration of the scale and nature of key project activities, the regional and local development context, the characteristics of communities likely to be affected, and how both positive and negative impacts may be reasonably perceived or experienced by different stakeholders (DPE, 2023a).

In relation to the local and regional development context, the project is within the Wentworth Local Government Area and South West REZ, where multiple energy projects are currently proposed. Nearby proposed development are detailed in Section 2.2.

a Project activities

The nature of key Project activities, as known at the time of social impact scoping, informs the identification and evaluation of potential changes to the social environment, the stakeholders affected and the geographic extent of these changes. These are outlined in Table 6.8.

Table 6.8 Key project activities and potential change to social environment

Key project activity	Potential change to social environment	Stakeholder affected	Geographic extent of social change
Generation of employment opportunities during construction and operations	• Increase in supply and demand for skilled and unskilled labour	• Local and regional communities • Local and regional businesses • Local government	Local area Nearby townships Regional area
	• Increase in supply and demand for housing and short-term accommodation	• Accommodation providers • Local communities • Vulnerable groups • Local government • Traditional Owners and Aboriginal communities	Local area Nearby townships Regional area
Generation of business risks and opportunities during construction	• Increase in supply and demand for goods and services.	• Local and regional businesses • Local economic and industry groups	Nearby townships Regional area
	• Increase in trade and revenue for local businesses	• Local and regional businesses • Traditional Owners and Aboriginal businesses	Local area Nearby townships Regional area
Construction activities including earthworks for laydown areas, minor	• Changes to visual amenity, lifestyle and environmental values	• Local communities • Traditional Owners and Aboriginal communities	Local area

Table 6.8 Key project activities and potential change to social environment

Key project activity	Potential change to social environment	Stakeholder affected	Geographic extent of social change
construction access roads and associated vegetation clearing	• Changes to amenity due to noise, vibration and dust generation	• Landholder and surrounding neighbours	Local area
	• Increase in road usage and changes to traffic conditions and road safety	• Local and regional communities • Local government • Emergency service providers	Local area Regional area Nearby townships
	• Changes to sites and landscape of cultural or historical heritage	• Local communities • Traditional Owners and Aboriginal communities	Local area
Operation of project	• Increase awareness and education of renewable energy	• Local and regional communities	Local area Regional area Nearby townships

b Project social locality

The social locality applicable to the review of social impacts and benefits associated with the project is described in Table 6.9. Definition of the project's social locality was based on the Australian Statistical Geography Standard (ASGS), a social geography developed by the ABS to reflect the location of people and communities and used for data collection and analysis (ABS, 2023).

Table 6.9 Project social locality

Social locality	Geographic area	ASGS statistical area code	Relevance to proposed Project
Local area	Wentworth	SAL 14242	The project investigation area is located within Wentworth SAL (excluding Ellerslie SAL and Pomona SAL) and borders the SAL's of Curlwaa, Coomealla, Mourquong, Buronga, and Gol Gol. Residents immediately surrounding the proposed project site may experience direct project associated impacts, such as those relating to amenity and traffic, during the construction phase.
	Curlwaa	SAL 11171	
	Coomealla	SAL 11041	
	Mourquong	SAL 12820	
	Buronga	SAL 10693	
	Gol Gol	SAL 11697	
Key townships	Buronga and Gol Gol townships	UCL 112013 Mildura-Buronga (Buronga Part)	Buronga and Gol Gol are the nearest townships to the project, located approximately 8 km to the south.
	Mildura regional city	UCL 212003 Mildura-Buronga (Mildura Part)	Mildura is the nearest regional city to the project, located approximately 10 km to the south of the project in Victoria. Mildura is an important service centre for communities and industries along the NSW and Victorian border. Buronga, Gol Gol, and Mildura are the most likely centres where labour, services, accommodation may be sourced and utilised by the project.

Table 6.9 Project social locality

Social locality	Geographic area	ASGS statistical area code	Relevance to proposed Project
Sub-regional	Wentworth (NSW)	LGA 18200	The project is located within the LGA of Wentworth. Mildura LGA borders Wentworth LGA and hosts Mildura regional city. There may be broader, indirect impacts experienced by people in the region, including those associated with workforce demand, accommodation, traffic, and land use management.
	Mildura (VIC)	LGA 24780	
South West REZ	Wentworth	LGA 18200	The project is located within the South West REZ which spans across the seven LGAs of Wentworth, Balranald, Murray River, Hay, Edward River, Carrathool and Murrumbidgee.
	Balranald	LGA 10300	
	Murray River	LGA 15520	
	Hay	LGA 13850	
	Edward River	LGA 12730	
	Carrathool	LGA 11600	
	Murrumbidgee	LGA 15560	
Area of reference	New South Wales	STE 1	The State is used as a comparator to distinguish key trends and characteristics within the study areas.

Notes: Suburbs and Localities (SAL); Urban Centre and Localities (UCL); Local Government Area (LGA)

ii Existing environment

Community profiles are provided below for each of the local areas and for each of the key townships. The profiles are based on qualitative and quantitative analysis of key social trends and characteristics of each community, including comparison of localised population, dwelling and labour force characteristics benchmarked to the South West REZ as a whole.

a Local area

Wentworth

Wentworth is a rural locality within Wentworth LGA that borders the state of Victoria to the south. Land use across Wentworth locality predominantly comprises irrigated agriculture operations, pastoral areas, semi-arid plains and residential. The small border town of Wentworth, located at the junction of the Darling and Muray Rivers, is the main population centre within the locality. Silver City Highway is the main road connecting Wentworth residents to the other towns in NSW and the regional city of Mildura across the Murray River in Victoria.

There were 1,577 residents in Wentworth (locality) at the 2021 Census of which 82.8% of the population resided in the township of Wentworth (ABS, 2021). Over the five-year period to 2021, the population in Wentworth grew by 9.7%, from 1,437 residents to 1,577 residents. Relative to the South West REZ, the population of Wentworth is typically older with a smaller proportion of children (residents aged 14 years or younger). The median age of Wentworth residents is 56 years. The community is also made up of a higher proportion of lone person households and a higher rate of residents identifying as Indigenous, compared to the average for the South West REZ.

Within Wentworth, there is a marginally lower rate of home ownership and a higher proportion of social housing dwellings compared to the South West REZ (ABS, 2021). Dwelling occupancy within the locality aligned with that for the South West REZ, with around 84.0% of private dwellings in Wentworth occupied at the 2021 Census.

Wentworth recorded a high proportion of residents with core activity limitations, with around 11.0% of residents requiring assistance in their day to day lives in one or more core activity areas (self-care, mobility and communication) compared with the 5.8% recorded for the South West REZ (ABS, 2021). The locality also recorded a higher proportion of residents experiencing two or more long-term health conditions relative to the South West REZ (18.5% compared to 11.2%).

Health care and agriculture are the key industries in Wentworth with 17.3% of working residents employed in the health care and social assistance industry and 13.7% employed in the agriculture, forestry and fishing industry. Crops produced in the locality include citrus, grapes, stone fruits, and vegetables. At the 2021 Census, Wentworth recorded a lower labour force participation rate (40.9%) and a higher rate of unemployment (5.2%) compared to the South West REZ at 56.5% and 3.4% respectively (ABS, 2021).

Curlwaa

Curlwaa is an irrigation settlement located seven kilometres east of Wentworth within Wentworth LGA. The locality is situated on traditional lands of the Barkindji People and was historically the first irrigation settlement established by the NSW Government in the early 1990's (Experience Wentworth, 2024).

Curlwaa recorded a population of 496 residents at the 2021 Census across a land area of approximately 39.1 square kilometres (ABS, 2021). The locality experienced a population growth by 26.2% over the five-year period to 2021, from a population of 393 residents back in 2016. The median age of Curlwaa residents is 42 years. Relative to the South West REZ, the population of Curlwaa is typically younger with a higher proportion of residents aged 14 years or younger (children) and comprises a higher proportion of family households and a lower rate of residents identifying as Indigenous. Within the locality, there is also a higher rate of home ownership (outright or with a mortgage) and private dwelling occupancy.

Agriculture is a key industry in Curlwaa with 18.8% of residents employed in the agriculture forestry and fishing industry. At the 2021 Census, Curlwaa recorded a higher labour force participation rate (62.0%) and a lower rate of unemployment (2.5%) compared to the South West REZ at 56.5% and 3.4% respectively (ABS, 2021). Silver City Highway is the main road through the locality with Aboortsford Bridge providing access across the Murray River into Victoria. Social infrastructure in the locality is limited to a memorial hall, sports oval, rural fire station and boat ramp, as well as a caravan park adjacent to the Abbotsford Bridge.

Coomealla

Coomealla is a rural locality within Wentworth LGA. The locality was established in 1922 as an ambitious horticulture development (Coomealla Irrigation Area) and is best known today for its superior dried fruit and wine grapes (Experience Wentworth, 2024). The township of Dareton adjoins the locality and is referred to as the centre of the Coomealla Irrigation Area. Dareton was historically an Aboriginal mission and is now a residential area for a large number of Aboriginal and Torres Strait Islander peoples belonging to the Barkindji language group (Murdi Paaki Regional Assembly, 2019).

Coomealla recorded a population of 748 residents at the 2021 Census across a land area of 118.3 square kilometres, comprising predominantly of agriculture properties/operations. The locality experienced a population decline by 9.4% over the five-year period to 2021, from a population of 826 residents in 2016. The median age of Coomealla residents is 42 years. Relative to the South West REZ, the population of Coomealla is typically younger with a higher proportion of residents aged 24 years or younger (youth and children) and comprises a higher proportion of family households and a higher rate of residents identifying as Indigenous with 16.7% (more than double of the REZ). Within the locality, there is also a lower rate of homeownership and a higher proportion of social housing dwellings. At the 2021 Census, 40.0% of rented private dwellings comprised of social housing compared to 11.4% for the South West REZ.

Agriculture is a key industry in Coomealla with 20.1% of working residents employed in the agriculture, forestry and fishing industry. At the 2021 Census, the locality recorded a low labour force participation rate (49.8%) and a high unemployment rate (5.2%) compared to the South West REZ (56.5% and 3.4% respectively) (ABS, 2021). Youth and Indigenous unemployment were also notably high in Coomealla (12.7% and 42.1% respectively) relative to the REZ (7.3% and 11.1% respectively). Social infrastructure in the locality are limited to a high school and memorial garden with residents commuting to Dareton and surrounding communities for services.

Mourquong

Mourquong is a sparsely populated rural locality adjacent to Coomealla within Wentworth LGA. The locality covers a land area of approximately 12.9 square kilometres and had a population of 75 residents at the 2021 Census. The median age Mourquong residents is 42 years. Relative to the South West REZ, the population Mourquong is typically older with a higher proportion of residents aged 65 years or over (elderly) and comprises a higher proportion of family households and residents identifying as Indigenous (ABS, 2021).

Within the locality, notably lower levels of homeownership (54.5%) and higher levels of rented dwellings (45.5%) are also exhibited relative to the South West REZ (70.2% and 22.0% respectively). A higher proportion of residents with core activity limitations was also recorded, with 8.0% compared to 5.8% for the South West REZ (ABS, 2021).

Agriculture is a key industry in Mourquong with 40.6% of working residents employed in the agriculture, forestry and fishing industry. Similar to Curlwaa and Coomealla, Mourquong is also a distinct irrigation area with key produces comprising citrus and wine grapes. The locality recorded a low labour force participation rate and had no unemployed residents at the 2021 Census.

There are no social infrastructure or shops within the locality, however key features include Orange World, the Australian Inland Botanic Gardens, the Big Wine Cask, and two large wineries.

Buronga

Buronga is a rural locality within Wenworth LGA covering a land area of approximately 15.5 square kilometres. Land use within the locality primarily consists of primary production and low density residential, with the town of Buronga the main population centre. Key local industries include light industry, horticulture, viticulture and tourism.

Buronga recoded a population of 1,252 residents at the 2021 Census and a median age of 38 years. The locality experienced a population growth by 3.3% over the five-year period to 2021, from a population of 1,212 residents in 2016. Relative to the South West REZ, the population of Buronga is typically younger with a higher proportion of residents aged 24 years or younger (youth and children) and comprises a higher proportion of family households and a higher rate of residents identifying as Indigenous.

Within the locality, there is a high rate of homeownership and private dwelling occupancy as well as a higher proportion of social housing dwellings. At the 2021 Census, 15.9% of rented private dwellings comprised of social housing compared to the 11.4% for the South West REZ.

Buronga recorded a higher labour force participation rate (58.6%) and a high rate of unemployment (4.3%) compared to the South West REZ at 56.5% and 3.4% respectively in 2021 (ABS, 2021). Youth and Indigenous unemployment were also notably high in Buronga (18.8% and 18.2% respectively) relative to the REZ (7.3% and 11.1% respectively). The top three industries of employment in Buronga at the 2021 Census were retail trade, health care and social assistance, and education and training.

Gol Gol

Gol Gol is a rural locality adjacent to Buronga covering a land area of approximately 20.2 square kilometres. The locality predominantly comprises of agriculture properties/operations, with the main population centre, Gol Gol township, located along the banks of the Murray River.

Gol Gol recorded a population of 1,956 residents at the 2021 Census and a median age of 37 years. The locality experienced a significant population growth by 28.4% over the five-year period to 2021, from a population of 1,523 residents in 2016. Relative to the South West REZ, the population of Gol Gol is typically younger with almost a quarter of residents aged 14 years or younger (children) and comprises a high proportion of family households and a low rate of residents identifying as Indigenous. Within the locality, there is a high rate of homeownership and private dwelling occupancy.

Gol Gol recorded a high labour force participation rate (68.9%) and a low rate of unemployment (2.5%) compared to South West REZ (56.5% and 3.4% respectively) in 2021 (ABS, 2021). The top three industries of employment in Gol Gol at the 2021 Census were health care and social assistance, construction, and education and training. Irrigated horticulture is a major industry within the locality with citrus, grapes and vegetable the main crops produced.

b Key townships

Buronga and Gol Gol townships

The townships of Buronga and Gol Gol have a combined population of 2,400 residents at the 2021 Census and covers a land area of approximately 5.9 square kilometres. The townships combined experienced a significant population growth by 11.4% over the five-year period to 2021, from a population of 2,154 residents in 2016.

The two adjacent townships area approximately 4 kilometres by road along the Sturt Highway. Buronga township is located at the intersection of the Silver City Highway and Sturt Highway and connected to the regional city of Mildura via the George Chaffey Bridge. The township operates largely as a satellite suburb of Mildura due to its close proximity (approximately 6 kilometres by road) and has been experiencing a boom in housing development. Similar to Buronga, Gol Gol has also experienced rapid development in recent years and is progressively acting as a suburb of Mildura due to its proximity.

The two townships are serviced by a small but fast-growing retail area (in Buronga) with services including a post office, petrol stations, food outlets, market place and short-term accommodation. Social infrastructure available across the two townships are limited to emergency services (police and rural fire), early child facility, community centre, sporting oval, and two primary schools.

Relative to the South West REZ, the townships combined recorded a higher labour force participation rate as well as a higher rate of unemployment at the 2021 Census. Key employment industries include health care and social assistance, education and training, and retail trade.

Mildura regional city

Mildura is a regional city in north-west Victoria located directly south of Buronga township across the Murray River. The city's central business district is located a short distance from the banks of the Murray River and provides a wide range of services, including large retail stores and a hospital, to residents of Mildura as well as the neighbouring townships of Buronga, Gol Gol, and Wentworth in NSW. The regional city is well connected to public transport options with daily train services to and from Melbourne and Mildura airport receiving regular weekly flights to and from Melbourne, Sydney and the Gold Coast.

Mildura recorded a population of 35,652 at the 2021 Census and a median age of 39 years. The regional city experienced a population growth by 6.6% over the five-year period to 2021, from a population of 33,444 residents. Relative to the South West REZ, Mildura city is characterised by a higher proportion of children and youth; a lower proportion of residents who identify as Indigenous; a higher proportion of lone person households; a higher proportion of rented and social housing dwellings; a lower rate of labour force participation; and a higher rate of unemployment (ABS, 2021). Key industries of employment include health care and social assistance; retail trade; and education and training.

c Key social trends and characteristics

Table 6.10 provides a summary of the key social trends and characteristics within the sub-regional areas (Wentworth LGA and Mildura LGA) and the South West REZ. Social trends and characteristics within these geographic areas are identified and analysed across broad social themes.

Table 6.10 Key relevant social characteristics and trends

Social themes	Social characteristics and trends
Population	• In 2021, the sub-regional area recorded a population of 64,425 residents of which 84.4% were based in Mildura LGA. The population of the sub-regional area increased by 6.2% over the five-year period to 2021, with Wentworth LGA experiencing the highest population growth by 9.7%. The population of the South West REZ was smaller in contrast with 40,068 residents in 2021) and a lower population growth by 2.4% over the five-year period. • The sub-regional area population exhibited comparable age distribution to that of the State with a higher proportion of residents aged 24 year or young (children and youth). In comparison, the South West REZ recorded a higher proportion of residents aged 65 year or over, which accounted for almost a quarter of the resident population. • Both the sub-regional area and the South West REZ have a higher proportion of residents identifying as Indigenous compared to NSW as a whole. The traditional custodians of land in the regional area include the Latji Latji people (Mildura) and the Barkinji people (Wentworth). Within the South West REZ, traditional custodians of the land neighbouring the regional area include the Mutthi Mutthi, Dadi Dadi, and Kureinji peoples.
Housing and short-term accommodation	• The sub-regional area exhibits high levels of dwelling occupancy (90.1%) aligning with the figure for the broader State. Dwelling occupancy levels in the South West REZ were lower in comparison at 84.6% in 2021. Unoccupied dwellings include vacant houses, holidays homes, and dwellings due for demolition or repair. • Higher levels of home ownership are recorded within the South West REZ (70.2%) relative to the sub-regional area (66.2%) and NSW more broadly (64.0%). A high proportion of other dwelling tenure type was also recorded in the REZ (4.9% compared NSW's 1.9%), which includes dwellings occupied under a life tenure scheme and dwellings occupied rent free. • At the 2021 Census, the median rent for Wentworth and Mildura LGA were $200 and $265 per week respectively. The median rent for NSW more broadly was $420 per week. • Across the sub-regional area, a larger range of commercially operated short-term accommodation options are available in the more densely populated centres along the Murray River including Wentworth, Dareton, Buronga and Gol Gol in Wentworth LGA as well as Mildura, Merbein, Red Cliffs, Irympie and Nichols Point in Mildura LGA.
Social infrastructure and services	• The Silver City Highway and Sturt highway are the main transport links in Wentworth LGA, with the former also providing access across the Murray River into Mildura LGA via the Abbotsford Bridge and George Chaffey Bridge. • Public transport in Mildura LGA include bus and train services while there are no public transport services in Wentworth LGA. • The sub-regional area is serviced by Wentworth Health Service and Mildura Base Hospital. Other social infrastructure across the sub-regional area include primary and secondary schools, TAFE campuses, libraries, parks and recreation facilities, as well as a range of community and social support services (predominantly concentrated in Mildura regional city).
Labour force	• The sub-regional area is characterised by a labour force participation rate comparable to the South West REZ (56.8% and 56.5% respectively) and a higher rate of unemployment at 5.1% (1,517 people) in 2021. The rate of unemployment for the sub-regional area is comparable to that for NSW at 4.9%. • Indigenous and youth unemployment within the sub-regional area were also high (15.6% and 10.3%) compared to rate for the South West REZ (11.1% and 7.3%) and NSW as a whole (9.8% and 9.8%). • Key industries of employment in the sub-regional area consist of health care and social assistance; agriculture, forestry and fishing; and retail trade. For the South West REZ, key employing industries include agriculture, forestry and fishing; health care and social assistance; and construction.

Table 6.10 Key relevant social characteristics and trends

Social themes	Social characteristics and trends
Local business and industry	• Key industries in Mildura LGA include agriculture, transport and logistics, food and beverage manufacturing, retail, health and community services. Renewable energy generation, aquaculture, and mineral sands mining and recycling are emerging industries in the LGA. • Fruit and vegetable production are critical industries to Mildura with more than 80% of Victoria's grapes and much of the state's citrus fruit being produced in the region (Mildura Rural City Council, 2024). • Key industries in Wentworth LGA predominantly comprises of horticulture and dryland farming as well as tourism.
Community values	• Local and regional elements valued by the community of Wentworth include quiet country living and semi-rural environment; proximity to Mildura and access to services; strong sense of community; the environment and river; unique landscapes and attractions; parks and open space; and good public facilities. • Key features in Wentworth LGA include Willandra Lakes World Heritage Area and Mungo National Park (internationally significant for its cultural, archaeological and natural landscape features); confluence of the Murray and Darling Rivers; and the Australia Inland Botanic Gardens. • Local and regional elements valued by the community of Mildura include access to natural bushland, river and parks; protection of the natural ecosystem; the rural lifestyle and city benefits; access to a range of public facilities and infrastructure; local small businesses; and the agriculture and horticulture industries (Mildura Rural City Council, 2021).
Vulnerability	• According to the 2021 Socio-Economic Indexes for Areas (SEIFA), Wentworth LGA recorded an Index of Relative Socio-economic Disadvantage (IRSD) quintile ranking of 3 while Mildura LGA recorded a ranking of 2. The ranking indicates relatively greater disadvantage experienced in Mildura compared to Wentworth. • The sub-regional area recorded higher proportions of potentially vulnerable groups relative to the South West REZ including residents aged 24 years or younger (children and youth), unemployed, and requiring assistance with a core activity (i.e. self-care, mobility, and communication). • Both the sub-regional area and South West REZ recorded a higher proportion of households earning less than $650 per week (19.3% and 19.9% respectively) compared to NSW (15.3%). • Mental health, asthma, and arthritis are the three most prevalent long-term health conditions reported within both the sub-regional area and South West REZ.

iii Preliminary social impact identification and evaluation

This section presents the preliminary identification and evaluation of social impacts associated with the Project. The purpose of this preliminary evaluation is to determine the level which these impacts need to be assessed by the subsequent SIA. The initial identification and evaluation of social impacts was facilitated through completion of the SIA scoping worksheet, which is provided as Appendix F.

a Process of impact identification and evaluation

The identification of potential social impacts and benefits was an iterative process informed by:

- the review of project activities and the social effects they could generate
- analysis of existing baseline socio-economic conditions across the social locality.

Preliminary identification and evaluation of social impacts was further guided through application of the SIA scoping worksheet provided as part of the SIA Guideline. As defined in the SIA Guideline 2023, the level of assessment for each social impact are:

- Detailed assessment: the project may result in significant social impacts, including cumulative impacts

- Standard assessment: the project is unlikely to result in significant social impacts, including cumulative impacts
- Minor assessment: the project may result in minor social impacts
- Not relevant: the project will have no social impacts, or the social impacts of the project will be so small that they do not warrant consideration.

To determine the level of assessment for each social impact, a preliminary impact significance evaluation is undertaken by determining the likelihood and magnitude of the potential impact. The significance levels of an impact are low, medium, high, and very high, with each impact significance rating applied to a level of assessment:

- Impacts assigned a significance rating of High or Very High require a detailed assessment.
- Impacts assigned a significance rating of Medium require a standard assessment.
- Impacts assigned a significance rating of Low require a minor assessment.

The significance ratings identified are based on preliminary investigation and current understanding of the potential social impacts, prior to any mitigation measures being applied. The impact significance ratings will be revised in the Phase 2 SIA that forms part of EIS.

A summary of outcomes of the SIA scoping worksheet (Appendix F) is provided in Table 6.11 including preliminary measures which serve to mitigate potential project impacts and enhance potential benefits.

Table 6.11 Preliminary social impact evaluation

Social impact	Impact category	Project phase	Affected stakeholder group	Preliminary impact significance			Potential mitigation measures	Phase 2 assessment level
				Likelihood	Magnitude	Significance		
Negative impacts								
Community stress and anxiety due to uncertainty around project layout including final number and proposed placement of WTGs	Decision-making systems Surrounding Way of life Community	Pre-construction	Landholders Local communities	Likely (B)	Minor (2)	Medium (B2)	Refinements to Project design and layout based on feedback from early engagement.	Detailed
Reduced rural lifestyle values and sense of place due to changes to the visual landscape from the presence of WTGs	Surrounding Way of life Community	Construction Operation	Local communities	Likely (B)	Minor (2)	Medium (B2)	Visual impact assessment Ongoing community and stakeholder engagement.	Detailed
Land use competition between agriculture and renewable energy generation disrupting private property use	Way of life Livelihoods	Construction Operations	Landholders	Almost certain (A)	Minor (2)	Medium (A2)	Landholder agreements to reasonably compensate for disruptions to existing operations/land use	Detailed
Increased biosecurity risks potentially affecting agricultural productivity and subsequent profitability (e.g. introduction of weeds and pests)	Livelihoods Surroundings	Construction Operations	Landholders	Possible (C)	Major (4)	Medium (D4)	Weed risk assessment and implementation of land access biosecurity measures such as vehicle washdowns.	Detailed
Potential amenity and wellbeing impacts from noise, dust and visual impacts on sensitive receivers during construction	Health and wellbeing Way of life	Construction	Local residents Landholders Surrounding neighbours	Likely (B)	Major (4)	High (B3)	Environmental controls during construction based on air quality, acoustic and visual impact assessments. Advanced notification to local residents on timing of construction activities.	Detailed

Table 6.11 Preliminary social impact evaluation

Social impact	Impact category	Project phase	Affected stakeholder group	Preliminary impact significance			Potential mitigation measures	Phase 2 assessment level
				Likelihood	Magnitude	Significance		
Changes or disruptions to road and traffic conditions resulting in reduced access/connectivity on local road network and increased frustration and stress for existing road users	Access Way of life	Construction	Local and regional residents Local government	Likely (B)	Moderate (3)	High (B3)	Advanced notification to local residents on timing of construction activities including road closures and diversions. Development of a Traffic Management Plan	Detailed
Perceived deterioration of public safety due to additional construction traffic on local and regional roads	Health and wellbeing Access	Construction	Local and regional residents Local government Emergency service providers	Possible (C)	Moderate (3)	Medium (C3)	Advanced notification to local residents on timing of construction activities including road closures and diversions. Development of a Traffic Management Plan	Detailed
Perceived increase in health and safety risks due to Wind Farm associated hazards including shadow flicker, sleep disturbance, aviation incidents, bird strikes and blade throw risks	Health and wellbeing	Operation	Local residents Landholders Surrounding neighbours	Unlikely (D)	Major (4)	Medium (D4)	Community safety and hazard risk management Community engagement and education to improve understanding of Wind Farm co-existence and hazard risk reduction procedures	Detailed
Increase in demand for local housing (rentals) and short-term accommodation	Access Way of life	Construction	Local residents Local government	Likely (B)	Major (4)	High (B4)	Development of a Workforce Accommodation Strategy	Detailed
Increased competition for labour and reduced availability of skilled labour for local employers.	Livelihoods	Construction	Local and regional businesses Local and regional economic and industry groups	Likely (B)	Major (4)	High (B4)	Engage with relevant stakeholder to understand local and regional skills gaps and development opportunities. Provision of skills development and training initiatives by the project.	Detailed

Table 6.11 Preliminary social impact evaluation

Social impact	Impact category	Project phase	Affected stakeholder group	Preliminary impact significance			Potential mitigation measures	Phase 2 assessment level
				Likelihood	Magnitude	Significance		
Potential increase in demand and strain on local/regional services and infrastructure due temporary population increase attributed to project workforce	Access Way of life	Construction	Local communities Key townships Service providers	Possible (C)	Moderate (3)	Medium (C3)	Advanced notification to local service providers on timing of construction activities and anticipated workforce ramp up. Development of a community benefit plan for the project including initiatives to supports community infrastructure and service provision	Detailed
Potential disturbance or changes to sites or landscapes of tangible and intangible cultural heritage significance	Culture	Construction Operation	Traditional Owners and Aboriginal communities Local and regional communities	Possible (C)	Major (4)	Medium (C3)	Meaningful engagement with relevant stakeholders including Traditional Owners and the broader Aboriginal community. Aboriginal heritage assessment and development of an Aboriginal Cultural Heritage Management Plan	Detailed
Impacts to local environmental values resulting from land clearing, and potential for change to local biodiversity	Surroundings	Construction	Local communities Landholders Surrounding neighbours	Possible (C)	Minor (2)	Medium (C2)	Refinement to project design and layout to avoid/further minimise known habitats based on feedback from early engagement with local landholders and detailed biodiversity surveys.	Detailed
Positive impacts								
Economic benefits associated with generation of local and regional business supply opportunities, including small-medium enterprises and Indigenous businesses.	Livelihoods	Construction	Local communities Regional communities Traditional Owners and Aboriginal communities Local and regional economic and industry groups	Likely (B)	Major (4)	High (B4)	Advanced notification to local service providers on timing of construction activities and anticipated workforce ramp up. Development of an Aboriginal Participation Plan to maximise access to business opportunities	Detailed

Table 6.11 Preliminary social impact evaluation

Social impact	Impact category	Project phase	Affected stakeholder group	Preliminary impact significance			Potential mitigation measures	Phase 2 assessment level
				Likelihood	Magnitude	Significance		
Generation of training and skills development opportunities in local and regional area, including for under-represented groups	Livelihoods	Construction	Local communities Regional communities Traditional Owners and Aboriginal communities Local and regional economic and industry groups	Likely (B)	Major (4)	High (B4)	Workforce Development Strategy Development of an Aboriginal Participation Plan to maximise access to employment pathways	Detailed
Increase in trade and revenue for local businesses in key townships due to patronage/expenditure by the project workforce.	Livelihoods	Construction	Local and regional businesses	Possible (B)	Minor (3)	Medium (B2)	Engage with local employment and training service providers to establish local capacity and maximise opportunities for local skills development and employment. Commitment to use local contractors and supplier where feasible.	Detailed
Improved/enhanced local/regional social outcomes due to project's community investment initiatives.	Community	Construction Operations	Local and regional communities Social infrastructure and community service providers	Possible (B)	Minor (3)	Medium (B2)	Development of a community benefit plan for the project including establishment of a community investment initiative/program	Detailed
Contribute to intergenerational equity through provision of infrastructure that enables the transition to renewable energy generation.	Community Way of life	Operations	Local and regional communities	Likely (B)	Minor (2)	Medium (B2)	Employment strategies to build workforce skills needed to support renewable energy projects	Detailed

b Summary

The SIA scoping process and completion of the SIA Scoping worksheet (Appendix F) identified 20 potential social impacts (both positive and negative), of which all will require a detailed level of assessment during EIS phase, and preparation of the project's social impact assessment.

The potentially negative social impacts, requiring detailed assessment and management include:

- potential anxiety among local landholders as the project design and WTG locations are confirmed
- changes to rural lifestyle values and sense of place
- disruption to existing agricultural operations and land use
- amenity impacts during construction (noise, dust, visual)
- changes/disruptions to local and regional traffic conditions (access, connectivity, traffic volumes)
- increase in demand for local housing, short-term accommodation, social infrastructure and services
- potential for increased community safety and wellbeing concerns, resulting from increased traffic and during operation of WTGs.

The key predicted positive social impacts/benefits of the project include:

- generation of construction employment, training, and procurement opportunities
- increased trade for local businesses in key townships
- improved/enhanced social outcomes from the project supporting community initiatives
- contribution towards the NSW transition towards renewable energy generation

iv Assessment approach

The purpose of this SIA Scoping chapter was to inform the SEARs and the scale and scope of the SIA which is to be prepared as part of the EIS. The SIA will be developed in accordance with the requirements outlined in the SIA Guideline 2023 (DPE, 2023a) and SIA Technical Supplement 2023 (DPE, 2023b) and involve the following key activities:

- preparing a comprehensive and targeted social baseline that builds on the profiles provide in the scoping report
- identification of, and consultation with, affected communities and stakeholders including vulnerable groups
- a comprehensive assessment and evaluation of social impacts and benefits against existing baseline conditions
- development of project enhancement and mitigation measures
- consideration/assessment of cumulative impacts in the context of projects within the region.

Development of the SIA will be informed by SIA-specific engagement activities, together with input drawn from the outcomes of the project's broader community and stakeholder engagement program. All engagement activities informing project planning will be approached in an integrated way to ensure consistency of information provision, and to manage consultation fatigue.

6.2.6 Traffic and access

i Existing environment

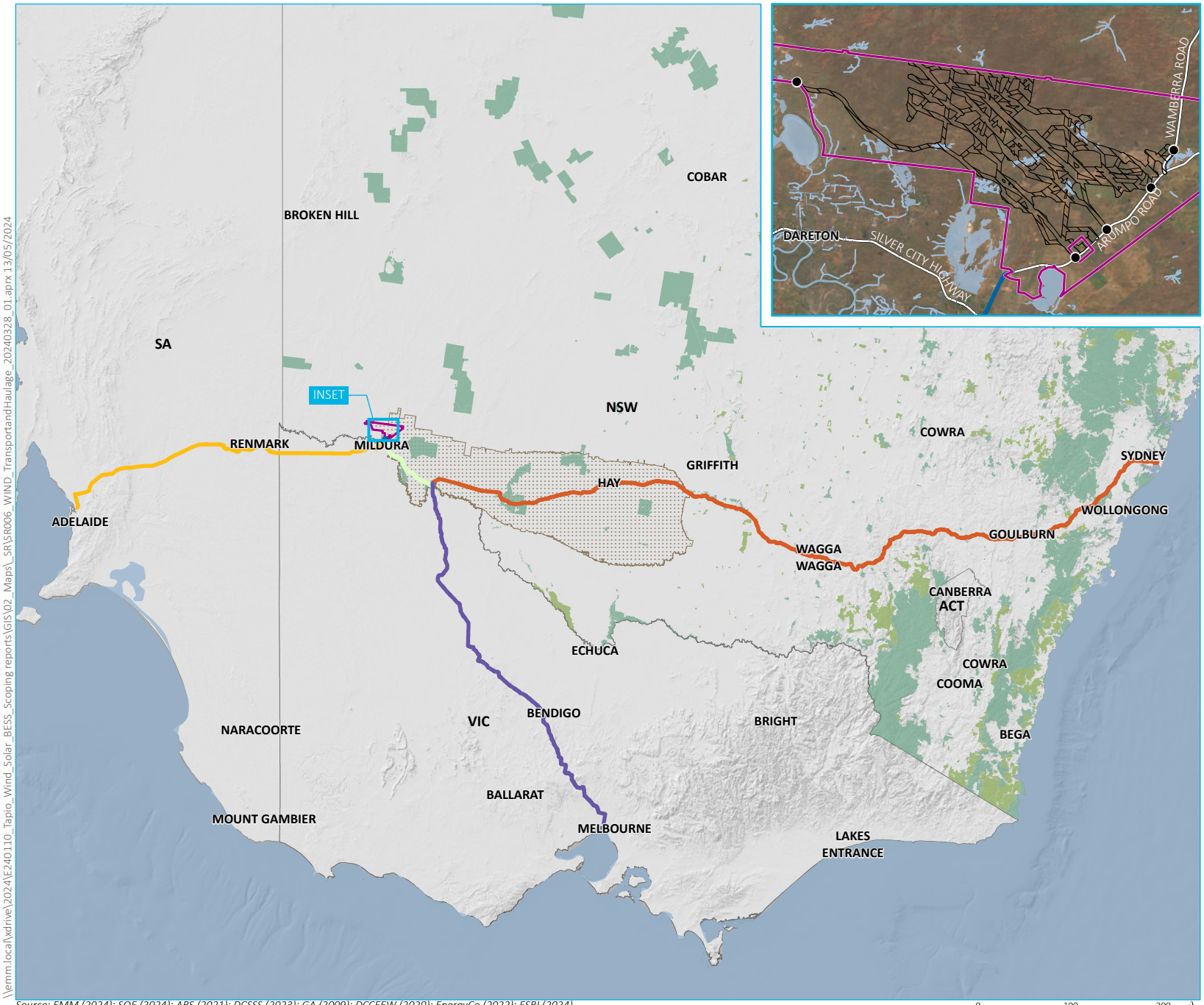
The Wind Farm development corridor is bound by Arumpo Road and Wamberra Road in the east and Fletchers Lake Road in the west, which are generally one lane each way sealed Regional Roads under the care and control of Wentworth Shire Council (Plate 6.1 and Plate 6.2). The speed limit on Arumpo Road and Fletchers Lake Road is restricted to 80 km/h.

The Wind Farm development corridor would be accessed from Arumpo Road and Wamberra Road in the east, from which, multiple site access points are proposed. A single access point is proposed from Fletchers Lake Road. Access to Arumpo Road and Fletchers Lake Road would be via Silver City Highway and Sturt Highway, two arterial roads in the vicinity of the project which are under the care and control of Transport for NSW (TfNSW). The locations of the potential site access points (to be finalised during the EIS phase) and the surrounding road network, is shown on Figure 6.5.

Source: Google Maps 2024

Plate 6.1 Arumpo Road near potential southern access (looking north)

Plate 6.2 Silver City Highway and Fletchers Lake Road intersection (looking north)



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Source: EMM (2024); SQE (2024); ABS (2021); DCSSS (2023); GA (2009); DCCEEW (2020); EnergyCo (2022); ESRI (2024)

Transport and haulage routes

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Scoping Report
Figure 6.5

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ii Potential impacts

The project will generate traffic during construction related to the movement of construction workers and the delivery of materials, plant and equipment. Construction traffic generation has the potential to impact on intersection performance and traffic volume capacity on the surrounding network and along key transport routes.

Proposed new access points from the public road network, likely Arumpo Road and Fletchers Lake Road, will be required for project construction access. From these access points, internal access tracks will also be established to connect the project components and other infrastructure areas to the public road network. The internal tracks will serve both as access for servicing and maintaining project infrastructure as well as fire trails.

OSOM vehicles will be required for the transport of oversized infrastructure and project components from port locations to the project. EnergyCo will work alongside TfNSW to upgrade the State's road network to help the transition to renewable energy under the 'Port to REZ' A Memorandum of Understanding (MOU) released in September 2023. The potential OSOM routes are shown in Figure 6.5, including from ports in NSW, Victoria and South Australia.

Ongoing road maintenance requirements and any potential need for localised upgrades to mitigate traffic impacts during construction will also need to be considered. Should upgrades be identified, these will be detailed in the EIS. Operational traffic generation will be minimal with some daily light vehicle movements and heavy vehicle deliveries only as required.

iii Assessment approach

Engagement with Transport for NSW (TfNSW) and Wentworth Shire Council will be required to identify any existing road safety concerns and ensure any potential deficiencies are clearly understood and assessed.

A traffic impact assessment (TIA) will be carried out to investigate potential impacts associated with the project. The traffic impact assessment will include:

- projections of traffic volumes and transport routes during construction and operation
- assessment of the potential traffic impacts of the project on road network function, including intersection performance, site access arrangements, and road safety, including school bus routes and cyclist safety
- assessment of the capacity and condition of the existing road network to accommodate the type and volume of traffic generated by the project (including OSOM vehicles and escorted deliveries) during construction and operation, with any potential cumulative impacts from other projects in the area being considered
- provide details of measures to manage potential impacts, including a schedule of required road upgrades, road maintenance contributions, and other traffic control measures, developed in consultation with the relevant road authority.

The assessment of traffic and access impacts will be prepared using the following guidelines, policies and design requirements:

- Guide to Traffic Generating Developments (RTA 2002)
- Austroads Guides to Road Design (various publications)
- *Austroads Guides to Traffic Management* (various publications)
- Australian Standard AS 2890 Parts 1 and 2
- *Australian Code for Dangerous Goods Transport*.

6.3 Standard assessment

6.3.1 Historic heritage

i Existing environment

The project lies within the Murray Darling Depression Bioregion, which covers 19,717,651 ha over New South Wales, Victoria and South Australia. The region has been subject to land clearing to make way for pastoral activities, but substantial tracts of remnant vegetation remain.

Statutory registers were reviewed including the World Heritage List (WHL), National Heritage List (NHL), the Commonwealth Heritage List (CHL), the State Heritage Register (SHR), the Section 170 Registers (s170) and Schedule 5 of the *Wentworth Local Environmental Plan 2011*. There are no listed heritage items in the project investigation area of National, State or local historical heritage significance. Heritage items in the vicinity of the project investigation area are in Table 6.12 and Figure 6.6.

Non-statutory registers reviewed as a part of this assessment include the Register of the National Estate (RNE) and Travelling Stock Reserves (TSRs).

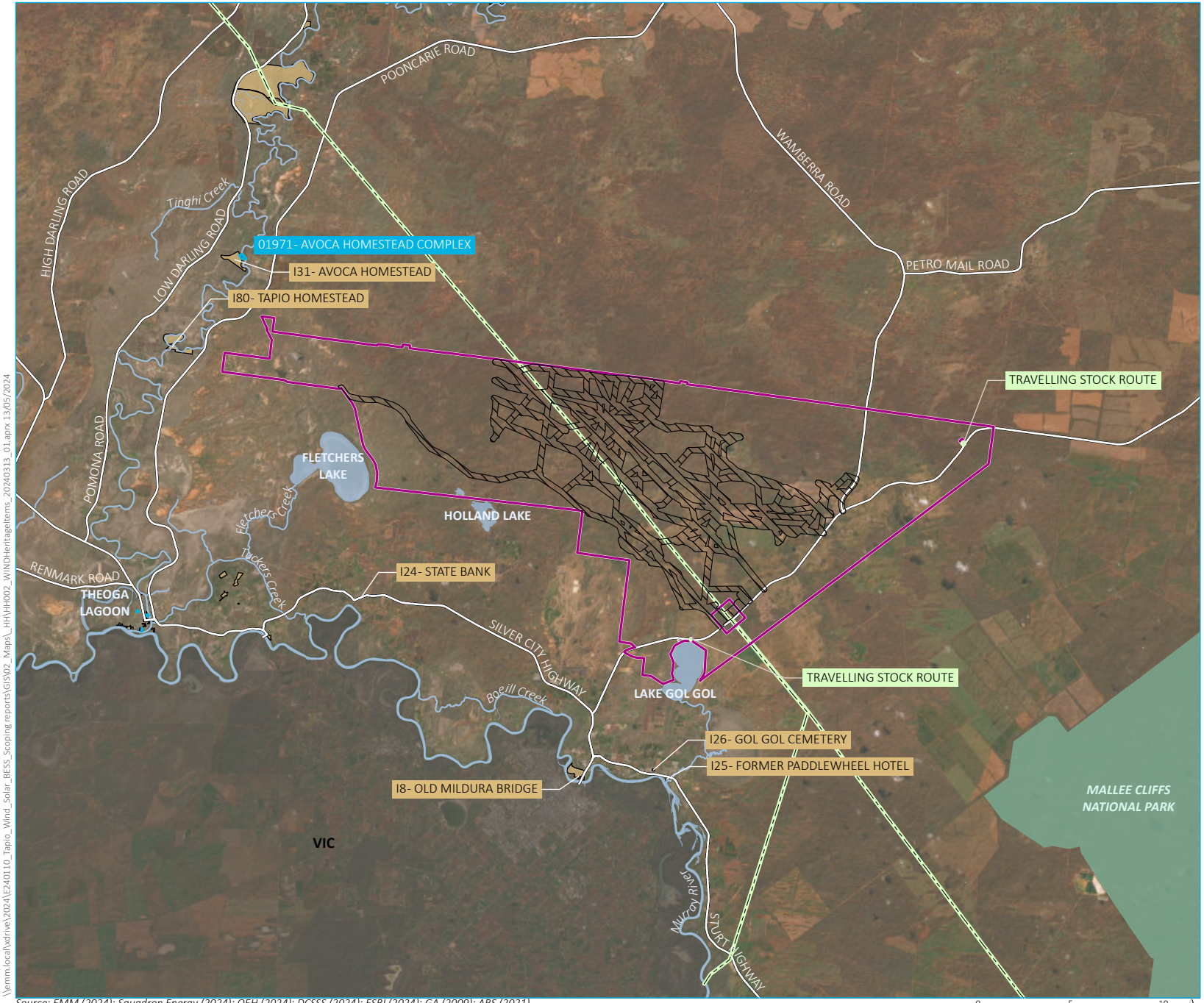
There are two features recorded of medium to low value on the Travelling Stock Reserves State Classification Map. These include one well and one water tank that are inside the wind farm project investigation area, but outside of the development corridor.

Table 6.12 Heritage register search results

Jurisdiction	Heritage Register	Within wind farm investigation area	Within 5 km of wind farm investigation area
Federal	World Heritage List (WHL)	Nil	Nil
	Commonwealth Heritage List (CHL)	Nil	Nil
	National Heritage List (NHL)	Nil	Nil
State	State Heritage Register (SHR)	Nil	SHR ID 01971, *Avoca Homestead Complex*, 2.5 km north-west of the project investigation area.
Local	Wentworth Local Environmental Plan 2011	Nil	LEP#I25, *Former Paddlewheel Hotel*, 5 km south of the project investigation area. LEP #I26, *Gol Gol Cemetery,* 4.6 km south of the project investigation area. LEP#I31, *Avoca Homestead*, 2.5 km north-west of the project investigation area. LEP #I80, *Tapio Homestead*, 1.7 km west of the project investigation area
Government agency list of heritage assets	S170 Section 170 of the *Heritage Act*	Nil	Nil
Non-statutory	Register of the National Estate (RNE)	Nil	Nil
	National Trust of Australia (NT)	Nil	Nil

Table 6.12 Heritage register search results

Jurisdiction	Heritage Register	Within wind farm investigation area	Within 5 km of wind farm investigation area
	Travelling Stock Reserves (TSRs)	R86545 SWP1035-Gol Gol Well, broken into three sections, within investigation area boundary north of Lake Gol Gol, but outside of wind farm development corridor. R76669 SWP1036-Tapio Tank, within investigation area but outside of wind farm development corridor.	



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line

Historic heritage item

- Travelling stock route
- State heritage register

Wentworth Local Environmental Plan 2011

- Item- General

Existing environment

- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- Victoria

Source: EMM (2024); Squadron Energy (2024); OEH (2024); DCSSS (2024); ESRI (2024); GA (2009); ABS (2021)

0 5 10 km

GDA2020 MGA Zone 54

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Listed heritage items

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Figure 6.6

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ii Potential impacts

Construction works will include leveling, excavation, and ground disturbance activities, which has the potential to impact archaeological resources. In addition, the construction of facilities, roads, and installation of associated services will also create sub-surface disturbance, increasing the probability of disturbing archaeological resources. The project will not impact listed heritage items of National, State or local historical heritage significance.

iii Assessment approach

Based on experience and the broader historical context of the agricultural development in the region, it is considered likely the project development corridor will contain archaeological resources related to farming activities of Tapio, including stock yards, tanks, troughs, huts and associated infrastructure. The proposed project development corridor is therefore an area of moderate to low archaeological potential and there is risk for the project to expose or impact archaeological resources or relics. As such, the following action is recommended:

- preparation of a Statement of Heritage Impact (SOHI) as part of the EIS to gain further understanding of historical heritage assessment of built, archaeological and landscape values. The assessment will include more detailed desktop research and consultation, which will also provide valuable information on the historical heritage values of the project investigation area and broader region. Mitigation and management measure will also be included in the SOHI, if necessary.

- a site inspection of the project development corridor, based on the presence of historical sites identified as part of the desktop analysis.

The SOHI will also consider the wider region to determine the potential for historical finds to be present in the project investigation area and if so, assess the potential significance of the finds and provide recommendations for the appropriate management of any finds.

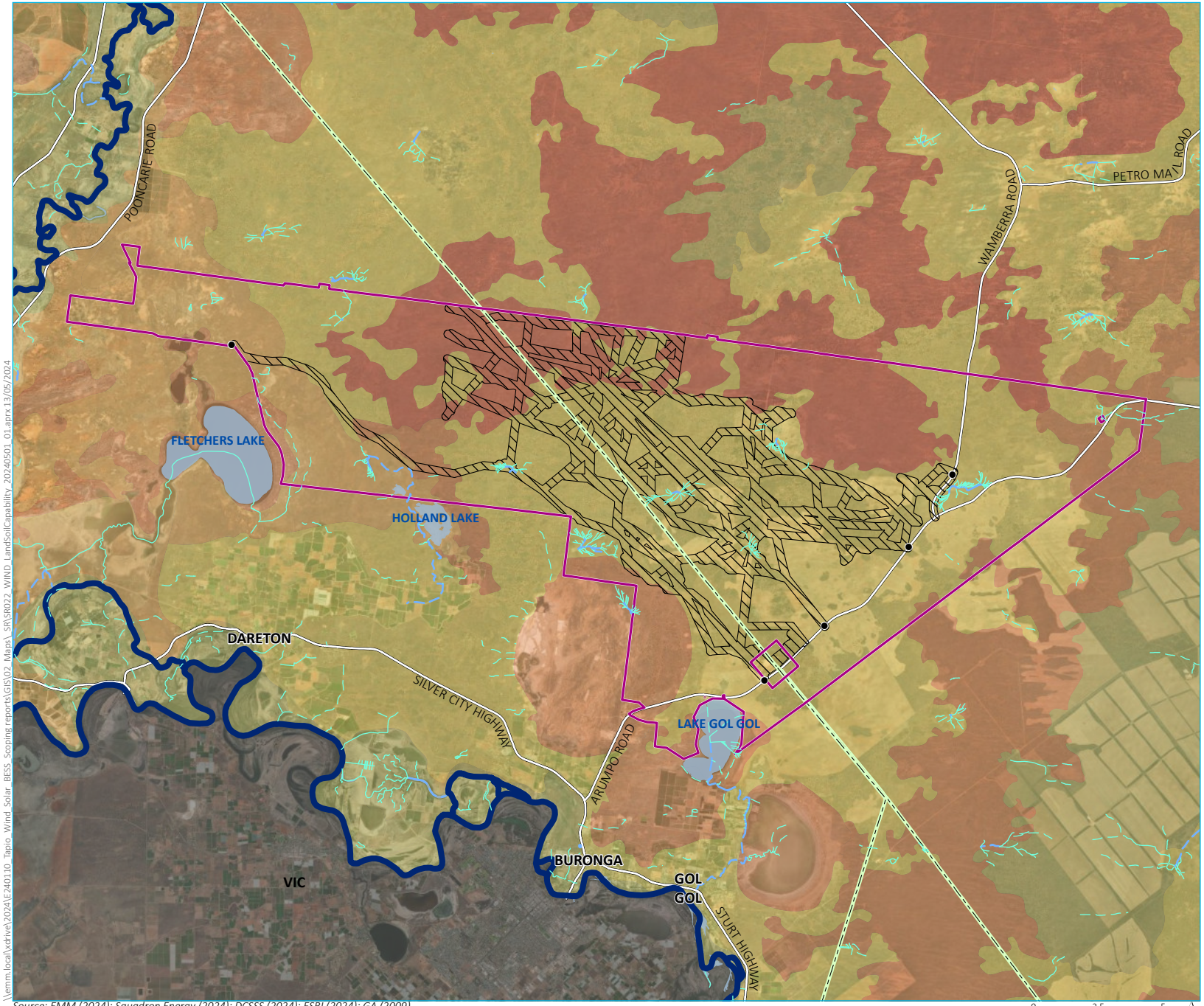
6.3.2 Land

i Existing environment

The land within the project investigation area is zoned RU1 Primary Production and C2 Environmental Conservation under the Wentworth LEP. The development corridor comes in close proximity to, but has been developed to avoid, the environmental conservation zoning. The development corridor is disturbed, currently used for agricultural purposes but does contain significant areas of remnant vegetation. Regional land and soil mapping data has been reviewed with a focus on the project investigation area. Land and soil capability mapping across the project investigation area is in Table 6.13 and Figure 6.7.

Table 6.13 Land and soil characteristics

Great soil group	Australian soil classification (ASC)	Inherent soil fertility	Land soil capability (LSC) class
Solonized Brown Soils	Calcarosols	Moderately low	5
Chocolate soils	Chromosols	Moderate	6
Grey, Brown and Red Clays	Vertisols	Moderate	7
Siliceous Sands	Rudosols	Low	8



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Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

Land and soil capability

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Figure 6.7

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Soils are consistent across the Australian soil classification (ASC) and land soil capability (LSC) associations, and the entire project investigation area is mapped as LSC Class 5, 6, 7 and 8 (severe to extreme limitations). There are no Class 1–4 soils identified in the project investigation area.

The project investigation area is not mapped as Biophysical Strategic Agricultural Land (BSAL). There are no acid sulfate soils (ASS) or potential acid sulphate soils mapped within the project investigation area.

A search of the NSW Environment Protection Authority (EPA) contaminated land public record was undertaken in April 2024 for contaminated sites within the Wentworth LGA. No recorded sites were returned.

ii Potential impacts

Soil disturbance during construction may result in:

- topsoil and subsoil impacts (e.g. degradation and loss of topsoil, compaction of soil through vehicle movement and poor reinstatement and soil inversion or mixing resulting in changes in constraints such as salinity and sodicity within the soil profile)
- disturbance and form changes affecting natural surface drainage
- erosion and sedimentation, particularly during clearance and soil exposure activities resulting in:
    - on-site impacts (such as erosion of constructed landforms)
    - off-site impacts (such as eutrophication of downstream waters)
- increased dust generation.

These impacts could result in reduction of soil quality that could be deleterious to agricultural productivity and land use after rehabilitation, if not suitably managed or mitigated. Decreasing soil quality or volumes during construction could result in limitations to rehabilitation from loss or degradation of soil materials that are needed to reinstate the soils in a suitable condition.

Any negative impact to soil characteristics presents a risk of harm to the land and soil capability and productivity of the development footprint post-rehabilitation.

iii Assessment approach

A land, soil and erosion (LSE) assessment will be prepared as part of the EIS and will include:

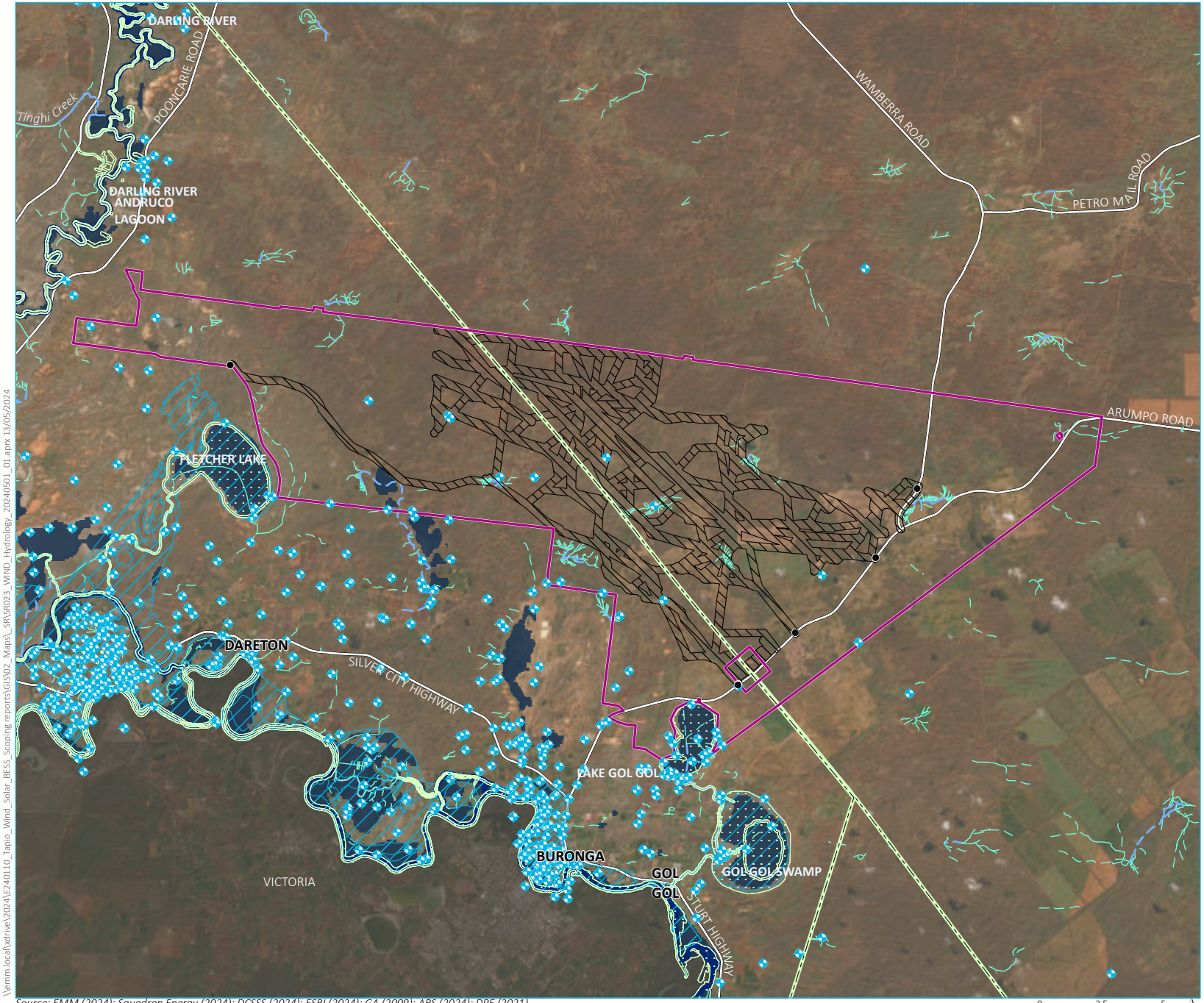
- a description of the biophysical environment (including soil landscapes and LSC class)
- an erosion hazard analysis
- an impact assessment of the project on soil types, LSC class and agricultural productivity
- recommendations for site decommissioning and rehabilitation to restore disturbed land back to agriculture.

6.3.3 Water

i Existing environment

The project is located within the Murray Darling Basin South. The Murray River flows from east to west in direction, approximately 7 km south of the project investigation area. Two nationally important wetlands, Lake Ranfurly and Kings Billabong Wetlands, are located approximately 15 km south of the project, south of the Murray River.

Several significant waterbodies, including Fletchers Lake, Holland Lake, Lake Gol Gol and Gol Gol Swamp are adjacent to the project investigation area, however within the project investigation area, there are no mapped waterways or waterbodies. See Figure 6.8 for mapped hydrological features in and around the project investigation area.



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line
- Site access

Hydrology

- Groundwater bore
- Land subject to flooding
- Key fish habitat
- Wetland

Strahler stream order

- 1st order
- 2nd order
- 3rd order
- 4th order
- 5th order
- 10th order

Existing environment

- Major road
- Named watercourse
- Victoria

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Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009); ABS (2024); DPE (2021)

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Hydrology

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Figure 6.8

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ii Potential impacts

The construction of the project has the potential to result in the following impacts to water resources in the absence of suitable controls:

- ground disturbance during bulk earthworks and other site activities could lead to exposure of soils and potential erosion and mobilisation of sediment into receiving watercourses
- contamination of surface waters or groundwater as a result of accidental spillage of materials such as fuel, lubricants, herbicides and other chemicals used to support construction activities
- partial blockage or redirection of floodwaters and downstream impacts as a result of poorly considered construction activities
- demand for water during construction.

Operation has the potential to result in the following impacts to water resources in the absence of suitable controls:

- demand for water for land management purposes
- potential ongoing erosion of soils and mobilisation of sediment into receiving watercourses
- contamination of surface water or groundwater as a result of accidental spillage of materials such as fuel, lubricants, herbicides and other chemicals used to support site activities, or through poor site and vegetation management practices
- partial blockage or redirection of floodwaters and downstream impacts as a result of poorly considered permanent facilities.

Specific design considerations and mitigation measures may be recommended to minimise potential impacts within and along drainage lines. Roads and services that require watercourse crossings will be designed and constructed in accordance with relevant regulations and best practice design and construction methods.

The project is not likely to impact groundwater during construction, operation, or decommissioning due to the limited amount of subsurface disturbance activities required during the installation and decommissioning of project infrastructure.

iii Assessment approach

A water resources assessment will be prepared as part of the EIS that will include a review of the existing water environment, an assessment of potential impacts on water resources and a description of any proposed mitigation and management measures. The water resources assessment will include:

- complete site characterisation including mapping to effectively characterise surface water features, groundwater features and relevant water users
- the likely impacts of the project (including flooding) on surface water and groundwater resources, drainage channels, wetlands, riparian land, farm dams, groundwater dependent ecosystems and acid sulfate soils, related infrastructure, adjacent licensed water users and basic landholder rights, and measures proposed to monitor, reduce and mitigate these impacts
- a qualitative review and assessment of the likely risks and impacts of the project on flooding and floodplain areas using available flood data and mapping
- a review of the relevant regulatory requirements (e.g. Water Sharing Plans) of relevance to the catchment and groundwater sources in which the project is located

- consideration of water requirements and supply arrangements for construction and operation
- erosion and sediment control measures that will be implemented to mitigate any impacts in accordance with *Managing Urban Stormwater: Soils & Construction* (Landcom 2004).

6.3.4 Air

i Existing environment

Land use within the project investigation area and surrounds is primarily agricultural, which is likely to influence local and regional air quality. Existing sources of air pollution within a local setting are limited and typically comprise dust and vehicle and machinery exhaust emissions associated with agricultural production and local roads. Wood smoke from bushfires and rural residences can also be a source of particulates.

The Buronga Substation is also currently being constructed adjacent to the project investigation area, that may currently be a source of dust emissions in the locality. Construction of the substation is expected to be complete prior to construction of the Gol Gol Wind Farm project and would not impact background air pollution levels at that time.

ii Potential impacts

The project is not anticipated to generate significant air quality impacts during construction or operation. Dust may be generated during construction due to an increase in exposed areas following site preparation works and from construction traffic movements on unsealed roads. This dust generation is expected to be localised, unlikely to have significant impacts at nearby receivers, and able to be mitigated through implementation of standard management measures.

No significant dust generation is expected during operations given exposed areas will have been rehabilitated. Minor levels of dust may be generated during decommissioning as a result of structures being removed, areas being temporarily exposed, and rehabilitation works. This will only occur for a short duration before rehabilitation of exposed areas has been established.

iii Assessment approach

A quantitative air quality assessment with dispersion modelling is not considered warranted given risk of air quality impacts is low and will not extend beyond the construction phase of the project.

Impacts to neighbouring sensitive receptors (human and ecological) from construction dust emissions (including the potential for cumulative emissions due to the possible concurrent construction of the project with the Mallee Solar Farm and Mallee Wind Farm) will be assessed using a qualitative impact assessment approach.

6.3.5 Hazards and risk

i Aviation

The EIS will consider potential interactions between the proposed WTGs and local air services (including safety hazards associated with intrusion of airspace and impacts on navigation instruments).

The closest known airport to the project is Mildura Airport located 20 km to the southwest. Given the rural landscape, there may also smaller aerodromes and runways surrounding the project investigation area. Additional aviation activities associated with agricultural operations (e.g. aerial spraying and pest management) may also occur in the locality.

An aviation impact assessment will be prepared and will assess potential impacts on aviation activities (including aerodromes, air routes, airspace and navigation/radar) and provide aviation safety advice in respect of relevant requirements of air safety regulations and procedures (including consultation with relevant aviation agencies).

The assessment will be undertaken in accordance with:

- Civil Aviation Safety Regulations 1998
- guidance material from the Civil Aviation Safety Authority
- National Airports Safeguarding Framework Guideline D: Managing the Risk to Aviation Safety of Wind Turbine Installations (Wind Farms)/Wind Monitoring Towers (DITRDC 2012)
- specific requirements as advised by Airservices Australia.

ii Telecommunications

Wind turbines can result in electromagnetic interference that has potential to disrupt telecommunications such as radio, tv broadcasts, aviation signals, mobile phone service, GPS systems and radar services.

The EIS will consider potential interactions between the proposed WTGs and nearby telecommunication services (including point to point microwave links, meteorological radars, mobile voice-based communications, wireless and satellite internet services, broadcast and digital radio and broadcast, digital and satellite television).

A telecommunications assessment will be prepared and will assess potential impacts on telecommunication services. Where impacts are identified, recommendations will be provided to mitigate and manage impacts.

iii Blade throw

A blade throw risk assessment will be completed as part of the EIS and will assess the likelihood of blade throw and calculate typical blade throw distances in order to determine appropriate separation distances between WTGs, residences and property boundaries. The assessment will also determine appropriate separation distances between WTGs and infrastructure associated with the Buronga substation and other neighbouring projects such as the Mallee Wind Farm and Mallee Solar Farm.

Management measures will be recommended, such as regular inspections of WTGs, to mitigate blade throw risk.

iv Preliminary hazard analysis

The EIS for the Project will include an assessment of potential hazards and risks associated with the construction and operation of the project. A preliminary risk screening will be completed in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP). Exposure to electromagnetic fields will also be assessed against the International Commission on Non-Ionizing Radiation Protection (1998) *Guidelines for Limiting Exposure to Time-varying Electric, Magnetic and Electromagnetic Fields*.

v Bushfire

The project investigation area is mapped predominantly as Vegetation Category 1 and 2 bushfire prone land, with some small pockets of excluded land. Vegetation Category 2 is considered to be a lower bushfire risk than Category 1 and Category 3 land, but higher than excluded land. Mapping of bushfire prone land is illustrated in Figure 6.9.

The project has the potential to be exposed to bushfire risk from grasslands and areas of dense vegetation within and adjacent to the project. There is also a risk of a fire starting within the project and spreading to adjacent land.

A bushfire hazard assessment will be prepared to identify potential hazards and risks associated with bushfires and to demonstrate compliance with *Planning for Bush Fire Protection* (RFS 2019).

vi Unexploded ordnance risk

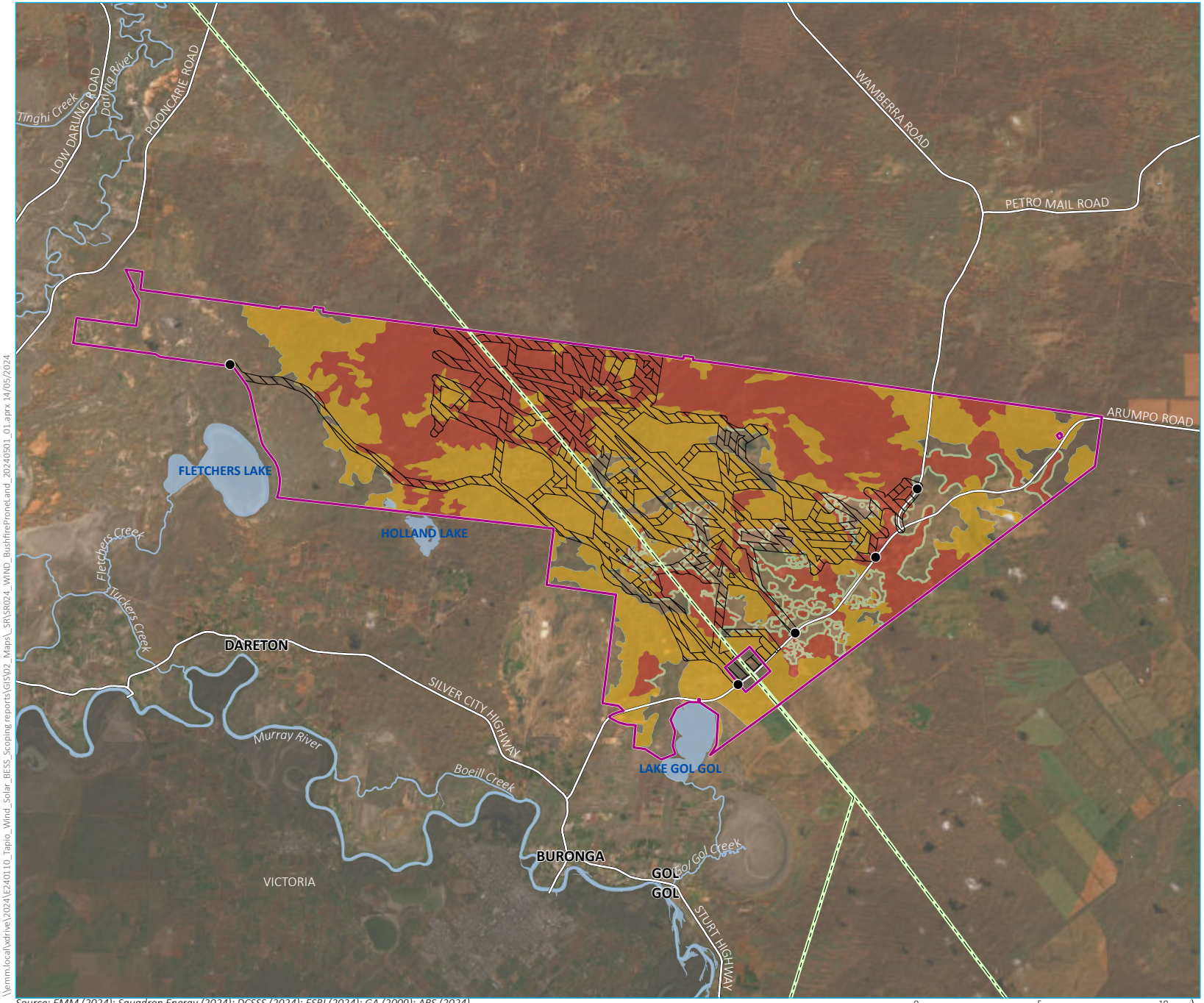
A review of the Department of Defence (Defence) UXO Mapping Application identified areas of the project investigation area as being mapped as 'slight potential' for the presence of unexploded ordnance devices (UXO).

Despite much of the development corridor having been continuously grazed since the 1940's without instance, due to the property's historical use as both RAAF air to ground or air to air ranges during World War II, an UXO Risk Assessment will be carried out and suitable construction management measures will be employed prior to undertaking any ground disturbance works.

vii Waste

The Project will produce various waste streams during construction, operation and decommissioning stages. All waste produced by the project will be classified, handled and managed in accordance with the Waste Classification Guidelines – Part 1 Classifying Waste (NSW EPA, 2014). Priority will be given to reusing materials on site or recycling if reusing is not possible.

Suitable reuse and/or waste disposal facilities will be identified in the EIS.



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Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009); ABS (2024)

Bushfire prone land

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Figure 6.9

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6.3.6 Aquatic biodiversity

There are no key fish habitats or threatened aquatic species predicted by the Fisheries NSW Spatial Data Portal to occur in the project investigation area.

The Commonwealth Protected Matters Search Tool predicted five threatened fish species may occur within 10 km of the project investigation area (Table 6.14). Of these species, one has a moderate potential to occur in the project investigation area.

Table 6.14 Threatened fish species – Likelihood of Occurrence

Threatened fish species	FM Act	EPBC Act	Likelihood of occurrence
Flathead Galaxias (*Galaxias rostratus*)	Critically Endangered	Critically Endangered	**Low**
Murray Hardhead (*Caterocephals fluviatilis*)	Critically Endangered	Endangered	**Low**
Murray Cod (*Maccullochella peelii*)	Not listed	Vulnerable	**Moderate**
Silver Perch (*Bidyanus bidyanus*)	Vulnerable	Critically Endangered	**Low**
Macquarie Perch (*Macquaria australasica*)	Endangered	Endangered	**Low**

The project investigation area contains several unnamed watercourses of Strahler Stream Order 1 to 3 (Figure 6.8) which intersect the development corridor in several locations.

An aquatic habitat assessment for fish species listed under the *Fisheries Management Act* 1994 and EPBC Act and classification of waterways in the project boundary for fish passage may be required as part of the EIS.

6.3.7 Economic

Economic considerations span all project phases and will be most significant during the construction phase. It is expected the project will result in an increase in local and regional expenditure for the provision of goods and services and increase local workforce demand. Economic benefits during operation would be considered with regard to overall benefit to the regional economy by contributing to renewable energy reliability and the growth of renewable energy in the South West REZ. However, this may not be readily quantifiable.

The EIS will include a local effects analysis that translates the effects estimated at the State level to the impacts on the communities located in the local and sub-regional area. The analysis will consider effects relating to local employment, non-labour project expenditure and social impacts on the local community. The findings will be used to inform consultation with the local community and support the development of mitigation opportunities for any adverse impacts.

6.3.8 Built environment

An assessment of impact on the built environment, including leased and private properties, public land and public infrastructure will be undertaken in the EIS. This will include those areas described in Section 2.2, and will include assessment as part of various technical studies including terrestrial biodiversity, social, visual and traffic.

6.4 Cumulative impacts

Cumulative impacts have been scoped and would be assessed in the EIS in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects*, the CIA Guideline (DPIE 2022c).

The project has the potential to generate cumulative impacts and benefits in conjunction with surrounding energy developments and major projects, including future projects in planning, during both construction and operation.

Of note are the proposed Mallee Solar Farm and Mallee Wind Farm, SSD projects in the assessment phase, that are located east of the project investigation area.

Squadron Energy is also proposing to develop separate BESS (Gol Gol BESS) and Solar Farm (Gol Gol Solar Farm) projects within the same overall landholding and within the wind farm project investigation area. These projects will be subject to separate SSD assessments. All potential cumulative impacts would be assessed during preparation of the EIS.

The scoping summary table (Appendix B) outlines the matters for which a cumulative impacts assessment (CIA) would be undertaken, and a CIA scoping table against major projects on the planning portal is provided in Appendix G.

6.5 Matters requiring no further assessment in the EIS

Based on the scoping assessment, the following matters are not considered to require any further assessment in the EIS:

- Access – Rail facilities, port and airport facilities
- Amenity - Odour
- Hazards and risks - Coastal hazards, dam safety and land movement.

7 Conclusion

Squadron Energy proposes to develop the Gol Gol Wind Farm, approximately 10 km north of Mildura in the Wentworth LGA in the Western Murray Region of New South Wales. The project will consist of 120 WTGs, including transmission, ancillary and temporary infrastructure. The project will have an installed capacity of up to approximately 840 MW.

The project investigation area is highly suitable for the Wind Farm project, with the key selection factors for the site including:

- availability of a suitable wind resource
- landholder agreeing to host the wind farm
- positioning within the South West REZ
- flat topography and large land area available to position infrastructure and avoid constraints
- proximity directly adjacent to existing transmission and the approved Project EnergyConnect infrastructure, including the Buronga Substation.

This scoping report has been prepared to assist with the development of SEARs for the project, which will guide the preparation of the EIS. The following key environmental aspects have been identified in Chapter 6 as requiring detailed assessment within the EIS:

- biodiversity - terrestrial
- heritage – Aboriginal
- amenity – visual and noise
- social
- access – traffic.

The project as outlined in this scoping report will be refined during the preparation of the EIS, including in response to the findings of detailed environmental investigations and feedback from community and stakeholder engagement. The EIS will be prepared in accordance with the SEARs issued by DPHI.

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Abbreviations

ABS	Australian Bureau of Statistics
ACHA	Aboriginal Cultural Heritage Assessment
AEMO	Australia Energy Market Operator
AHIMS	Aboriginal Heritage Information Management System
ASC	Australian soil classification
BAM	*Biodiversity Assessment Method*
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BESS	battery energy storage system
BSAL	Biophysical Strategic Agricultural Land
CEEC	critically endangered ecological community
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure (formerly DPE)
EEC	endangered ecological community
EIS	Environmental Impact Statement
EMM	EMM Consulting Pty Limited
EPA	NSW Environment Protection Authority
EPL	environment protection licence
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GHG	greenhouse gas
GW	gigawatt
ha	hectares
HV	High voltage
HIPAP	Hazardous Industry Planning Advisory Paper
IBRA	Interim Biogeographic Regionalisation for Australia
ICNG	NSW *Interim Construction Noise Guideline*
km	kilometre
km^2	square kilometre
kV	kilovolt
LCA	land category assessment
LCZ	landscape character zone

LEP	Local Environmental Plan
LGA	Local Government Area
LSC	land and soil capability
LVIA	landscape and visual impact assessment
MNES	Matters of national environmental significance
MW	Megawatt
NEM	National Electricity Market
NSW	New South Wales
OSOM	over-size, over-mass
PCT	plant community type
PMST	Commonwealth Protected Matters Search Tool
POEO Act	NSW *Protection of the Environment Operations Act 1997*
PV	photovoltaic
PVIA	Preliminary visual impact assessment
RAPs	Registered Aboriginal Party
REZ	Renewable Energy Zone
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State environmental planning policy
SIA	Social impact assessment
SLR	soil and land resource
SSD	State Significant Development
TEC	threatened ecological community
TfNSW	Transport for NSW
WTG	Wind turbine generator

Appendix A
Cadastral lots

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A.1 Cadastral lots within investigation area and development corridor

Lot	DP	Within development corridor
1	756955	No
1	756927	**Yes**
2	756927	**Yes**
1	756951	**Yes**
3	756939	**No**
3	802730	**Yes**
5	756945	**No**
11	1262716	**Yes**

Appendix B
Scoping summary table

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B.1 Scoping summary table

Level of assessment	Matter	Cumulative impact assessment	Engagement	Relevant policies and guidelines	Scoping report reference
Detailed	Terrestrial Biodiversity	Yes	Specific	• *Biodiversity Assessment Method* (DPIE 2020). • *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (DEC 2004). • *Surveying Threatened Plants and their Habitats: NSW Survey Guide for the Biodiversity Assessment Method* (DPIE 2020). • *Species Credit Threatened Bats and their Habitats* (OEH 2018). • *NSW Survey Guide for Threatened Frogs* (DPIE 2020). • *Commonwealth EPBC 1.1 Significant Impact Guidelines – Matters of National Environmental Significance* (Commonwealth of Australia, 2013). • *Commonwealth Department of the Environment – Survey Guidelines for Nationally Threatened Species* (various). • Onshore Wind Farm Guidance (DCCEEW 2023)	Section 6.2.1
	Aboriginal heritage	Yes	Specific	• *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). • *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010). • *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010).	Section 6.2.2
	Visual	Yes	Specific	• *Guidelines for Landscape and Visual Impact Assessment* (United Kingdom Landscape Institute of Environmental Management and Assessment 2013). • Wind Energy: Visual Assessment Bulletin AB 01 for State Significant Wind Energy Development (DPE 2016b). • *Guidance Note for Landscape and Visual Assessment* (Australian Institute of Landscape Architects 2018). • Draft Wind Energy Guideline (DPE 2023) • Draft Wind Energy Guideline; Technical Supplement for Landscape and Visual Impact Assessment (DPE 2023).	Section 6.2.3

Level of assessment	Matter	Cumulative impact assessment	Engagement	Relevant policies and guidelines	Scoping report reference
	Noise and vibration	Yes	Specific	• *NSW Interim Construction Noise Guideline* (DECC 2009). • NSW Noise Policy for Industry (EPA 2017). • NSW Road Noise Policy (DECCW 2011). • *Assessing Vibration: A Technical Guideline* (DECC 2006). • NSW Wind Energy: Noise Assessment Bulletin (DPE 2016).	Section 6.2.4
	Social	Yes	Specific	• *Social Impact Assessment Guideline for State Significant Projects* (DPE 2023).	Section 6.2.5
	Traffic and access	Yes	Specific	• *Guide to Traffic Generating Developments* (RTA 2002). • *Austroads Guides to Road Design* (various publications). • *Austroads Guides to Traffic Management* (various publications). • Australian Standard AS 2890 Parts 1 and 2. • Australian Code for Dangerous Goods Transport.	Section 6.2.6
Standard	Historic heritage	No	General	• The principal articles of The Burra Charter – *The Australia ICOMOS Charter for Places of Cultural Significance* (ICOMOS 2013). • *Statements of Heritage Impact* (Heritage Office 1996). • *Investigating Heritage Significance Draft Guideline* (Heritage Office 2004). • *Assessing Heritage Significance* (Heritage Office 2001). • *Assessing Significance for Historical Archaeological Sites and 'Relics'* (Heritage Branch Department of Planning 2009).	Section 6.3.1
	Land	No	General	• Land Use Conflict Risk Assessment Guideline (DPI 2011). • Best Practice Erosion and Sediment Control (IECA 2008) • Developments adjacent to National Parks and Wildlife Service lands (DPIE, 2020)	Section 6.3.2
	Water	No	General	• *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom 2004). • *Managing Urban Stormwater: Soils and Construction Volume 2* (DECC 2008). • *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC/ARMCANZ 2000). • *Guidelines for Instream Works on Waterfront Land* (NOW 2012). • *Guidelines for Riparian Corridors on Waterfront Land* (NOW 2012). • *Guidelines for Watercourse Crossings on Waterfront Land* (NOW 2012).	Section 6.3.3

Level of assessment	Matter	Cumulative impact assessment	Engagement	Relevant policies and guidelines	Scoping report reference
	Air quality	No	General	• *Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales* (DECC, 2005)	Section 6.3.4
	Hazards and risk	No	General	• National Airports Safeguarding Framework Guideline D: Managing Wind Turbine Risk to Aircraft (NASAG, 2012) • Hazardous Industry Planning Advisory Paper No. 6 – *Guideline for Hazard Analysis* (DoP, 2011). • Multi-Level Risk Assessment (DoP, 2011). • *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* (DoP, 2011). • *Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields* (ICNIRP 1998) • *Planning for Bushfire Protection* (RFS, 2019) • *Waste Classification Guidelines* (EPA, 2014)	Section 6.3.5
	Aquatic	No	General	• *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI 2013)	Section 6.3.6

Appendix C
Preliminary Biodiversity Assessment

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Preliminary Biodiversity Assessment

Gol Gol Wind Farm

Prepared for Squadron Energy

May 2024

Preliminary Biodiversity Assessment

Gol Gol Wind Farm

Squadron Energy

E240110 RP#11

May 2024

Version	Date	Prepared by	Approved by	Comments
1	7 May 2024	Nicole Damaggio	Maya Potapowicz	v1 for issue to client
2	13 May 2024	Nicole Damaggio	Maya Potapowicz	

Approved by

Maya Potapowicz
Associate Ecologist
13 May 2024

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Appendices

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Figures

1 Introduction

Squadron Renewable Energy Developments Pty Ltd (Squadron Energy), 'the Applicant', proposes to develop the Gol Gol Wind Farm (the project) approximately 10 kilometres (km) north of Mildura in the local government area (LGA) of Wentworth in the Western Murray Region of New South Wales. The proposed project will be developed on predominantly freehold land that is used for agricultural activities.

The project will include the development of 120 wind turbine generators (WTGs) including transmission, ancillary and temporary infrastructure, with an installed capacity of up to approximately 840 gigawatts (GW).

This preliminary biodiversity assessment has been prepared to support the scoping report to request Secretary's Environmental Assessment Requirements (SEARs). The project will be assessed under Part 4 Division 4.7 of the *Environmental Planning & Assessment Act 1979* (EP&A Act), and therefore will require assessment in accordance with the Biodiversity Assessment Method (DPIE, 2020) and the preparation of a Biodiversity Development Assessment Report (BDAR) will be required. This report has also been prepared to provide supporting documentation for the referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW Commonwealth).

Potential biodiversity constraints and development opportunities have been identified to assist Squadron Energy with preliminary project design and avoiding known impacts to date, and the NSW Department of Planning, Housing and Infrastructure (DPHI) in developing biodiversity-related SEARs.

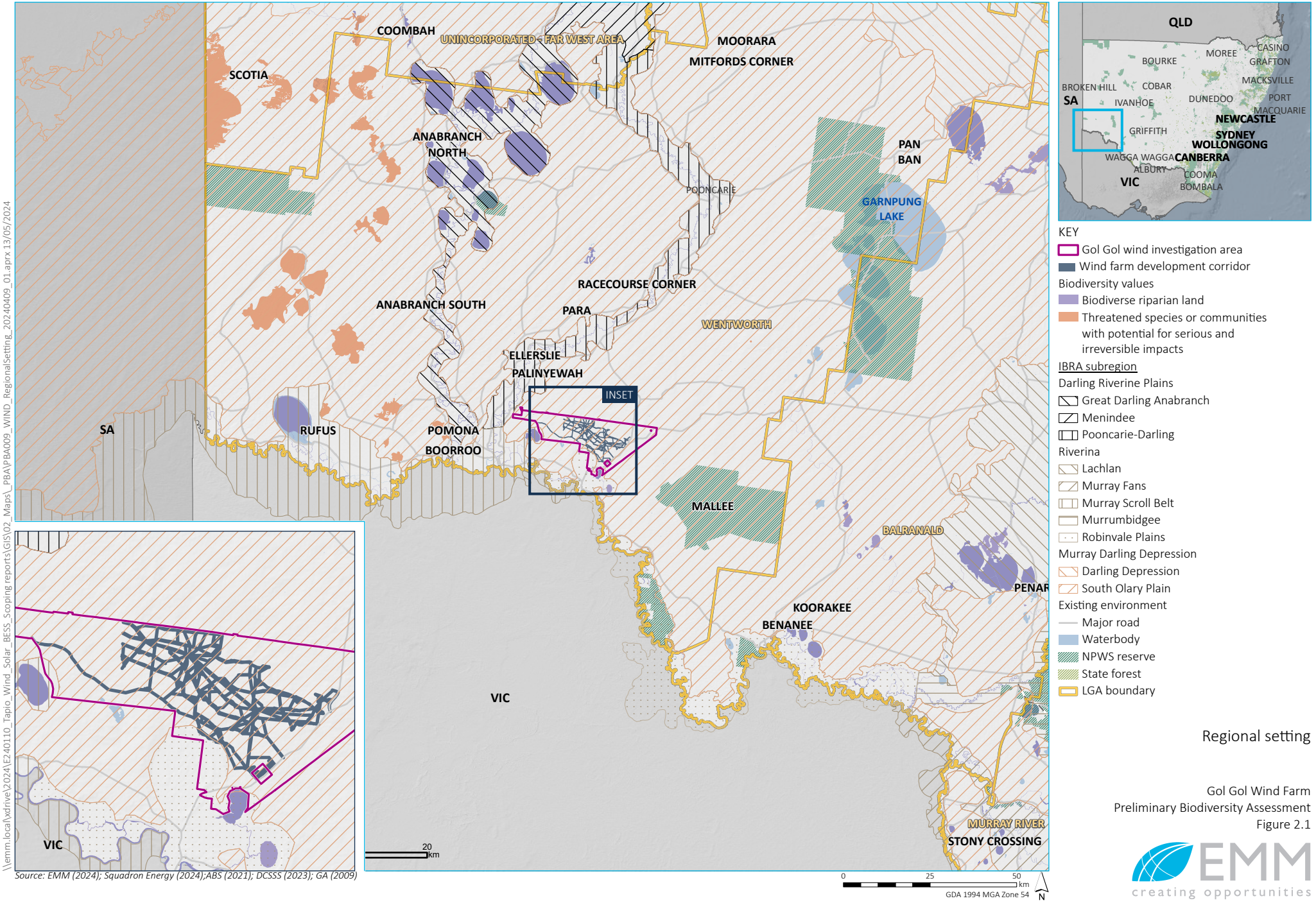
2 Site context

The project is located on predominantly freehold land owned by a single landowner who undertakes agricultural operations within the land. This landholding consists of four lots and is termed the project investigation area, and within the project investigation area is the proposed development corridor, the land within which all elements of the Wind Farm are proposed and will be subject to ongoing design refinement. The final development corridor will be presented in the Environmental Impact Statement (EIS). The extents of the project investigation area and the proposed development corridor are shown in Figure 2.1.

The project is located within the Riverina and Murray Darling Depression Interim Biogeographic Regionalisation for Australia (IBRA) and the South Olary Plain and Robinvale Plains IBRA subregions. It is situated 5 km north of the Murray River and 1.5 km east of the Darling River. Two nationally important wetlands, Lake Ranfurly and Kings Billabong Wetlands, are located 10 km south of the project, south of the Murray River.

Several significant waterbodies, including Lake Gol Gol, Gol Gol Swamp and Fletchers Lake, are adjacent to the project investigation area. Mallee Cliffs National Park is located approximately 10 km south-east of the project. The surrounding landscape includes large tracts of remnant vegetation, cleared agricultural areas and the township of Mildura.

The majority of the project investigation area is remnant vegetation with large patches of previously cleared, Category 1 land in the south-east.



Source: EMM (2024); Squadron Energy (2024);ABS (2021); DCSSS (2023); GA (2009)

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Regional setting

Gol Gol Wind Farm
Preliminary Biodiversity Assessment
Figure 2.1

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3 Desktop review

3.1 Documents and datasets reviewed

A desktop review of the project investigation area was undertaken to identify ecological values, areas of biodiversity constraint and development opportunities. The following information was reviewed for this preliminary biodiversity assessment:

- Commonwealth Protected Matters Search Tool (PMST) for Matters of National Environmental Significance (MNES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool) (search undertaken in March 2024 and results presented in Appendix A)
- threatened species records within 10 km of the site, via the Atlas of NSW Wildlife (https://www.environment.nsw.gov.au/atlasapp/) data tool (results are presented in Appendix A) and the Fisheries NSW Spatial Data Portal (https://www.dpi.nsw.gov.au/fishing/fisheries-research/spatial-data-portal)
- NSW State Vegetation Type Map (SVTM) (DPE, 2022) and key fish habitat datasets (https://www.dpi.nsw.gov.au/fishing/fisheries-research/spatial-data-portal)
- Bionet Vegetation Classification, to derive a list of threatened species associated with PCTs predicted by the State Vegetation Type Map (https://vegetation.bionet.nsw.gov.au/LoginPR.aspx?ReturnUrl=%2f)
- previous ecological reports relevant to the area (WSP, 2022; WSP, 2020)
- interpretation of aerial photo imagery
- NSW Government Biodiversity Values Map (DPE, 2023)

3.2 Limitations

This assessment has relied upon information and existing spatial data for the project investigation area and should be considered preliminary in nature. Detailed field survey will be required to validate this assessment to inform the future BDAR.

Some of the key limitations of the information consulted in this assessment include:

- reliance on the NSW State Vegetation Map (SVTM). This vegetation mapping project has been generated on a broad scale and therefore can contain inaccuracies when assessed at the project scale. Field surveys will be required to validate the actual vegetation communities present on site
- use of the NSW SVTM to identify candidate threatened species and ecological communities. Revised vegetation mapping of the project investigation area through field survey may identify additional candidate threatened species and communities requiring consideration.

4 Preliminary land categories and biodiversity constraints

4.1 Preliminary land category assessment

The project investigation area contains three separate land sub-categories under the Native Vegetation Regulatory Map. These subcategories, their regulatory effect and what the areas contain are shown in Table 4.1.

Table 4.1 Assessment of draft land categories

Category	Policy reference	Regulatory effect	What it contains
Category 1 - exempt	Section 60H of the LLS Act	Land that has been cleared (including significantly disturbed or modified) as at 1 January 1990 or lawfully cleared between 1 January 1990 and 25 August 2017. This is land where clearing native vegetation in rural areas does not require approval under the LLS Act and does not need to comply with provisions relating to 'allowable activities' or any Land Management Code made under the LLS Act. Section 60H of the LLS Act Native vegetation regulatory map method statement 8 Category/overlay Regulatory effect. Other legislation and regulation may still apply on this land, e.g. development consent may be required under a Local Environmental Plan or a State Environmental Planning Policy.	Cleared land, as shown on the NSW State Vegetation Type Map (SVTM) (DPE, 2022)
Category 2 – regulated land	Section 60I(2)(l) of the LLS Act LLS Act - Schedule 5A Land Management Code	Land where native vegetation clearing in rural areas requires approval under the LLS Act unless the clearing complies with the provisions relating to allowable activities or any Land Management Code made under the LLS Act.	Land containing habitat for threatened species and communities, as shown on NSW State Vegetation Type Map (DPE, 2022) (and PCT species associations), BV Map (DPE, 2023) and Bionet records
Category 2 - sensitive regulated land	Section 108, 111, 113 of the LLS Regulation	Category 2 areas that contain sensitive lands such as critically endangered ecological communities (CEECs), rainforest, koala habitat, etc. Additional restrictions apply to allowable activities, and Land Management Code cannot be applied in these areas.	Set-aside and offset areas

Category 1 land is generally consistent with the area shown as PCT 0 (non-native) on Figure 4.1, while the remainder of lands represent the different subcategories of Category 2 land (Table 4.1).

4.2 Preliminary biodiversity assessment - overview

A preliminary assessment of biodiversity constraints has been conducted based on the results of the desktop review outlined in Section 3.1. Potential biodiversity constraints are discussed below in relation to native vegetation, threatened ecological communities (TEC) and threatened species.

4.3 Native vegetation

A total of 22 Plant Community Types (PCTs) are mapped within the project investigation area. These include a range of wetland, open woodland, shrubland and mallee communities. There is also one non-native PCT (PCT 0).

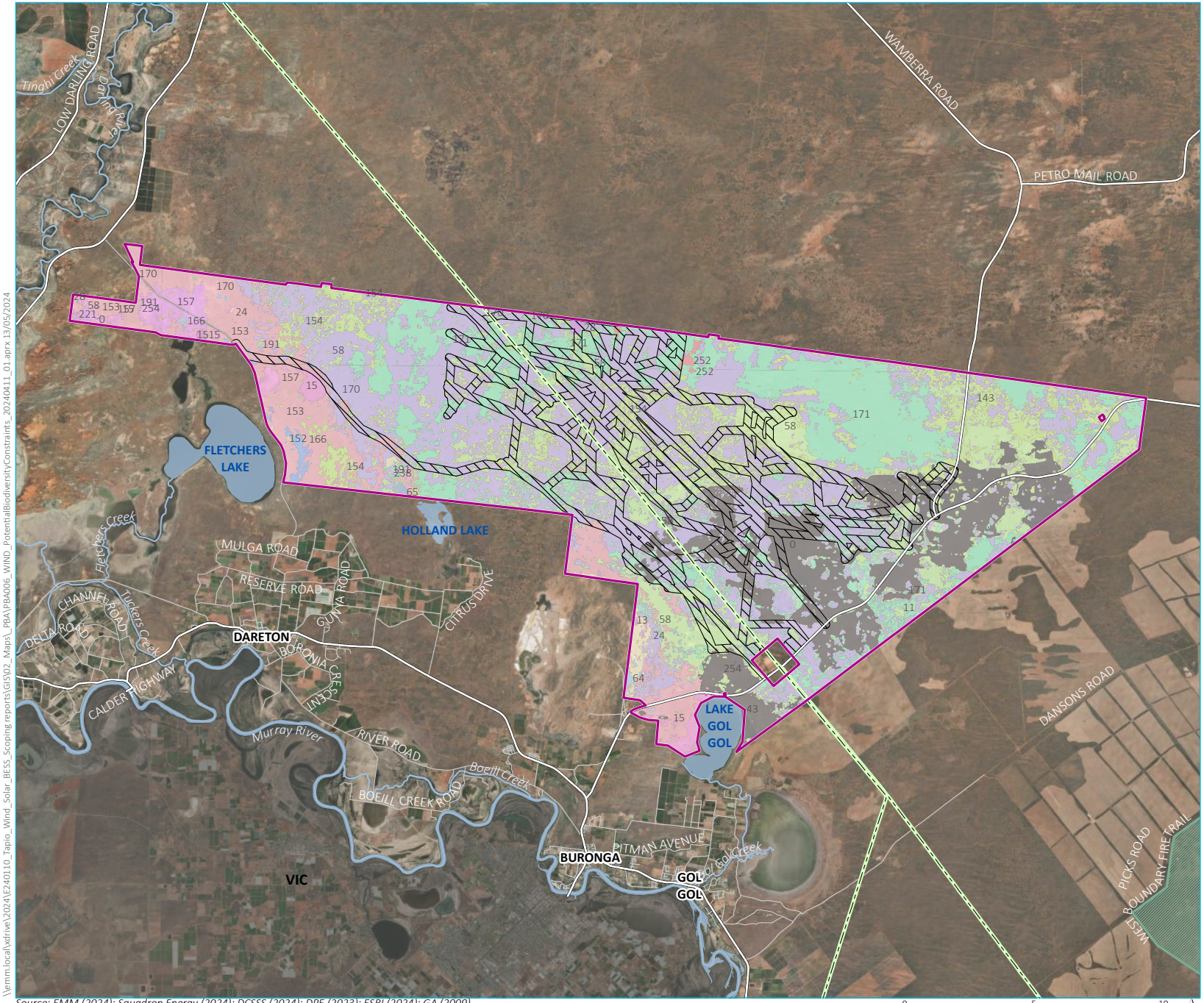
PCTs mapped within the project investigation area are shown in Table 4.2 and Figure 4.1.

Table 4.2 PCTs predicted in the project investigation area (SVTM)

Plant Community Type	Vegetation class	Vegetation Formation
0 - Not classified – non-native vegetation	-	-
11 - River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Inland Riverine Forests	Forested Wetlands
13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Inland Floodplain Woodlands	Semi-arid Woodlands (Grassy sub-formation)
15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Inland Floodplain Woodlands	Semi-arid Woodlands (Grassy sub-formation)
24 - Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains	Inland Floodplain Shrublands	Freshwater Wetlands
28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Riverine Sandhill Woodlands	Semi-arid Woodlands (Shrubby sub-formation)
43 - Mitchell Grass grassland - chenopod low open shrubland on floodplains in the semi-arid (hot) and arid zones	Semi-arid Floodplain Grasslands	Grasslands
58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Semi-arid Sand Plain Woodlands	Semi-arid Woodlands (Shrubby sub-formation)
64 - Samphire - Water Weed - Sea-Heath shrubland saline wetland of depressions of the arid and semi-arid (warm) zones	Inland Saline Lakes	Saline Wetlands
65 - Halosarcia lylei low, open shrubland saline wetland of arid and semi-arid regions	Inland Saline Lakes	Saline Wetlands
143 - Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.	Sand Plain Mulga Shrublands	Arid Shrublands (Acacia sub-formation)
152 - Lunette chenopod shrubland mainly of the Murray Darling Depression Bioregion	Aeolian Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)
153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones	Aeolian Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)
154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains	Aeolian Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)
157 - Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion	Riverine Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)
166 - Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	Inland Saline Lakes	Saline Wetlands
170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Sand Plain Mallee Woodlands	Semi-arid Woodlands (Shrubby sub-formation)

Table 4.2 PCTs predicted in the project investigation area (SVTM)

Plant Community Type	Vegetation class	Vegetation Formation
171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	Dune Mallee Woodlands	Semi-arid Woodlands (Shrubby sub-formation)
191 - Snap and Rattle Mallee - Moonah open mallee shrubland in the Murray Darling Depression Bioregion	Dune Mallee Woodlands	Semi-arid Woodlands (Shrubby sub-formation)
221 - Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones	Semi-arid Sand Plain Woodlands	Semi-arid Woodlands (Shrubby sub-formation)
238 - Permanent and semi-permanent freshwater lakes wetland of the inland slopes and plains	Inland Floodplain Swamps	Freshwater Wetlands
252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion	Semi-arid Sand Plain Woodlands	Semi-arid Woodlands (Shrubby sub-formation)
254 - Black Oak - Bladder Saltbush on light clays in the arid zone	Riverine Chenopod Shrublands	Arid Shrublands (Chenopod sub-formation)



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line

Plant community type ID

- 0 (Cleared)
- 11
- 13
- 15
- 24
- 28
- 43
- 58
- 64
- 65
- 143
- 152
- 153
- 154
- 157
- 166
- 170
- 171
- 191
- 221
- 238
- 252
- 254

Existing environment

- Major road
- Minor road
- Named watercourse
- Named waterbody
- NPWS reserve
- Victoria

Potential biodiversity constraints

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); DPE (2023); ESRI (2024); GA (2009)

0 5 10 km

GDA2020 MGA Zone 54

N

Gol Gol Wind Farm
Preliminary Biodiversity Assessment
Figure 4.1

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4.4 Threatened ecological communities

Nine threatened ecological communities (TECs) listed under the *NSW Biodiversity Conservation Act 2015* (BC Act) or EPBC Act were identified with the potential to occur within the project investigation area. The likelihood of these TECs being present within the project investigation area is summarised in Table 4.3.

Of these, six are considered with a moderate to high likelihood of occurring in the development corridor:

- *Acacia loderi shrublands*
- *Acacia melvillei shrublands in the Riverina and Murray-Darling Depression bioregions*
- Mallee Bird Community of the Murray Darling Depression Bioregion
- *Tecticornia lylei*, Wiry Glasswort, low open-shrubland in the Murray Darling Depression Bioregion
- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions *(Allocasuarina luehmannii* Woodlands of the Riverina and Murray-Darling Depression Bioregions)
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions.

Table 4.3 Threatened Ecological Communities – Likelihood of Occurrence

Threatened Ecological Community	BC Act	EPBC Act	Associated PCTs	Likelihood of occurrence in development corridor
Acacia loderi shrublands	E	-	58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion 143 - Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes. 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones 154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	**High**. This community is known to occur in the South Olary Plain IBRA Subregion and *Acacia loderi* has been recorded directly adjacent to the project investigation area.
Acacia melvillei shrublands in the Riverina and Murray-Darling Depression bioregions	E	-	28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	**High**. This community is known to occur in the South Olary Plain IBRA Subregion and has been recorded directly south of the project in Mildura.

Table 4.3 Threatened Ecological Communities – Likelihood of Occurrence

Threatened Ecological Community	BC Act	EPBC Act	Associated PCTs	Likelihood of occurrence in development corridor
Artesian Springs Ecological Community in the Great Artesian Basin	CE	-	24 - Canegrass swamp tall grassland wetland of drainage depressions, lakes and pans of the inland plains 43 - Mitchell Grass grassland - chenopod low open shrubland on floodplains in the semi-arid (hot) and arid zones 238 - Permanent and semi-permanent freshwater lakes wetland of the inland slopes and plains	**Nil**. This TEC is restricted to the Great Artesian Basin region in North-western NSW, and therefore does not occur within the project investigation area.
Mallee Bird Community of the Murray Darling Depression Bioregion	-	E	170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion 191- Snap and Rattle Mallee - Moonah open mallee shrubland in the Murray Darling Depression Bioregion	**High**. This TEC is associated with mallee habitats mapped within the site and it is likely that this TEC occurs in the project investigation area.
Tecticornia lylei, Wiry Glasswort, low open-shrubland in the Murray Darling Depression Bioregion	E	-	65 - *Halosarcia lylei* low, open shrubland saline wetland of arid and semi-arid regions	**High**. This TEC is associated with PCT 65 which occurs in ephemeral wetlands mapped within the site. It is likely that this TEC occurs in the project investigation area.
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (*Allocasuarina luehmannii* Woodlands of the Riverina and Murray-Darling Depression Bioregions)	E	E	28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	**Moderate.** The community is known from the South Olary Plain IBRA subregion in which the project is located.
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	-	CE	170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	**Low**. This TEC primarily occurs in a region south of the site. Similarly, surveys for the Euston Wind Farm found areas of PCT 170 did not meet diagnostic criteria for the TEC, and therefore it is unlikely to occur in the project investigation area.
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	CE	-	-	**Nil**. This TEC is restricted to the northern riverine plains and is not known from the South Olary Plain IBRA.
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	E	-	28 - White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	**High.** The community is predicted to occur in the South Olary Plain IBRA in which the project is located and has been mapped as occurring in the Energy Connect BDAR for the Buronga substation and western section of the energy transmission line.

E = Endangered, CE = Critically Endangered

4.5 Threatened and migratory species

In total, 105 threatened species listed under the BC or EPBC Act were identified with potential to occur in the project investigation area (Appendix B). Of these species, 49 are known to occur on or within 10 km of the project investigation area according to NSW Bionet Atlas database records and preliminary surveys conducted for previous ecological reports (WSP, 2022; WSP, 2020), and therefore have a higher likelihood of occurring in the project investigation area. These species are summarised in Table 4.4.

Table 4.4 Threatened species known to occur within 10 km of the project

Common name	Scientific name	BC Act Status	EPBC Act Status	Class of credit
Amphibians				
Southern Bell Frog	*Litoria raniformis*	E	V	Species
Birds				
Southern Whiteface	*Aphelocephala leucopsis*	V	-	-
Australian Bustard	*Ardeotis australis*	E	-	Species
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	Ecosystem
Australasian Bittern	*Botaurus poiciloptilus*	E	E	Ecosystem
Bush Stone-curlew	*Burhinus grallarius*	E	-	Species
Curlew Sandpiper	*Calidris ferruginea*	E	CE, Mi	Species/Ecosystem
Pied Honeyeater	*Certhionyx variegatus*	V	-	Ecosystem
Chestnut Quail-thrush	*Cinclosoma castanotum*	V	-	Ecosystem
Spotted Harrier	*Circus assimilis*	V	-	Ecosystem
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	-	Ecosystem
Varied Sittella	*Daphoenositta chrysoptera*	V	-	Ecosystem
Southern Scrub-robin	*Drymodes brunneopygia*	V	-	Ecosystem
White-fronted Chat	*Epthianura albifrons*	V	-	Ecosystem
Grey Falcon	*Falco hypoleucos*	V	V	Ecosystem
Black Falcon	*Falco subniger*	V	-	Ecosystem
Purple-crowned Lorikeet	*Glossopsitta porphyrocephala*	V	-	Ecosystem
Painted Honeyeater	*Grantiella picta*	V	V	Ecosystem
Brolga	*Grus rubicunda*	V	-	Ecosystem
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	-	Species/Ecosystem
Little Eagle	*Hieraaetus morphnoides*	V	-	Species/Ecosystem
White-throated Needletail	*Hirundapus caudacutus*	-	V, Mi	Ecosystem

Table 4.4 Threatened species known to occur within 10 km of the project

Common name	Scientific name	BC Act Status	EPBC Act Status	Class of credit
Malleefowl	*Leipoa ocellata*	E	V	Ecosystem
Black-tailed Godwit	*Limosa limosa*	V	Mi	Species/Ecosystem
Major Mitchell's Cockatoo	*Lophochroa leadbeateri*	V	-	Species/Ecosystem
Square-tailed Kite	*Lophoictinia isura*	V	-	Species/Ecosystem
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	V	-	Ecosystem
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V	-	Ecosystem
Blue-billed Duck	*Oxyura australis*	V	-	Ecosystem
Gilbert's Whistler	*Pachycephala inornata*	V	-	Ecosystem
Plains-wanderer	*Pedionomus torquatus*	E	CE	Species/Ecosystem
Flame Robin	*Petroica phoenicea*	V	-	Ecosystem
Regent Parrot (eastern subspecies)	*Polytelis anthopeplus monarchoides*	E	V	Species/Ecosystem
Redthroat	*Pyrrholaemus brunneus*	V	-	Ecosystem
Australian Painted Snipe	*Rostratula australis*	E	E	Ecosystem
Freckled Duck	*Stictonetta naevosa*	V	-	Ecosystem
Mammals				
Kultarr	*Antechinomys laniger*	E	-	Ecosystem
Western Pygmy Possum	*Cercartetus concinnus*	E	-	Ecosystem
Little Pied Bat	*Chalinolobus picatus*	V	-	Ecosystem
Southern Ningaui	*Ningaui yvonneae*	V	-	Ecosystem
South-eastern long eared bat	*Nyctophilus corbeni*	V	V	Ecosystem
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	Ecosystem
Inland Forest Bat	*Vespadelus baverstocki*	V	-	Ecosystem
Plants				
Swamp She-oak	*Casuarina obesa*	E	-	Species
Bitter Quandong	*Santalum murrayanum*	E	-	Species
Menindee Nightshade	*Solanum karsense*	V	V	Species
Reptiles				
Mallee Worm-lizard	*Aprasia inaurita*	E	-	Ecosystem
Marble-faced Delma	*Delma australis*	E	-	Ecosystem

Table 4.4 Threatened species known to occur within 10 km of the project

Common name	Scientific name	BC Act Status	EPBC Act Status	Class of credit
Western Blue-tongued Lizard	*Tiliqua occipitalis*	V	-	Ecosystem

4.6 Candidate entities for serious and irreversible impacts

Five candidate entities for serious and irreversible impacts (SAII) under the BC Act have been recorded within the locality and have potential to occur in the project investigation area. The likelihood of occurrence within the project investigation area and the justification is provided in Table 4.5.

Table 4.5 Potential SAII in project investigation area

Candidate entity		Likelihood of occurrence in project investigation area
Curlew Sandpiper	*Calidris ferruginea*	**Moderate** - PMST likelihood is known, last recorded in area in 1993, habitat constraints present however suitable habitat limited
Purple-wood Wattle	*Acacia carneorum*	**Moderate** - Is outside the geographic restriction identified in the dispersal column. Site has fresh water areas which would be appropriate habitat
A spear-grass	*Austrostipa nullanulla*	**High** - Grows with several species of Mallee and chenopods recorded on site
A burr-daisy	*Calotis moorei*	**High** - Grows in sandy soils in chenopod shrublands which are present on site
Swamp She-oak	*Casuarina obesa*	**High** - Recorded within 20km of site and grows in ephemeral saline lakes which are present on site

4.7 Key fish habitat and aquatic species

There are no key fish habitats or threatened aquatic species predicted by the Fisheries NSW Spatial Data Portal (https://www.dpi.nsw.gov.au/fishing/fisheries-research/spatial-data-portal) to occur in the project investigation area.

The PMST predicted six threatened fish species may occur within 10 km of the project investigation area (Table 4.6). Of these species, three have a moderate potential to occur in the project investigation area.

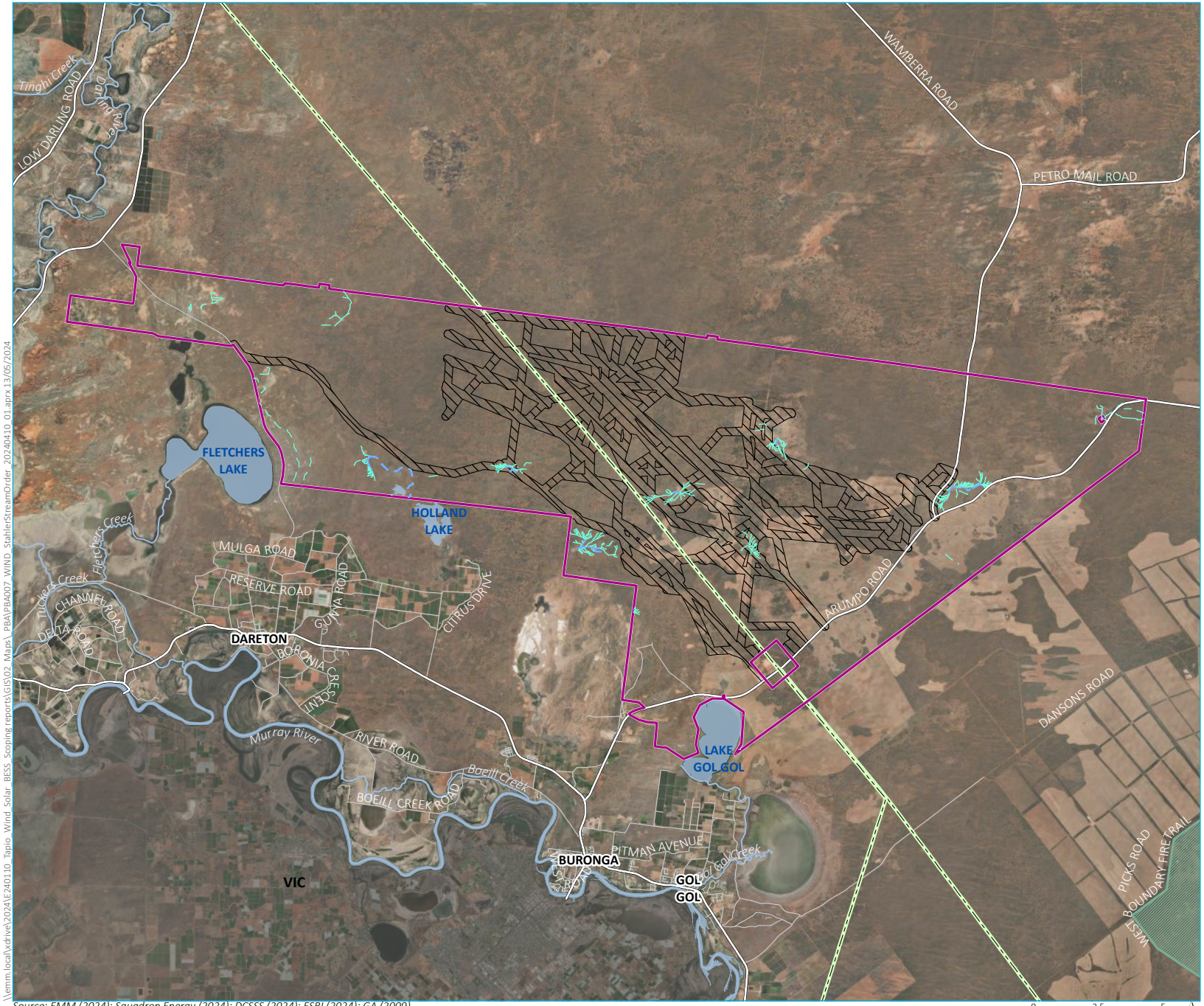
Table 4.6 Threatened fish species – Likelihood of Occurrence

Threatened fish species	FM Act	EPBC Act	Likelihood of occurrence
Flathead Galaxias (*Galaxias rostratus*)	Critically Endangered	Critically Endangered	**Low** - Site occurs within predicted geographic range, habitat requirements unlikely to be met
Murray Hardhead (*Caterocephals fluviatilis*)	Critically Endangered	Endangered	**Low** - Occur in rivers, streams and billabongs, geographic requirements are met, habitat requirements may not be met on site due to lack of connectivity ot natural waterways
Murray Cod (*Maccullochella peelii*)	Not listed	Vulnerable	**Moderate** - PMST likelihood is known, however no connectivity to natural water bodies is present within the project investigation area. Saline lakes present

Table 4.6 Threatened fish species – Likelihood of Occurrence

Threatened fish species	FM Act	EPBC Act	Likelihood of occurrence
Silver Perch (*Bidyanus bidyanus*)	Vulnerable	Critically Endangered	**Low** - PMST likelihood is known, however no connectivity to natural water bodies and species generally prefers fast flowing water
Macquarie Perch (*Macquaria australasica*)	Endangered	Endangered	**Low** – Occur in streams and rivers which are not present within the project investigation area

The project investigation area contains several unnamed watercourses of Strahler Stream Order 1 to 3 (Figure 4.2), which intersect the development corridor in several locations.



KEY

- Gol Gol wind investigation area
- Wind farm development corridor

Strahler stream order

- 1st order
- 2nd order
- 3rd order
- 4th order

Existing environment

- Major road
- Minor road
- Named watercourse
- Named waterbody
- NPWS reserve
- Victoria
- Existing 220 kV transmission line

Strahler stream order

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

0 2.5 5 km

GDA2020 MGA Zone 54

N

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Gol Gol Wind Farm
Preliminary Biodiversity Assessment
Figure 4.2

EMM
creating opportunities

5 Potential impacts

5.1 Potential impacts to TECs

Potential impacts on TECs likely to be present in the project investigation area are outlined in Table 5.1.

Table 5.1 Potential TEC impacts

TEC	Associated PCTs	Potential impacts
Acacia loderi shrublands	58, 143, 153, 154, 170	Permanent removal, loss of habitat, fragmentation
Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions	28, 58, 170	Permanent removal, loss of habitat, fragmentation
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (*Allocasuarina luehmannii* Woodlands of the Riverina and Murray-Darling Depression Bioregions)	28	Permanent removal, loss of habitat, fragmentation
Mallee Bird Community of the Murray Darling Depression Bioregion	170, 171, 191	Permanent removal, loss of habitat, fragmentation, turbine strike
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	28	Permanent removal, loss of habitat, fragmentation
Tecticornia lylei, Wiry Glasswort, low open-shrubland in the Murray Darling Depression Bioregion	65	Permanent removal, loss of habitat, fragmentation

5.2 Potential impacts to threatened species

The preliminary likelihood of occurrence for threatened species was assessed. Potential impacts on threatened taxa likely to occur in the project investigation are outlined in Table 5.2 for species likely to be present (moderate to high likelihood of occurrence). Potential collision risk for bird and bat species are discussed in Section 5.4.

Table 5.2 Potential threatened species impacts

Threatened taxa	Threatened species	Potential impacts
Hollow-dependent birds	Purple-crowned Lorikeet (*Glossopsitta porphyrocephala*), Swift Parrot (*Lathamus discolor*), Pink Cockatoo (*Lophochroa leadbeateri*), Scarlet-chested Parrot (*Neophema splendida*), Barking Owl (*Ninox connivens*), Masked Owl (*Tyto novaehollandiae*)	Loss of hollow-bearing trees, loss of breeding and foraging habitat

Table 5.2 Potential threatened species impacts

Threatened taxa	Threatened species	Potential impacts
Woodland/mallee birds	Murray Mallee striated grasswren (*Amytornis striatus howei*), Southern Whiteface (*Aphelocephala leucopsis*), Australian Bustard (*Ardeotis australis*), Dusky Woodswallow (*Artamus cyanopterus cyanopterus*), Bush Stone-curlew (*Burhinus grallarius*), Rufous Fieldwren (*Calamanthus campestris*), Pied Honeyeater (*Certhionyx variegatus*), Chestnut Quail-thrush (*Cinclosoma castanotum*), Spotted Harrier (*Circus assimilis*), Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*), Varied Sittella (*Daphoenositta chrysoptera*), Southern Scrub-robin (*Drymodes brunneopygia*), Painted Honeyeater (*Grantiella picta*), White-throated Needletail (*Hirundapus caudacutus*), Shy Heathwren (*Hylacola cautus*), Malleefowl (*Leipoa ocellata*), Purple-gaped Honeyeater (*Lichenostomus cratitius*), Hooded Robin (south-eastern form) (*Melanodryas cucullata cucullata*), Black-chinned Honeyeater (eastern subspecies) (*Melithreptus gularis gularis*), Gilbert's Whistler (*Pachycephala inornata*), Red-lored Whistler (*Pachycephala rufogularis*), Plains-wanderer (*Pedionomus torquatus*), Flame Robin (*Petroica phoenicea*), Regent Parrot (eastern subspecies) (*Polytelis anthopeplus monarchoides*), Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*), Redthroat (*Pyrrholaemus brunneus*), Diamond Firetail (*Stagonopleura guttata*)	Loss of breeding and foraging habitat
Wetland birds	Australasian Bittern (*Botaurus poiciloptilus*), Curlew Sandpiper (*Calidris ferruginea*), White-fronted Chat (*Epthianura albifrons*), Brolga (*Grus rubicunda*), Black-tailed Godwit (*Limosa limosa*), Blue-billed Duck (*Oxyura australis*), Australian Painted Snipe (*Rostratula australis*), Freckled Duck (*Stictonetta naevosa*)	Habitat loss and fragmentation
Raptors	Grey Falcon (*Falco hypoleucos*), Black Falcon (*Falco subniger*), White-bellied Sea-Eagle (*Haliaeetus leucogaster*), Black-breasted Buzzard (*Hamirostra melanosternon*), Little Eagle (*Hieraaetus morphnoides*), Square-tailed Kite (*Lophoictinia isura*)	Loss of mature trees, loss of breeding and hunting habitat
Mammals (bats excluded)	Kultarr (*Antechinomys laniger*), Western Pygmy Possum (*Cercartetus concinnus*), Southern Hairy-nosed Wombat (*Lasiorhinus latifrons*), Southern Myotis (*Myotis macropus*), Southern Ningaui (*Ningaui yvonneae*), Bolam's Mouse (*Pseudomys bolami*), Sandy Inland Mouse (*Pseudomys hermannsburgensis*), Stripe-faced Dunnart (*Sminthopsis macroura*)	Habitat loss and fragmentation
Bats	Inland Forest Bat (*Vespadelus baverstocki*) Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) South-eastern long eared bat (*Nyctophilus corbeni*) Little Pied Bat (*Chalinolobus picatus*)	Loss of hollow-bearing trees, loss of breeding and foraging habitat
Reptiles	Mallee Worm-lizard (*Aprasia inaurita*), Brooks Ctenotus (*Ctenotus brooksi*), Mallee Slender Blue-tongue Lizard (*Cyclodomorphus melanops elongatus*), Marble-faced Delma (*Delma australis*), Bardick (*Echiopsis curta*), Grey Snake (*Hemiaspis damelii*), Yellow-tailed Plain Slider (*Lerista xanthura*), Crowned Gecko (*Lucasium stenodactylum*), Ringed Brown Snake (*Pseudonaja modesta*), Jewelled Gecko (*Strophurus elderi*), Western Blue-tongued Lizard (*Tiliqua occipitalis*)	Habitat loss and fragmentation
Fish	Murray Cod (*Maccullochella peelii*)	Bed and bank impacts from crossing construction

Table 5.2 Potential threatened species impacts

Threatened taxa	Threatened species	Potential impacts
Plants	Harrow Wattle (*Acacia acanthoclada*), Purple-wood Wattle (*Acacia carneorum*), A saltbush (*Atriplex infrequens*), A spear-grass (*Austrostipa metatoris*), A spear-grass (*Austrostipa nullanulla*), Mossgiel Daisy (*Brachyscome papillosa*), A burr-daisy (*Calotis moorei*), Swamp She-oak (*Casuarina obesa*), Bluebush Daisy (*Cratystylis conocephala*), Desert Hopbush (*Dodonaea stenozyga*), Yellow Gum (*Eucalyptus leucoxylon* subsp. *pruinosa*), Fleshy Minuria (*Kippistia suaedifolia*), Pink Velvet Bush (*Lasiopetalum behrii*), Winged Peppercress (*Lepidium monoplocoides*), Button Immortelle (*Leptorhynchos waitzia*), Thyme Rice-Flower (*Pimelea serpyllifolia* subsp. *serpyllifolia*), Greenhood Orchid (*Pterostylis cobarensis*), Bitter Quandong (*Santalum murrayanum*), Menindee Nightshade (*Solanum karsense*), Bladder Senna (*Swainsona colutoides*), Slender Darling Pea (*Swainsona murrayana*), Yellow Swainson-pea (*Swainsona pyrophila*)	Habitat loss and fragmentation, potential for SAII (see Section 5.3)
Frogs	Southern Bell Frog (*Litoria raniformis*) and Painted Burrowing Frog (*Neobatrachus pictus*)	Habitat loss and fragmentation

5.3 Potential impacts to candidate entities for SAII

The project has potential to result in impacts to SAII to candidate entities including the Curlew Sandpiper (*Calidris ferruginea*), Purple-wood Wattle (*Acacia carneorum*), A spear-grass (*Austrostipa nullanulla*), A burr-daisy (*Calotis moorei*) and Swamp She-oak (*Casuarina obesa*). Further investigation will be required during the preparation of the BDAR and EIS to establish the presence and level of impact to candidate entities, the potential for SAII and where required, mitigation measures to avoid SAII.

5.4 Potential wind turbine strike impacts

To assess potential wind turbine strike impacts upon threatened and migratory birds and bat species, a preliminary site characterisation was undertaken with guidance from the Commonwealth 'Onshore wind farms – interim guidance on bird and bat management' (DAWE 2021) and a desktop analysis of site context, following Draft Turbine Risk Assessment and Avoidance Guidance (BCD, 2023). The outcomes of this assessment for species considered likely to occur on the site are provided in Table 5.3.

Species information used to inform the assessment has been drawn from species profiles on the NSW Department of Climate Change, Energy, Environment and Water (DCCEEW NSW) threatened species profile database (OEH 2024), along with species conservation advice from the Commonwealth Department of Climate Change, Energy, Environment and Water (DCCEEW Commonwealth), where available.

If present in the project investigation area, several species represent a possible collision risk, including species recorded in the locality like Dusky Woodswallow (*Artamus cyanopterus cyanopterus*), Inland Forest Bat (*Vespadelus baverstocki*), Little Eagle (*Hieraeetus morphnoides*), Major Mitchell's Cockatoo (*Cacatua leadbeateri*), Pied Honeyeater (*Cerhionyx variegatus*), Regent Parrot (*Polytelis antopeplus monarchoides*), Spotted Harrier (*Circus assimilis*), Square-tailed Kite (*Lophoictinia isura*), Varied Sitella (*Daphoenositta chrysoptera*) and White-bellied Sea-eagle (*Haliaeetus leucogaster*).

Table 5.3 Preliminary site characterisation and potential collision risk

Species	Site characteristics	Behaviour	Presence	Potential site use	Demographics	Migratory Flight Paths	Flight characteristics
Black Falcon (*Falco subniger*)	Inhabits a diverse range of habitats, including shrublands, grasslands, woodlands and farmlands (SWIFFT 2023), which are all present on site.	Nests in large old trees alongside rivers and creeks (SWIFFT 2023).	Ongoing	Breeding and foraging	Solitary individuals, pairs, or in family groups of parents and offspring	Not migratory, although travels hundreds of kilometres	Fly at great heights
Black-breasted Buzzard (*Hamirostra melanosternon*)	Lives in a range of inland habitats, especially along timbered watercourses which are likely to occur on site. Suitable foraging habitat in the form of grassland and sparsely timbered woodland is also present.	Nests in tall trees alongside water.	Ongoing	Breeding and foraging	Likely to be solitary or in breeding pairs	Not migratory	Fly at great heights
Blue-winged Parrot (*Neophema chrysostoma*)	Suitable foraging habitat in the form of semi-arid chenopod shrublands and sparse grasslands are present on site. Species is often found near wetlands which are likely to occur on site.	Breed in Tasmania and coastal south-eastern Australia and southern Victoria	Transitory	Foraging	Feed in pairs or small groups	Migrate north and inland from breeding territories in the southern states during winter, travelling as far as 100km inland to feed	Fly at reasonable heights
Brown Treecreeper (*Climaceris picumnus victoriae*)	Suitable mallee woodland and river red gum habitat are likely to occur on site.	Nests in hollows in dead or live trees and tree stumps, forages in trees and on the ground	Ongoing	Breeding and foraging	Usually observed in pairs or small groups of 8-12 birds	Not migratory	Fly at reasonable heights

Chestnut Quail-thrush (*Cinclosoma castanotum*)	Suitable mallee woodland habitats are present on the site.	Forages on the ground, often among spinifex clumps. Nests in a depression on the ground lined with vegetation nearby tree trunks, fallen branches or low bushes.	Ongoing	Breeding and foraging	Occur in pairs or small family parties of 3-5 (Morcombe 2004).	Not migratory	Low-flyer, predominantly ground-dwelling bird.
Corben's Long-eared Bat (*Nyctophilus corbeni*)	Suitable mallee woodland habitats (DPE 2023) are present on the site.	Low-flying bat, foraging under the canopy and sometimes on the ground.	Ongoing	Breeding and foraging	Solitary roosting. Most roost sites are used for a single day and large distances are travelled at night, with consecutive roost sites within 4km.	Not migratory	Low-flying bat, foraging under the canopy and sometimes on the ground
Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)	Suitable dry, open eucalypt forests and woodlands, including mallee associations are present on site. Also occurs in shrublands and farmland), which are present on site.	Primarily forages above the canopy or low over waterbodies, but occasionally consumes nectar, fruit and seed within the canopy. Nests in shrubs or low trees.	Ongoing/Migratory - depending on location	Breeding and foraging	Breeds in solitary pairs or small flocks, however large flocks may form around abundant food sources in winter and preceding migration.	NSW populations migrate to the north of the state and southeastern Queensland after breeding.	Fly at reasonable heights
Hooded Robin (*Melanodryas cucullata cucullata*)	Suitable open eucalypt woodland, acacia scrub and mallee habitats are present on the subject site	Breeds between July and November	Ongoing	Breeding and foraging	Largely sedentary, occurring in pairs and small groups.	Not migratory	Low-flyer, breeds and forages close to the ground.
Gilbert's Whistler (*Pachycephala inornata*)	Occurs mainly in mallee shrublands which are predicted to occur onsite, but also occurs in, Cypress Pine and Belah woodlands and River Red Gum	Forages on or near the ground, and construct nests between 2-6 m height.	Ongoing	Breeding and foraging	Movements poorly understood, but pairs are believed to be sedentary.		Low-flyer, constructs nests up to 6 m height and forages close to the ground.

	forests which are also predicted.,						
Inland Forest Bat (*Vespadelus baverstocki*)	Requirements of this species are poorly known but it has been recorded from a variety of woodland formations, including Mallee and River Red Gum woodland, predicted to occur onsite.	Roosts in tree hollows and abandoned buildings. Known to roost in very small hollows in stunted trees only a few metres high	Ongoing	Breeding and foraging	Colony size ranges from a few individuals to more than sixty. Females congregate to raise young in November and December, with young carried for the first week following birth. Young are independent by January.	Not migratory	Flight height unknown, however These bats fly rapidly and cover an extensive foraging area and are presumed to be an aerial hunter, feeding on flying insects.
Little Eagle (*Hieeraeetus morphnoides*)	Suitable open eucalypt forest, woodland or open woodland are present on site.	Nests in tall living trees within remnant patches of vegetation. Preys predominantly on birds, reptiles, and mammals.	Ongoing	Breeding and foraging	Solitary individuals or breeding pairs.	Not migratory	Fly at great heights
Little Pied Bat (*Chalinolobus picatus*)	Suitable mallee woodland habitats are present on the site.	Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings.	Ongoing	Breeding and foraging	Can roost in groups of 20 to 40 bats	Not migratory	An aerial forager, taking insects mid-flight close to vegetation, mainly in the low and middle strata of the canopy (Churchill 2009). Communiting height unknown.
Major Mitchell's Cockatoo (*Cacatua leadbeateri*)	Inhabits a wide range of treed and treeless habitats, always within reach of water Suitable breeding habitat (e.g. hollow-bearing trees) and foraging habitat nearby large	Feeds mostly on the ground, especially on the seeds of native and exotic melons and seeds of saltbush, wattles, cypress pines. Nests in tree hollows	Ongoing	Breeding and foraging	Normally found in pairs or small groups occupying large home ranges, although flocks of hundreds may be found where food is abundant .	Not migratory	Fly at reasonable heights

	waterbodies is present on site.						
Malleefowl (*Leipoa ocellata*)	Inhabits mallee communities and eucalypt woodlands, which are present on site.	Incubate eggs in large mounds and occupies home ranges from 50 - 500 ha in size).	Ongoing	Ongoing	Lives in pairs, sometimes with overlapping ranges.	Not migratory	Low flyer, predominantly ground-dwelling bird
Pied Honeyeater (*Certhionyx variegatus*)	Suitable mallee, spinifex and eucalypt woodlands are present on site.	Feeds on nectar, predominantly from emu-bushes and mistletoes (DPE 2023). Highly nomadic species, following the erratic flowering of shrubs and breeds in the fork of a shrub or tree up to 5m above the ground (DPE 2023).	Transitory	Breeding and foraging	Variable, small groups to large flocks	Unpredictable; follows erratic flowering of food trees	Fly at reasonable heights
Regent Parrot (*Polytelis antopeplus monarchoides*)	Suitable mallee woodland foraging habitat is present on site. Nests in mature river red gums (DPE 2023) which may be present in riparian areas of the site.	Breeding is colonial. Can be cryptic and frequently sits quietly within trees.	Ongoing	Foraging, potentially breeding	Usually occur in pairs or small groups, although breeding is colonial with many nests occurring within 150m of each other	Not migratory	Fly at reasonable heights
Shy Heathwren (*Hylacaula cautus*)	Inhabits mallee woodlands which are predicted to occur onsite, with a relatively dense understorey of shrubs and heath plants.	Feeds on the ground, almost entirely on insects (cockroaches, grasshoppers, bugs, lerps, beetles, caterpillars, moths, ants, spiders and insect eggs) and rarely on seeds, including those of saltbush	Ongoing	Breeding and foraging	Generally occurs singly or in pairs	Not migratory	Low flier

Southern Scrub-robin (*Dryomodes brunneopygia*)	Inhabits mallee and acacia scrub which are predicted to occur onsite, particularly with dense sub-shrubs in the understorey, including Broombush and other dry shrubs.	Forages around the base of mallee trees and on the ground beneath shrubs for ground- and litter-dwelling invertebrates, with certain ant species dominating	Ongoing	Breeding and foraging	Unknown. Assumed to be individuals or pairs as with other robin species.	Not migratory	Low flier
Spotted Harrier (*Circus assimilis*)	Suitable mallee, grassy open woodland and wetland habitats are likely to occur on site.	Nests in tall trees (DPE 2023).	Ongoing	Breeding and foraging	Likely to be solitary or in breeding pairs	Not migratory	Fly at great heights
Square-tailed Kite (*Lophoictinia isura*)	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses, which occur onsite. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland, which are predicted to occur onsite.	Is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage.	Transitory, occupies large hunting ranges of 100 square kilometres	Breeding and foraging	Mainly solitary but occurs in pairs during the breeding season	Not migratory, but occupies a large hunting range	Fly at great heights
Varied Sitella (*Daphoenositta chrysoptera*)	Broadly inhabits eucalypt forest and woodlands , which are present on site	Feeds on arthropods in rough or decorticating bark, dead branches, dead	Ongoing	Breeding and foraging	Normally occur in small flocks (Morcombe 2004).	Not migratory	Fly at reasonable heights

		trees and small branches in the tree canopy . Builds a nest high up in the tree canopy.					
White-bellied Sea-eagle (*Haliaeetus leucogaster*)	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea.	Hunts its prey from a perch or whilst in flight (by circling slowly, or by sailing along 10–20 m above the shore). Prey is usually carried to a feeding platform or (if small) consumed in flight, but some items are eaten on the ground	Transitory	Breeding and foraging	May be solitary, or live in pairs or small family groups consisting of a pair of adults and dependent young	Uncertain, however would likely follow migratory flight paths along large rivers such as the Murray	Fly at reasonable heights
White-fronted Chat (*Epthianura albifrons*)	Utilises bare or grassy ground nearby wetland areas (DPE 2023), which occur in areas of the site.	Builds nests in low vegetation between 20cm to 2.5m above the ground (DPE 2023).	Ongoing	Breeding and foraging	Occurs singly or in pairs (DPE 2023).	Not migratory	Low-flyer, breeds and forages close to the ground.

5.5 Summary of potential impacts on MNES

If present in the development corridor, the project has potential to result in the following impacts on MNES (Table 5.4).

Table 5.4 Potential MNES impacts

MNES	Threatened biodiversity	Potential impacts
Threatened ecological communities	Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions Mallee Bird Community of the Murray Darling Depression Bioregion Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Potential impacts on mallee-dependent bird species in PCTs 24, 58, 152, 153, 154, 170, 171 and 252
Threatened plants	Winged Pepper-cress (*Lepidium monoplocoides*), Yellow Swainson-pea (*Swainsona pyrophila*), Mossgiel Daisy (*Brachyscome papillosa*), Slender Darling-pea (*Swainsona murrayana*) and Menindee Nightshade (*Solanum karsense*)	Potential impacts on riparian woodland, wetland and mallee vegetation in PCTs 11, 13, 24, 58, 152, 153, 154, 170, 171 and 252
Threatened birds	Plains-wanderer (*Pedionomus torquatus*), Swift Parrot (*Lathamus discolor*), Curlew Sandpiper (*Calidris ferruginea*), Murray Mallee Striated Grasswren (*Amytornis striatus howei*), Australian Painted Snipe (*Rostratula australis*), Black-eared Miner (*Manorina melanotis*), Hooded Robin (south-eastern) (*Melanodryas cucullata cucullata*), Greenshank (*Tringa nebularia*), Australasian Bittern (*Botaurus poiciloptilus*), Eastern Major Mitchell's Cockatoo (*Lophochroa leadbeateri leadbeateri*), Diamond Firetail (*Stagonopleura guttata*), Blue-winged Parrot (*Neophema chrysostoma*), Southern Whiteface (*Aphelocephala leucopsis*), Malleefowl (*Leipoa ocellata*), Regent Parrot (eastern) (*Polytelis anthopeplus monarchoides*), Sharp-tailed Sandpiper (*Calidris acuminata*), Latham's Snipe (*Gallinago hardwickii*), Grey Falcon (*Falco hypoleucos*), Painted Honeyeater (*Grantiella picta*)	Potential impacts on riparian woodland, Belah woodland, wetland and mallee vegetation in PCTs 11, 13, 24, 58, 152, 153, 154, 170, 171 and 252
Threatened microbats	Corben’s Long-eared Bat (*Nyctophilus corbeni*)	Potential impacts on riparian woodland, Belah woodland, wetland and mallee vegetation in PCTs 11, 13, 24, 58, 152, 153, 154, 170, 171 and 252
Threatened fish	Flathead Galaxias (*Galaxias rostratus*), Macquarie Perch (*Macquaria australasica*), Murray Cod (*Maccullochella peelii*), Murray Hardyhead (*Craterocephalus fluviatilis*), Silver Perch (*Bidyanus bidyanus*)	Potential bed and bank impacts in streams from crossing construction
Threatened amphibians	Southern Bell Frog (*Litoria raniformis*)	Potential impacts on riparian areas and PCT 11 and 13

6 Assessment requirements

As the project will be assessed under Part 4 Division 4.7 of the EP&A Act, an assessment in accordance with the Biodiversity Assessment Method (DPIE, 2020) and the preparation of a Biodiversity Development Assessment Report (BDAR) is required. The following key tasks would be completed during the BDAR:

- validate and refine the State Vegetation Type Map, and delineate into vegetation zones
- conduct vegetation integrity plots
- revise Bionet threatened species search radius to 20 km, to identify any additional threatened species from surrounding conservation reserves
- conduct field-based threatened species habitat assessment
- generate a list of candidate species for further assessment, and conduct targeted surveys for those candidate 'species credit' species, where a habitat constraint and or suitable microhabitats are present
- conduct targeted surveys (if required) for MNES
- conduct BAM calculations and prepare BDAR for lodgement.

An aquatic habitat assessment for fish species listed under the FM Act and EPBC Act (Section 4.7) and classification of waterways in the project investigation area for fish passage may be required.

Given the potential for impacts on threatened bird and bat species, a Bird and Bat Utilisation Study (BBUS) and monitoring program will be required (see Section 5.4). The Biodiversity and Conservation Division (BCD) of DCCEEW NSW have advised that they require a 24-month monitoring dataset, with one survey per season (8 surveys total). BCD have recently provided guidance documents to proponents working in the south-west renewable energy zone, comprising:

- draft Turbine Risk Assessment and Avoidance Guideline
- suggested BBUS Method
- draft BBAMP Framework 2023.

DCCEEW Commonwealth have also recently released an updated version of the Onshore Wind Farm Guidance. The aforementioned guidelines would be considered when developing the monitoring program and when assessing prescribed impacts during the BDAR.

As the project also has potential to impact MNES, a referral will be lodged with DCCEEW Commonwealth. The referral would address the MNES outlined in Section 5.5 an any other issues deemed relevant by DCCEEW Commonwealth. As the project will likely use the bilateral assessment, SEARs would be issued by DPHI with supplementary environmental assessment requirements provided by DCCEEW Commonwealth if required.

References

BCD. (2023). *Draft Turbine Risk Assessment.* Department of Planning and Environment.

DPE. (2022). NSW State Vegetation Type Map. Department of Planning and Environment.

DPE. (2022). *NSW State Vegetation Type Map, Version C1.1.M1.1.* Sydney: Department fo Planning and Environment.

DPE. (2023). Biodiversity Values Map. Department of Planning and Environment.

DPIE. (2020). *Biodiversity Assessment Method.* Sydney: Department of Planning, Industry and Environment.

NGH Consultling and DP Energy. (2023). Scoping Report Euston Wind Farm.

WSP. (2020). *EnergyConnect (NSW – Western Section) - Technical paper 1 – Biodiversity development assessment report.* Newcastle: TransGrid.

WSP. (2022). *EnergyConnect (NSW - Eastern Section) Technical Paper 1 - Biodiversity Development Assessment Report.* Sydney: Transgrid.

Appendix A
Database search results

EMM
creating opportunities

Australian Government

Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 19-Mar-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	40
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	7
Commonwealth Heritage Places:	None
Listed Marine Species:	26
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	4
Regional Forest Agreements:	None
Nationally Important Wetlands:	2
EPBC Act Referrals:	12
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	100 - 150km upstream from Ramsar site	In feature area
Riverland	50 - 100km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	200 - 300km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community known to occur within area	In feature area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area	In feature area
Mallee Bird Community of the Murray Darling Depression Bioregion	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Amytornis striatus howei			
Murray Mallee Striated Grasswren, Striated Grasswren (sandplain) [91648]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat may occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lophochroa leadbeateri leadbeateri Major Mitchell's Cockatoo (eastern), Eastern Major Mitchell's Cockatoo, Pink Cockatoo (eastern) [82926]	Endangered	Species or species habitat known to occur within area	In feature area
Manorina melanotis Black-eared Miner [449]	Endangered	Species or species habitat may occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat known to occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Polytelis anthopeplus monarchoides Regent Parrot (eastern) [59612]	Vulnerable	Breeding likely to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
Stipiturus mallee Mallee Emu-wren [59459]	Endangered	Species or species habitat may occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Craterocephalus fluviatilis Murray Hardyhead [56791]	Endangered	Species or species habitat known to occur within area	In feature area
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area	In buffer area only
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
FROG			
Litoria raniformis Southern Bell Frog,, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat known to occur within area	In feature area
MAMMAL			
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
Atriplex infrequens [4143]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Brachyscome papillosa Mossgiel Daisy [6625]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat likely to occur within area	In feature area
Myriophyllum porcatum Ridged Water-milfoil [19919]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterostylis xerophila Desert Greenhood [7997]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Solanum karsense Menindee Nightshade [7776]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat may occur within area	In feature area
Swainsona pyrophila Yellow Swainson-pea [56344]	Vulnerable	Species or species habitat likely to occur within area	In feature area
REPTILE			
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat may occur within area	In feature area

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In buffer area only
Migratory Wetlands Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Commonwealth Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [16417]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [16416]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia & Moya Grace Murphy [16415]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia & Moya Grace Murphy [16418]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [15651]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Corporation [16073]	NSW	In buffer area only
Defence		
Defence - KAIRIVU BARRACKS - MILDURA [20998]	VIC	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Recurvirostra novaehollandiae			
Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Stiltia isabella			
Australian Pratincole [818]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa glareola			
Wood Sandpiper [829]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis			
Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Kings Billabong Park	Conservation Park	VIC	In buffer area only
River Murray Reserve	Natural Features Reserve	VIC	In buffer area only
River Murray Reserve (non-PV)	Natural Features Reserve	VIC	In buffer area only
Southern Mallee	NRS Addition - Gazettal in Progress	NSW	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status

Wetland Name	State	Buffer Status
Kings Billabong Wetlands	VIC	In buffer area only
Lake Ranfurly	VIC	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Electricity Transmission Line	2001/380	Controlled Action	Completed	In feature area
EnergyConnect NSW - Western Section	2020/8673	Controlled Action	Post-Approval	In feature area
Great Darling Anabranch - pipeline construction and environmental water flow ma	2004/1319	Controlled Action	Post-Approval	In feature area
Not controlled action				
Capture of Juvenile Murray Hardyheads to Establish a Captive Management and Breeding Prog	2008/4015	Not Controlled Action	Completed	In buffer area only
Conversion of the North Western Victoria rail system from broad gauge to standar	2002/657	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Modifications to Lock and Weir 10 Wentworth	2004/1367	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) ,Commonwealth listed ,Protected ,CAMBA listed ,JAMBA listed or ROKAMBA listed Entities in selected area [North: -33.90 West: 141.89 East: 142.45 South: -34.23] returned a total of 14,729 records of 352 species.

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Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Myobatrachidae	3131	*Crinia parinsignifera*		Eastern Sign-bearing Froglet	P		39	
Animalia	Amphibia	Myobatrachidae	9048	*Limnodynastes sp.*		unidentified Limnodynastes	P		1	
Animalia	Amphibia	Limnodynastidae	3058	*Limnodynastes dumerilii*		Eastern Banjo Frog	P		39	
Animalia	Amphibia	Limnodynastidae	3059	*Limnodynastes fletcheri*		Long-thumbed Frog	P		27	
Animalia	Amphibia	Limnodynastidae	3060	*Limnodynastes interioris*		Giant Banjo Frog	P		1	
Animalia	Amphibia	Limnodynastidae	3063	*Limnodynastes tasmaniensis*		Spotted Grass Frog	P		55	
Animalia	Amphibia	Limnodynastidae	3086	*Neobatrachus sudellae*		Sudell's Frog	P		4	
Animalia	Amphibia	Hylidae	3171	*Litoria caerulea*		Green Tree Frog	P		1	
Animalia	Amphibia	Hylidae	3204	*Litoria peronii*		Peron's Tree Frog	P		49	
Animalia	Amphibia	Hylidae	3207	*Litoria raniformis*		Southern Bell Frog	E1,P	V	10	
Animalia	Amphibia	Hylidae	9034	*Litoria sp.*		Unidentified Tree Frog	P		1	
Animalia	Reptilia	Chelidae	5259	*Chelodina expansa*		Broad-shelled Turtle	P		1	
Animalia	Reptilia	Chelidae	2017	*Chelodina longicollis*		Eastern Snake-necked Turtle	P		6	
Animalia	Reptilia	Chelidae	2951	*Emydura macquarii macquarii*		Macquarie River Turtle	P		1	
Animalia	Reptilia	Carphodactylidae	2138	*Underwoodisaurus milii*		Thick-tailed Gecko	P		1	
Animalia	Reptilia	Diplodactylidae	2076	*Diplodactylus tessellatus*		Tessellated Gecko	P		1	
Animalia	Reptilia	Diplodactylidae	2077	*Diplodactylus vittatus*		Wood Gecko	P		4	
Animalia	Reptilia	Diplodactylidae	2109	*Lucasium damaeum*		Beaded Gecko	P		16	
Animalia	Reptilia	Diplodactylidae	5204	*Rhynchoedura ormsbyi*		Eastern Beaked Gecko	P		7	
Animalia	Reptilia	Gekkonidae	2126	*Christinus marmoratus*		Marbled Gecko	P		1	
Animalia	Reptilia	Gekkonidae	2092	*Gehyra variegata*		Tree Dtella	P		20	
Animalia	Reptilia	Gekkonidae	2105	*Heteronotia binoei*		Bynoe's Gecko	P		15	
Animalia	Reptilia	Pygopodidae	2143	*Aprasia inaurita*		Mallee Worm-lizard	E1,P		2	
Animalia	Reptilia	Pygopodidae	2154	*Delma australis*		Marble-faced Delma	E1,P		2	
Animalia	Reptilia	Pygopodidae	2167	*Delma butleri*		Unbanded Delma	P		7	
Animalia	Reptilia	Pygopodidae	2170	*Lialis burtonis*		Burton's Snake-lizard	P		2	
Animalia	Reptilia	Pygopodidae	2911	*Pygopus schraderi*		Eastern Hooded Scaly-foot	P		2	
Animalia	Reptilia	Scincidae	5156	*Cryptoblepharus australis*		Inland Snake-eyed Skink	P		17	
Animalia	Reptilia	Scincidae	T222	*Cryptoblepharus pannosus*		Ragged Snake-eyed Skink	P		5	
Animalia	Reptilia	Scincidae	2340	*Ctenotus atlas*		Southern Mallee Ctenotus	P		24	
Animalia	Reptilia	Scincidae	2342	*Ctenotus brachyonyx*		Short-clawed Ctenotus	P		2	
Animalia	Reptilia	Scincidae	2913	*Ctenotus olympicus*			P		6	
Animalia	Reptilia	Scincidae	2374	*Ctenotus regius*		Pale-rumped Ctenotus	P		33	
Animalia	Reptilia	Scincidae	2375	*Ctenotus robustus*		Robust Ctenotus	P		2	
Animalia	Reptilia	Scincidae	2379	*Ctenotus schomburgkii*		Barred Wedgesnout Ctenotus	P		15	
Animalia	Reptilia	Scincidae	2389	*Ctenotus uber*		Spotted Ctenotus	P		1	
Animalia	Reptilia	Scincidae	2437	*Eremiascincus fasciolatus*		Narrow-banded Sand-swimmer	P		3	
Animalia	Reptilia	Scincidae	2438	*Eremiascincus richardsonii*		Broad-banded Sand-swimmer	P		1	
Animalia	Reptilia	Scincidae	5154	*Lerista muelleri*		Wood Mulch-slider	P		42	
Animalia	Reptilia	Scincidae	2499	*Lerista punctatovittata*		Eastern Robust Slider	P		16	
Animalia	Reptilia	Scincidae	2413	*Liopholis inornata*		Desert Skink	P		1	
Animalia	Reptilia	Scincidae	2519	*Menetia greyii*		Common Dwarf Skink	P		21	
Animalia	Reptilia	Scincidae	2526	*Morethia boulengeri*		South-eastern Morethia Skink	P		17	
Animalia	Reptilia	Scincidae	2579	*Tiliqua occipitalis*		Western Blue-tongued Lizard	V,P		1	
Animalia	Reptilia	Scincidae	2583	*Tiliqua rugosa*		Shingle-back	P		23	

Animalia	Reptilia	Agamidae	2185	*Ctenophorus fordi*	Mallee Military Dragon	P		19
Animalia	Reptilia	Agamidae	2199	*Ctenophorus pictus*	Painted Dragon	P		5
Animalia	Reptilia	Agamidae	5059	*Diporiphora nobbi*	Nobbi Dragon	P		13
Animalia	Reptilia	Agamidae	2204	*Pogona vitticeps*	Central Bearded Dragon	P		15
Animalia	Reptilia	Varanidae	2271	*Varanus gouldii*	Gould's Goanna	P		5
Animalia	Reptilia	Varanidae	2283	*Varanus varius*	Lace Monitor	P		6
Animalia	Reptilia	Typhlopidae	2588	*Anilios bituberculatus*	Prong-snouted Blind Snake	P		1
Animalia	Reptilia	Pythonidae	2625	*Morelia spilota*	Carpet & Diamond Pythons	P		1
Animalia	Reptilia	Pythonidae	5097	*Morelia spilota metcalfei*	Murray/Darling Carpet Python	P		3
Animalia	Reptilia	Elapidae	2711	*Brachyurophis australis*	Coral Snake	P		5
Animalia	Reptilia	Elapidae	2655	*Demansia psammophis*	Yellow-faced Whip Snake	P		1
Animalia	Reptilia	Elapidae	2669	*Furina diadema*	Red-naped Snake	P		4
Animalia	Reptilia	Elapidae	2681	*Notechis scutatus*	Tiger Snake	P		1
Animalia	Reptilia	Elapidae	T033	*Pseudonaja sp.*	Unidentified Brown Snake	P		4
Animalia	Reptilia	Elapidae	2699	*Pseudonaja textilis*	Eastern Brown Snake	P		4
Animalia	Aves	Casuariidae	0001	*Dromaius novaehollandiae*	Emu	P		17
Animalia	Aves	Megapodiidae	0007	*Leipoa ocellata*	Malleefowl	E1,P	V	7
Animalia	Aves	Phasianidae	0009	*Coturnix pectoralis*	Stubble Quail	P		2
Animalia	Aves	Phasianidae	0011	*Synoicus ypsilophora*	Brown Quail	P		3
Animalia	Aves	Anseranatidae	0199	*Anseranas semipalmata*	Magpie Goose	V,P		1
Animalia	Aves	Anatidae	0210	*Anas castanea*	Chestnut Teal	P		14
Animalia	Aves	Anatidae	0211	*Anas gracilis*	Grey Teal	P		2251
Animalia	Aves	Anatidae	0212	*Anas rhynchotis*	Australasian Shoveler	P		28
Animalia	Aves	Anatidae	0208	*Anas superciliosa*	Pacific Black Duck	P		655
Animalia	Aves	Anatidae	0215	*Aythya australis*	Hardhead	P		58
Animalia	Aves	Anatidae	0217	*Biziura lobata*	Musk Duck	P		6
Animalia	Aves	Anatidae	0202	*Chenonetta jubata*	Australian Wood Duck	P		91
Animalia	Aves	Anatidae	0203	*Cygnus atratus*	Black Swan	P		118
Animalia	Aves	Anatidae	0213	*Malacorhynchus membranaceus*	Pink-eared Duck	P		30
Animalia	Aves	Anatidae	0216	*Oxyura australis*	Blue-billed Duck	V,P		2
Animalia	Aves	Anatidae	0214	*Stictonetta naevosa*	Freckled Duck	V,P		7
Animalia	Aves	Anatidae	0207	*Tadorna tadornoides*	Australian Shelduck	P		87
Animalia	Aves	Podicipedidae	0060	*Podiceps cristatus*	Great Crested Grebe	P		8
Animalia	Aves	Podicipedidae	0062	*Poliocephalus poliocephalus*	Hoary-headed Grebe	P		22
Animalia	Aves	Podicipedidae	0061	*Tachybaptus novaehollandiae*	Australasian Grebe	P		38
Animalia	Aves	Columbidae	0031	*Geopelia cuneata*	Diamond Dove	P		1
Animalia	Aves	Columbidae	9931	*Geopelia striata*	Peaceful Dove	P		45
Animalia	Aves	Columbidae	0043	*Ocyphaps lophotes*	Crested Pigeon	P		93
Animalia	Aves	Columbidae	0034	*Phaps chalcoptera*	Common Bronzewing	P		56
Animalia	Aves	Podargidae	0313	*Podargus strigoides*	Tawny Frogmouth	P		21
Animalia	Aves	Aegothelidae	0317	*Aegotheles cristatus*	Australian Owlet-nightjar	P		31
Animalia	Aves	Apodidae	0335	*Apus pacificus*	Fork-tailed Swift	P	C,J,K	1
Animalia	Aves	Apodidae	0334	*Hirundapus caudacutus*	White-throated Needletail	P	V,C,J,K	1
Animalia	Aves	Anhingidae	8731	*Anhinga novaehollandiae*	Australasian Darter	P		21
Animalia	Aves	Phalacrocoracidae	0100	*Microcarbo melanoleucos*	Little Pied Cormorant	P		24
Animalia	Aves	Phalacrocoracidae	0096	*Phalacrocorax carbo*	Great Cormorant	P		43
Animalia	Aves	Phalacrocoracidae	T021	*Phalacrocorax sp.*	Unidentified Cormorant	P		1
Animalia	Aves	Phalacrocoracidae	0097	*Phalacrocorax sulcirostris*	Little Black Cormorant	P		21
Animalia	Aves	Phalacrocoracidae	0099	*Phalacrocorax varius*	Pied Cormorant	P		16
Animalia	Aves	Pelecanidae	0106	*Pelecanus conspicillatus*	Australian Pelican	P		221
Animalia	Aves	Ardeidae	0186	*Ardea intermedia*	Intermediate Egret	P		4
Animalia	Aves	Ardeidae	0189	*Ardea pacifica*	White-necked Heron	P		20
Animalia	Aves	Ardeidae	T179	*Ardea/Egretta sp.*	Unidentified Egret	P		2
Animalia	Aves	Ardeidae	0197	*Botaurus poiciloptilus*	Australasian Bittern	E1,P	E	15

Animalia	Aves	Ardeidae	0977	*Bubulcus ibis*	Cattle Egret	P		4
Animalia	Aves	Ardeidae	8712	*Casmerodius modesta*	Eastern Great Egret	P		21
Animalia	Aves	Ardeidae	0185	*Egretta garzetta*	Little Egret	P		4
Animalia	Aves	Ardeidae	0188	*Egretta novaehollandiae*	White-faced Heron	P		124
Animalia	Aves	Ardeidae	8703	*Ixobrychus dubius*	Australian Little Bittern	P		28
Animalia	Aves	Ardeidae	0192	*Nycticorax caledonicus*	Nankeen Night Heron	P		9
Animalia	Aves	Threskiornithidae	0182	*Platalea flavipes*	Yellow-billed Spoonbill	P		37
Animalia	Aves	Threskiornithidae	0181	*Platalea regia*	Royal Spoonbill	P		9
Animalia	Aves	Threskiornithidae	0178	*Plegadis falcinellus*	Glossy Ibis	P		12
Animalia	Aves	Threskiornithidae	0179	*Threskiornis moluccus*	Australian White Ibis	P		48
Animalia	Aves	Threskiornithidae	0180	*Threskiornis spinicollis*	Straw-necked Ibis	P		36
Animalia	Aves	Accipitridae	0222	*Accipiter cirrocephalus*	Collared Sparrowhawk	P		13
Animalia	Aves	Accipitridae	0221	*Accipiter fasciatus*	Brown Goshawk	P		30
Animalia	Aves	Accipitridae	0224	*Aquila audax*	Wedge-tailed Eagle	P		37
Animalia	Aves	Accipitridae	0219	*Circus approximans*	Swamp Harrier	P		15
Animalia	Aves	Accipitridae	0218	*Circus assimilis*	Spotted Harrier	V,P		10
Animalia	Aves	Accipitridae	0232	*Elanus axillaris*	Black-shouldered Kite	P		17
Animalia	Aves	Accipitridae	0226	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V,P		2
Animalia	Aves	Accipitridae	0228	*Haliastur sphenurus*	Whistling Kite	P		133
Animalia	Aves	Accipitridae	0225	*Hieraaetus morphnoides*	Little Eagle	V,P		16
Animalia	Aves	Accipitridae	0230	^^*Lophoictinia isura*	Square-tailed Kite	V,P,3		5
Animalia	Aves	Accipitridae	0229	*Milvus migrans*	Black Kite	P		48
Animalia	Aves	Falconidae	0239	*Falco berigora*	Brown Falcon	P		21
Animalia	Aves	Falconidae	0240	*Falco cenchroides cenchroides*	Nankeen Kestrel	P		153
Animalia	Aves	Falconidae	0236	^*Falco hypoleucos*	Grey Falcon	V,P,2	V	2
Animalia	Aves	Falconidae	0235	*Falco longipennis*	Australian Hobby	P		11
Animalia	Aves	Falconidae	0237	*Falco peregrinus*	Peregrine Falcon	P		21
Animalia	Aves	Falconidae	0238	*Falco subniger*	Black Falcon	V,P		3
Animalia	Aves	Gruidae	0177	*Grus rubicunda*	Brolga	V,P		2
Animalia	Aves	Rallidae	0059	*Fulica atra*	Eurasian Coot	P		395
Animalia	Aves	Rallidae	0056	*Gallinula tenebrosa*	Dusky Moorhen	P		13
Animalia	Aves	Rallidae	0046	*Hypotaenidia philippensis*	Buff-banded Rail	P		7
Animalia	Aves	Rallidae	0058	*Porphyrio porphyrio*	Purple Swamphen	P		6
Animalia	Aves	Rallidae	0049	*Porzana fluminea*	Australian Spotted Crake	P		7
Animalia	Aves	Rallidae	0050	*Porzana pusilla*	Baillon's Crake	P		5
Animalia	Aves	Rallidae	0051	*Porzana tabuensis*	Spotless Crake	P		10
Animalia	Aves	Rallidae	0055	*Tribonyx ventralis*	Black-tailed Native-hen	P		39
Animalia	Aves	Otididae	0176	*Ardeotis australis*	Australian Bustard	E1,P		2
Animalia	Aves	Burhinidae	0174	*Burhinus grallarius*	Bush Stone-curlew	E1,P		5
Animalia	Aves	Recurvirostridae	0147	*Cladorhynchus leucocephalus*	Banded Stilt	P		10
Animalia	Aves	Recurvirostridae	0146	*Himantopus himantopus*	Black-winged Stilt	P		61
Animalia	Aves	Recurvirostridae	0148	*Recurvirostra novaehollandiae*	Red-necked Avocet	P		45
Animalia	Aves	Charadriidae	0140	*Charadrius bicinctus*	Double-banded Plover	P		5
Animalia	Aves	Charadriidae	0143	*Charadrius ruficapillus*	Red-capped Plover	P		37
Animalia	Aves	Charadriidae	0144	*Elseyornis melanops*	Black-fronted Dotterel	P		68
Animalia	Aves	Charadriidae	0132	*Erythrogonys cinctus*	Red-kneed Dotterel	P		33
Animalia	Aves	Charadriidae	8006	*Pluvialis fulva*	Pacific Golden Plover	P	C,J,K	2
Animalia	Aves	Charadriidae	0133	*Vanellus miles*	Masked Lapwing	P		117
Animalia	Aves	Charadriidae	0135	*Vanellus tricolor*	Banded Lapwing	P		15
Animalia	Aves	Pedionomidae	0020	^^*Pedionomus torquatus*	Plains-wanderer	E1,P,3	CE	1
Animalia	Aves	Rostratulidae	0170	*Rostratula australis*	Australian Painted Snipe	E1,P	E	5
Animalia	Aves	Scolopacidae	0129	*Arenaria interpres*	Ruddy Turnstone	P	C,J,K	6
Animalia	Aves	Scolopacidae	0163	*Calidris acuminata*	Sharp-tailed Sandpiper	P	C,J,K	30
Animalia	Aves	Scolopacidae	0164	*Calidris canutus*	Red Knot	P	E,C,J,K	1
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*	Curlew Sandpiper	E1,P	CE,C,J,K	12

Animalia	Aves	Scolopacidae	0978	*Calidris melanotos*	Pectoral Sandpiper	P	J,K	5	
Animalia	Aves	Scolopacidae	0162	*Calidris ruficollis*	Red-necked Stint	P	C,J,K	14	
Animalia	Aves	Scolopacidae	0965	*Calidris subminuta*	Long-toed Stint	P	C,J,K	4	
Animalia	Aves	Scolopacidae	0168	*Gallinago hardwickii*	Latham's Snipe	P	J,K	1	
Animalia	Aves	Scolopacidae	0167	*Limicola falcinellus*	Broad-billed Sandpiper	V,P	C,J,K	1	
Animalia	Aves	Scolopacidae	0153	*Limosa lapponica*	Bar-tailed Godwit	P	C,J,K	2	
Animalia	Aves	Scolopacidae	0152	*Limosa limosa*	Black-tailed Godwit	V,P	E,C,J,K	4	
Animalia	Aves	Scolopacidae	0151	*Numenius minutus*	Little Curlew	P	C,J,K	3	
Animalia	Aves	Scolopacidae	0154	*Tringa glareola*	Wood Sandpiper	P	C,J,K	3	
Animalia	Aves	Scolopacidae	0158	*Tringa nebularia*	Common Greenshank	P	C,J,K	15	
Animalia	Aves	Scolopacidae	0159	*Tringa stagnatilis*	Marsh Sandpiper	P	C,J,K	10	
Animalia	Aves	Turnicidae	0014	*Turnix varius*	Painted Button-quail	P		2	
Animalia	Aves	Turnicidae	0018	*Turnix velox*	Little Button-quail	P		2	
Animalia	Aves	Glareolidae	0173	*Stiltia isabella*	Australian Pratincole	P		1	
Animalia	Aves	Laridae	0110	*Chlidonias hybrida*	Whiskered Tern	P		31	
Animalia	Aves	Laridae	0109	*Chlidonias leucopterus*	White-winged Black Tern	P	C,J,K	1	
Animalia	Aves	Laridae	0125	*Chroicocephalus novaehollandiae*	Silver Gull	P		112	
Animalia	Aves	Laridae	0111	*Gelochelidon nilotica*	Gull-billed Tern	P	C	4	
Animalia	Aves	Laridae	0112	*Hydroprogne caspia*	Caspian Tern	P	J	27	
Animalia	Aves	Cacatuidae	0269	*Cacatua galerita*	Sulphur-crested Cockatoo	P		7	
Animalia	Aves	Cacatuidae	0271	*Cacatua sanguinea*	Little Corella	P		406	
Animalia	Aves	Cacatuidae	0272	*Cacatua tenuirostris*	Long-billed Corella	P		2	
Animalia	Aves	Cacatuidae	0273	*Eolophus roseicapilla*	Galah	P		59	
Animalia	Aves	Cacatuidae	0270	*^Lophochroa leadbeateri*	Pink Cockatoo	V,P,2		33	
Animalia	Aves	Cacatuidae	0274	*Nymphicus hollandicus*	Cockatiel	P		10	
Animalia	Aves	Psittacidae	0294	*Barnardius zonarius*	Australian Ringneck	P		30	
Animalia	Aves	Psittacidae	0291	*Barnardius zonarius barnardi*	[Mallee Ringneck]	P		43	
Animalia	Aves	Psittacidae	0259	*^^Glossopsitta porphyrocephala*	Purple-crowned Lorikeet	V,P,3		5	
Animalia	Aves	Psittacidae	0310	*Melopsittacus undulatus*	Budgerigar	P		11	
Animalia	Aves	Psittacidae	0306	*Neophema chrysostoma*	Blue-winged Parrot	V,P	V	2	
Animalia	Aves	Psittacidae	0297	*Northiella haematogaster*	Blue Bonnet	P		53	
Animalia	Aves	Psittacidae	0282	*Platycercus elegans*	Crimson Rosella	P		3	
Animalia	Aves	Psittacidae	0284	*Platycercus elegans flaveolus*	[Yellow Rosella]	P		23	
Animalia	Aves	Psittacidae	0288	*Platycercus eximius*	Eastern Rosella	P		1	
Animalia	Aves	Psittacidae	T039	*Platycercus sp.*	Unidentified Rosella	P		1	
Animalia	Aves	Psittacidae	0709	*^^Polytelis anthopeplus monarchoides*	Regent Parrot (eastern subspecies)	E1,P,3	V	2	
Animalia	Aves	Psittacidae	0295	*Psephotus haematonotus*	Red-rumped Parrot	P		70	
Animalia	Aves	Psittacidae	0296	*Psephotus varius*	Mulga Parrot	P		52	
Animalia	Aves	Psittacidae	9947	*Trichoglossus haematodus*	Rainbow Lorikeet	P		9	
Animalia	Aves	Cuculidae	0338	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	P		5	
Animalia	Aves	Cuculidae	0342	*Chalcites basalis*	Horsfield's Bronze-Cuckoo	P		20	
Animalia	Aves	Cuculidae	0341	*Chalcites osculans*	Black-eared Cuckoo	P		4	
Animalia	Aves	Cuculidae	0347	*Eudynamys orientalis*	Eastern Koel	P		1	
Animalia	Aves	Cuculidae	0337	*Heteroscenes pallidus*	Pallid Cuckoo	P		19	
Animalia	Aves	Strigidae	9922	*Ninox novaeseelandiae*	Southern Boobook	P		18	
Animalia	Aves	Tytonidae	9923	*Tyto javanica*	Eastern Barn Owl	P		5	
Animalia	Aves	Tytonidae	9025	*Tyto sp.*	Unidentified 'Barn' Owl	P		1	
Animalia	Aves	Alcedinidae	0322	*Dacelo novaeguineae*	Laughing Kookaburra	P		61	
Animalia	Aves	Alcedinidae	0325	*Todiramphus pyrrhopygius*	Red-backed Kingfisher	P		9	
Animalia	Aves	Alcedinidae	0326	*Todiramphus sanctus*	Sacred Kingfisher	P		39	
Animalia	Aves	Meropidae	0329	*Merops ornatus*	Rainbow Bee-eater	P		74	
Animalia	Aves	Coraciidae	0318	*Eurystomus orientalis*	Dollarbird	P		1	
Animalia	Aves	Climacteridae	0561	*Climacteris affinis*	White-browed Treecreeper	P		84	
Animalia	Aves	Climacteridae	8127	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P	V	146	

Animalia	Aves	Ptilonorhynchidae	0680	*Chlamydera maculata*	Spotted Bowerbird	P		1	
Animalia	Aves	Maluridae	0529	*Malurus cyaneus*	Superb Fairy-wren	P		18	
Animalia	Aves	Maluridae	0536	*Malurus lamberti*	Variegated Fairy-wren	P		43	
Animalia	Aves	Maluridae	0535	*Malurus leucopterus*	White-winged Fairy-wren	P		60	
Animalia	Aves	Maluridae	0532	*Malurus splendens*	Splendid Fairy-wren	P		57	
Animalia	Aves	Acanthizidae	0476	*Acanthiza apicalis*	Inland Thornbill	P		5	
Animalia	Aves	Acanthizidae	0486	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	P		139	
Animalia	Aves	Acanthizidae	0471	*Acanthiza nana*	Yellow Thornbill	P		17	
Animalia	Aves	Acanthizidae	0484	*Acanthiza reguloides*	Buff-rumped Thornbill	P		1	
Animalia	Aves	Acanthizidae	0481	*Acanthiza uropygialis*	Chestnut-rumped Thornbill	P		228	
Animalia	Aves	Acanthizidae	0466	*Aphelocephala leucopsis*	Southern Whiteface	V,P	V	302	
Animalia	Aves	Acanthizidae	0463	*Gerygone fusca*	Western Gerygone	P		2	
Animalia	Aves	Acanthizidae	0497	*Pyrrholaemus brunneus*	Redthroat	V,P		2	
Animalia	Aves	Acanthizidae	0465	*Smicrornis brevirostris*	Weebill	P		207	
Animalia	Aves	Pardalotidae	0565	*Pardalotus punctatus*	Spotted Pardalote	P		11	
Animalia	Aves	Pardalotidae	0566	*Pardalotus punctatus xanthopyge*	[Yellow-rumped Pardalote]	P		10	
Animalia	Aves	Pardalotidae	0976	*Pardalotus striatus*	Striated Pardalote	P		183	
Animalia	Aves	Meliphagidae	0640	*Acanthagenys rufogularis*	Spiny-cheeked Honeyeater	P		391	
Animalia	Aves	Meliphagidae	0638	*Anthochaera carunculata*	Red Wattlebird	P		45	
Animalia	Aves	Meliphagidae	T210	*Anthochaera sp.*	Unidentified Wattlebird	P		1	
Animalia	Aves	Meliphagidae	0614	*Caligavis chrysops*	Yellow-faced Honeyeater	P		4	
Animalia	Aves	Meliphagidae	0602	*Certhionyx variegatus*	Pied Honeyeater	V,P		7	
Animalia	Aves	Meliphagidae	0641	*Entomyzon cyanotis*	Blue-faced Honeyeater	P		16	
Animalia	Aves	Meliphagidae	0448	*Epthianura albifrons*	White-fronted Chat	V,P		78	
Animalia	Aves	Meliphagidae	0450	*Epthianura aurifrons*	Orange Chat	P		6	
Animalia	Aves	Meliphagidae	0449	*Epthianura tricolor*	Crimson Chat	P		68	
Animalia	Aves	Meliphagidae	0608	*Gavicalis virescens*	Singing Honeyeater	P		261	
Animalia	Aves	Meliphagidae	0598	*Grantiella picta*	Painted Honeyeater	V,P	V	3	
Animalia	Aves	Meliphagidae	0635	*Manorina flavigula*	Yellow-throated Miner	P		21	
Animalia	Aves	Meliphagidae	0634	*Manorina melanocephala*	Noisy Miner	P		31	
Animalia	Aves	Meliphagidae	0583	*Melithreptus brevirostris*	Brown-headed Honeyeater	P		139	
Animalia	Aves	Meliphagidae	8303	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V,P		8	
Animalia	Aves	Meliphagidae	0578	*Melithreptus lunatus*	White-naped Honeyeater	P		7	
Animalia	Aves	Meliphagidae	0617	*Nesoptilotis leucotis*	White-eared Honeyeater	P		50	
Animalia	Aves	Meliphagidae	0646	*Philemon citreogularis*	Little Friarbird	P		11	
Animalia	Aves	Meliphagidae	0585	*Plectorhyncha lanceolata*	Striped Honeyeater	P		93	
Animalia	Aves	Meliphagidae	0622	*Ptilotula ornata*	Yellow-plumed Honeyeater	P		604	
Animalia	Aves	Meliphagidae	0625	*Ptilotula penicillata*	White-plumed Honeyeater	P		241	
Animalia	Aves	Meliphagidae	0594	*Purnella albifrons*	White-fronted Honeyeater	P		158	
Animalia	Aves	Meliphagidae	0589	*Sugomel nigrum*	Black Honeyeater	P		18	
Animalia	Aves	Pomatostomidae	0446	*Pomatostomus ruficeps*	Chestnut-crowned Babbler	P		29	
Animalia	Aves	Pomatostomidae	0445	*Pomatostomus superciliosus*	White-browed Babbler	P		140	
Animalia	Aves	Falcunculidae	0416	*Falcunculus frontatus frontatus*	Eastern Shrike-tit	P		4	
Animalia	Aves	Psophodidae	0437	*Cinclosoma castanotum*	Chestnut Quail-thrush	V,P		9	
Animalia	Aves	Neosittidae	0549	*Daphoenositta chrysoptera*	Varied Sittella	V,P		17	
Animalia	Aves	Campephagidae	0423	*Coracina maxima*	Ground Cuckoo-shrike	P		2	
Animalia	Aves	Campephagidae	0424	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	P		51	
Animalia	Aves	Campephagidae	0430	*Lalage sueurii*	White-winged Triller	P		22	
Animalia	Aves	Oreoicidae	0419	*Oreoica gutturalis*	Crested Bellbird	P		72	
Animalia	Aves	Pachycephalidae	0408	*Colluricincla harmonica*	Grey Shrike-thrush	P		113	
Animalia	Aves	Pachycephalidae	0403	*Pachycephala inornata*	Gilbert's Whistler	V,P		26	
Animalia	Aves	Pachycephalidae	0398	*Pachycephala pectoralis*	Golden Whistler	P		1	
Animalia	Aves	Pachycephalidae	0401	*Pachycephala rufiventris*	Rufous Whistler	P		131	

Animalia	Aves	Oriolidae	0671	*Oriolus sagittatus*	Olive-backed Oriole	P		1
Animalia	Aves	Artamidae	0546	*Artamus cinereus*	Black-faced Woodswallow	P		23
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P		35
Animalia	Aves	Artamidae	0543	*Artamus leucoryn*	White-breasted Woodswallow	P		2
Animalia	Aves	Artamidae	0544	*Artamus personatus*	Masked Woodswallow	P		32
Animalia	Aves	Artamidae	0545	*Artamus superciliosus*	White-browed Woodswallow	P		86
Animalia	Aves	Artamidae	0700	*Cracticus nigrogularis*	Pied Butcherbird	P		69
Animalia	Aves	Artamidae	T022	*Cracticus sp.*	Unidentified Butcherbird	P		1
Animalia	Aves	Artamidae	0702	*Cracticus torquatus*	Grey Butcherbird	P		90
Animalia	Aves	Artamidae	0705	*Gymnorhina tibicen*	Australian Magpie	P		174
Animalia	Aves	Artamidae	0697	*Strepera versicolor*	Grey Currawong	P		7
Animalia	Aves	Rhipiduridae	0361	*Rhipidura albiscapa*	Grey Fantail	P		17
Animalia	Aves	Rhipiduridae	0364	*Rhipidura leucophrys*	Willie Wagtail	P		185
Animalia	Aves	Corvidae	0691	*Corvus bennetti*	Little Crow	P		15
Animalia	Aves	Corvidae	0930	*Corvus coronoides*	Australian Raven	P		111
Animalia	Aves	Corvidae	0954	*Corvus mellori*	Little Raven	P		34
Animalia	Aves	Corvidae	9067	*Corvus sp.*	Unidentified Corvid	P		2
Animalia	Aves	Monarchidae	0415	*Grallina cyanoleuca*	Magpie-lark	P		100
Animalia	Aves	Monarchidae	9955	*Myiagra inquieta*	Restless Flycatcher	P		31
Animalia	Aves	Corcoracidae	0693	*Corcorax melanorhamphos*	White-winged Chough	P		34
Animalia	Aves	Corcoracidae	0675	*Struthidea cinerea*	Apostlebird	P		39
Animalia	Aves	Petroicidae	0441	*Drymodes brunneopygia*	Southern Scrub-robin	V,P		3
Animalia	Aves	Petroicidae	8367	*Melanodryas cucullata cucullata*	South-eastern Hooded Robin	E1,P	E	64
Animalia	Aves	Petroicidae	0377	*Microeca fascinans*	Jacky Winter	P		29
Animalia	Aves	Petroicidae	0381	*Petroica goodenovii*	Red-capped Robin	P		281
Animalia	Aves	Petroicidae	0382	*Petroica phoenicea*	Flame Robin	V,P		1
Animalia	Aves	Alaudidae	0648	*Mirafra javanica*	Horsfield's Bushlark	P		2
Animalia	Aves	Cisticolidae	0525	*Cisticola exilis*	Golden-headed Cisticola	P		2
Animalia	Aves	Acrocephalidae	0524	*Acrocephalus australis*	Australian Reed-Warbler	P		58
Animalia	Aves	Locustellidae	0508	*Cincloramphus cruralis*	Brown Songlark	P		10
Animalia	Aves	Locustellidae	0509	*Cincloramphus mathewsi*	Rufous Songlark	P		19
Animalia	Aves	Locustellidae	0522	*Poodytes gramineus*	Little Grassbird	P		33
Animalia	Aves	Hirundinidae	0358	*Cheramoeca leucosterna*	White-backed Swallow	P		16
Animalia	Aves	Hirundinidae	0357	*Hirundo neoxena*	Welcome Swallow	P		67
Animalia	Aves	Hirundinidae	0360	*Petrochelidon ariel*	Fairy Martin	P		13
Animalia	Aves	Hirundinidae	0359	*Petrochelidon nigricans*	Tree Martin	P		31
Animalia	Aves	Zosteropidae	0574	*Zosterops lateralis*	Silvereye	P		75
Animalia	Aves	Dicaeidae	0564	*Dicaeum hirundinaceum*	Mistletoebird	P		32
Animalia	Aves	Estrildidae	0653	*Taeniopygia guttata*	Zebra Finch	P		15
Animalia	Aves	Motacillidae	0647	*Anthus novaeseelandiae*	Australian Pipit	P		51
Animalia	Mammalia	Ornithorhynchida e	1001	*Ornithorhynchus anatinus*	Platypus	P		2
Animalia	Mammalia	Tachyglossidae	1003	*Tachyglossus aculeatus*	Short-beaked Echidna	P		30
Animalia	Mammalia	Dasyuridae	1043	*Antechinomys laniger*	Kultarr	E1,P		2
Animalia	Mammalia	Dasyuridae	1027	*Antechinus flavipes*	Yellow-footed Antechinus	P		1
Animalia	Mammalia	Dasyuridae	1008	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	1
Animalia	Mammalia	Dasyuridae	1055	*Ningaui yvonneae*	Southern Ningaui	V,P		3
Animalia	Mammalia	Dasyuridae	1018	*Phascogale calura*	Red-tailed Phascogale	E4,P	V	1
Animalia	Mammalia	Dasyuridae	1072	*Sminthopsis crassicaudata*	Fat-tailed Dunnart	P		6
Animalia	Mammalia	Dasyuridae	1061	*Sminthopsis murina*	Common Dunnart	P		24
Animalia	Mammalia	Myrmecobiidae	1086	*Myrmecobius fasciatus*	Numbat	E4,P	E	1
Animalia	Mammalia	Chaeropodidae	1110	*Chaeropus ecaudatus*	Pig-footed Bandicoot	E4,P	X	1
Animalia	Mammalia	Thylacomyidae	1106	*Macrotis lagotis*	Bilby	E4,P	V	2
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*	Koala	E1,P	E	2
Animalia	Mammalia	Burramyidae	1151	*Cercartetus concinnus*	Western Pygmy Possum	E1,P		6
Animalia	Mammalia	Pseudocheiridae	1129	*Pseudocheirus peregrinus*	Common Ringtail Possum	P		1
Animalia	Mammalia	Phalangeridae	T082	*Trichosurus sp.*	brushtail possum	P		11
Animalia	Mammalia	Phalangeridae	1113	*Trichosurus vulpecula*	Common Brushtail Possum	P		16

Animalia	Mammalia	Potoroidae	1764	*Bettongia lesueur graii*	Boodie, Burrowing Bettong (mainland)	E4,P	X	2	
Animalia	Mammalia	Macropodidae	1194	*Lagorchestes leporides*	Eastern Hare-wallaby	E4,P	X	1	
Animalia	Mammalia	Macropodidae	T108	*Macropod sp.*	unidentified macropod	P		41	
Animalia	Mammalia	Macropodidae	1263	*Macropus fuliginosus*	Western Grey Kangaroo	P		74	
Animalia	Mammalia	Macropodidae	1265	*Macropus giganteus*	Eastern Grey Kangaroo	P		19	
Animalia	Mammalia	Macropodidae	T085	*Macropus sp.*	kangaroo / wallaby	P		38	
Animalia	Mammalia	Macropodidae	1266	*Osphranter robustus*	Common Wallaroo	P		1	
Animalia	Mammalia	Macropodidae	1275	*Osphranter rufus*	Red Kangaroo	P		100	
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P		2	
Animalia	Mammalia	Molossidae	1324	*Austronomus australis*	White-striped Freetail-bat	P		5	
Animalia	Mammalia	Molossidae	T454	*Molossidae sp.*	unidentified mastiff bat	P		8	
Animalia	Mammalia	Molossidae	1946	*Ozimops petersi*		P		12	
Animalia	Mammalia	Vespertilionidae	1349	*Chalinolobus gouldii*	Gould's Wattled Bat	P		32	
Animalia	Mammalia	Vespertilionidae	1351	*Chalinolobus morio*	Chocolate Wattled Bat	P		3	
Animalia	Mammalia	Vespertilionidae	1352	*Chalinolobus picatus*	Little Pied Bat	V,P		6	
Animalia	Mammalia	Vespertilionidae	T315	*Nyctophilus corbeni*	Corben's Long-eared Bat	V,P	V	3	
Animalia	Mammalia	Vespertilionidae	1335	*Nyctophilus geoffroyi*	Lesser Long-eared Bat	P		30	
Animalia	Mammalia	Vespertilionidae	T092	*Nyctophilus sp.*	long-eared bat	P		24	
Animalia	Mammalia	Vespertilionidae	1364	*Scotorepens balstoni*	Inland Broad-nosed Bat	P		5	
Animalia	Mammalia	Vespertilionidae	1362	*Scotorepens greyii*	Little Broad-nosed Bat	P		3	
Animalia	Mammalia	Vespertilionidae	1382	*Vespadelus baverstocki*	Inland Forest Bat	V,P		9	
Animalia	Mammalia	Vespertilionidae	1378	*Vespadelus regulus*	Southern Forest Bat	P		1	
Animalia	Mammalia	Vespertilionidae	T088	*Vespadelus sp.*	Unidentified Eptesicus	P		14	
Animalia	Mammalia	Vespertilionidae	1379	*Vespadelus vulturnus*	Little Forest Bat	P		13	
Animalia	Mammalia	Muridae	1415	*Hydromys chrysogaster*	Water-rat	P		3	
Animalia	Mammalia	Muridae	1429	*Leporillus conditor*	Greater Stick-nest Rat	E4,P	V	3	
Animalia	Mammalia	Muridae	1480	*Notomys mitchellii*	Mitchell's Hopping-mouse	E4,P		1	
Animalia	Mammalia	Muridae	1446	*Pseudomys desertor*	Desert Mouse	E4A,P		1	
Plantae	Flora	Amaranthaceae	6599	*Ptilotus exaltatus var. exaltatus*	Tall Mulla Mulla	P		12	
Plantae	Flora	Asteraceae	8912	*Pycnosorus pleiocephalus*		P		9	
Plantae	Flora	Asteraceae	1652	*Senecio behrianus*		E4	E	1	
Plantae	Flora	Casuarinaceae	2023	*Casuarina obesa*	Swamp She-oak	E1		2	
Plantae	Flora	Santalaceae	5869	*Santalum murrayanum*	Bitter Quandong	E1		13	
Plantae	Flora	Solanaceae	6086	*Solanum karsense*	Menindee Nightshade	V	V	1	

Appendix B

Likelihood of occurrence of threatened species

EMM
creating opportunities

Table B.1 Likelihood of occurrence of threatened species

Common name	*Scientific name*	BC Act Status	EPBC Act Status	Source	SAII Entity	Likelihood of occurrence	Justification
Amphibians							
Sloane's Froglet	*Crinia sloanei*	V	E	Veg associations	-	Low	Falls within the potential geographic range, associated with one PCT on site and habitat requirements are met, however no recorded sightings and current distribution is very restricted
Southern Bell Frog	*Litoria raniformis*	E	V	Veg associations/ PMST/Bionet	-	High	Last sighting in area in 2011, associated with PCTs that occur on site
Painted Burrowing Frog	*Neobatrachus pictus*	E	-	Veg associations	-	Moderate	Associated with most PCTs located on site, very few individuals observed in NSW
Birds							
Murray Mallee striated grasswren	*Amytornis striatus howei*	E	E	PMST	-	Moderate	PMST predicts species may occur, site covers predicted species range, no nearby records
Magpie Goose	*Anseranas semipalmata*	V	-	Bionet	-	Low	Recorded at the site in 1986, occurs within identified geographic restriction identified in the Dispersal column, assocaited PCTs do not occur
Southern Whiteface	*Aphelocephala leucopsis*	V	-	PMST/Bionet	-	High	Last records in area in 2020. Site is within geographic restriction and contains appropriate habitat requirements
Australian Bustard	*Ardeotis australis*	E	-	Veg associations/ Bionet	-	High	Habitat constraints likely to occur, recorded in 2006
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	Veg associations/ Bionet	-	High	Last recorded in area in 2020, habitat requirements are met
Australasian Bittern	*Botaurus poiciloptilus*	E	E	Veg associations/ PMST/Bionet	-	High	Last recorded in area in 2010, PMST likelihood is known
Bush Stone-curlew	*Burhinus grallarius*	E	-	Veg associations/ Bionet	-	High	Last recorded in area in 2013, habitat requirements present, rare in geographical range

Table B.1 Likelihood of occurrence of threatened species

Common name	*Scientific name*	BC Act Status	EPBC Act Status	Source	SAII Entity	Likelihood of occurrence	Justification
Rufous Fieldwren	*Calamanthus campestris*	V	-	Veg associations	-	Moderate	Site is possibly within geographical constraints, site contains habitat requirements
Red Knot	*Calidris canutus*	-	E, Mi	Bionet	-	Low	Last recorded in area in 1984, likely a vagrant record due to absence of habitat requirements
Curlew Sandpiper	*Calidris ferruginea*	E	CE, Mi	Veg associations/ PMST/Bionet	Yes	Moderate	PMST likelihood is known, last recorded in area in 1993, habitat constraints present however suitable habitat limited
Pied Honeyeater	*Certhionyx variegatus*	V	-	Veg associations/ Bionet	-	High	Last recorded in area in 2009, species geographic and habitat requirements met
Chestnut Quail-thrush	*Cinclosoma castanotum*	V	-	Veg associations/ Bionet	-	High	Sighting in 2011, geographic and habitat requirements met
Spotted Harrier	*Circus assimilis*	V	-	Veg associations/ Bionet	-	High	Sighting in 2015, associated with PCTs on site, geographic and habitat requirements are met
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	-	Bionet	-	High	Sighting in 2010, habitat requirements met
Varied Sittella	*Daphoenositta chrysoptera*	V	-	Veg associations/ Bionet	-	High	Sighting in 2017, geographic and habitat requirements met
Southern Scrub-robin	*Drymodes brunneopygia*	V	-	Veg associations/ Bionet	-	High	Sighting in 2019, geographic and habitat requirements met
White-fronted Chat	*Epthianura albifrons*	V	-	Veg associations/ Bionet	-	High	Sightings from 2020, habitat and geographic requirements met.
Grey Falcon	*Falco hypoleucos*	V	V	Veg associations/ PMST/Bionet	-	High	Last recorded in site area in 1988, habitat and geographic requirements met, PMST likelihood 'Likely'
Black Falcon	*Falco subniger*	V	-	Veg associations/ Bionet	-	High	Sighted in 2021
Purple-crowned Lorikeet	*Glossopsitta porphyrocephala*	V	-	Veg associations/ Bionet	-	High	Last sighting in area in 2007, found in mallee

Table B.1 Likelihood of occurrence of threatened species

Common name	*Scientific name*	BC Act Status	EPBC Act Status	Source	SAII Entity	Likelihood of occurrence	Justification
Painted Honeyeater	*Grantiella picta*	V	V	Veg associations/ PMST/Bionet	-	High	Last sighting in area in 2006, PMST likelihood is known
Brolga	*Grus rubicunda*	V	-	Veg associations/ Bionet	-	Moderate	Last signting in area in 1984, habitat is present, sparse in southern range
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	-	Veg associations/ Bionet	-	High	Last sigting in area in 1984, Gegraphic and habitat requirements are met
Black-breasted Buzzard	*Hamirostra melanosternon*	V	-	Veg associations	-	High	Geographic requirements met as site occurs within range, foraging habitat present on site
Little Eagle	*Hieraaetus morphnoides*	V	-	Veg associations/ Bionet	-	High	Last sighting in area in 2018, geographic and habitat requirements met
White-throated Needletail	*Hirundapus caudacutus*	-	V, Mi	Bionet	-	Moderate	Single record from 1996, less common inland than coastal
Shy Heathwren	*Hylacola cautus*	V	-	Veg associations	-	High	Habitat and grographic requirements are met
Swift Parrot	*Lathamus discolor*	E	CE	Veg associations/ PMST	-	Moderate	PMST likelihood is May, habitat may be present on site
Malleefowl	*Leipoa ocellata*	E	V	Veg associations/ PMST/Bionet	-	High	Last recorded in area in 2003, PMST likelihood is known, geographic and habitat requirements are met
Purple-gaped Honeyeater	*Lichenostomus cratitius*	V	-	Veg associations	-	High	Geographic requirements met, habitat requirements met, several associated PCTs occur on site
Broad-billed Sandpiper	*Limicola falcinellus*	V	Mi	Bionet	-	Low	Last sighting in 1963, primarily coastal species, habitat and geographic requirements not met
Bar-tailed Godwit (baueri)	*Limosa lapponica baueri*	-	V	PMST	-	Low	Less commonly occurs in saltlakes and brackish wetlands, geographic requirements not met
Black-tailed Godwit	*Limosa limosa*	V	Mi	Veg associations/ PMST/Bionet	-	Moderate	Last sighting in area in 1986, primarily coastal species, PMST likelihood is known

Table B.1 Likelihood of occurrence of threatened species

Common name	*Scientific name*	BC Act Status	EPBC Act Status	Source	SAII Entity	Likelihood of occurrence	Justification
Major Mitchell's Cockatoo	*Lophochroa leadbeateri*	V	-	Veg associations/ Bionet	-	High	Last sighting in 2022, geographic requirements met (South West NSW), habitat requirements met (saltbush/Cypress)
Square-tailed Kite	*Lophoictinia isura*	V	-	Veg associations/ Bionet	-	High	Last sighted in area in 2007, resident along major west flowing river systems, habitat of chenopods present
Black-eared Miner	*Manorina melanotis*	CE	E	Veg associations/ PMST	-	Low	Restricted to old growth connected Mallee, particularly in scotia sanctuary (Geographic requirements not met and habitat requiremetns unlikely to be met)
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	V	-	Veg associations/ PMST/Bionet	-	High	Last recorded in area in 2009, geographic and habitat requirements met PMST likelihood Known
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V	-	Veg associations/ Bionet	-	Moderate	Last recorded in 2013, geograhic requirements met, limited suitable habitat on site
Scarlet-chested Parrot	*Neophema splendida*	V	-	Veg associations	-	High	Saltbush groundcover in mallee fits habitat requirements, associated with PCTs on site
Barking Owl	*Ninox connivens*	V	-	Veg associations	-	Moderate	Geographic requirements met. Found along timbered water courses which occur nearby the site.
Blue-billed Duck	*Oxyura australis*	V	-	Veg associations/ Bionet	-	High	Aquatic habitat present on site, geographic requirements met, associated PCTs on site
Gilbert's Whistler	*Pachycephala inornata*	V	-	Veg associations/ Bionet	-	High	Sightings in area from 2013, associated PCTs found on site, habitat and geographic requirements met
Red-lored Whistler	*Pachycephala rufogularis*	CE	V	Veg associations	-	Moderate	Associated with PCTs on site, site is within geographic range

Table B.1 Likelihood of occurrence of threatened species

Common name	*Scientific name*	BC Act Status	EPBC Act Status	Source	SAII Entity	Likelihood of occurrence	Justification
Plains-wanderer	*Pedionomus torquatus*	E	CE	PMST/Bionet	-	Moderate	PMST likelihood is known, nearby record from 2022, habitat and geographic requirements met however specific grassland habitat requirements may not occur on site
Flame Robin	*Petroica phoenicea*	V	-	Bionet	-	Moderate	Last sighting in area in 1984, habitat requirements may be present, is at the western limit of range but still within
Regent Parrot (eastern subspecies)	*Polytelis anthopeplus monarchoides*	E	V	Veg associations/ PMST/Bionet	-	High	Recorded near site in 2006. Occurs along murray river (geographic requirements met as site is nearby) and forage in mallee woodlands. Associated with PCTs found on site
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V	-	Veg associations	-	Moderate	Associated with PCTs present on site, geographic requiremetns met
Redthroat	*Pyrrholaemus brunneus*	V	-	Veg associations/ Bionet	-	High	Last recorded in area in 1987, habitat requirement of chenopod shrubland met , geographic range overlaps with site area
Australian Painted Snipe	*Rostratula australis*	E	E	Veg associations/ PMST/Bionet	-	High	Last sighting in area 2011, habitat requirements of dams present, geographic requirements met
Diamond Firetail	*Stagonopleura guttata*	V	-	Veg associations/ PMST	-	Moderate	Rarely found west of the Darling river but occurs in Mallee
Freckled Duck	*Stictonetta naevosa*	V	-	Veg associations/ Bionet	-	High	Recorded in area last in 1993, habitat requirement of permanent freshwater met, geographic requirements are met nearby (murray river wetlands)
Masked Owl	*Tyto novaehollandiae*	V	-	Veg associations	-	Moderate	Predicted range overlaps with site, no records in area, potential foraging habitat on site
Mammals							
Kultarr	*Antechinomys laniger*	E	-	Veg associations/ Bionet	-	Moderate	Recorded at the site in 1947, habitat constraints of claypans met

Table B.1 Likelihood of occurrence of threatened species

Common name	*Scientific name*	BC Act Status	EPBC Act Status	Source	SAII Entity	Likelihood of occurrence	Justification
Western Pygmy Possum	*Cercartetus concinnus*	E	-	Veg associations/ Bionet	-	High	Last recorded in area in 2004, habitat requirements likely to be present, site located in geographical range
Little Pied Bat	*Chalinolobus picatus*	V	-	Veg associations/ Bionet	-	High	Last recorded in area in 2019, habitat requirements are met, site falls within geographic range
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	Bionet	-	Low	Last sighting in area in 1980, Geographic requirements met, suitable habitat unlikely to occur - no associated PCTs on site
Southern Hairy-nosed Wombat	*Lasiorhinus latifrons*	E	-	Veg associations	-	Moderate	Geographic requirements met as site occurs within range, habitat requirements present on site
Southern Myotis	*Myotis macropus*	V	-	Veg associations	-	Moderate	Limited waterways present on site, habitat requirements may not be met
Southern Ningaui	*Ningaui yvonneae*	V	-	Veg associations/ Bionet	-	High	Last sighted in area in 2004, associated with Mallee woodlands in NSW
South-eastern long eared bat	*Nyctophilus corbeni*	V	V	Veg associations/ PMST/Bionet	-	High	Last sighted 2019, occurs in mallee
Koala	*Phascolarctos cinereus*	E	E	Bionet	-	Low	Last sighting in 2006, current OEH distribution doesn't coincide with site
Bolam's Mouse	*Pseudomys bolami*	E	-	Veg associations	-	High	Geographic range extends into south-western corner of NSW coinciding with site area. Chenopod shrubland and mallee woodland present on site (Habitat requirements met)
Desert Mouse	*Pseudomys desertor*	CE	-	Veg associations/ Bionet	-	Low	Were once abundant in the locality, no recent sightings (last in 1857). Quite likely to be absent
Sandy Inland Mouse	*Pseudomys hermannsburgensis*	V	-	Veg associations	-	Moderate	Associate with PCTs present however no known occurrences near site
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	Veg associations/ Bionet	-	High	Recorded twice in are a in 2008, occurs rarely in south-western NSW.

Table B.1 Likelihood of occurrence of threatened species

Common name	*Scientific name*	BC Act Status	EPBC Act Status	Source	SAII Entity	Likelihood of occurrence	Justification
Stripe-faced Dunnart	*Sminthopsis macroura*	V	-	Veg associations	-	Moderate	Associated with PCTs on site, geographic requirements unlikely to be met based on known sightings, habitat requirements on site
Inland Forest Bat	*Vespadelus baverstocki*	V	-	Veg associations/ Bionet	-	High	Recorded last in the locality in 2018, most common in NSW south west. Remnant trees on site likely provide habitat requirements
Plants							
Harrow Wattle	*Acacia acanthoclada*	E	-	Veg associations	-	High	Is within the geographic restriction identified within the dispersal column but
Purple-wood Wattle	*Acacia carneorum*	V	V	Veg associations	Yes	Moderate	Is outside the geographic restriction identified in the dispersal column. Site has fresh water areas which would be appropriate habitat
A saltbush	*Atriplex infrequens*	V	V	Veg associations/ PMST	-	Moderate	Grows in drainage lines but little is known of its habitat
A spear-grass	*Austrostipa metatoris*			0	-	Moderate	0
A spear-grass	*Austrostipa nullanulla*	E	-	Veg associations	Yes	High	Grows with several species of Mallee and chenopods recorded on site
Mossgiel Daisy	*Brachyscome papillosa*	V	V	Veg associations/ PMST	-	Moderate	Grows within Cypress pines but prefers Bladder Saltbush
A burr-daisy	*Calotis moorei*	E	E	Veg associations	Yes	High	Grows in sandy soils in chenopod shrublands which are present on site
Swamp She-oak	*Casuarina obesa*	E	-	Veg associations/ Bionet	Yes	High	Recorded within 20km of site and grows in ephemeral saline lakes which are present on site
Bluebush Daisy	*Cratystylis conocephala*	E	-	Veg associations	-	High	Grows with Rosewood, Black Oak and Red Mallee which is known from site
Desert Hopbush	*Dodonaea stenozyga*	CE	-	Veg associations	-	High	grows with Red Mallee which has been recorded on site

Table B.1 Likelihood of occurrence of threatened species

Common name	*Scientific name*	BC Act Status	EPBC Act Status	Source	SAII Entity	Likelihood of occurrence	Justification
Yellow Gum	*Eucalyptus leucoxylon subsp. pruinosa*	V	-	Veg associations	-	High	grows on floodplains along the Murray River
Fleshy Minuria	*Kippistia suaedifolia*	E	-	Veg associations	-	High	grows in saline lakes which are present within the site
Pink Velvet Bush	*Lasiopetalum behrii*	CE	-	Veg associations	-	High	Grows in Mallee, associated PCTs present
Winged Peppercress	*Lepidium monoplocoides*	E	E	Veg associations/ PMST	-	High	grows in seasonally waterlogged sites
Button Immortelle	*Leptorhynchos waitzia*	E	-	Veg associations	-	High	grows in intermittently flooded areas
Thyme Rice-Flower	*Pimelea serpyllifolia subsp. serpyllifolia*	E	-	Veg associations	-	High	Grows in sandy soils in mallee communities
Greenhood Orchid	*Pterostylis cobarensis*	V	-	Veg associations	-	High	grows in sandy soils in mallee or Callitris woodlands
Bitter Quandong	*Santalum murrayanum*	E	-	Veg associations/ Bionet	-	Present	Grows in mallee communities in south-western NSW, associated with PCTs on site
Menindee Nightshade	*Solanum karsense*	V	V	Veg associations/ PMST/Bionet	-	High	grows in periodically flooded depressions which are present within the site
Bladder Senna	*Swainsona colutoides*	E	-	Veg associations	-	High	Grows in Mallee woodland
Slender Darling Pea	*Swainsona murrayana*	V	V	PMST	-	Moderate	Out of range, unlikely to occur
Yellow Swainson-pea	*Swainsona pyrophila*	V	V	Veg associations/ PMST	-	High	Grows in mallee habitat
Silky Swainson-pea	*Swainsona sericea*	V	-	Veg associations	-	Nil	Habitat constraints not met
Reptiles							
Mallee Worm-lizard	*Aprasia inaurita*	E	-	Veg associations/ Bionet	-	High	Site is within geographic restriction and contains habitat requirements
Brooks Ctenotus	*Ctenotus brooksi*	V	-	Veg associations	-	Moderate	Occurs with PCTs located on site, habitat constraints may not be met, geographic requirements met

Table B.1 Likelihood of occurrence of threatened species

Common name	*Scientific name*	BC Act Status	EPBC Act Status	Source	SAII Entity	Likelihood of occurrence	Justification
Mallee Slender Blue-tongue Lizard	*Cyclodomorphus melanops elongatus*	E	-	Veg associations	-	Moderate	Habitat and geographic requirements met
Marble-faced Delma	*Delma australis*	E	-	Veg associations/ Bionet	-	High	Sighting in 2008, geographic and habitat requirements met
Bardick	*Echiopsis curta*	E	-	Veg associations	-	High	Records from nearby area, geographic and habitat requirements met
Grey Snake	*Hemiaspis damelii*	E	E	PMST	-	Moderate	PMST likelihood is May, floodplain and heavy clay soils present, site is within predicted geographic range
Yellow-tailed Plain Slider	*Lerista xanthura*	V	-	Veg associations	-	High	Site occurs within geographic range, habitat requirements met
Crowned Gecko	*Lucasium stenodactylum*	V	-	Veg associations	-	High	Occurs with PCTs located on site, geographic requirements met
Ringed Brown Snake	*Pseudonaja modesta*	E	-	Veg associations	-	High	Associated PCTs located on site, habitat requirements are met, 'Known' geographic range overlaps with site however no records nearby
Interior Blind Snake	*Ramphotyphlops endoterus*	E	-	Veg associations	-	Low	Associated with PCTs present however no known occurrences near site, occur further northwest, habitat requirements met but not geographic requirements.
Jewelled Gecko	*Strophurus elderi*	V	-	Veg associations	-	High	Associated with two PCTs that occur on site and are known to occur in south west NSW (geographic requirements met)
Western Blue-tongued Lizard	*Tiliqua occipitalis*	V	-	Veg associations/ Bionet	-	High	Single record from 2008, Geographic requirements met, inhabits mallee

Appendix D

Preliminary Visual Impact Assessment

EMM
creating opportunities

Gol Gol Wind Farm

Preliminary landscape and visual assessment

Prepared for Squadron Energy

May 2024

Gol Gol Wind Farm

Preliminary landscape and visual assessment

Squadron Energy

E240110 RP12

May 2024

Version	Date	Prepared by	Reviewed by	Comments
1	6 May 2024	Simon Lacey	Mark Trudgett	V1 for client review
2	13 May 2024	Simon Lacey	Mark Trudgett	

Approved by

Simon Lacey
Associate Landscape Architect
13 May 2024

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1 Introduction

1.1 Overview

Squadron Renewable Energy Developments Pty Ltd (Squadron Energy), 'the Applicant', proposes to develop the Gol Gol Wind Farm (the project) approximately 10 kilometres (km) north of Mildura in the far Western Murray Region of New South Wales (refer to Figure 1.1). The proposed project will be developed on freehold land that is predominantly used for agricultural activities.

The project will include the development of 120 wind turbine generators (WTGs), including transmission, ancillary and temporary infrastructure. The project will have an installed capacity of up to approximately 840 megawatts (MW).

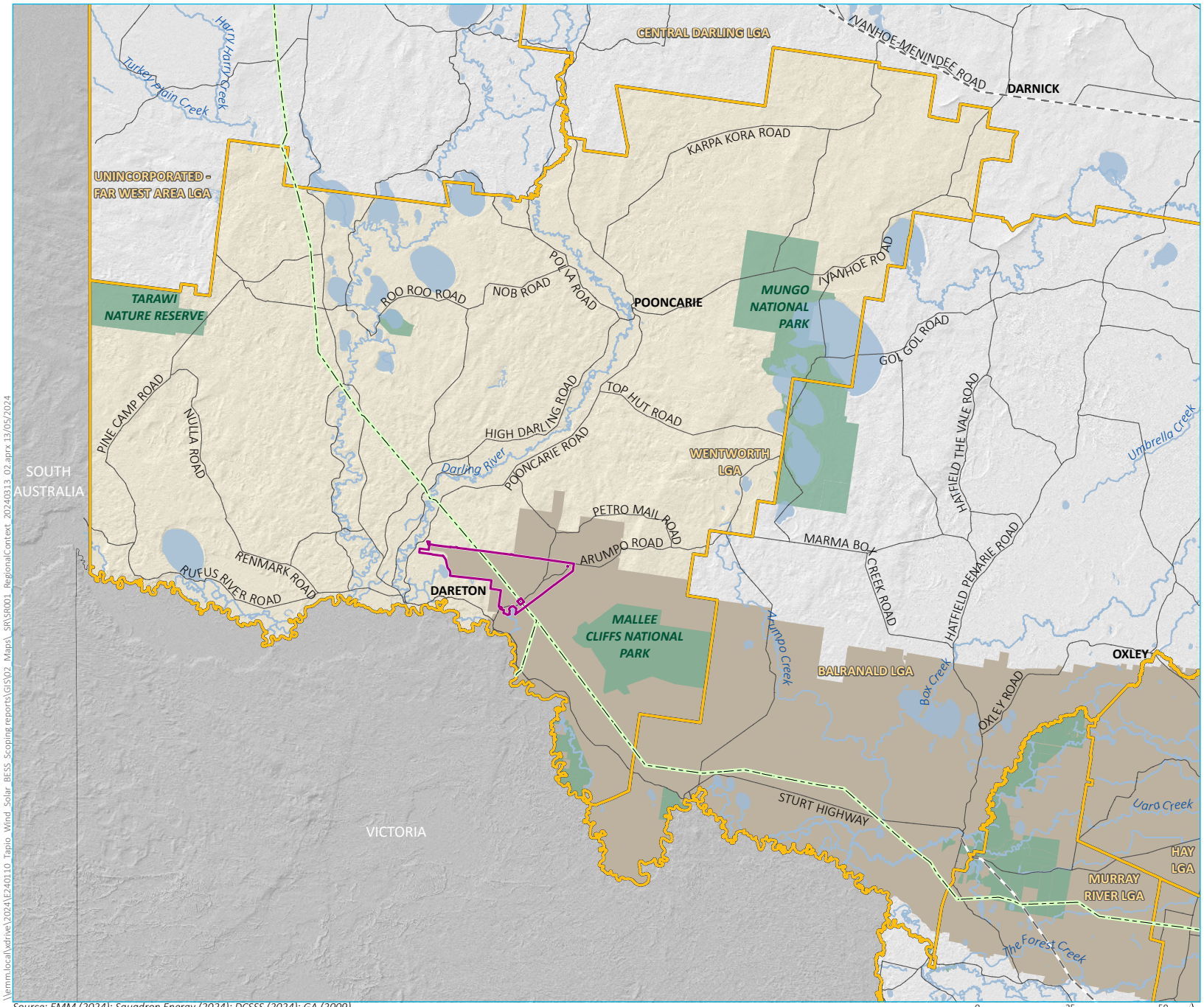
1.2 Project overview

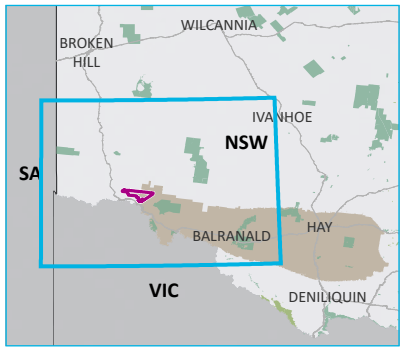
The project is located within eight freehold land parcels (Lot 11 DP 1262716, Lot 1 DP 756951, Lot 1 DP 756955, Lot 1 DP 756927, Lot 2 DP 756927, Lot 3 DP 756939, Lot 3 DP 802730 and Lot 5 DP 756945) known as the project investigation area, shown in Figure 1.2. Within the project investigation area is the proposed development corridor, the land within which all elements of the Wind Farm are proposed to be located. The development corridor is about 10,500 ha and the final development corridor will be presented in the Environmental Impact Statement (EIS).

All the required project infrastructure will be contained within the development corridor, and the preliminary project layout is detailed in Figure 1.2.

The project will consist of the following key components:

- approximately 120 WTGs with a total height (tip height) of approximately 280 metres (m), with an installed generating capacity of up to 840 MW
- a network of underground and overhead powerlines will be installed across the development corridor and will connect the WTGs to up to three on-site collector substations and transmission connections to the Buronga Substation
- infrastructure including private access roads and tracks, operations and maintenance facilities.





KEY

- Gol Gol wind investigation area
- Existing 220 kV transmissions line
- South West renewable energy zone

Existing environment

- Rail line
- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- Local government area
- Wentworth local government area

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); GA (2009)

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Regional context

Gol Gol Wind Farm
Visual Impact Assessment
Figure 1.1

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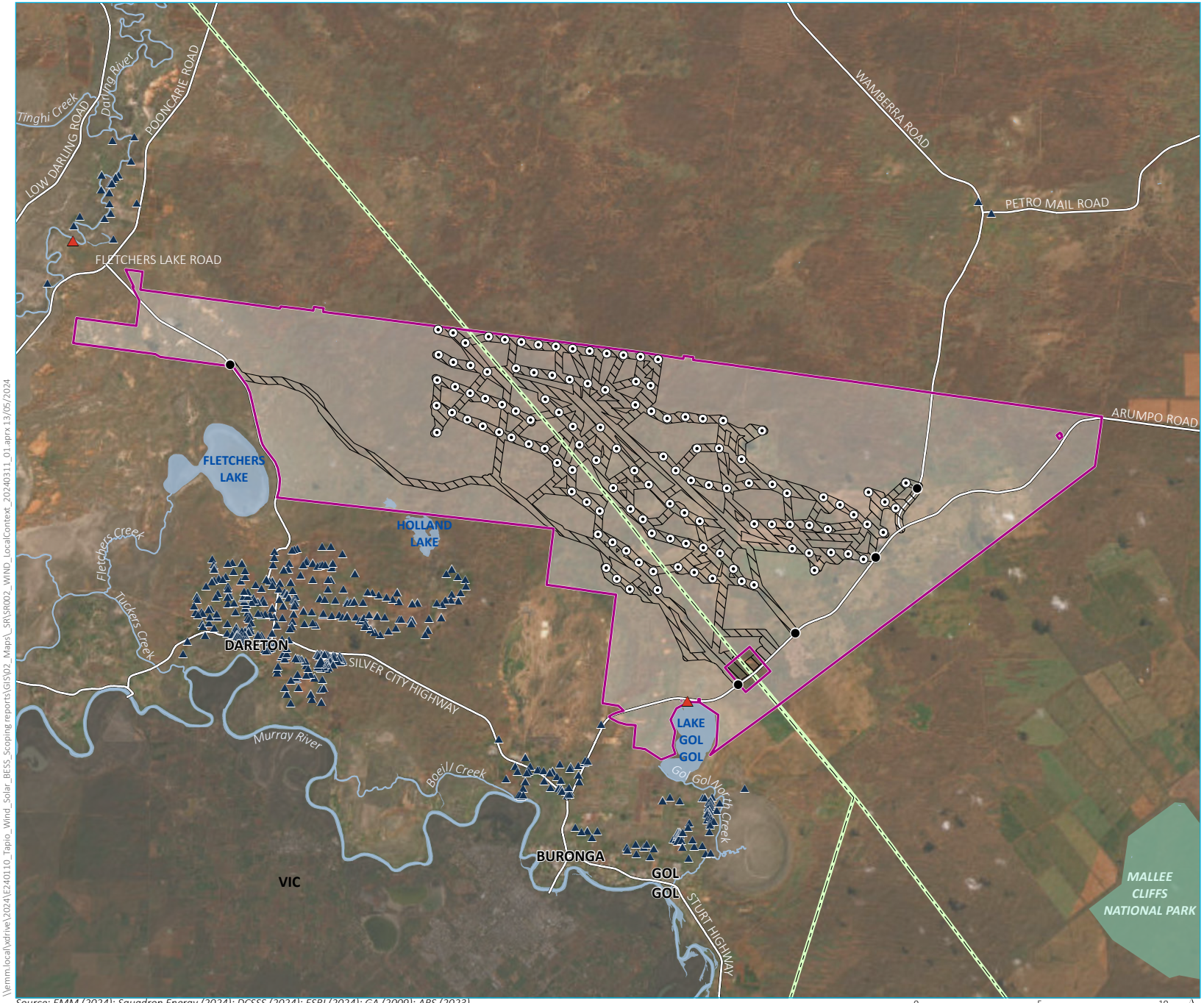

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Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009); ABS (2023)

Local context

Gol Gol Wind Farm
Visual Impact Assessment
Figure 1.2

EMM
creating opportunities

2 Assessment methodology

2.1 Overview

This preliminary visual impact assessment (PVIA) is a preliminary evaluation of the potential visual impacts of the project on landscape values, visual amenity, and scenic vistas. It presents findings from fieldwork and assessment of landscape features and visual settings.

Visual impacts from wind projects are evaluated according to the *Wind Energy: Visual Assessment Bulletin AB 01 For State significant wind energy development* (2016) (VA Bulletin) NSW Department of Planning and Environment.

Additional guidance is provided by the following guidelines:

- *Guidelines for Landscape and Visual Impact Assessment Third Edition* (2013) (the GLVIA), prepared by the Landscape Institute and Institute of Environmental Management and Assessment
- *Guideline for landscape character and visual impact assessment* (2020) Centre for Urban Design Transport for NSW.

2.2 Assessment methodology

The following studies have been undertaken during the development of this PVIA report.

2.2.1 Visual baseline study

The visual baseline establishes the existing landscape and visual conditions. This forms the basis of determining the level of impacts of a proposed project. The assessment method used in this report is adapted from the GLVIA and VA Bulletin, which involve information review, consultation, field observations and photography, computer-based data processing and analysis, and application of subjective professional judgement. The following desktop assessment has been carried out:

- The use of preliminary assessment tools helps identify receptors with potential sensitivity.
- A preliminary Zone of Visual Influence (ZVI) was created to define the theoretical area where the project could be visible.
- Key viewpoints and landscape features were identified using available maps and background documents.

2.2.2 Landscape character

The landscape character is determined by the number, size, type and contrast of elements present. Typically, the key elements are topography, vegetation, water features and built elements. Other important factors are the consistency of these elements and whether they have developed progressively over time and become well integrated into a harmonious landscape. In addition, consideration must be given to the prevalence of change, including whether the landscape is experiencing large-scale development.

2.2.3 Scenic quality

Scenic quality refers to the relative scenic or aesthetic value placed on the landscape by the community. This is based on the presence of key landscape features known to be associated with community perceptions of high, moderate, or low scenic quality. In accordance with the VA Bulletin, a scenic quality 'frame of reference' has been assessed. The scenic quality classifications used in this assessment are identified in Table 2.1.

Table 2.1 Scenic quality classification

Scenic quality	Landforms	Vegetation	Waterbodies
High	Isolated peaks, steep rocky ridges, cones or escarpments with distinctive form and/or colour contrast that become focal points. Larger areas of distinctive rock outcrops or boulders. Well defined, steep sided valley gorges.	Strongly defined patterns with combinations of eucalypt forest, naturally appearing openings, streamside vegetation and/or scattered exotics. Distinctive stands of vegetation that may create unusual forms, colours or textures in comparison to surrounding vegetation.	Visually prominent lakes, reservoirs, rivers, streams and swamps.
Moderate	Steep, hilly and undulating ranges that are not visually dominant. Broad shallow valleys. Moderately deep gorges or moderately steep valley walls. Minor rock outcrops.	Predominantly open forest or woodland combined with some natural openings in patterns that offer some visual relief. Vegetative stands that exhibit a range of size, form, colour, texture and spacing.	Intermittent streams, lakes, rivers, swamps and reservoirs.
Low	Large expanses of flat or gently undulating terrain. Indistinct, dissected or unbroken landforms that provide little illusion of spatial definition or landmarks.	Extensively cleared and cropped areas with very limited variation in colour and texture.	Natural waterbody absent.

2.2.4 Community Consultation

Community consultation has taken place during the scoping phase of the project via digital online surveys, providing insights into community perspectives on landscape values to inform the PVIA. Community consultation is detailed further in Chapter 4 and will continue throughout the project to gather as much community feedback as possible.

3 Visual baseline study

3.1 Regional Context

The project is within the Wentworth Shire Council Local Government Area (LGA), approximately 700 km west of Sydney and 400 km east of Adelaide, 550 km north west of Melbourne and 12 km north of Mildura. The Wentworth Shire Council LGA encompass an area of approximately 26,000 square kilometres (km^2) and forms part of the NSW Murray Region (Figure 1.1). The region is one of the most productive farming regions in Australia producing citrus, grapes, almonds, and wine. The Sturt Highway and Silver City Highway, directly south of the project, intersect at Buronga and connects the region to major population centres in NSW, Victoria, and South Australia.

The development corridor accommodates the project and is located within the South West REZ and is adjacent to Project EnergyConnect, which includes the construction and operation of a new high voltage (HV) 330 kilovolt (kV) interconnector between NSW and South Australia, with an additional 220 kV connection to the north-west Victoria.

There are also a number of other SSD and SSD modification projects within the South West REZ, the Wentworth LGA and the neighbouring Balranald LGA. Of note, the Mallee Wind Farm (SSD-53293710), and the Mallee Solar Farm (SSD-69576706), are located to the east of the project.

3.2 Bioregion

The project is situated in the Lower Murray Darling Depression Bioregion in southwestern NSW. This area is distinguished by shallow lakes, swamps, and depressions, with a variety of vegetation types.

The gently rolling terrain includes minor, isolated calcareous sand hills named after the Mallee, a small, multi stemmed Eucalypt that is the region's primary tree type. Dominant plant species generally consist of Rosewood (*Heterodendrum oleifolium*) and Belah (*Casuarina cristata*) along sandplains, with mixed communities primarily composed of Mallee (Eucalyptus sp.) (DPE, 2021).

3.3 Land use

The Wind farm is located on freehold land owned by a single landowner who undertakes agricultural operations within the land. The project investigation area is mainly zoned RU1 Primary Production under the Wentworth Local Environmental Plan 2011 (Wentworth LEP), with a smaller parcel of land in the north of the project investigation area zoned C2 Environmental Conservation. The land use within and surrounding the project investigation area in shown in Figure 3.1.

RU1 Primary Production

The Wentworth LEP 2011 states the following objectives for the RU1 – Primary Production zone:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To encourage and promote the growth and diversification of economic and employment opportunities in agriculture, horticulture and tourism.

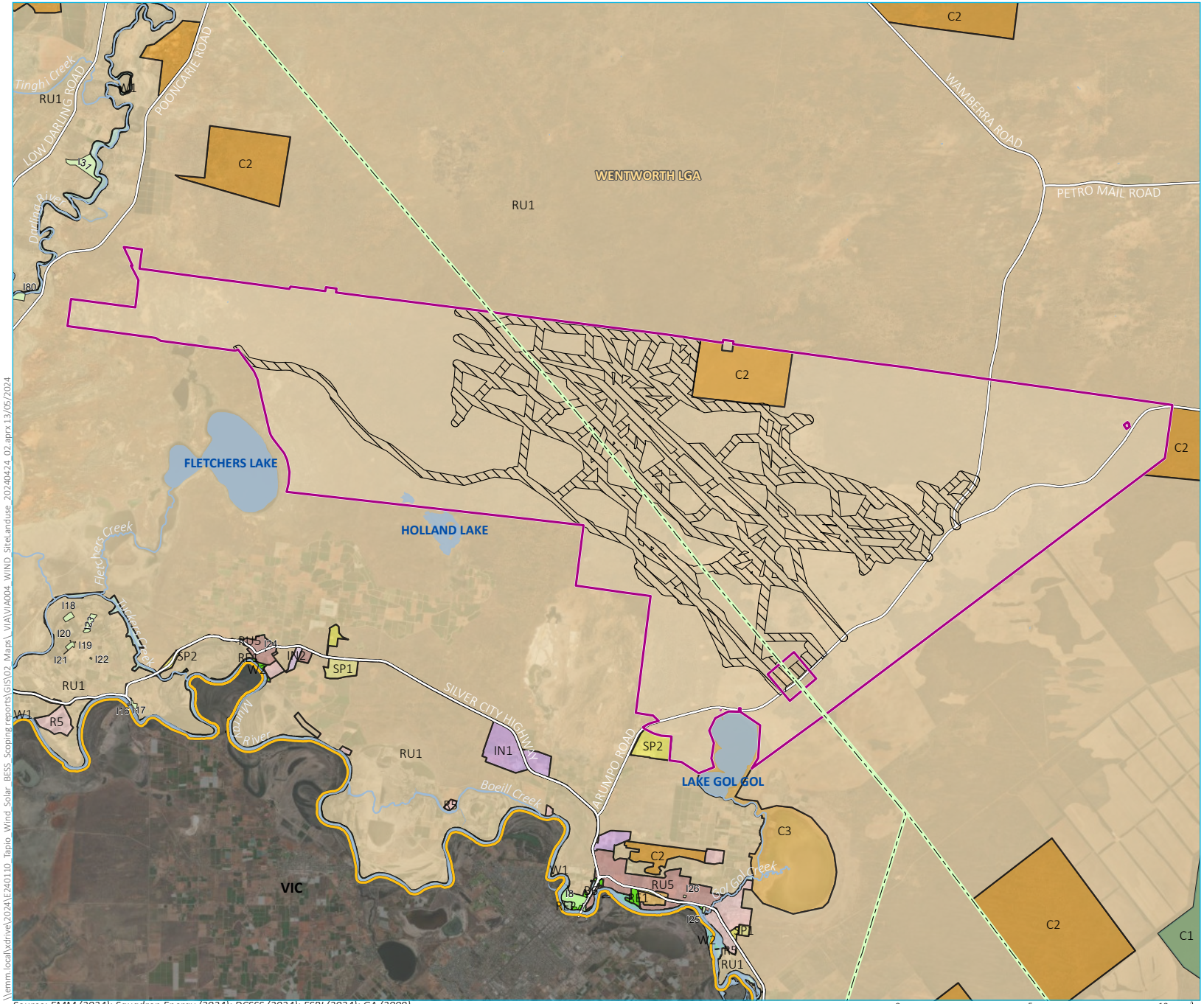
- To enable the development of restaurants and cafes and kiosks as part of agritourism development.

C2 Environmental Conservation

There are small parcels of C2 – Environmental Conservation located adjacent to the study area. These areas generally contain isolated remnant vegetation. The Wentworth LEP 2011 states the following objectives:

- To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.
- To prevent development that could destroy, damage or otherwise have an adverse effect on those values.

The project investigation area is sparsely populated, with no residential dwellings. However, population density increases towards the southern townships of Dareton and Buronga beyond the project investigation area.



KEY

Wind farm investigation area

Wind farm development corridor

Existing 220 kV transmissions line

Existing environment

Major road

Named watercourse

Named waterbody

NPWS reserve

Local government area

Victoria

Local Environmental Plan

Land zoning

B6 | Enterprise Corridor

C1 | National Parks and Nature Reserves

C2 | Environmental Conservation

C3 | Environmental Management

IN1 | General Industrial

IN2 | Light Industrial

R5 | Large Lot Residential

RE1 | Public Recreation

RE2 | Private Recreation

RU1 | Primary Production

RU5 | Village

SP1 | Special Activities

SP2 | Infrastructure

W1 | Natural Waterways

W2 | Recreational Waterways

LEP- listed heritage item

Item- General

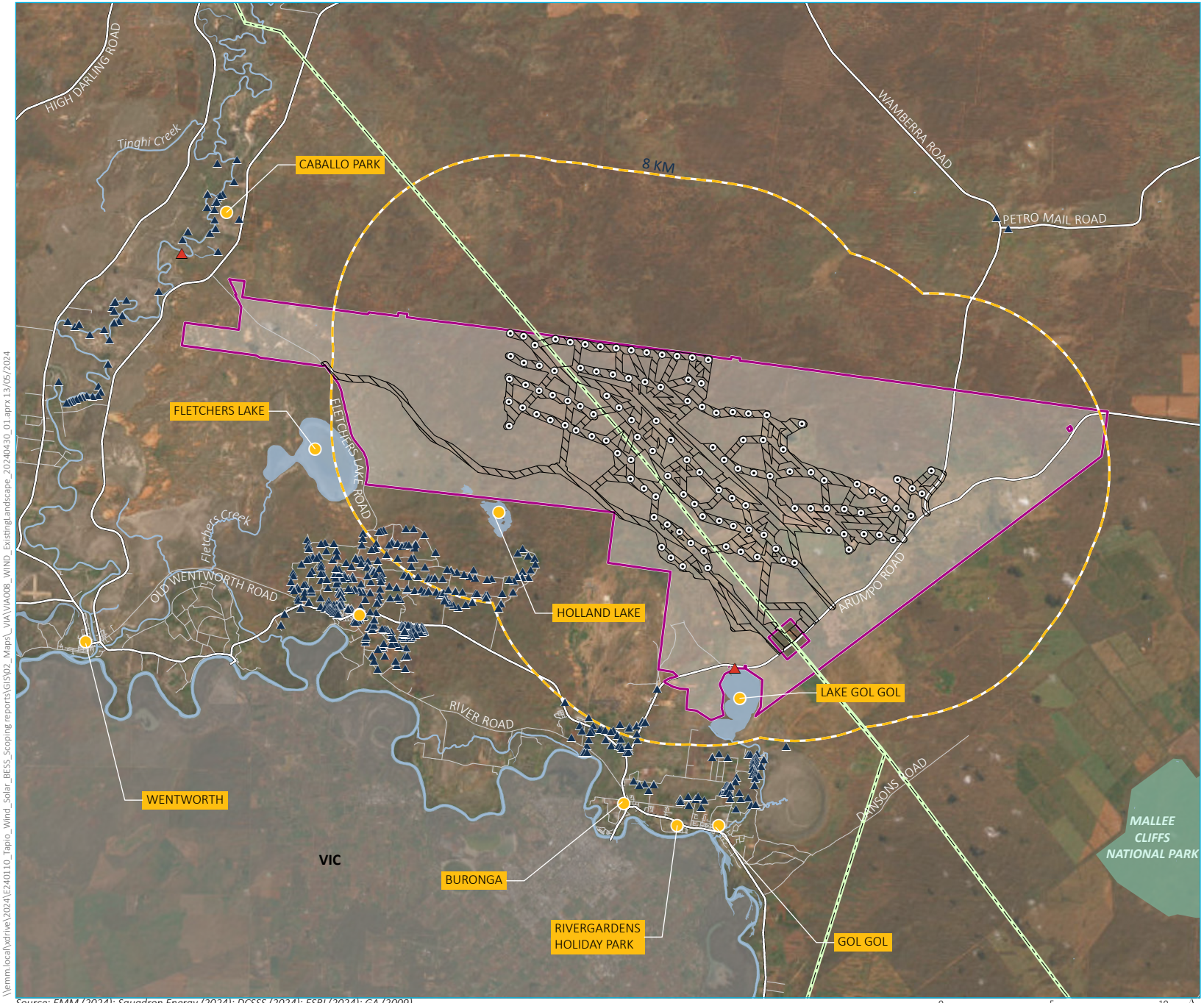
Site landuse

Gol Gol Wind Farm
Visual Impact Assessment
Figure 3.1

EMM
creating opportunities

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

\\emm.local\xdrive\2024\E240110_Tapio_Wind_Solar_BESS_Scoping reports\GIS\02_Maps_VIA\VIA004_WIND_SiteLanduse_20240424_02.aprx 13/05/2024



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Wind farm visual assessment buffer
- Existing 220 kV transmissions line
- Wind farm- turbine location
- Point of interest

Sensitive receiver

- Associated residence
- Dwelling not associated with the project

Existing environment

- Major road
- Minor road
- Named watercourse
- Named waterbody
- NPWS reserve
- Victoria

Existing Landscape Features

Gol Gol Wind Farm
Visual Impact Assessment
Figure 3.2

EMM creating opportunities

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

0 5 10 km
GDA2020 MGA Zone 54

N

\\emm.local\xdrive\2024\E240110_Tapio_Wind_Solar_BESS_Scoping reports\GIS\02_Maps_VIA\VIA008_WIND_ExistingLandscape_20240430_01.aprx 13/05/2024

3.4 Roads

Access to the site will be via Arumpo Road to the east of the project. Access to Arumpo Road will be predominantly via the Sturt Highway and Silver City Highway to the south of the project. Arumpo Road is a sealed thoroughfare. Internal access tracks will be established to link infrastructure components back to Arumpo Road.

3.5 Surrounding developments

Additionally, several other Significant State Developments (SSD) projects are in operation/planning within the South West REZ and the Wentworth LGA. Notable among these due to the proximity to the project are the Project EnergyConnect (SSI-9172452), Mallee Wind Farm (SSD-53293710), and the Mallee Solar Farm (SSD-69576706).

3.6 Landscape character

Landscape character is a way to understand the environment in which the project is located. It helps identify key features and the scenic value of the area. The landscape character also influences the visual conditions and visibility of a project. The natural features surrounding the project area are described below.

i Murray Darling Depression Bioregion Vegetation

The surrounding landscape's vegetation aligns with the characteristics of the Murray Darling Depression Bioregion and evolves in response to the landforms within the area. Semi-arid conditions support dominant Mallee communities with derived grasslands, Belah (*Casuarina pauper*)-Rosewood (*Heterodendrum oleifolium*) woodlands, and isolated Mulga (*Acacia aneura*) and Bluebush (*Maireana pyramidata*) shrublands (NSW & OEH, 2018). The absence of tall canopy species creates an expansive landscape, while dense clusters of Mallee vegetation provide a rich habitat for diverse fauna, including the endangered Mallee fowl and other species native to the region. In other parts to the north, east, and west of the project investigation area, low vegetation predominates, offering favourable grazing conditions for sheep and making the area suitable for livestock. The surrounding landscape features extensive areas of remnant vegetation cleared agricultural lands, and the town of Mildura. The project investigation area primarily consists of previously cleared land, including Category 1 and Category 2 land, with patches of remnant and disturbed native vegetation. The NSW Government Biodiversity Values Map does not identify any areas within the project investigation area.

ii National Parks and Nature Reserves

Mallee Cliffs National Park (MCNP), located within 10km southeast of the site, encompasses a range of nature reserves such as Banya, Wilddog, and Gulthul. These reserves fall under the category of C1 - National Parks and Nature Reserves and showcase the typical low-relief landscapes of the Murray Darling Basin Bioregion. The park's topography is predominantly flat, lacking natural streams or water bodies, while its vegetation is characteristic of semi-arid environments. This includes dominant Mallee communities, derived grasslands, scattered Belah-Rosewood woodlands, and Mulga-Bluebush shrublands. The objectives of MCNP prioritize the protection of natural environments, the preservation of cultural heritage, public park usage, and educational opportunities.

Even though this landscape feature is outside the study area, due to the area's flat topography and the elevated height of the wind turbines, this feature has been considered for the PVIA. It's important to note that public access and activities have been restricted as access is through private roads, which may significantly minimise the impact.

iii Dry lakes and swamps

The region features shallow depressions such as dry lakes and swamps, which exhibit well-formed lunettes along their edges, as well as scattered and isolated bedrock ridges rising above the sandplains (National Parks and

Wildlife Service (NSW), 2003). These dry lakes and swamps remain dry for most of the year, while rivers and waterways are significant landscape features that contribute notable visual appeal within the region. Key water features include Lake Holland, Lake Fletcher, Gol Gol Creek, Lake Gol Gol, and Gol Gol Swamp. The lakes and depressions typically have shallow, clay floors and defined vegetation.

iv Recreational Associations and Points of Interest

Recreational opportunities in the wider Study Area are limited. Caballo Park (located approximately 3.3 km Northwest of the project investigation area) and Rivergardens Holiday Park (also around 5 km south of the project investigation area) are the nearest public recreational spots for enjoying the surrounding landscape. Given their proximity to the project, assessing the impact of these rest areas will be required for the purposes of this PVIA.

3.7 Landscape character units and scenic quality

The evaluation of current land use and landscape features reveals an agricultural heritage in the project and its surroundings, marked by grazing and cropping activities, alongside ecological connections to the nearby Mallee Cliffs National Park and Associated Nature Reserves. Five distinct landscape character units (LCUs) were recognised, in the greater regional area, with one predominant LCU within the study area. Their scenic quality has been assessed using a standardised framework in accordance with VA Bulletin.

Table 3.1 summarises the LCUs with a more detailed description in the sections following.

Table 3.1 Landscape character units

LCU	Name	Description	Preliminary scenic quality rating
LCU01	Grazing and Native Vegetation Paddocks	• Expansive, open land parcels primarily used for livestock grazing. • Comprises open plains with sparse or absent tree coverage, dominated by Chenopod Mallee and Shrubland. • Common land uses include grazing, dryland cropping, and both modified and irrigated pastures.	Low
LCU02	Dry Lakes and Swamps	• Riverine vegetation along boundaries. • Significant features include Gol Gol Swamp, Gol Gol Creek, Lake Holland, Lake Fletcher, Gol Gol Lake. • Human influence evident through urban development along riverbanks. • Varying tree density observed across different areas, with native vegetation altered due to urbanisation. • Lakes or depressions are generally shallow with clay floors and remain dry through most of the year. • Predominant vegetation consists of Red Gum trees.	Moderate
LCU03	Townships	• Rural urban development and notable human influence. • Buronga (4.9km from the project investigation area) and Gol Gol (5.2km from the project investigation area) serve as the nearest townships to the project, acting as vital town centres in the Riverina region. • Situated within the broader Sunraysia area along the Murray River, which sits outside and south of the current project investigation area	Low
LCU04	Mallee Woodlands and Shrublands	• Semi-arid landscapes within and around the project investigation area. • Dominated by low, multi-stemmed Eucalyptus (Mallee) that rarely grow taller than 6m	Moderate

Table 3.1 Landscape character units

LCU	Name	Description	Preliminary scenic quality rating
LCU05	National Parks and Nature Reserves	• Mallee Cliffs National Park (MCNP) is situated 10 km southeast of the site. • MCNP includes nature reserves such as Banya, Wilddog, and Gulthul, categorised as C1 - National Parks and Nature Reserves. • The park features low-relief landscapes typical of the Murray Darling Basin Bioregion. • Topography of the park is mostly flat and lacks natural streams or water bodies. • Vegetation in the park is characteristic of semi-arid environments, including dominant Mallee communities and scattered Belah-Rosewood woodlands • Public access and activities have been restricted due to access being available only via private roads.	High

i LCU01 - Grazing and native vegetation paddocks

The LCU features vast expanses of land altered for both dryland cropping and irrigated agriculture, showcasing extensive agricultural activity. Vegetation is predominantly fragmented, serving primarily as windbreaks or screening elements. Moreover, large portions of land have been repurposed to accommodate pastoral farming and irrigated agricultural practices (Photograph 3.1). Notably, this LCU is frequently observed both within the project and its surrounding environs, reflecting its significant presence and impact on the region.

Scenic quality rating: Low

Photograph 3.1 Modified paddocks with clear vegetation to support grazing

ii LCU02 – Dry Lakes and Swamps

This character unit is characterised dry lakes and swamps such as Gol Gol Swamp, Gol Gol Creek, Lake Holland, Lake Fletcher and Lake Gol Gol, with an example provided in Photograph 3.2. Human influence is apparent through urban development along the riverbanks, affecting native vegetation and resulting in varying tree density across different areas. Surrounding wetlands serve as retention basins for urban and agricultural runoff. Lakes and depressions in the region are generally shallow with clay floors, remaining dry for most of the year. Rivers and

waterways are viewed as significant features within the landscape and hold notable visual amenity within the region.

Scenic quality rating: Moderate

Photograph 3.2 Dry lake area near Lake Gol Gol

iii LCU03 – Townships

The LCU is generally characterised by rural urban development with substantial human impact. The nearest towns to the project are Buronga and Gol Gol, which serve as important urban centres in the Riverina region. Situated within the larger Sunraysia region along the Murray River, both towns play a key role in fruit and vegetable production.

Scenic quality rating: Low

iv LCU04 – Mallee woodlands and shrublands

The Mallee woodlands and shrublands occur in semi-arid landscapes within and around the project investigation area. It is dominated by low, multi-stemmed Eucalyptus (Mallee) that rarely grow taller than 6 m. The understorey can be made up of shrubs or grasses, depending on the local rainfall, soil and fire history.

Visually, the Mallee woodlands and shrublands creates a uniform landscape with sculptural multi-stemmed trees of similar size (Photograph 3.3). This is in sharp contrasted with adjacent cleared paddocks and roadways that cut through the woodlands.

Scenic quality rating: Moderate

Photograph 3.3 Low stemmed Eucalyptus (Mallee) woodlands and shrublands dominate the landscape

v LCU05 – National Parks and Nature Reserves

This landscape character unit comprises of The Mallee Cliffs National Park (MCNP) located within 10 km southeast of the site, encompasses a range of nature reserves such as Banya, Wilddog and Gulthul.

These reserves fall under the category of C1 - National Parks and Nature Reserves and showcase the typical low-relief landscapes of the Murray Darling Basin Bioregion. The park's topography is predominantly flat, lacking natural streams or water bodies, while its vegetation is characteristic of semi-arid environments. This includes dominant Mallee communities, derived grasslands, scattered Belah-Rosewood woodlands, and Mulga-Bluebush shrublands.

Scenic quality rating: High

4 Community Consultation

Aligned with the VA Bulletin, community consultation at this initial stage has been undertaken in the form of an online digital survey distributed via Squadron Energy's existing stakeholder database, including all attendees and participants of their recent community engagement events. The survey was active during April 2024.

As of May 2024, a total of one (1) survey has been completed. As the survey administration was done using EMM's survey platform, the primary data sources have been accessible to the VIA team directly to inform independent analysis.

As part of this PVIA, the primary objective of community consultation is to:

- Establish key landscape features.
- Define areas of scenic quality.
- Identify key public viewpoints valued by that community.

Community involvement should continue during the EIS Phase, offering additional opportunities for the community to contribute feedback to the Visual Baseline Study of the LVIA.

4.1.1 Landscape features and values

Following the initial desktop assessment of current land use and landscape characteristics, the community consultation questionnaire invited respondents to highlight significant landscape features. The questionnaire posed the following questions in relation to landscape features and values:

- What elements of the surrounding landscape are most important to you?
- Are there any nearby hiking trails, lookouts, or places you like to visit? If so, what is it about that place that you enjoy (views, water, tranquillity)?
- Are there any places that are important to the community?

There was one (1) response to the questions raised above. The following landscape features were identified as significant by the community:

- Redgum laced riverbanks.
- Natural bushland, clean air, limited noise.
- The rivers and natural bushland are particular features of the surrounding environment that are particularly important.

4.1.2 Key Viewpoints

The questionnaire also sought insights from the community regarding their favoured viewpoints. Only one (1) response was given to the question 'Thinking about the views from your home, what views do you enjoy the most? And why? What about that view makes it important?' The following points were shared:

- The River Darling, majestic, beautiful, peaceful. Its natural setting without too many man made objects within the landscape.

4.1.3 Summary of community consultation

The respondent raised concerns about the broader visual landscape in the area and the ability to maintain the 'peaceful and natural' setting of the surrounding area.

Where feasible, these features and viewpoints have been mapped in Figure 3.2 of this PVIA. Further consultation and detailed assessment of these features and viewpoints will be conducted during the EIS phase.

5 Preliminary assessment tools

To aid in defining the visual catchment, initial assessment tools have been devised in the Bulletin. Following the Bulletin guidelines, the primary aim of these preliminary assessment tools is to offer an early indication of areas where turbine placement demands scrutiny due to potential visual impacts. These tools are applicable to both residential properties and significant public viewpoints within the study area.

They offer an early indication of areas requiring further assessment and justification for turbine placement, as well as where targeted consultation with potentially affected landowners is imperative—including discussions regarding landholder agreements. The preliminary assessment tools entail the analysis of two critical visual parameters:

- Visual Magnitude
- Multiple Wind Turbine Tool

Once identified, the Bulletin stipulates that additional assessment and rationale for siting turbines in these sensitive areas must be provided in the EIS. This documentation should include a description of mitigation and management strategies implemented to mitigate impacts. This assessment may reveal that factors such as topography, distance, and existing vegetation could mitigate or even eliminate the project's impacts.

5.1 Preliminary Assessment Tool 1: Visual Magnitude

The Visual Magnitude Threshold is determined by the height of the proposed wind turbines to the blade tip and their distance from residences or significant public viewpoints, as shown in Figure 5.1.

As per the Bulletin guidelines, turbines proposed below the black line must be identified, along with nearby residences or key public viewpoints, as part of the request for SEARs. Conversely, key viewpoints or dwellings located above the black line, but below the blue line, may require further detailed assessment. The relative viewpoint in relation to a dwelling is also an important consideration and should be outlined in the EIS.

The proposed wind turbines are based on a worst-case scenario with a tip height of 280 meters. The 'black line' intersects at 3,750 meters, while the 'blue line' intersects at 5,500 meters. For the Preliminary Assessment, the Visual Magnitude thresholds are established based on a 2D evaluation of the project alone. However, further analysis suggests that factors such as topography, distance, and existing vegetation may mitigate or even eliminate the project's impacts on residences.

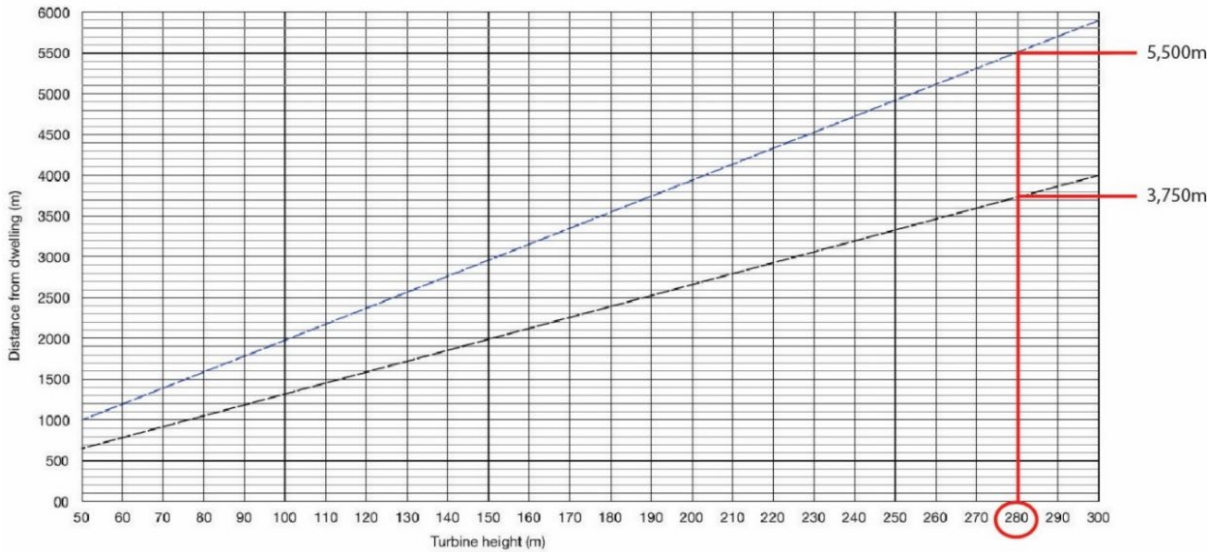
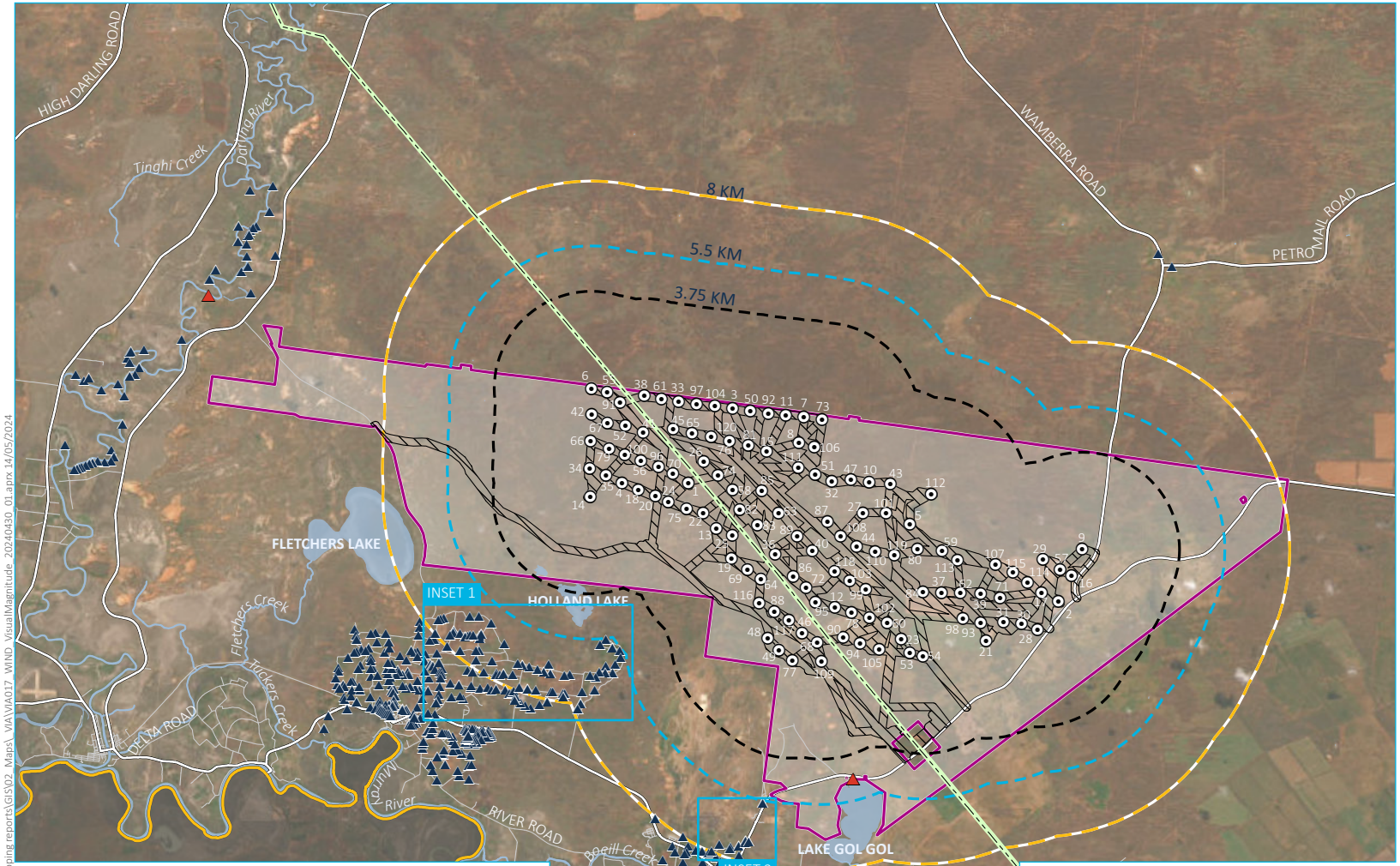
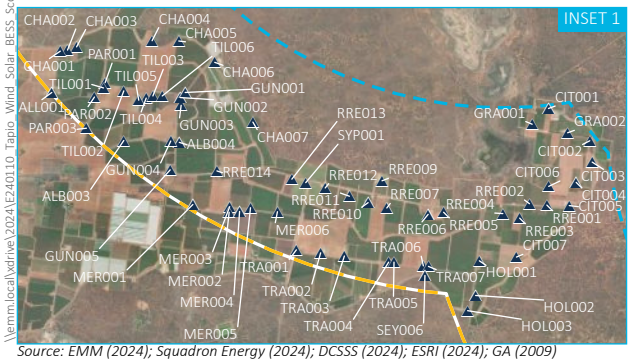
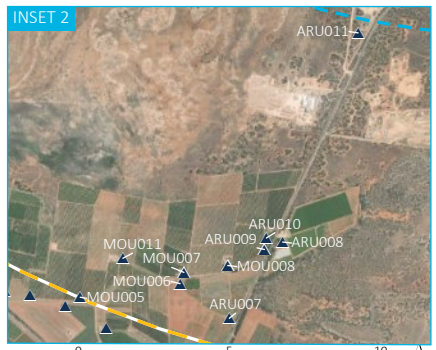


Figure 5.1 Visual Magnitude thresholds







0 5 10 km

GDA2020 MGA Zone 54

N

KEY

- Gol Gol wind investigation area
- Wind farm development corridor

Visual assessment buffer

- 3.75 km
- 5.5 km
- 8 km
- Existing 220 kV transmissions line
- Wind farm- turbine location

Sensitive receiver

- Dwelling associated with the project
- Dwelling not associated with the project

Existing environment

- Major road
- Minor road
- Named watercourse
- Named waterbody
- Local government area
- Victoria

Visual magnitude

Gol Gol Wind Farm
Visual Impact Assessment
Figure 5.2

EMM
creating opportunities

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

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5.1.1 Summary of preliminary visual magnitude assessment

Application of the preliminary assessment tools for the project revealed dwellings necessitating additional evaluation as per the Bulletin guidelines. Figure 5.2 illustrates no dwellings identified within 3,750 m (black line of visual magnitude) and one (1) associated dwelling between 3,750 to 5,500 m (blue line of visual magnitude) from the nearest proposed turbine. This is summarised below:

- No dwellings have identified within 0 m – 3,750 m of the proposed wind turbine locations (within the black line of visual magnitude)
- One (1) associated dwellings have been identified within 3,750 m – 5,500 m of the proposed wind turbine locations (within the blue line of visual magnitude).
- 73 non-associated dwellings have been identified within 5,500 m – 8,000 m of the proposed turbine locations

Table 5.1 lists the viewpoints for the private receivers identified for this assessment and the rational for the selection. Figure 5.2 illustrates where the viewpoints are located.

Table 5.1 Identified private receivers: Visual magnitude tool

Viewpoint reference - Residences	Viewpoint type	Location	Representative receptors	Rationale for selection	Requires further assessment
Dwellings located within 0m – 3,750m					
None					
Dwellings located within 3,750m – 5,500m					
ARU012	House	Gol Gol Lake 664 Arumpo Rd, Wentworth 2648	Private dwelling	Residential dwelling within 3,750m – 5,500m of the WTGs.	No
Dwellings located within 5,500m – 8,000m					
CIT001	House	82 Grazies Gr, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
GRA001	House	82 Grazies Gr, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
GRA002	House	375 Citrus Dr, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CIT002	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CIT003	House	317 Citrus Dr, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CIT004	House	247a Citrus Dr, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CIT006	House	Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CIT005	House	531 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No

Table 5.1 Identified private receivers: Visual magnitude tool

Viewpoint reference - Residences	Viewpoint type	Location	Representative receptors	Rationale for selection	Requires further assessment
RRE001	House	503 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE002	House	481 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE003	House	464 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE004	House	464 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CIT007	House	107 Citrus Dr, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE005	House	Farm 278 358 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE006	House	348 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE009	House	96 Trawalla Rd, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE007	House	286 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE010	House	96 Trawalla Rd, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE011	House	234 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE012	House	96 Trawalla Rd, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
SYP001	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE013	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
RRE014	House	57 Reserve Road E, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
GUN005	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
ALB004	House	358 Gunya Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
GUN004	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
GUN003	House	275 Reserve Road W, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No

Table 5.1 Identified private receivers: Visual magnitude tool

Viewpoint reference - Residences	Viewpoint type	Location	Representative receptors	Rationale for selection	Requires further assessment
GUN002	House	275 Reserve Road W, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
GUN001	House	275 Reserve Road W, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CHA006	House	Farm 205, 160 Channel Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CHA005	House	28 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CHA004	House	258 Channel Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CHA003	House	Channel Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CHA002	House	391 Channel Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CHA001	House	82 Allomba Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
ALL001	House	30 Allomba Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
PAR001	House	88 Parraweena Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TIL001	House	28 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
PAR002	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TIL002	House	28 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TIL004	House	5 Alexanders Lane, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TIL005	House	11 Alexanders Lane, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TIL003	House	78 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TIL006	House	82 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
ALB003	House	145 Alba Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
PAR003	House	28 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No

Table 5.1 Identified private receivers: Visual magnitude tool

Viewpoint reference - Residences	Viewpoint type	Location	Representative receptors	Rationale for selection	Requires further assessment
MER001	House	90 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
MER003	House	90 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
MER002	House	104 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
MER004	House	104 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
MER005	House	Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
MER006	House	151 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TRA001	House	164 Syphon Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TRA002	House	35 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TRA003	House	96 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TRA004	House	125 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TRA005	House	131 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TRA006	House	173 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
TRA007	House	175 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
SEY006	House	Farm 307 207 Seymour Road, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
HOL001	House	260 Hollands Lake Rd, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
HOL002	House	Farm 311 216 Hollands Lake Rd, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
HOL003	House	193 Hollands Lake Rd, Coomealla 2717	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
MOU011	House	93 Mourquong Rd, Mourquong 2739	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
ARU007	House	82 Arumpo Rd, Mourquong 2739	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No

Table 5.1 Identified private receivers: Visual magnitude tool

Viewpoint reference - Residences	Viewpoint type	Location	Representative receptors	Rationale for selection	Requires further assessment
MOU007	House	143 Mourquong Rd, Mourquong 2739	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
MOU006	House	130 Mourquong Rd, Mourquong 2739	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
MOU008	House	175 Mourquong Rd, Mourquong 2739	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
ARU009	House	173a Arumpo Rd, Mourquong 2739	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
ARU010	House	173b Arumpo Rd, Mourquong 2739	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
ARU008	House	Arumpo Rd, Mourquong 2739	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
ARU011	House	319 Arumpo Rd, Wentworth 2648	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
ARU012	House	Gol Gol Lake 664 Arumpo Rd, Wentworth 2648	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No
CHA007	House	River Rd, Boeill Creek 2739	Private dwelling	Residential dwelling within 5,500m – 8,000m of the WTGs.	No

Based on the preliminary assessment results, no further assessment of private dwellings is required under the visual magnitude tool. This is because no private dwellings, other than one associated dwelling, were found within 0 m – 5,500 m of the wind turbines.

5.2 Preliminary Assessment Tool 2: Multiple Wind Turbine Tool

The Multiple Wind Turbine Tool offers an initial assessment of potential cumulative impacts resulting from the proposed wind energy project. To determine the extent to which dwellings or significant public viewpoints might be affected by multiple wind turbines, the developer is required to map proposed turbines into six sectors of 60° each. Additionally, any existing or approved turbines within an 8km radius of each dwelling or significant public viewpoint must be included. One (1) associated and 73 non-associated private viewpoints were identified within 8,000 meters of the nearest turbine. Figure 5.3 below illustrates instances where a dwelling or significant public viewpoint may have sightlines to turbines in multiple 60° sectors.

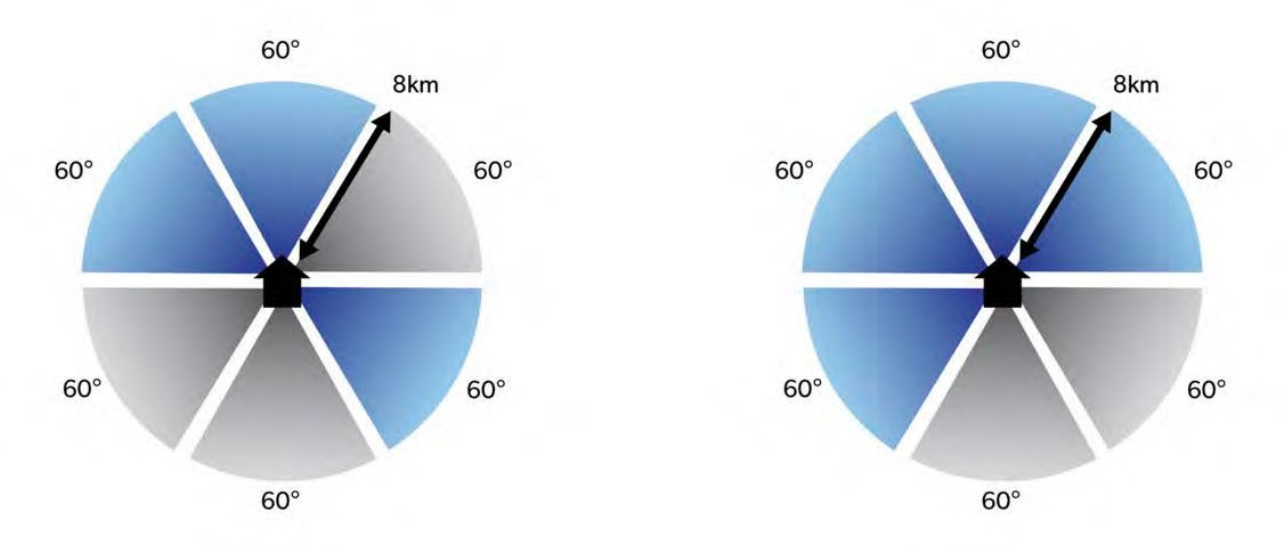


Figure 5.3 Preliminary assessment tool: Multiple wind turbines

As per the Bulletin guidelines, if wind turbines are visible within the horizontal views of a dwelling or significant public viewpoint across three or more 60° sectors, the developers are required to identify these turbines, along with the corresponding dwelling or viewpoint, and their relative distances. This information must be submitted to the Department as part of the request for SEARs. These identified turbines will be subject to focused assessment during the EIS phase.

5.2.1 Summary of preliminary multiple wind turbine assessment

The 2D Multiple Wind Turbine Tool, shown in Figure 5.4, identified one (1) associated dwelling and 73 non-associated dwellings within 8,000 m of the nearest turbine. Of the 73 dwellings identified:

- 13 non-associated dwellings have turbines in 3 60° sectors (up to 180°)
- Two (2) non-associated dwellings have turbines in 2 60° sectors (up to 120°)
- 59 non-associated dwellings have turbines in 1 60° sectors (up to 60°)

Table 5.2 lists the viewpoints for the private receivers for this assessment and the rational for the selection. Figure 5.4 illustrates where the viewpoints are located.

As per the Bulletin, dwellings that are visible withing the horizontal views in three or more 60° sectors will require further assessment during the EIS phase. There are thirteen (13) dwellings identified. This will help to assess whether any existing features, such as topography or other screening factors (including vegetation and structures) may assist in reducing visible turbines.

Table 5.2 Identified private receivers: Multiple wind turbine tool

Viewpoint reference - Residences	Viewpoint type	Location	Representative receptors	Number of 60° sectors (Based on a 2D assessment)	Requires further assessment
Dwellings with turbines in up to one (1) 60° sectors (up to 60°)					
RRE009	House	96 Trawalla Rd, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
RRE007	House	286 Reserve Rd E, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
RRE010	House	96 Trawalla Rd, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
RRE011	House	234 Reserve Rd E, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
RRE012	House	96 Trawalla Rd, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
SYP001	House	To be confirmed at EIS stage	Private dwelling	**1** 60° sectors (up to 60°)	No
RRE013	House	To be confirmed at EIS stage	Private dwelling	**1** 60° sectors (up to 60°)	No
RRE014	House	57 Reserve Road E, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
GUN005	House	To be confirmed at EIS stage	Private dwelling	**1** 60° sectors (up to 60°)	No
ALB004	House	358 Gunya Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
GUN004	House	To be confirmed at EIS stage	Private dwelling	**1** 60° sectors (up to 60°)	No
GUN003	House	275 Reserve Road W, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
GUN002	House	275 Reserve Road W, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
GUN001	House	275 Reserve Road W, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
CHA006	House	Farm 205, 160 Channel Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
CHA005	House	28 Tilba Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
CHA004	House	258 Channel Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
CHA003	House	Channel Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
CHA002	House	391 Channel Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No

Table 5.2 Identified private receivers: Multiple wind turbine tool

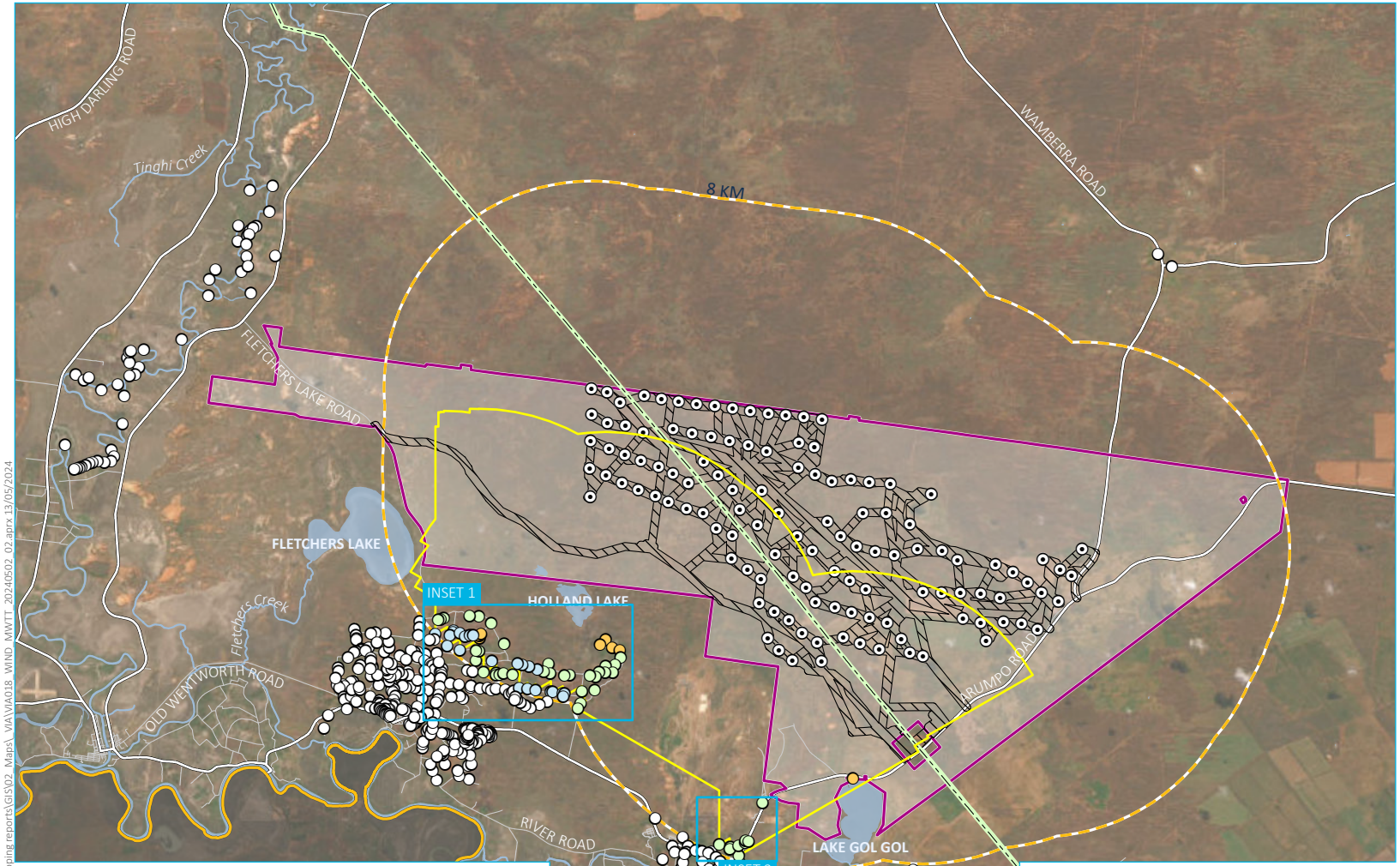
Viewpoint reference - Residences	Viewpoint type	Location	Representative receptors	Number of 60° sectors (Based on a 2D assessment)	Requires further assessment
CHA001	House	82 Allomba Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
ALL001	House	30 Allomba Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
PAR001	House	88 Parraweena Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TIL001	House	28 Tilba Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
PAR002	House	To be confirmed at EIS stage	Private dwelling	**1** 60° sectors (up to 60°)	No
TIL002	House	28 Tilba Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TIL004	House	5 Alexanders Lane, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TIL005	House	11 Alexanders Lane, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TIL003	House	78 Tilba Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TIL006	House	82 Tilba Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
ALB003	House	145 Alba Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
PAR003	House	28 Tilba Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
MER001	House	90 Merindah Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
MER003	House	90 Merindah Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
MER002	House	104 Merindah Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
MER004	House	104 Merindah Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
MER005	House	Merindah Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
MER006	House	151 Merindah Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TRA001	House	164 Syphon Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No

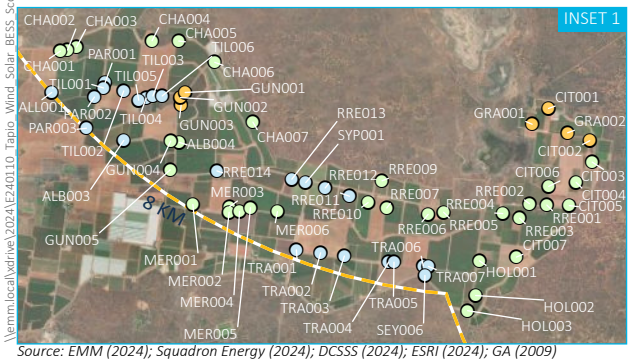
Table 5.2 Identified private receivers: Multiple wind turbine tool

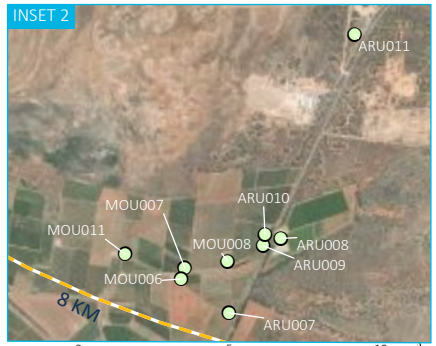
Viewpoint reference - Residences	Viewpoint type	Location	Representative receptors	Number of 60° sectors (Based on a 2D assessment)	Requires further assessment
TRA002	House	35 Trawalla Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TRA003	House	96 Trawalla Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TRA004	House	125 Trawalla Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TRA005	House	131 Trawalla Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TRA006	House	173 Trawalla Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
TRA007	House	175 Trawalla Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
SEY006	House	Farm 307 207 Seymour Road, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
HOL001	House	260 Hollands Lake Rd, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
HOL002	House	Farm 311 216 Hollands Lake Rd, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
HOL003	House	193 Hollands Lake Rd, Coomealla 2717	Private dwelling	**1** 60° sectors (up to 60°)	No
MOU011	House	93 Mourquong Rd, Mourquong 2739	Private dwelling	**1** 60° sectors (up to 60°)	No
ARU007	House	82 Arumpo Rd, Mourquong 2739	Private dwelling	**1** 60° sectors (up to 60°)	No
MOU007	House	143 Mourquong Rd, Mourquong 2739	Private dwelling	**1** 60° sectors (up to 60°)	No
MOU006	House	130 Mourquong Rd, Mourquong 2739	Private dwelling	**1** 60° sectors (up to 60°)	No
MOU008	House	175 Mourquong Rd, Mourquong 2739	Private dwelling	**1** 60° sectors (up to 60°)	No
ARU009	House	173a Arumpo Rd, Mourquong 2739	Private dwelling	**1** 60° sectors (up to 60°)	No
ARU010	House	173b Arumpo Rd, Mourquong 2739	Private dwelling	**1** 60° sectors (up to 60°)	No
ARU008	House	Arumpo Rd, Mourquong 2739	Private dwelling	**1** 60° sectors (up to 60°)	No
ARU011	House	319 Arumpo Rd, Wentworth 2648	Private dwelling	**1** 60° sectors (up to 60°)	No

Table 5.2 Identified private receivers: Multiple wind turbine tool

Viewpoint reference - Residences	Viewpoint type	Location	Representative receptors	Number of 60° sectors (Based on a 2D assessment)	Requires further assessment
ARU012	House	Gol Gol Lake 664 Arumpo Rd, Wentworth 2648	Private dwelling	**1** 60° sectors (up to 60°)	No
CHA007	House	River Rd, Boeill Creek 2739	Private dwelling	**1** 60° sectors (up to 60°)	No
Dwellings with turbines in up to two (2) 60° sectors (up to 120°)					
RRE005	House	Farm 278 358 Reserve Rd E, Coomealla 2717	Private dwelling	**2** 60° sectors (up to 120°)	No
RRE006	House	348 Reserve Rd E, Coomealla 2717	Private dwelling	**2** 60° sectors (up to 120°)	No
Dwellings with turbines in up to three (3) 60° sectors (up to 180°)					
CIT001	House	82 Grazies Gr, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
GRA001	House	82 Grazies Gr, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
GRA002	House	375 Citrus Dr, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
CIT002	House	To be confirmed at EIS stage	Private dwelling	**3** 60° sectors (up to 180°)	Yes
CIT003	House	317 Citrus Dr, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
CIT004	House	247a Citrus Dr, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
CIT006	House	Reserve Rd E, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
CIT005	House	531 Reserve Rd E, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
RRE001	House	503 Reserve Rd E, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
RRE002	House	481 Reserve Rd E, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
RRE003	House	464 Reserve Rd E, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
RRE004	House	464 Reserve Rd E, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes
CIT007	House	107 Citrus Dr, Coomealla 2717	Private dwelling	**3** 60° sectors (up to 180°)	Yes







0 5 10 km

GDA2020 MGA Zone 54

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KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Wind farm visual assessment buffer
- Field of vision sector boundary (8 km)
- Existing 220 kV transmissions line
- Wind farm- turbine location

MWTT results for dwelling/key public viewpoint

- Up to three 60° sectors
- Up to two 60° sectors
- One 60° sector
- In excess of 8 km

Existing environment

- Major road
- Minor road
- Named watercourse
- Named waterbody
- Local government area
- Victoria

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

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Multiple wind turbine tool

Gol Gol Wind Farm
Visual Impact Assessment
Figure 5.4

EMM
creating opportunities

6 Visual assessment

As noted earlier, the PVIA is meant to identify the viewpoints that need to be assessed in the Landscape and Visual Impact Assessment (LVIA) at the EIS stage. In theory, it begins by identifying all possible viewpoints that have views of the project. These views are then evaluated and viewpoints with low potential for visual impacts are eliminated. The remaining viewpoints are identified as needing detailed assessments in the LVIA.

6.1 Viewshed mapping

Viewshed mapping is used to identify the locations with views to the project infrastructure. It illustrates the area in the surrounding landscape from which the project may be visible. It also indicates areas that have intervening hills or other landforms that block views.

6.1.1 Zone of visual influence

A ZVI diagram illustrates the theoretical visibility of the proposed project infrastructure, or the area over which a development can theoretically be seen. Refer to Figure 6.1 for the ZVI.

The ZVI diagram is created utilising a digital elevation model (DEM) encompassing the project boundaries. However, the DEM doesn't encompass the entire 10 km study radius. To address this gap, EMM has acquired supplementary DEM data. This segment of the DEM was constructed using publicly accessible ELVIS spatial data from the Foundation Spatial Data Framework. Considering spatial coverage constraints, the assessment did not extend to the northwest section of the study area, prompting the adoption of a worst-case scenario for this region. It is imperative that this data gap is addressed during the EIS stage to ensure a comprehensive and precise assessment. The DEM is representative of the bare earth surface and only considers the topography of the landscape. This does not account for any vegetation (trees), or structures (e.g. rural dwellings, farm sheds and agricultural infrastructure) that may screen views into the development footprint. It represents a worst-case scenario in terms of project visibility.

It is important to note that the Technical Supplement requires that vegetation (trees) and built structures not be included in the mapping. The resulting maps can therefore only show where landforms obstruct views. This can be important for viewpoints that are behind vegetation or buildings and have no or obstructed views of the proposed development yet are assessed as having a potential impact in this PVIA.

Note the following regarding the ZVI diagram:

- The ZVI does not account for the diminishing size of project elements as the viewer moves further away. It only indicates where project elements will be visible.
- It does not indicate specifically how many turbines or which turbines are visible from a particular location.
- The ZVI uses colour to indicate high visibility and low visibility. Highly visible areas show locations on the ground from which all or most turbines would be visible. Low levels of visibility are locations where small numbers of turbines are visible. No colour within the study area would indicate locations where no turbine is predicted to be visible.

6.1.2 Summary of ZVI

The ZVI is used to select viewpoints by indicating areas that are predicted to have views into the project. Conversely, it indicates areas that are not predicted to have any views of the project. With this knowledge, viewpoints can be selected from areas where the project is visible. Areas that do not have line-of-sight to the project can be eliminated from the assessment.

The ZVI indicates:

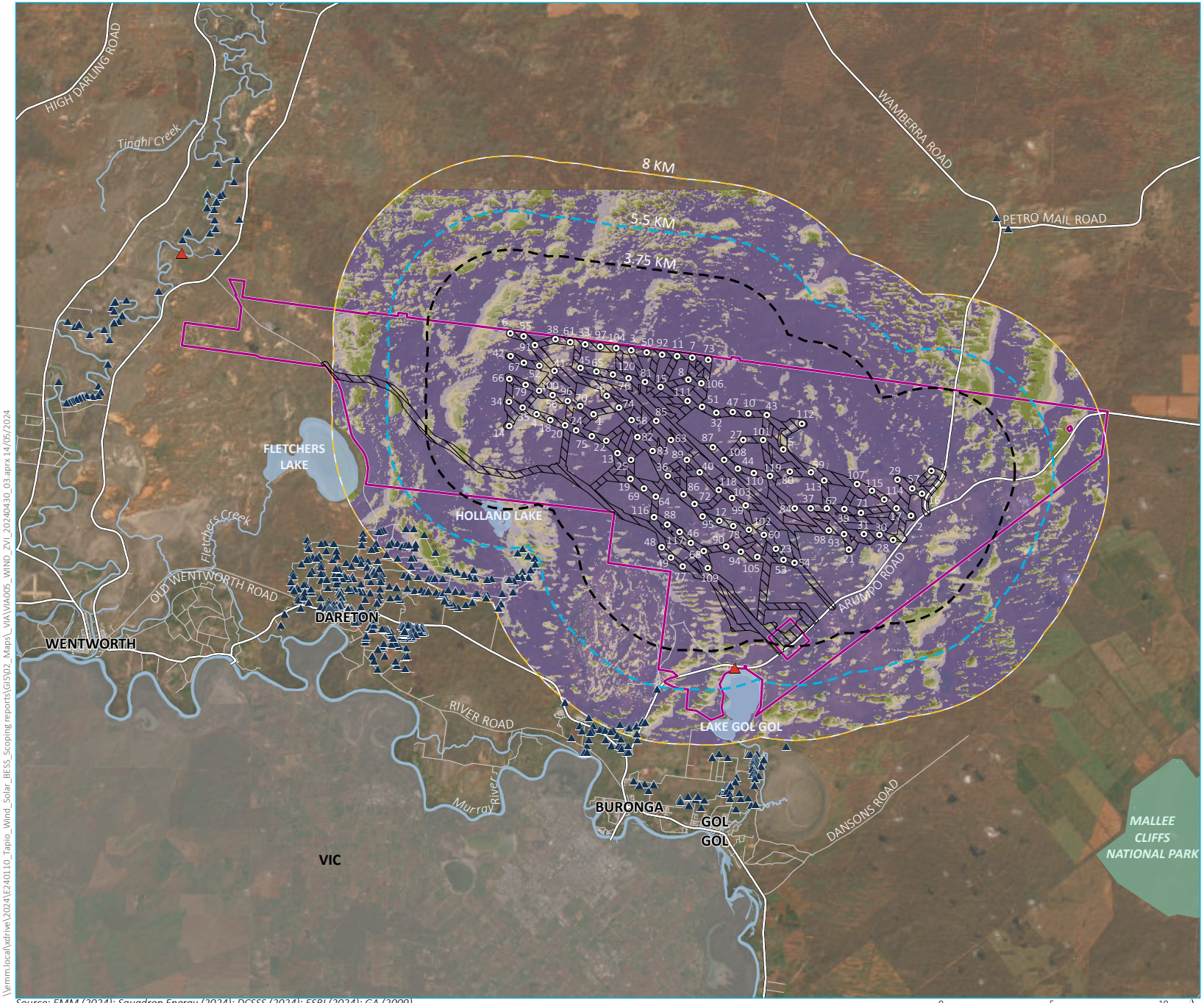
- Due to the generally flat terrain and the total wind turbine blade tip height of 280 m, the ZVI depicts a large percentage of wind turbines linked to the project would theoretically be visible from the surrounding areas within the extents of the study area.

- The ZVI identifies one (1) associated dwelling and seventy-three (73) non-associated dwellings within the zone of theoretical visibility, of which a large number of dwellings in the town of Buronga having a high potential to view the project in its entirety. It's important to note that this assessment solely accounts for topography and does not factor in intervening elements like vegetation and existing structures.

- Views from receptors located within an 8km radius of the project site are likely to have a significant view of the wind turbines linked to the project. Approximately 73 non-associated receptors situated within the 8 km radius, predominantly located towards the south, extending from Lake Gol Gol to the southwest at Holland Lake, It's important to note that this assessment solely accounts for topography and does not factor in intervening elements like vegetation and existing structures.

- The ZVI identified 22 public receptors within the 8 km study area. Roads users of Arumpo Road, the southern part of Wamberra Road, and parts of Fletchers Lake Road will have the potential to view the project close up and in its entirety. Note, this is based on an assessment of topography alone and existing intervening elements such as vegetation and built form are expected to reduce the visibility.

The ZVI is a tool to help identify the project's visibility from the surrounding landscape. The extent of the project's visibility and the potential for impacts on visual amenity is verified by field work and photographic evidence and should be carried out in the EIS phase of the assessment.



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Wind farm- turbine location

Visual assessment buffer

- 3.75 km
- 5.5 km
- 8 km

Sensitive receiver

- Associated residence
- Dwelling not associated with the project

Visibility of wind turbines

- ≤ 25
- 26- 50
- 51- 75
- 76- 100
- 101- 120

Existing environment

- Major road
- Minor road
- Named watercourse
- Named waterbody
- NPWS reserve
- Victoria

The ZVI diagram is created utilising a digital elevation model (DEM) provided by Squadron Energy Pty Ltd, encompassing the project boundaries. However, the DEM doesn't encompass the entire 10 km study radius. To address this gap, EMM has acquired supplementary DEM data. This segment of the DEM was constructed using publicly accessible ELVIS spatial data from the Intergovernmental Committee on Surveying and Mapping (ICSM).

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

0 5 10 km

GDA2020 MGA Zone 54

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Zone of visual influence: wind

Gol Gol Wind Farm
Visual Impact Assessment
Figure 6.1

EMM
creating opportunities

6.2 Viewpoint identification

For the purposes of the preliminary assessment, there are two types of viewpoints. These are:

- Public viewpoints – locations that are publicly accessible (roads, parks, trails, tourist areas) and offer views into the development site. These views are limited to the distance defined in the public viewpoint study area (8 km for this project)
- Private viewpoints – locations that are not accessible to the public (mainly residences) and have views into the development site. These views are limited to the distance defined in the private viewpoint study area (8 km for this project).

6.2.1 Preliminary roads and rail viewpoints

Roads and rail carry many people who have the potential for visual impacts if the road is located near the project. However, due to the transitory nature of the view as travellers move through the landscape, the visual impact is reduced when compared to a stationary viewer.

Travellers along Arumpo Road, Wamberra Road, and Fletchers Lake Road will potentially have views of the project as the roads run adjacent to the project site.

There are no railways near the project.

6.2.2 Preliminary public viewpoints

Public viewpoints represent various types of locations. The types of locations include public gathering areas like parks, sporting fields and walking trails in the surrounding community. They also include roads, trails, scenic viewpoints and campsites that are located within regional, state and national parks, reserves and forests. Tourist attractions, heritage sites and public buildings can also be included in this category.

Only locations within the public viewpoint study area are selected, and therefore not all of the public areas will be represented by viewpoints. There are no public viewpoints within 8km of the project.

6.2.3 Preliminary private viewpoints

Private receivers are primarily residences and land held by private individuals. Access to these locations is typically restricted, limiting the number of people who are impacted by a project. However, these are locations where people spend most of their time. Therefore, duration of a visual impact is substantial for those living there.

Private receivers are assessed in one of two ways:

- Residences near the project that are likely to have significant visual impacts area assessed individually. These are likely to require detailed assessments in the LVIA. During the LVIA process, photographs will be taken from the residence, in a location that captures views from important rooms in the house.
- Residences further away from the project are assessed in groups. Typically, a viewpoint is selected to represent a cluster of residences. The viewpoint is chosen where the impact is likely to be greatest for that group of residences. Photographs that represent a cluster of residences are usually taken from the roadway or common drive.

A site investigation should be carried out to validate the findings. These investigations include a viewpoint analysis inventory and assessments of dwellings to confirm the accuracy of the data. Analysis and evaluation of the identified sensitive receptors should be undertaken to demonstrate if existing intervening vegetation in the Study Area is likely to diminish the visibility of turbines from the selected viewpoints.

The dwellings and public viewpoints identified with potential visual impacts are shown in Table 6.1.

6.2.4 Selected viewpoints

Table 6.1 lists the viewpoints selected for the private and public (road) receivers and the rational for the selection. Figure 6.2 illustrates where the viewpoints are located.

Table 6.1 Preliminary viewpoint assessment locations

Viewpoint reference	Viewpoint type	Location	Representative receptors	Rationale for selection
GRA001	House	82 Grazies Gr, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
GRA002	House	375 Citrus Dr, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CIT002	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 8km of the WTG layout.
CIT003	House	317 Citrus Dr, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CIT004	House	247a Citrus Dr, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CIT006	House	Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CIT005	House	531 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE001	House	503 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE002	House	481 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE003	House	464 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE004	House	464 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CIT007	House	107 Citrus Dr, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE005	House	Farm 278 358 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE006	House	348 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE009	House	96 Trawalla Rd, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE007	House	286 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE010	House	96 Trawalla Rd, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.

Table 6.1 Preliminary viewpoint assessment locations

Viewpoint reference	Viewpoint type	Location	Representative receptors	Rationale for selection
RRE011	House	234 Reserve Rd E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE012	House	96 Trawalla Rd, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
SYP001	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE013	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 8km of the WTG layout.
RRE014	House	57 Reserve Road E, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
GUN005	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 8km of the WTG layout.
ALB004	House	358 Gunya Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
GUN004	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 8km of the WTG layout.
GUN003	House	275 Reserve Road W, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
GUN002	House	275 Reserve Road W, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
GUN001	House	275 Reserve Road W, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CHA006	House	Farm 205, 160 Channel Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CHA005	House	28 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CHA004	House	258 Channel Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CHA003	House	Channel Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CHA002	House	391 Channel Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
CHA001	House	82 Allomba Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
ALL001	House	30 Allomba Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
PAR001	House	88 Parraweena Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TIL001	House	28 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.

Table 6.1 Preliminary viewpoint assessment locations

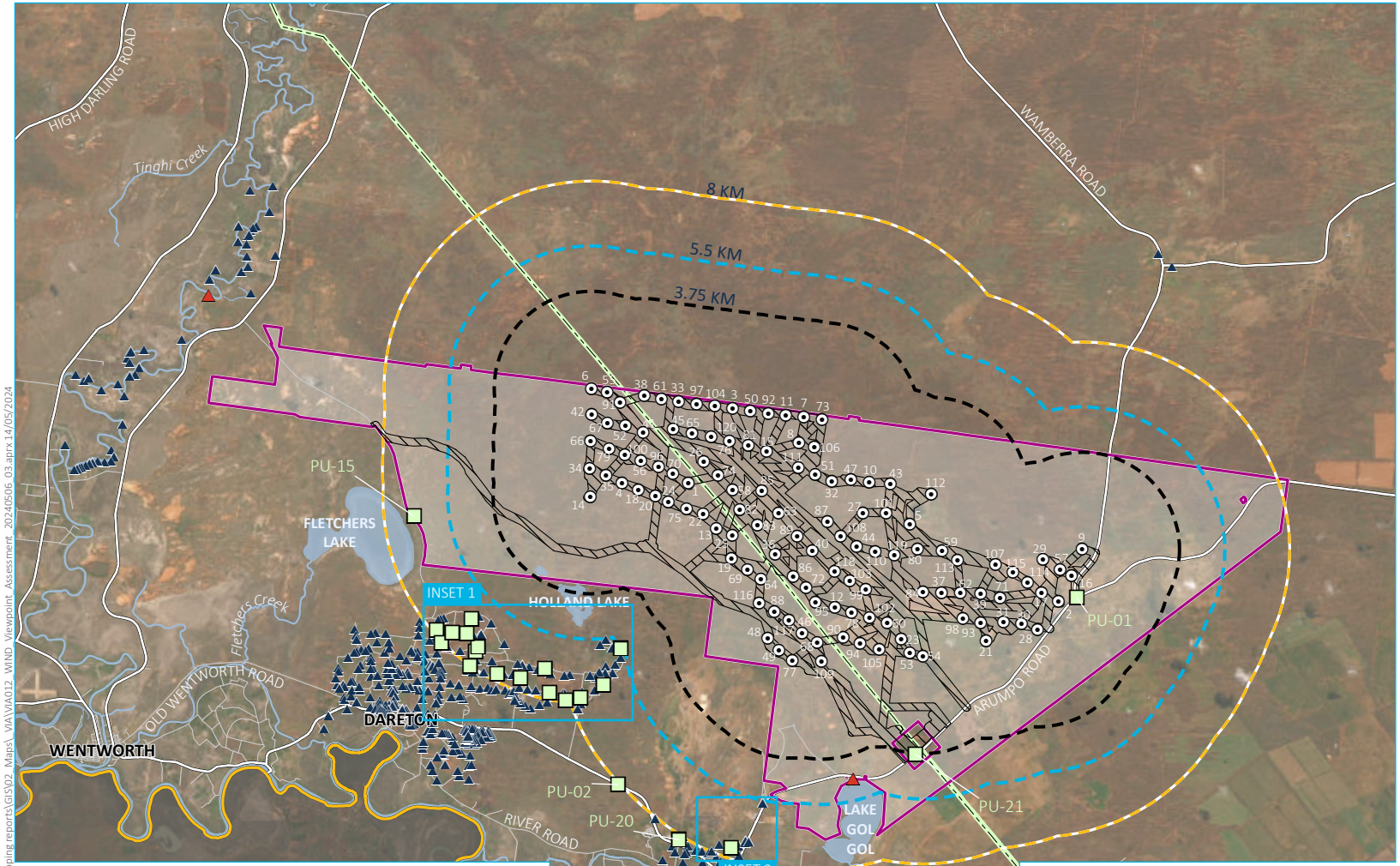
Viewpoint reference	Viewpoint type	Location	Representative receptors	Rationale for selection
PAR002	House	To be confirmed at EIS stage	Private dwelling	Residential dwelling within 8km of the WTG layout.
TIL002	House	28 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TIL004	House	5 Alexanders Lane, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TIL005	House	11 Alexanders Lane, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TIL003	House	78 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TIL006	House	82 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
ALB003	House	145 Alba Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
PAR003	House	28 Tilba Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
MER001	House	90 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
MER003	House	90 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
MER002	House	104 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
MER004	House	104 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
MER005	House	Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
MER006	House	151 Merindah Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TRA001	House	164 Syphon Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TRA002	House	35 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TRA003	House	96 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TRA004	House	125 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TRA005	House	131 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
TRA006	House	173 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.

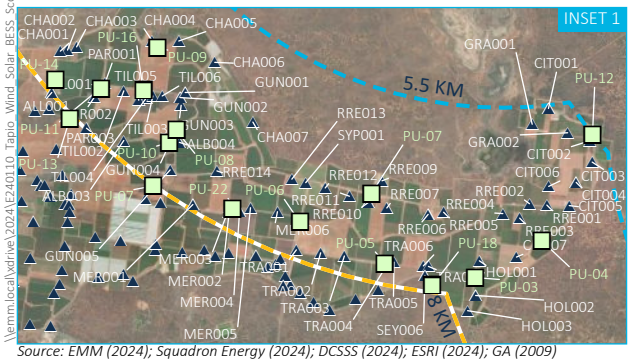
Table 6.1 Preliminary viewpoint assessment locations

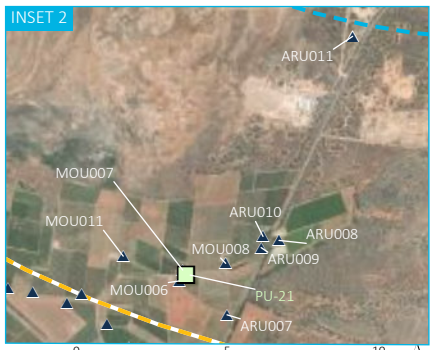
Viewpoint reference	Viewpoint type	Location	Representative receptors	Rationale for selection
TRA007	House	175 Trawalla Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
SEY006	House	Farm 307 207 Seymour Road, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
HOL001	House	260 Hollands Lake Rd, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
HOL002	House	Farm 311 216 Hollands Lake Rd, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
HOL003	House	193 Hollands Lake Rd, Coomealla 2717	Private dwelling	Residential dwelling within 8km of the WTG layout.
MOU011	House	93 Mourquong Rd, Mourquong 2739	Private dwelling	Residential dwelling within 8km of the WTG layout.
ARU007	House	82 Arumpo Rd, Mourquong 2739	Private dwelling	Residential dwelling within 8km of the WTG layout.
MOU007	House	143 Mourquong Rd, Mourquong 2739	Private dwelling	Residential dwelling within 8km of the WTG layout.
MOU006	House	130 Mourquong Rd, Mourquong 2739	Private dwelling	Residential dwelling within 8km of the WTG layout.
MOU008	House	175 Mourquong Rd, Mourquong 2739	Private dwelling	Residential dwelling within 8km of the WTG layout.
ARU009	House	173a Arumpo Rd, Mourquong 2739	Private dwelling	Residential dwelling within 8km of the WTG layout.
ARU010	House	173b Arumpo Rd, Mourquong 2739	Private dwelling	Residential dwelling within 8km of the WTG layout.
ARU008	House	Arumpo Rd, Mourquong 2739	Private dwelling	Residential dwelling within 8km of the WTG layout.
ARU011	House	319 Arumpo Rd, Wentworth 2648	Private dwelling	Residential dwelling within 8km of the WTG layout.
ARU012	House	Gol Gol Lake 664 Arumpo Rd, Wentworth 2648	Private dwelling	Residential dwelling within 8km of the WTG layout.
CHA007	House	River Rd, Boeill Creek 2739	Private dwelling	Residential dwelling within 8km of the WTG layout.
PU-01	Local Road	Wamberra Road	Road users	Road users within the 8km study area of WTG layout.
PU-02	Local Road	Silver City Highway	Road users	Road users within the 8km study area of WTG layout.
PU-03	Local Road	Hollands Lake Road	Road users	Road users within the 8km study area of WTG layout.
PU-04	Local Road	Cirus Drive	Road users	Road users within the 8km study area of WTG layout.

Table 6.1 Preliminary viewpoint assessment locations

Viewpoint reference	Viewpoint type	Location	Representative receptors	Rationale for selection
PU-05	Local Road	Trawalla Road	Road Users	Road users within the 8km study area of WTG layout.
PU-06	Local Road	Syphon Road	Road Users	Road users within the 8km study area of WTG layout.
PU-07	Local Road	Reserve Road	Road Users	Road users within the 8km study area of WTG layout.
PU-08	Local Road	Gunya Road	Road Users	Road users within the 8km study area of WTG layout.
PU-09	Local Road	Channel Road	Road Users	Road users within the 8km study area of WTG layout.
PU-10	Local Road	Alba Road	Road Users	Road users within the 8km study area of WTG layout.
PU-11	Local Road	Parraweena Road	Road Users	Road users within the 8km study area of WTG layout.
PU-12	Local Road	Grazies Grove	Road Users	Road users within the 8km study area of WTG layout.
PU-13	Local Road	Mulga Road	Road Users	Road users within the 8km study area of WTG layout.
PU-14	Local Road	Allomba Road	Road Users	Road users within the 8km study area of WTG layout.
PU-15	Local Road	Fletchers Lake Road	Road Users	Road users within the 8km study area of WTG layout.
PU-16	Local Road	Tilba Road	Road Users	Road users within the 8km study area of WTG layout.
PU-17	Local Road	Alexanders Lane	Road Users	Road users within the 8km study area of WTG layout.
PU-18	Local Road	Seymour Road	Road Users	Road users within the 8km study area of WTG layout.
PU-19	Local Road	Mourquong Road	Road Users	Road users within the 8km study area of WTG layout.
PU-20	Local Road	Link Road	Road Users	Road users within the 8km study area of WTG layout.
PU-21	Local Road	Arumpo Road	Road Users	Road users within the 8km study area of WTG layout.
PU-22	Local Road	Merindah Road	Road Users	Road users within the 8km study area of WTG layout.







KEY

- GoI Gol Gol wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line

Visual assessment buffer

- 3.75k
- 5.5km
- 8 km
- Wind farm- turbine location
- Viewpoint assessment location

Sensitive receiver

- Dwelling associated with the project
- Dwelling not associated with the project

Existing environment

- Major road
- Minor road
- Named watercourse
- Named waterbody
- Local government area
- Victoria

0 5 10 km

GDA2020 MGA Zone 54

N

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

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Preliminary dwelling and viewpoint assessment locations: wind

Gol Gol Wind Farm
Visual Impact Assessment
Figure 6.2

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7 Conclusion and Recommendations

The preliminary assessment is a tool to help identify viewpoints with potential visual impacts from a project. It offers a structured process to identify potential viewpoints and evaluate whether a viewpoint needs further assessment. The PVIA also provides a preliminary assessment of the existing landscape within the project and surrounding it.

The PVIA identified five landscape character categories that will be refined and characterised in greater detail in the EIS stage of the project. The categories identified are:

- LCU01 – Grazing and Native Vegetation Paddocks
- LCU02 – Dry Lakes and Swamps
- LCU03 – Townships
- LCU04 – Mallee Woodlands and Shrublands
- LCU05 – National Parks and Nature Reserves

The preliminary assessment is a tool to help identify viewpoints with potential visual impacts from the project. These viewpoints will be further evaluated and assessed in the detailed LVIA during the EIS.

7.1 Visual magnitude tool

Based on the preliminary assessment results, no further assessment of private dwellings is required under the visual magnitude tool. This is because no private dwellings, other than one associated dwelling, were found within 0 m – 5,500 m of the wind turbines.

7.2 Multiple wind turbine tool

The 2D Multiple Wind Turbine Tool identified 73 non-associated dwellings within 8,000 m of the nearest turbine. Among the 73 dwellings, 13 have turbines in three 60° sectors (up to 180°) that require further assessment during the Environmental Impact Statement (EIS) phase.

7.3 Zone of visual influence

The Zone of Visual Influence (ZVI) study suggests that due to the flat terrain and anticipated turbine height (280 m), a significant number of wind turbines from the project would be visible within the study area. The assessment identifies 73 non-associated dwellings within the visibility zone, with many in Buronga having a high potential to view the project. 22 public receptors within the 8 km study area, including users of Arumpo Road, the southern part of Wamberra Road, and parts of Fletchers Lake Road, are likely to view the project and the EIS will require further investigation of these receptors.

7.4 Next steps

The LVIA will then proceed to evaluate each sensitive receptor or group in further detail. This assessment will consider various factors such as topography, vegetation coverage, and other screening elements such as structures that may influence visual perceptions.

The project, comprising of wind components, also has the potential for cumulative visual impacts, as it is one of a number of major projects planned within the study area. Other major projects in the vicinity of the Gol Gol Wind Farm project include Project EnergyConnect, Mallee Solar Farm and Mallee Wind Farm. The EIS will carry out a

cumulative assessment in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE 2021c).

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Appendix E

Preliminary Noise Impact Assessment

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Gol Gol Wind Farm

Preliminary Noise Impact Assessment

Prepared for Squadron Energy

May 2024

Gol Gol Wind Farm

Preliminary Noise Impact Assessment

Squadron Energy

E240110 RP13

May 2024

Version	Date	Prepared by	Approved by	Comments
1	19 April 2024	Rick Scully	Alex Dundon	Issued to client
2	13 May 2024	Rick Scully	Mark Trudgett	

Approved by

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Project Director
13 May 2024

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1 Introduction

1.1 Background

Squadron Renewable Energy Developments Pty Ltd (Squadron Energy), proposes to develop the Gol Gol Wind Farm (GGWF) (the project) approximately 10 kilometres (km) north of Mildura in the far Western Murry Region of New South Wales. The proposed project will be developed on freehold land and is predominantly used for agricultural activities.

The project will include the development of 120 wind turbine generators (WTGs) including transmission, ancillary and temporary infrastructure. The project will have an installed capacity of up to approximately 840 megawatts (MW).

1.2 Project overview

The key components of the project are:

- approximately 120 WTGs with a total height (tip height) of approximately 280 metres (m), with an installed generating capacity of up to 840 MW
- a network of underground and overhead powerlines will connect to on-site collector substations and connect the wind farm project to adjacent electricity infrastructure
- internal roads
- hardstands
- operation and maintenance facilities.

The final layout and capacity of the project will be selected on the basis of environmental constraints identification, outcomes of stakeholder engagement, engineering assessments and design of project infrastructure. It is noted that the proposed development corridor is a conservative area for early assessment purposes and the proposed disturbance area will likely be significantly smaller.

1.3 Purpose of this report

This Preliminary Noise Impact Assessment (PNIA) has been developed in accordance with the *Noise Assessment Bulletin; For State significant wind energy development December 2016 (the* Noise Assessment Bulletin*),* to provide an initial prediction of noise levels from the wind farm within the proposed development corridor at surrounding land uses. This initial assessment will be expanded on with a detail Noise and Vibration Impact Assessment (NVIA) in the Environmental Impact Statement (EIS) phase.

2 Modelling inputs

2.1 Wind turbines

As the final wind turbines are not known for the project, EMM has assumed the sound power level from the General Electric ('GE') GE 6.0 164-50Hz wind turbine which would be a candidate turbine for a project of this size. The final selection would include a range of agreed performance conditions, including sound power levels and compliance with noise limits and nearby sensitive receivers.

The proposed hub height for the wind turbines is approximately 180m, with a rotor diameter of up to 200m. The sound power level (Lw) for the proposed wind turbines is 107.0 dBA.

An adjustment for uncertainty was not incorporated into this assessment this stage. As the design progresses into the EIS phase and the current candidate turbines are considered for this project, the applicability of an adjustment to sound power levels to account for uncertainty will be considered. The results of this assessment will be incorporated into the NVIA, which will support the EIS.

Spectral data used in the modelling is shown in Table 2.1, with limited information on tonal audibility available at this stage. The need for adjustments to account for tonality will be considered in the NVIA during the EIS phase.

Table 2.1 Modelled turbine sound power level – GE 6.0 164-50Hz

A weighted octave band sound power level, dBA										Overall, dBA
16 Hz	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	
65.2	78.8	88.1	93.6	98.1	100.7	102.3	100.1	92.6	76.8	107.0

2.2 Modelling process

At this preliminary stage of assessment, operational wind farm noise levels have been predicted using SoundPLAN version 8.2 software. The method used to predict A-weighted noise levels at nearby sensitive receivers is International Standard ISO 9613-2: 1996 *Acoustics—Attenuation of sound during propagation outdoors – Part 2: General method of calculation* (ISO 9613-2). This algorithm is consistent with the guidance provided by the South Australian *Wind Farm Environmental Noise Guidelines* referenced by the Noise Assessment Bulletin.

Adjustments to this methodology have been made on the basis of international research and guidance. These are contained in the UK Institute of Acoustics *A good practice guide to the application of ETSU-R-97 for the assessment and rating of wind turbine noise* (IOA Good Practice Guide). These adjustments include application of terrain screening and ground effects to ensure consistency with research findings regarding validity of modelling.

3 Noise criteria

3.1 Noise Assessment Bulletin

The Noise Assessment Bulletin provides guidance for how noise impacts should be assessed for large-scale wind energy development projects classified as State Significant Development. The Noise Assessment Bulletin adopts the South Australian EPA publication *Wind Farms Environmental Noise Guidelines* (Guidelines) to be used as the relevant assessment standard, subject to some variations applicable to assessment of projects within NSW. These variations are related to noise limits, special noise characteristics and noise monitoring.

While the Guidelines generally uses a 40 dB baseline criterion for most projects (except in areas zoned for Rural Living), the Noise Assessment Bulletin sets a baseline of 35 dB(A). Noise criteria are defined within the Noise Assessment Bulletin as follows:

> The predicted equivalent noise level (LAeq,10 minute) adjusted for tonality and low frequency noise in accordance with these guidelines, should not exceed 35 dB(A) or the background noise (LA90(10minute)) by more than 5 dB(A), whichever is the greater, at all relevant receivers for wind speed from cut-in to rated power of the wind turbine generator and each integer wind speed in between.

An outcome of this preliminary noise assessment is to identify locations at which the 35 dB(A) baseline limit may be exceeded, and therefore where background noise monitoring should be completed in order to determine background noise levels in accordance with the Noise Assessment Bulletin. The outcomes of this background noise monitoring will be used to derive wind farm noise criteria at each integer wind speed.

3.2 Associated receivers

The noise criteria above apply to noise sensitive locations that are non-associated residences (refer to Glossary for definition). The Noise Assessment Bulletin addresses associated receivers as follows:

> The criteria in this bulletin have been developed to address potential noise impacts on the amenity of residents and other relevant receivers in the vicinity of a proposed wind energy project. Wind energy proponents commonly negotiate agreements with private land owners where applicable noise limits may not be achievable at relevant receiver locations. A negotiated agreement will be considered as part of the assessment of a wind energy project, as will the requirements of SA 2009 and this Bulletin. The proponent's EIS should clearly identify the expected noise levels at all receiver locations including host properties to ensure that affected persons are appropriately informed regarding the development proposal.

The Guidelines suggest a level of 45 dB L_{Aeq} should be considered as a base criterion for financial stakeholders. However, this level is not considered a limit, and noise levels at these properties would generally be controlled through commercial agreement between the wind farm developer and property owners.

3.3 Draft guideline update

In November 2023, the Department of Planning, Housing and Infrastructure (DPHI) released the *Draft Energy Policy Framework* (DEPF). This includes updates to the noise impact assessment methodology to align with the updates to the South Australian wind farm noise guidelines (2021) (these updates do not change the noise criteria and would not materially change modelling results). Additionally, the policy adopts a new noise criterion of 50dBA for passive recreation areas within National Parks to minimise land use conflicts.

These updates to assessment methodology will need to be incorporated in the detailed noise impact assessment conducted as part of the EIS phase of works, should these changes be adopted by DPHI.

3.4 Ancillary infrastructure

Operational noise from ancillary infrastructure (transformers, inverters, cooling equipment, batteries) are to be assessed in accordance with the NSW EPA's *Noise Policy for Industry* (NPFI). Under the NPFI, project noise trigger levels (PNTLs) are derived as noise criteria for the project. Derivation of PNTLs and a detailed assessment under NPFI will be completed as part of the NVIA during the EIS phase.

4 Assessment results

4.1 Predicted noise levels

The noise model described in previous sections was used to predict resultant noise levels from the proposed WTG locations. When assessing environmental noise from most sources, noise levels are rounded to the nearest whole integer. However, in the case of wind farm developments, it is routine to report predicted levels to the nearest tenth of a decibel. This is as a result of noise criteria being statistically determined, and changes in WTG locations generally leading to very minor changes in predicted noise levels given typical receiver to turbine distances.

These predictions were carried out on the basis of a 107.0 dBA sound power level, corresponding to a hub height wind speed of 9 m/s.

4.1.1 Non-associated receivers

There are no non-associated receivers within 5km of the proposed wind farm. The maximum calculation distance for assessment under ISO 9613 is 5km, hence predicted noise levels are not provided. Predicted noise levels at all non-associated receivers will be below 35 dB $L_{Aeq,10min}$. Figure 4.1 shows the predicted noise contours from the proposed wind farm in relation to the non-associated receivers.

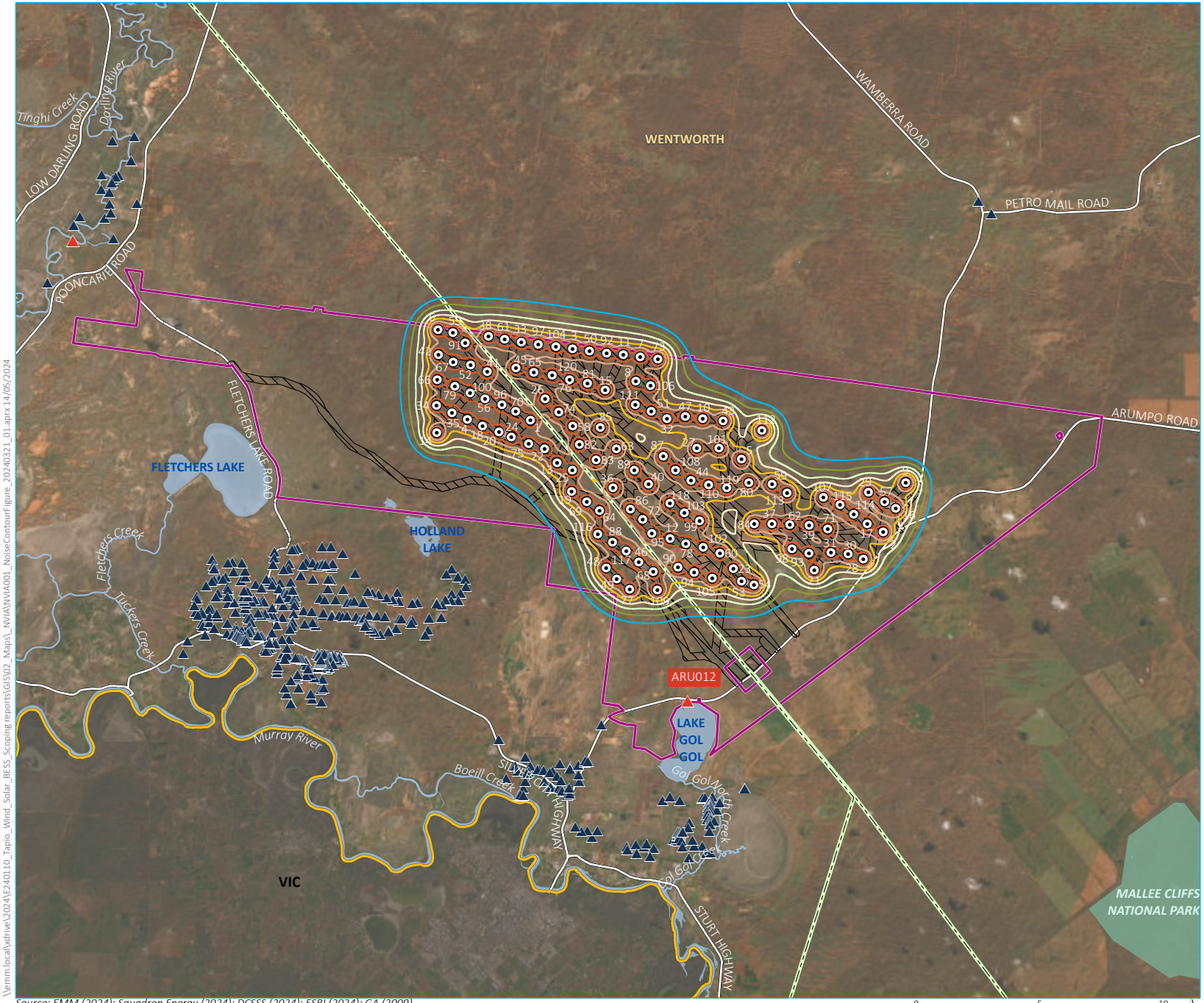
4.1.2 Associated receivers

There is only one associated receiver within 5km of the proposed wind farm. Table 4.2 provides the results for this associated receiver. Figure 4.1 shows the predicted noise contours from the proposed wind farm in relation to the associated receivers.

Table 4.2 Predicted noise levels – associated receivers

Receiver ID	Easting	Northing	Distance to nearest turbine (m)	Predicted operational noise level
ARU012	613666	6224516	4668	12.9

All associated receivers are predicted to comply with the recommended base criterion of 45 dBA.



KEY

- Gol Gol wind investigation area
- Wind farm development corridor
- Existing 220 kV transmission line
- Wind farm- turbine location

Sensitive receiver

- Associated residence
- Non-associated residence

Operational noise contour (dB)

- 35 dB
- 37 dB
- 39 dB
- 41 dB
- 43 dB
- 45 dB
- 47 dB
- 49 dB
- 51 dB

Existing environment

- Major road
- Named watercourse
- Named waterbody
- NPWS reserve
- Local government area
- Victoria

Source: EMM (2024); Squadron Energy (2024); DCSSS (2024); ESRI (2024); GA (2009)

0 5 10 km

GDA2020 MGA Zone 54

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Wind turbine generator operational noise contours

Gol Gol Wind Farm
Noise and Vibration Impact Assessment
Figure 4.1

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5 Noise and vibration assessment

As part of the EIS for this project, a NVIA will be prepared. This assessment will focus on:

- construction noise and vibration
- traffic noise assessment due to construction traffic
- operational wind farm noise
- operational noise from ancillary equipment.

Construction noise and vibration impacts will be assessed against the ICNG and *Assessing vibration: a technical guideline* (DEC, 2006). Once construction schedules are developed and traffic impacts understood, an assessment of road traffic noise arising from haul routes and construction worker traffic will be conducted against the *NSW Road Noise Policy* (EPA, 2011).

Ancillary equipment for the wind farm may include various size transformers and associated HVAC equipment, although at this stage, there is no firm design information to conduct a detailed assessment. A detailed assessment will be conducted against environmental noise requirements of NPFI.

As more information becomes available during the design process, an assessment at all hub height wind speed ranges will be conducted to confirm compliance with the current/transitioning NSW renewable energy noise regulatory framework for the final design and available technology. The results of these assessments will be incorporated into the NVIA which will support the EIS for this project.

6 Conclusion

A preliminary assessment has been conducted for operational wind turbine noise for the proposed project in accordance with the NSW Noise Assessment Bulletin demonstrating that for the proposed wind turbine technology and turbine locations modelled, the minimum threshold target of 35 dBA would be achieved at all of the non-associated landowners under circumstances of maximum emissions (i.e. worst case scenario).

Appendix F
Social Impact Scoping Worksheet

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Social Impact Assessment (SIA) Worksheet Date: May 2024

CATEGORIES OF SOCIAL IMPACTS	POTENTIAL IMPACTS ON PEOPLE	ASSESSMENT LEVEL FOR EACH IMPACT				PROJECT REFINEMENT	MITIGATION / ENHANCEMENT MEASURES
what **social impact categories** could be affected by the project activities	What impacts are likely, and what concerns/aspirations have people expressed about the impact? Summarise how each relevant stakeholder group might experience the impact. NB. Where there are multiple stakeholder groups affected differently by an impact, or more than one impact from the activity, please add an additional row.	Level of assessment for each social impact	What methods and data sources will be used to investigate this impact?			Has the project been refined in response to preliminary impact evaluation or stakeholder feedback?	What **mitigation / enhancement measures** are being considered?
			Secondary data	Primary Data - Consultation	Primary Data - Research		
Decision-making systems Surrounding Way of life Community	Community stress and anxiety due to uncertainty around project layout including final number and proposed placement of WTGs	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Refinements to Project design and layout based on feedback from early engagement.
Surroundings Way of life Community	Reduced rural lifestyle values and sense of place due to changes to the visual landscape from the presence of WTGs	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Visual impact assessment and mitigation treatments •Ongoing community and stakeholder engagement. •Refinements to Project design and layout based on feedback from early engagement.
Surroundings Way of life Livelihoods	Land use competition between agriculture and renewable energy generation affecting private property use	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Landholder agreements to reasonably compensate for disruptions to existing operations/land use
Livelihoods Surroundings	Increased biosecurity risks potentially affecting agricultural productivity and subsequent profitability (e.g.,introduction of weeds and pests)	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	• Weed risk assessment and implementation of land aceess biosecurity measures such as vehicle washdowns.
Health and wellbeing Way of life	Potential amenity and wellbeing impacts from noise, dust and visual impacts on sensitive receivers during construction	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Environmental controls during construction based on air quality, acoustic and visual impact assessments. •Advanced notification to local residents on timing of construction activities.
Access Way of life	Changes or disruptions to road and traffic conditions resulting in reduced access/connectivity on local road network and increased frustration and stress for existing road users.	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Advanced notification to local residents on timing of construction activities including road closures and diversions. •Development of a Traffic Management Plan
Health and wellbeing	Perceived deterioation of public safety due to additioanl construction traffic on local and regional roads.	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Advanced notification to local residents on timing of construction activities including road closures and diversions. •Development of a Traffic Management Plan
Access	Increase in demand for local housing (rentals) and short-term accommodation	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Development of a Workforce Accommodation Strategy
Health and wellbeing	Perceived increase in health and safety risks due to Wind Farm associated hazards including shadow flicker, sleep disturbance, aviation incidents, bird strikes and blade throw risks	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Community safety and hazard risk management •Community engagement and education to improve understanding of Wind Farm co-existence and hazard risk reduction procedures
Livelihoods	Increase in trade and revenue for local businesses in key townships due to patronage/expenditure by the project workforce.	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Engage with local employment and training service providers to establish local capacity and maximise opportunities for local skills development and employment. •Commitment to use local contractors and supplier where feasible.
Culture	Potential disturbance or changes to sites or landscapes of tangible and intangible cultural heritage significance	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Meaningful engagement with relevant stakeholders including Traditional Owners and the broader Aboriginal community. •Aboriginal heritage assessment and development of an Aboriginal Cultural Heritage Management Plan
Surroundings Community Culture	Impacts to local environmental values resulting from land clearing, and potential for change to local biodiversity	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Refinement to project design and layout to avoid/further minimise known habitats based on feedback from early engagement with local landholders and detailed biodiversity surveys.

CATEGORIES OF SOCIAL IMPACTS	POTENTIAL IMPACTS ON PEOPLE	ASSESSMENT LEVEL FOR EACH IMPACT				PROJECT REFINEMENT	MITIGATION / ENHANCEMENT MEASURES
what **social impact categories** could be affected by the project activities	What impacts are likely, and what concerns/aspirations have people expressed about the impact? Summarise how each relevant stakeholder group might experience the impact. NB. Where there are multiple stakeholder groups affected differently by an impact, or more than one impact from the activity, please add an additional row.	Level of assessment for each social impact	What methods and data sources will be used to investigate this impact?			Has the project been refined in response to preliminary impact evaluation or stakeholder feedback?	What **mitigation / enhancement measures** are being considered?
			Secondary data	Primary Data - Consultation	Primary Data - Research		
Livelihoods	Economic benefits for landholders hosting WTGs through receipt of compensation payments	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	
Decision-making systems	Community stress and anxiety due to uncertainty around project layout including final number and proposed placement of WTGs	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Refinements to Project design and layout based on feedback from early engagement.
Livelihoods	Increased compeitition for labour and reduced availability of skilled labour for local employers.	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Engage with relevant stakeholder to understand local and regional skills gaps and development opportunities. •Provision of skills development and training initiatives by the project.
Livelihoods	Economic benefits associated with generation of local and regional business supply opportunities, including small-medium enterprises and Indigneous businesses.	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Advanced notification to local service providers on timing of construction activities and anticipated workforce ramp up. •Development of an Aboriginal Participation Plan to maximise access to business opportunities
Livelihoods	Generation of training and skills development opportunities in local and regional area, including for traditionally under-represented groups	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Workforce Development Strategy •Development of an Aboriginal Participation Plan to maximise access to employment pathways
Access Way of Life Community	Potential increase in demand and strain on local/regional services and infrastrcuture due temporary population increase attributed to project workforce.	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Advanced notification to local service providers on timing of construction activities and anticipated workforce ramp up. •Development of a community benefit plan for the project including initiatives to supports community infrastructure and service provision
Community	Improved/enhanced local/regional social outcomes due to projet's community investment initiatives.	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Development of a community benefit plan for the project including establishment of a community investment initiative/program
Way of Life Community	Contribute to intergenerational equity through provision of infrastructure that enables the transition to renewable energy generation.	Detailed assessment of the impact	Required	Broad consultation	Targeted research	Unknown	•Circular economy, supply chain transition and workforce development strategies to support renewable energy projects
INSERT NEW ROWS ABOVE THIS ROW							

Appendix G
Cumulative impact scoping

EMM
creating opportunities

G.1 Cumulative impact scoping

Text here

Key	
Detailed assessment	The project may result in significant impacts on the matter, including cumulative impacts. Detailed assessment is characterised by: 1. Potential overlap in impacts between a future project and the proposed project. 2. Potential for significant cumulative impacts as a result of the overlap, requiring detailed technical studies to assess the impacts. 3. Sufficient data is available on the future project to allow a detailed assessment of cumulative impacts with the proposed project for the relevant matter. 4. Uncertainties exist with respect to data, mitigation, assessment methods and criteria
Standard assessment	The project is unlikely to result in significant impacts on the matter, including cumulative impacts. Standard assessments are characterised by: 1. Impacts are well understood. 2. Impacts are relatively easy to predict using standard methods. 3. Impacts are capable of being mitigated to comply with relevant standards or performance measures. 4. The assessment is unlikely to involve any significant uncertainties or require any detailed cumulative impact assessment.
N/A	No potential overlap in impacts between a future project and the proposed project that would warrant any consideration in the cumulative impact assessment.

Table G.1 Cumulative impact scoping table

Relevant project	Approximate distance	Project status	Terrestrial biodiversity	Aboriginal heritage	Amenity – visual	Amenity - noise	Social and economic	Traffic and access
Project EnergyConnect	Adjacent	Approved – under construction	Impacting similar PCTs (<50km)	Overlap in impact areas	Local visual catchment	No construction timing overlap	No construction timing overlap	No construction timing overlap
Mallee Solar Farm	2 km south east	Proposed – EIS in preparation	Impacting similar PCTs (<50km)	Local context	Local visual catchment	Possible construction overlap	Construction workforce	Possible construction overlap
Mallee Wind Farm	10 km east	Proposed – EIS in preparation	Impacting similar PCTs (<50km) Potential operational impacts to birds and bats	Local context	Local visual catchment	Possible construction and operational overlap	Construction workforce	Possible construction overlap
Buronga Landfill Expansion	5 km south	Operational	Impacting similar PCTs (<50km)	Local context	Sufficient separation	Sufficient separation	No construction timing overlap	No construction timing overlap
Euston Mineral Sands mine	40 km south east	Proposed – EIS in preparation	Impacting similar PCTs (<50km)	Regional context	Sufficient separation	Sufficient separation	Construction workforce	Sufficient separation
Euston Wind Farm	55 km south east	Proposed – EIS in preparation	Impacting similar PCTs (>50km)	Regional context	Sufficient separation	Sufficient separation	Construction workforce	Sufficient separation
Koorakee Energy Park	60 km south east	Proposed – awaiting SEARs	Impacting similar PCTs (>50km)	Regional context	Sufficient separation	Sufficient separation	Construction workforce	Sufficient separation
Limondale Solar Farm	135 km south east	Operational	Impacts completed	Regional context	Sufficient separation	Sufficient separation	No construction timing overlap	Sufficient separation
Sunraysia Solar Farm	135 km south east	Operational	Impacts completed	Regional context	Sufficient separation	Sufficient separation	No construction timing overlap	Sufficient separation
Junction Rivers Wind Farm	140 km south east	Proposed – EIS in preparation	Impacting similar PCTs (>50km)	Regional context	Sufficient separation	Sufficient separation	Sufficient separation	Sufficient separation
Balranald Mineral Sands mine	105 km east	Approved	Impacting similar PCTs (>50km)	Regional context	Sufficient separation	Sufficient separation	No construction timing overlap	Sufficient separation

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