SQUADRON ENERGY

Gol Gol Solar Farm

Scoping Report

Final
May 2024

Gol Gol Solar Farm

Scoping Report

Prepared for Squadron Energy

May 2024

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Scoping Report

Squadron Energy

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10 May 2024

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Executive Summary

Squadron Renewable Energy Developments Pty Ltd (Squadron Energy), 'the Applicant', proposes to develop the Gol Gol Solar Farm project (the project) approximately 12 kilometres (km) north of Mildura in the Wentworth local government area (LGA) in the Western Murray Region of New South Wales.

The project will include the installation of solar photovoltaic (PV) panels as well as transmission, substations, ancillary and temporary infrastructure. The project will have an installed capacity of up to approximately 600 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 a single freehold land parcel owned by a single landowner. A smaller section of this landholding, the project investigation area, has been investigated for the purpose of locating the solar farm, in the eastern part of the landholding and north of the Buronga substation.

The project investigation area is approximately 2,900 hectares (ha), although a proposed development corridor of approximately 2,500 ha is proposed to site the solar infrastructure, including PV panels. 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, social and access – traffic. Aspects requiring standard assessment include amenity – noise and vibration, 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 Solar Farm (the project) approximately 12 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 freehold land that is used for agricultural activities.

The project will include the installation of solar photovoltaic (PV) panels as well as transmission, substations, ancillary and temporary infrastructure. The project will have an installed capacity of up to approximately 600 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 will contribute to meeting these objectives and carries the additional benefits including:

- job creation during the construction and operational phases
- indirect economic benefits to the local community throughout the life of the project.

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

1.3 Project overview

The key components of the project are:

- the installation of PV panels with a generation capacity of up to 600 MW, accommodated within an area of approximately 1,500 ha
- a network of underground and overhead powerlines will be installed across the development corridor and will connect the solar PV panels to up to two on-site collector substations and transmission connections to the Buronga Substation
- infrastructure including private access, internal tracks, operations and maintenance facilities.

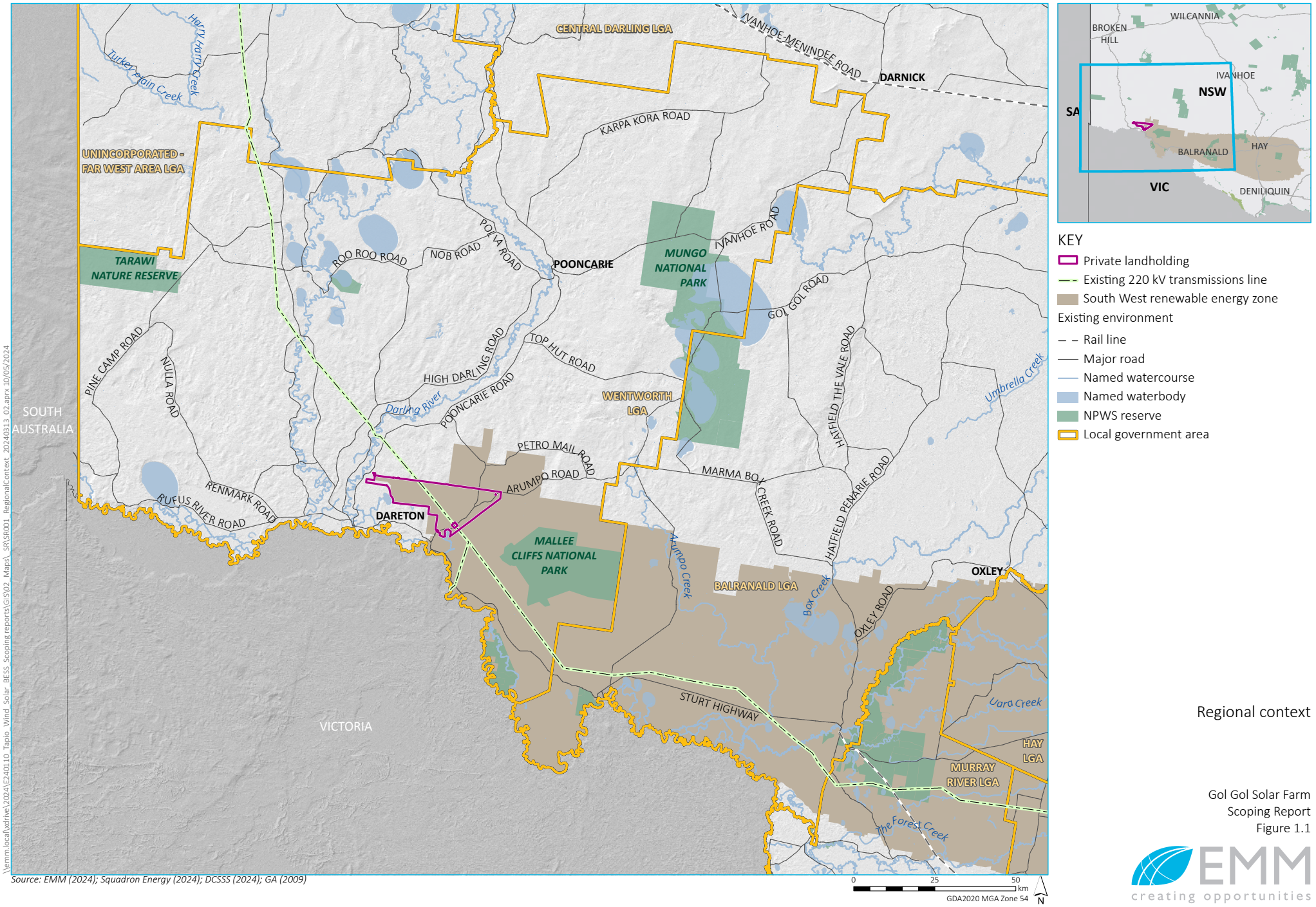
The project is located approximately 12 km north east of the regional Victorian city of Mildura and 10 km north of Gol Gol. The project is located in the Wentworth Shire Council LGA and in the western part of the South West Renewable Energy Zone (REZ). The regional context shown in Figure 1.1.

The project is located within a single freehold land parcel, Lot 11 DP 1262716. A smaller section of this landholding has been investigated for the purpose of locating the solar farm and is referred to as the project investigation area. Within the project investigation area is the proposed development corridor, the land within which all elements of the Solar Farm are proposed to be located.

The identified development corridor is about 2,500 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.



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

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Regional context

Gol Gol Solar 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)
- *Large-scale Solar Energy Guideline for State Significant Development (DPIE 2022d).*

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

There is currently no existing or approved development within the project investigation area that would be incorporated into the project or operated in conjunction with the project under a separate development consent or approval.

The project will ultimately connect to the Buronga Substation located on Arumpo Rd approximately 10 km north of Buronga. The project is located on freehold land directly adjacent to the Buronga Substation lot. The final connection proposal would be detailed in the EIS.

Squadron Energy is also proposing to develop separate Wind Farm (Gol Gol Wind Farm) and Battery Energy Storage System (Gol Gol BESS) projects on lands adjacent to and partially overlapping the Solar 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 (km^2) and forms part of the NSW Murray Region (Figure 1.1). The project is located approximately 12 km north east of Mildura and 10 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 area, intersect at Buronga and connects the region to major population centres in NSW, Victoria, and South Australia.

The development corridor accommodates the Solar Farm and is located within the South West REZ and 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 and SSD modification projects 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 12 km north east 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. Wentworth is approximately 35 km west of the project and has a population of around 1,577 people. Dareton is approximately 20 km west of the project and has a population of around 456 people. Buronga is approximately 10 km south of the project and has a population of around 1,252 people. Gol Gol is approximately 10 km south of the project and has a population of around 1,959. The townships are all located on the Sturt Highway and near the Murray River.

2.2 Project investigation and surrounds

The Solar Farm is located on predominantly freehold land (Lot 11 DP 1262716) owned by a single landowner who undertakes agricultural operations within the land. The Solar Farm investigation area is a smaller subset of the larger landholding and predominately consists of land used for agricultural purposes, mainly cropping and grazing, with some native vegetation within and surrounding the site.

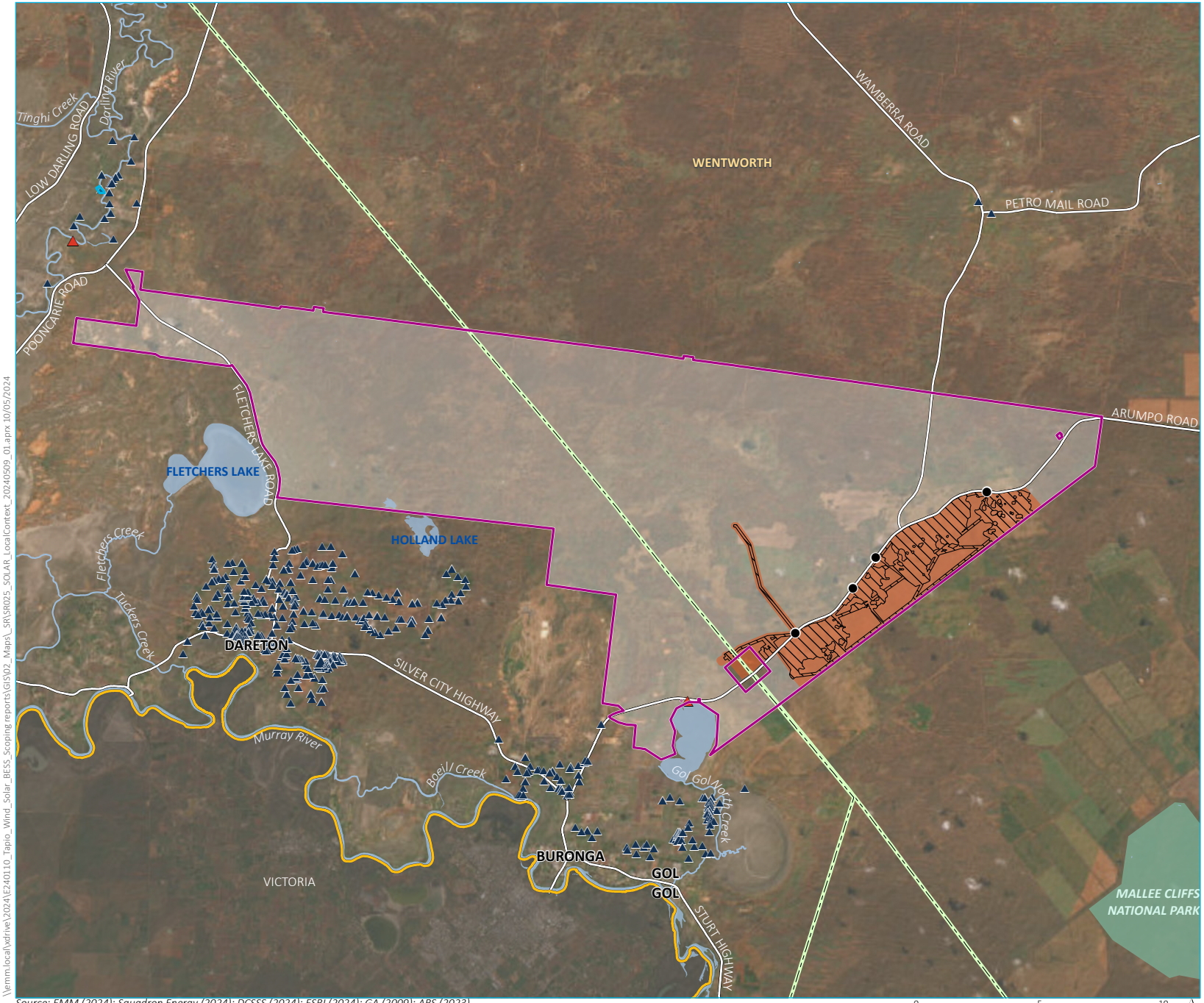
Site access will be via Arumpo Road, which traverses the project investigation area. Arumpo Road would be accessed predominantly from the Sturt Highway and Silver City Highway to the south of the project (Figure 2.1). Arumpo Road is a sealed road, from which internal access tracks will be established 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 and Buronga.

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 project investigation area 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: • Buronga - approximately 10 km south (population of approximately 1,252 (ABS 2021)) • Gol Gol - approximately 10 km south (population of approximately 1,959 (ABS 2021)) • Wentworth – approximately 12km south west (population of approximately 1,577 (ABS 2021)) • Dareton – approximately 20 km west (population of approximately 456 (ABS 2021))
Landscape	The landscape within the development corridor is mostly flat expanses with gentle rolling hills used for grazing or cropping. stands of native trees. The development corridor is predominantly previously cleared land with patches of remnant vegetation and disturbed native vegetation.
Land use	Land use within the project investigation area includes agricultural operations (livestock grazing as well as discrete areas for cropping).
Land ownership	The development corridor is on freehold land, comprising one lot (Lot 11 DP 1262716). 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 • Three Mile Creek • Holland Lake • Murray River • Various unnamed waterways
Nearby infrastructure	State Roads: Silver City Highway (B79) and Sturt Highway (A20), Local Roads: Arumpo Road, Wamberra Road Energy infrastructure: 220kV transmission line Energy infrastructure under construction: Project EnergyConnect and Buronga Substation



KEY

- Private landholding
- Solar farm development corridor
- Existing 220 kV transmission line
- Solar farm investigation area
- Site access

Sensitive receiver

- Dwelling associated with the project
- Dwelling not associated with the project
- State heritage register

Existing environment

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

Gol Gol Solar Farm
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Figure 2.1

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2.2.1 Property vegetation plan

A property vegetation plan is in place in the freehold landholding, that was approved on 22 August 2017 before the repeal of the Native Vegetation Act 2003. The exact boundaries of the protection or offset areas under this plan are not clear but are not thought to intersect with the solar development corridor. The PVPs will be investigated further as part of the EIS and offset areas and areas not to be cleared will be accommodated through detailed design.

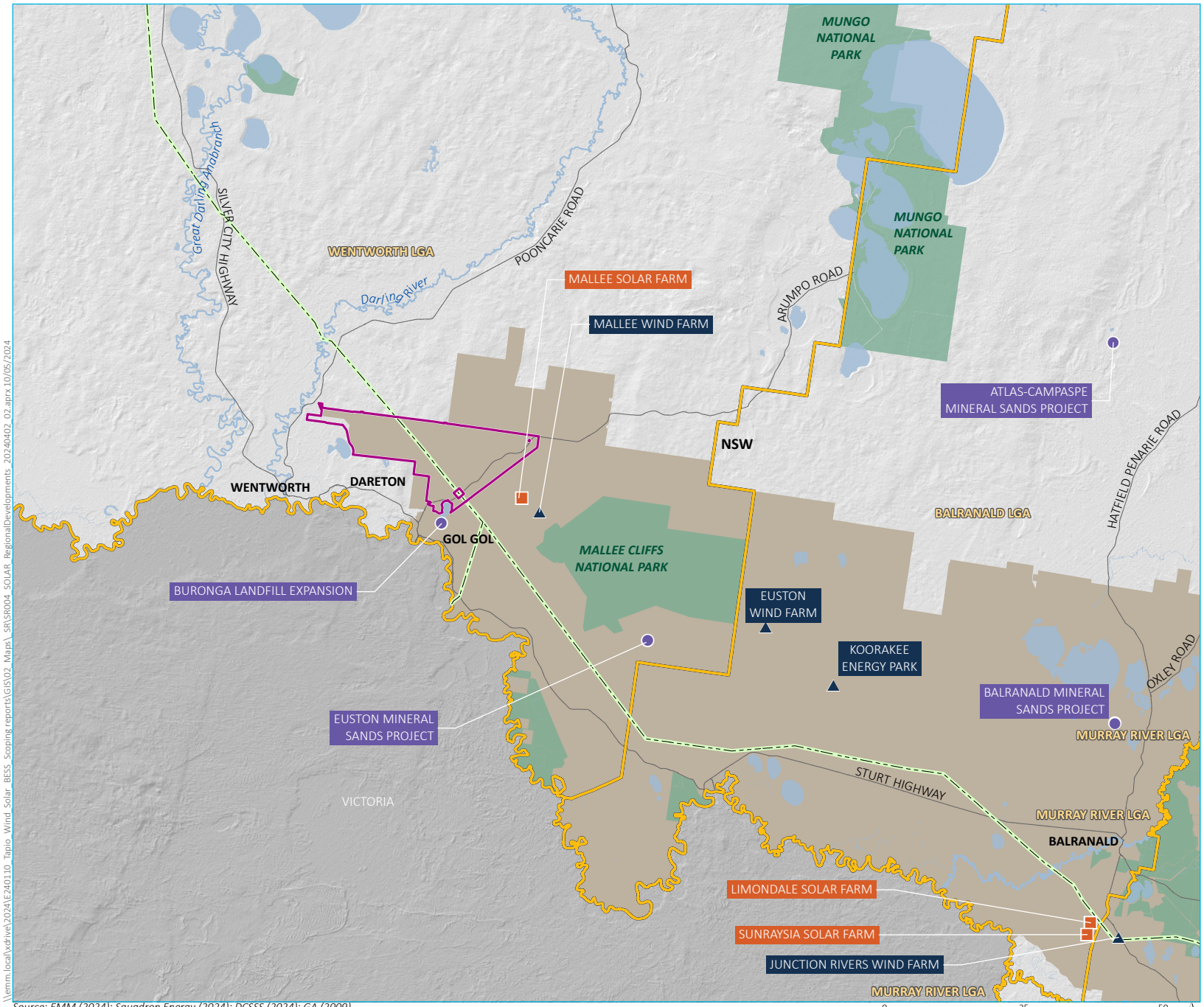
2.2.2 Renewable energy and other developments

The project is within the South West REZ and 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, with further details on these nearby projects provided in the cumulative impact scoping in Section 6.3.7 and Appendix E.

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

- Private landholding

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)

0 25 50 km

GDA2020 MGA Zone 54

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Renewable energy and other developments in the region

Gol Gol Solar Farm
Scoping Report
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 frameworks and policy context

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 solar 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 frameworks and policy context

Plan, policy or strategy	Description	Alignment with strategic framework
	2024 before its finalisation and publication circa June 2024.	The Draft ISP recognises that renewable generation, focused in identified REZ's is an optimal development path for reliability and affordability within the NEM. 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.

Table 2.3 Alignment with key strategic planning frameworks and policy context

Plan, policy or strategy	Description	Alignment with strategic framework
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.
Large-Scale Solar Energy Guideline (DPE 2022d)	The *Large-Scale Solar Energy Guideline* (DPE 2022d) provides the community, industry, applicants and regulators with guidance on the planning framework for the assessment of large-scale solar projects and identifies the key planning considerations relevant to solar 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 for 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. These updates include minor amendments to the *Large-Scale Solar Energy Guideline* including updates to the considerations and methodologies of landscape and visual impact assessment and requiring details regarding decommissioning costs. The *Benefit-Sharing Guideline* contains guidance for benefit sharing with communities and planning agreements for solar 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 frameworks and policy context

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 under the Wentworth LEP 2011. The solar farm development corridor comes in close proximity to but has been developed to avoid the environmental conservation zoning C2. 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 will take advantage of existing infrastructure to provide electricity storage capacity for new renewable energy projects.
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 – Recent emergence of large-scale solar farms has caused a rise in local full-time employment.

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 600 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 solar resource
- landholder agreement to host the solar farm
- positioning within the South West REZ
- minimal biodiversity constraints
- flat topography and large land area available to position infrastructure and avoid constraints
- proximity directly adjacent to existing transmission lines 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 of a large-scale solar PV generation facility and associated infrastructure (Figure 3.1).The project will have an installed capacity of up to 600 MW, accommodated within area of approximately 1,500 ha.

Project infrastructure will be contained within the development corridor, which has been sized with sufficient flexibility to accommodate design refinement during 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.

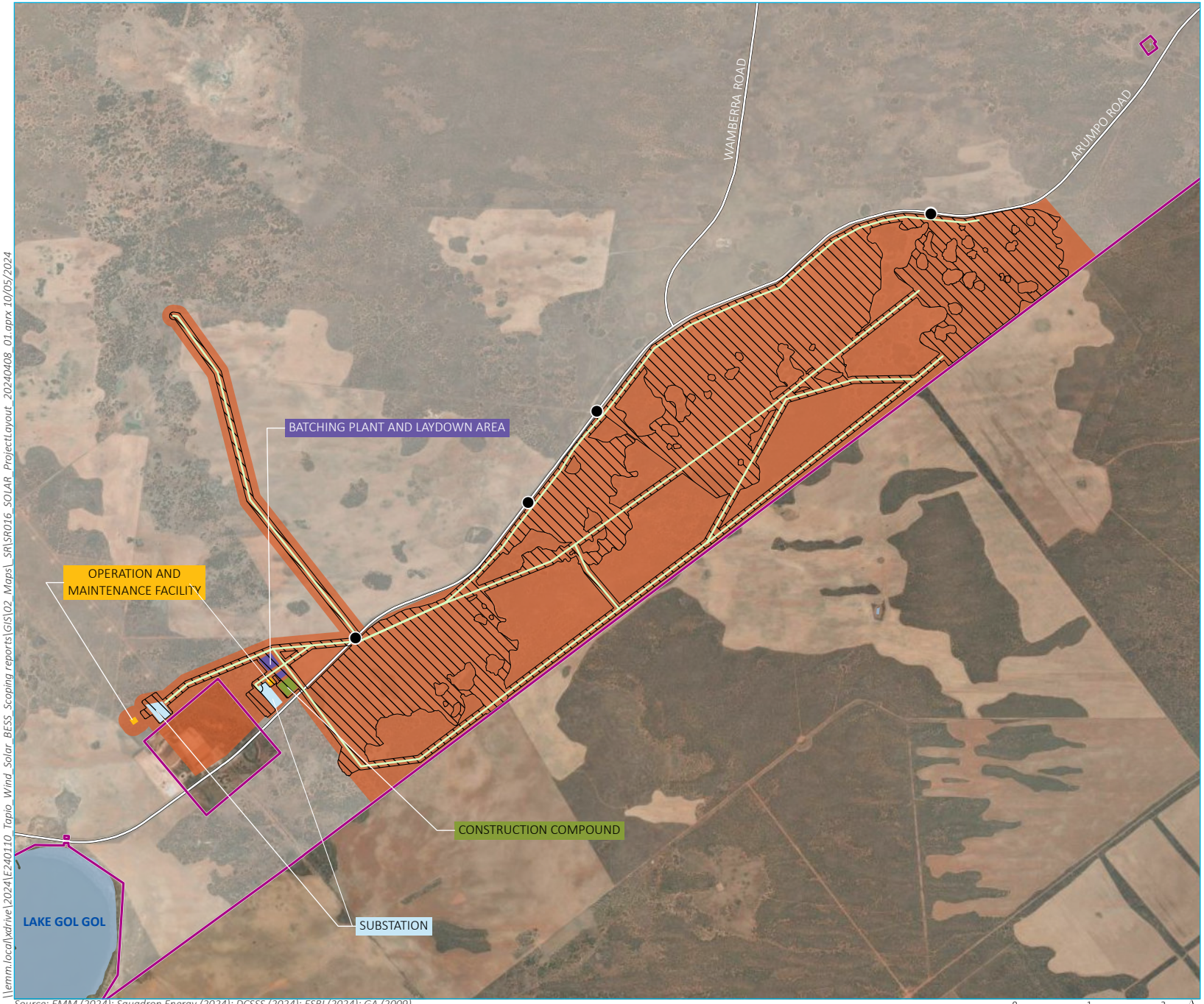
A summary of the project elements is provided in Table 3.1 and detailed in Figure 3.1, with further details provided in Sections 3.2 to 3.4.

Table 3.1 Indicative project summary

Project element	Details
Overview	
Investigation area	Approximately 3,000 ha
Development corridor	Approximately 2,500 ha (subject to further design refinement as the project progresses)
Land tenure	The development corridor is on freehold land (Lot 11 DP 1262716), owned by a single landowner.
Project capacity	Up to 600 MW
Solar PV	
Solar PV generation area	600 MW accommodated within an area of approximately 1,500 ha
Number of PV modules	Approximately 2 million
Ancillary Infrastructure	
Substations	Up to 2 locations. Approximately 8 ha each
Operations and maintenance compounds	Up to 2 locations. Approximately 1 ha each
Transmission	Overhead and / or underground transmission lines will be constructed to connect the Solar farm to the Gol Gol BESS and/or the Buronga Substation. The route and specifications of the connection will be presented in the EIS.
Internal roads and drainage	Approximately 6 m wide unsealed private roads (excluding batters)
Temporary construction facilities	
Operations and maintenance facility	Up to two locations. Approximately 1ha each.
Construction compound	Approximately 6 ha

Table 3.1 Indicative project summary

Project element	Details
Laydown area / batching plant Option 1	Approximately 5 ha
Laydown area / batching plant Option 2	Approximately 2 ha
Roads	
Site access	Access will be primarily from Arumpo Road, which passes through the development corridor. Arumpo Road intersects 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 at Arumpo Road. OSOM upgrades along State roads from NSW ports to the South West REZ are assumed to be managed by EnergyCo and TfNSW, as per the 'Port to REZ' Memorandum of Understanding (MOU) finalised 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	Construction materials will be sourced regionally, locally and through available suppliers.
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 200 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 hours	24 hours per day/7 days per week
Operations on-site workforce	Approximately 4 FTE
Project lifespan	Approximately 30 years, Repowering of the site at the end of the Project's life may be considered.



KEY

- Private landholding
- Site access
- Overhead transmission line
- Solar farm development corridor
- Solar farm investigation area
- Batching plant and laydown area
- Construction compound
- Operation & maintenance facility
- Substation

Existing environment

- Major road
- Named watercourse
- Named waterbody

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

0 1 2 km

GDA2020 MGA Zone 54

N

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Project layout

Gol Gol Solar Farm
Scoping Report
Figure 3.1

EMM
creating opportunities

3.2 Physical layout and design

3.2.1 Photovoltaic panels

The project will include the installation of PV modules mounted on single-axis tracking systems that will be configured in rows positioned to maximise the use of the available solar resource. PV modules will be fixed to and supported by ground-mounted framing.

The PV modules will be up to 2.5 m from the ground when in the horizontal position, while the lower edge of each PV module will be no less than 0.3 m from the ground or above the flood depth level at the maximum tilt angle. The maximum height of the modules to the higher edge from ground level at the maximum tilt angle is expected to be approximately 4.7 m, which is assuming a '2 in portrait' (2P) configuration (i.e. worst-case assumption for visual impact assessment).

As shown in Figure 3.1, is anticipated that PV modules will be installed east of Arumpo Road, on land predominately cleared of native vegetation. The PV modules will be installed in parallel rows within each section, with an indicative spacing of approximately 5–10 m between each row. The rows of PV modules will be aligned in a north-south direction, allowing the modules to rotate from east to west during the day, tracking the sun's movement.

Initial investigations indicate approximately 2 million PV modules can be installed for the project; however, the final design will depend on a range of factors including module technology, available grid capacity, economies of scale, grid connection and environmental constraints.

DC cables will be strung underneath the PV modules, housed in cable trays, or be passed through the tracker tubes before being connected to the power conversion units (PCUs). The PCUs convert the DC electricity generated by the PV modules into AC form, which is compatible with the electricity grid. The exact dimensions and configuration of the PCUs will be determined during detailed design.

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 solar PV panels to up to two 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
- an operation and maintenance facility
- hardstands

- internal roads.

Indicative details of construction and operational ancillary facilities are included in Table 3.1 and indicative locations for some permanent ancillary areas are shown in Figure 3.1.

3.2.4 Site access

Site access will be from Arumpo Road via the Silver City Highway (Figure 3.1). Arumpo Road is sealed and accommodates one lane in each direction of travel.

Internal access tracks will also be established to connect the solar farm and other key infrastructure elements back to Arumpo 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 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 200 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 and the local community 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 solar technology used and energy market demands. Consideration will be given to the responsible decommissioning or repowering of the site at the end of the Projects life.

Key activities during operations will be energy generation, with the solar component 365 days a year but limited to the daylight hours of the solar resource. During operation, the project will require up to 4 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 PV modules, inverters, transformers and 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.

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, 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. 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 the solar farm to achieve targeted energy generation, while factoring in the initially identified environmental constraints. The timing of the project will allow for the phased connection to the BESS (Gol Gol BESS) and to the Buronga Substation.

Squadron Energy is also proposing to develop separate Wind Farm (Gol Gol Wind Farm) and BESS (Gol Gol BESS) projects on lands adjacent to and partially overlapping the solar project investigation area. These projects will be subject to separate SSD applications.

Further details on the timing of the solar 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 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
- minimising impacts to the road network by identifying any required road upgrades, road maintenance contributions and other traffic control measures.
- 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 2022e) (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*	The POEO Act regulates pollution to the environment and requires licences for environment protection including waste, air, water and noise pollution control. Section 48 of the POEO Act requires an environment protection licence (EPL) to undertake scheduled activities at any premises. Scheduled activities are defined in Schedule 1 of the POEO Act. Solar farms are not a scheduled activity and therefore an EPL is not required
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)	There are no civil aviation regulations or rules regarding the assessment or installation of solar farms. CASA applies the guidance information prepared by the Federal Aviation Administration (FAA) when assessing the suitability of a solar installation near Wentworth Aerodrome and Mildura Airport to inform the EIS. The final determination sits with DPHI. 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.
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 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 Solar project has been developed and is available at the project website (https://www.squadronenergy.com/our-projects/gol-gol-solar-farm).

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	March 2024 - 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 Wind 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 numerous 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 2:00 pm to 7:00 pm. The event 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 Solar Farm project, the two benefits with the highest positive rating were renewable energy generation (10 people) and employment opportunities (9 people). In contrast, the potential impacts with the highest negative rating were increased traffic, impacts on agriculture activities, changed land use and access, and health impacts due to reduced air quality and dust throughout construction (6 people).

Four survey respondents expressed frustration over the proximity of the solar farm to their residence, with these sentiments being focused on perceived unequal benefit from the generated energy. 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.

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 solar farm related to the inclusion test excavations as part of the heritage assessment.

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 the impacts of the project, 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 B) and visual impact (Appendix C).

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 A 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
	Social
	Access - Traffic
Standard	Amenity – Noise and vibration
	Heritage - Historic
	Land
	Water
	Air
	Hazards and risk
	Biodiversity – Aquatic flora and fauna
	Economic

Table 6.1 Level of assessment required in EIS

Level of assessment	Aspect
	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 6.2.5, 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 B) 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 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

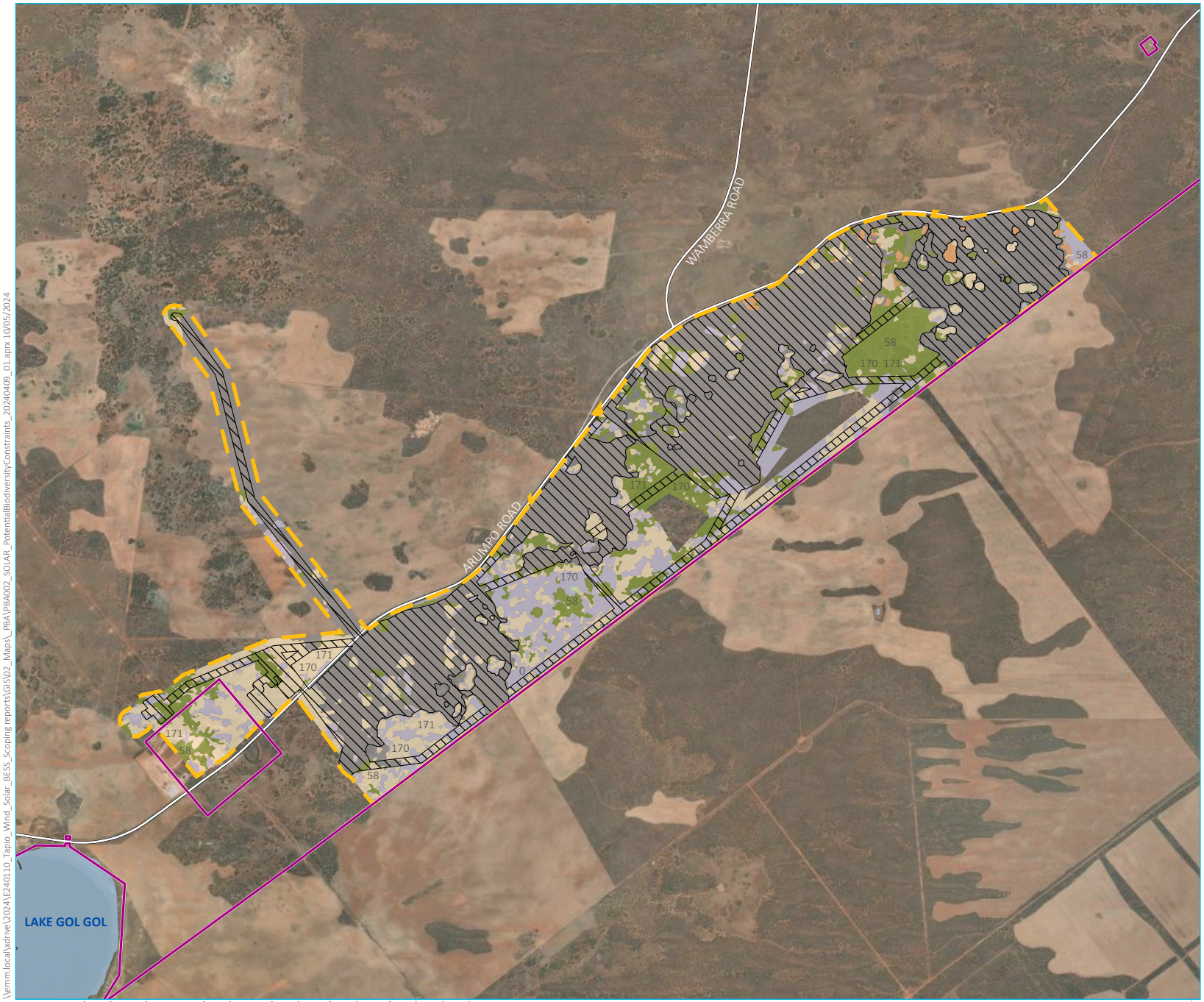
The project investigation area is located within the Murray Darling Depression Interim Biogeographic Regionalisation for Australia (IBRA) and the South Olary Plain IBRA sub-region. It is situated 9 km north of the Murray River and 29 km east of the Darling River. Two nationally important wetlands, Lake Ranfurly and Kings Billabong Wetlands, are located 14 km south of the project investigation area. Several significant waterbodies, including Lake Gol Gol and Gol Gol Swamp are located approximately 2 km south of the project investigation area. Mallee Cliffs National Park is located approximately 13 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 half of the project investigation area has previously been cleared and half contains patches of remnant vegetation and disturbed native vegetation. There are no areas mapped on the NSW Government Biodiversity Values Map occurring within the project investigation area.

a Native vegetation

A total of six native Plant Community Types (PCTs) are predicted to occur in the project investigation area by the NSW SVTM. These include a range of wetland, open woodland, shrubland and mallee communities. There is also one non-native PCT (PCT 0).

PCTs mapped within project investigation area are shown in Figure 6.1.



KEY

- Private landholding
- Solar farm development corridor
- Solar farm investigation area

Plant community type ID

- 0 (Cleared)
- 11
- 43
- 58
- 154
- 170
- 171

Existing environment

- Major road
- Minor road
- Named waterbody

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

0 2.5 5 km

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Plant community types

Gol Gol Solar Farm
Scoping report
Figure 6.1

EMM
creating opportunities

b Threatened ecological communities

Six threatened ecological communities (TECs) listed under the 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 site are summarised in Table 6.2. Of these, three are considered with a moderate to high likelihood of occurring in the project investigation area:

- *Acacia loderi shrublands*
- *Acacia melvillei shrublands in the Riverina and Murray-Darling Depression bioregions*
- *Mallee Bird Community of the Murray Darling Depression Bioregion*.

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, 170	**Moderate**
Acacia melvillei shrublands in the Riverina and Murray-Darling Depression bioregions	E	-	58, 170	**High**
Artesian Springs Ecological Community in the Great Artesian Basin	CE	-	-	**Nil**
Mallee Bird Community of the Murray Darling Depression Bioregion	-	E	170, 171	**High**
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	-	CE	170	**Low**
Allocasuarina luehmannii (Buloke) Woodlands of the Riverina and Murray-Darling Depression Bioregions	E	E	-	**Low**

E = Endangered, CE = Critically Endangered

c Threatened and migratory species

In total, 104 threatened and migratory species listed under the BC Act or EPBC Act were identified with potential to occur with 10 km of the project investigation area, including 20 plants, 51 birds, 6 fish, 13 mammals, 12 reptiles and 2 frogs.

Of these species, 36 (2 flora and 34 fauna) species are known to occur within or nearby the project investigation area, according to NSW Bionet Atlas database records. These species are listed in Table 6.3.

Table 6.3 Threatened species known to occur in the project locality

Species	Conservation status (BC Act)	Conservation status (EPBC Act)
Bardick (*Echiopsis curta*)	Endangered	Not listed
Bitter Quandong (*Santalum murrayanum*)	Endangered	Not listed
Black Falcon (*Falco subniger*)	Vulnerable	Not listed
Black-breasted Buzzard (*Hamirostra melanosternon*)	Vulnerable	Not listed
Bolam's Mouse (*Pseudomys bolami*)	Endangered	Not listed
Chestnut Quail-thrush (*Cinclosoma castanotum*)	Vulnerable	Not listed

Table 6.3 Threatened species known to occur in the project locality

Species	Conservation status (BC Act)	Conservation status (EPBC Act)
Crowned Gecko (*Lucasium stenodactylum*)	Vulnerable	Not listed
Harrow Wattle (*Acacia acanthoclada*)	Endangered	Not listed
Hooded Robin (*Melanodryas cucullata cucullata*)	Vulnerable	Endangered
Gilbert's Whistler (*Pachycephala inornata*)	Vulnerable	Not listed
Grey Falcon (*Falco hypoleucos)*	Vulnerable	Vulnerable
Inland Forest Bat (*Vespadelus baverstocki*)	Vulnerable	Not listed
Jeweled Gecko (*Strophurus elderi)*	Vulnerable	Not listed
Little Eagle (*Hieraeetus morphnoides*)	Vulnerable	Not listed
Little Pied Bat (*Chalinolobus picatus*)	Vulnerable	Not listed
Major Mitchell's Cockatoo (*Lophochroa leadbeateri*)	Vulnerable	Endangered
Mallee Worm Lizard (*Aprasia inaurita*)	Endangered	Not listed
Malleefowl (*Leipoa ocellata*)	Endangered	Vulnerable
Marble-faced Delma (*Delma australis*)	Endangered	Not listed
Painted Honeyeater (*Grantiella picta*)	Vulnerable	Vulnerable
Pied Honeyeater (*Certhionyx variegatus*)	Vulnerable	Not listed
Purple-gaped Honeyeater (*Lichenostomus cratitius)*	Vulnerable	Not listed
Redthroat (*Pyrrholaemus brunneus*)	Vulnerable	Not listed
Regent Parrot (*Polytelis anthopeplus monarchoides*)	Endangered	Vulnerable
Scarlet-chested Parrot (*Neophema splendida)*	Vulnerable	Not listed
Southern Ningaui (*Ningaui yvonneae*)	Vulnerable	Not listed
South-eastern long eared bat (*Nyctophilus corbeni*)	Vulnerable	Vulnerable
Southern Scrub-robin (*Drymodes brunneopygia*)	Vulnerable	Not listed
Southern Whiteface (*Aphelocephala leucopsis*)	Vulnerable	Vulnerable
Spotted Harrier (*Circus assimilis*)	Vulnerable	Not listed
Square-tailed Kite (*Lophoictinia isura*)	Vulnerable	Not listed
Varied Sitella (*Daphoenositta chrysoptera*)	Vulnerable	Not listed
Western Blue-tongued Lizard (*Tiliqua occipitalis*)	Vulnerable	Not listed
Western Pygmy Possum (*Cercartetus concinnus*)	Endangered	Not listed
White-bellied Sea-eagle (*Haliaeetus leucogaster*)	Vulnerable	Marine
Yellow-tailed Plain Slider (*Lerista xanthura*)	Vulnerable	Not listed

ii Potential impacts

Impacts on native vegetation, potentially including TECs listed under both the BC Act and EPBC Act, 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 some vegetation.

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.

a Candidate entities for serious and irreversible impacts

No candidate entity for serious and irreversible impacts (SAII) under the BC Act have been recorded near to the project investigation area, however, there is the potential for the A burr-daisy (*Calotis moorei*) to be present on site. *Allocasuarina luehmannii* (Buloke) *Woodland in the Riverina and Murray-Darling Depression Bioregions* is an SAII entity, but as addressed in Table 6.2, is unlikely to occur within the project investigation area.

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	Mallee Bird Community of the Murray Darling Depression Bioregion
Threatened plants	Purple-wood Wattle (*Acacia carneorum),* A saltbush (*Atriplex infrequens*), A Spear-grass (*Austrostipa metatoris),* Mossgiel Daisy (*Brachyscome papillosa),* A burr-daisy *(Calotis moorei),* Winged Peppercress *(Lepidium monoplocoides),* Menindee Nightshade *(Solanum karsense),* Slender Darling Pea *(Swainsona murrayana),* Yellow Swainson-pea (*Swainsona pyrophila)*
Threatened birds	Murray Mallee striated grasswren (*Amytornis striatus howei*), Southern Whiteface (*Aphelocephala leucopsis*), Australasian Bittern *(Botaurus poiciloptilus*) Sharp-tailed Sandpiper (*Calidris acuminata*), Curlew Sandpiper (*Calidris ferruginea*), Grey Falcon (*Falco hypoleucos*), Latham's Snipe *(Gallinago hardwickii*), Painted Honeyeater (*Grantiella picta*), Swift Parrot (*Lathamus discolor*), Malleefowl (*Leipoa ocellata*), Major Mitchell's Cockatoo (*Lophochroa leadbeateri*), Black-eared Miner (*Manorina melanotis*), Red-lored Whistler (*Pachycephala rufogularis*), Plains-wanderer (*Pedionomus torquatus*), Regent Parrot (eastern subspecies) (*Polytelis anthopeplus monarchoides*), Australian Painted Snipe (*Rostratula australis*), Mallee Emu-wren (*Stipiturus mallee*), Common Greenshank (*Tringa nebularia*)
Migratory birds	Common Sandpiper (*Actitis hypoleucos*), Fork-tailed Swift (*Apus pacificus*), Sharp-tailed Sandpiper (*Calidris acuminata*), Pectoral Sandpiper (*Calidris melanotos*), Latham's Snipe *(Gallinago hardwickii*), Yellow Wagtail (*Motacilla flava*), Common Greenshank (*Tringa nebularia*)
Threatened mammals	South-eastern long eared bat (*Nyctophilus corbeni*)
Threatened amphibians	Sloane's Froglet (*Crinia sloanei*), Southern Bell Frog (*Litoria raniformis)*
Threatened reptiles	Grey Snake (*Hemiaspis damelii)*

Table 6.4 Potential MNES to be assessed

MNES	Threatened biodiversity
Threatened fish	Flathead Galaxias (*Galaxias rostratus*), Macquarie Perch (*Macquaria australasica*), Murray Cod *(Maccullochella peelii*), Murray Hardyhead (*Craterocephalus fluviatilis*), Silver Perch (*Bidyanus bidyanus*), Trout Cod (*Maccullochella macquariensis*)

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:

- validate and refine the State Vegetation Type Map, and delineate into vegetation zones
- conduct vegetation integrity plots
- 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.

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 development corridor. The landscape is characterised by extensive undulating dunefields 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 is located 2 km north of Lake Gol Gol and 20 km east of Fletchers Lake, locations within which significant cultural and ancestral remains have been recovered. The landscape within the project investigation area is predominantly characterised by the Mallee Cliffs Sandplains Mitchell Landscape (Mcs).

Approximately half of the project investigation area has been previously cleared, with the other half containing remnant vegetation. The majority of the development corridor is on cleared land currently subject to agricultural activities. There are no major watercourses located within the project investigation area, with the closest permanent water source being the Murray River, located 10 km south west.

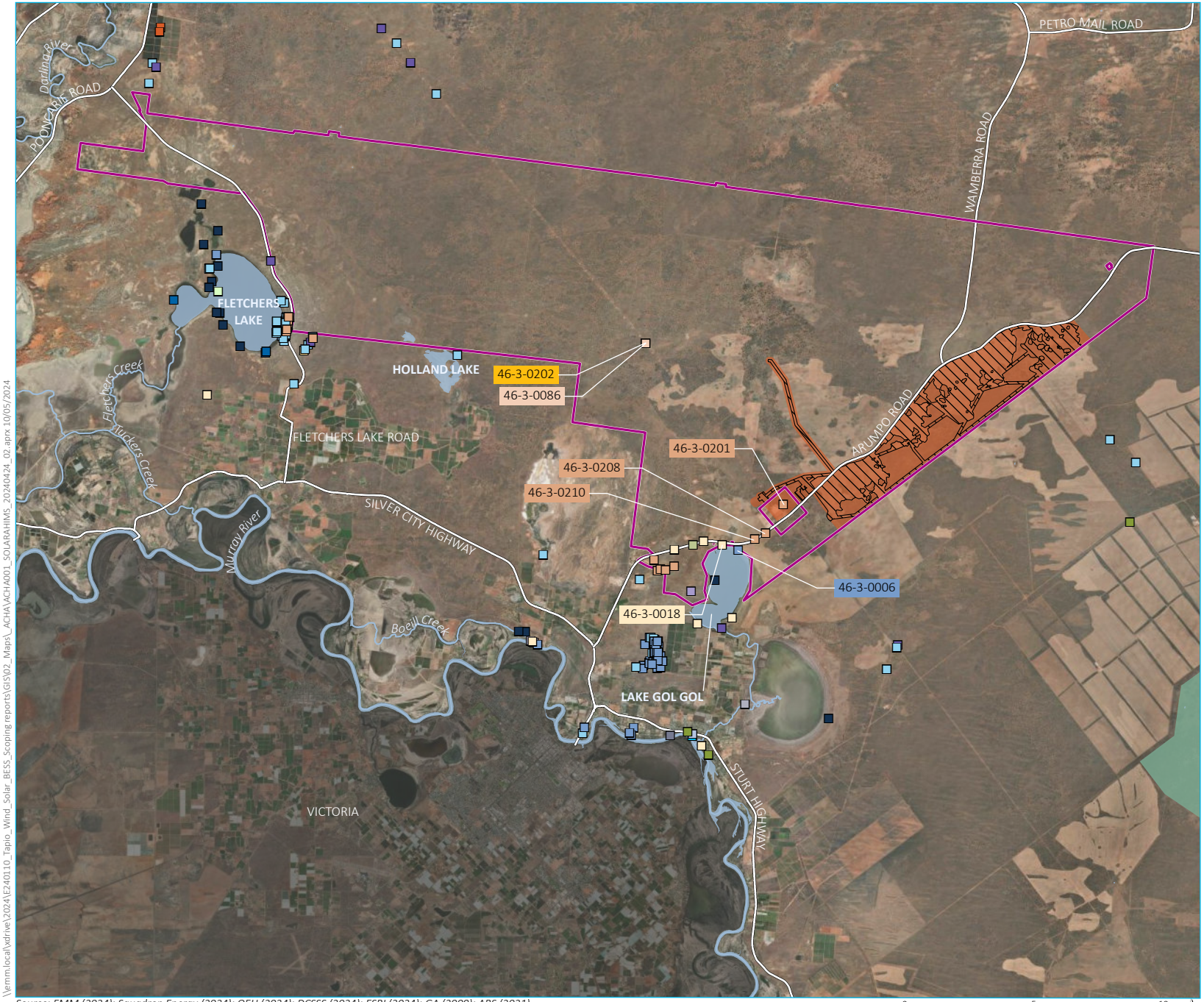
A search of previously documented cultural materials within the Aboriginal Heritage Information Management System (AHIMS) database (7 February 2024; Client Service ID: 862188 and 862190) revealed 192 Aboriginal sites in the region (Figure 6.2). This search area extended beyond the project investigation 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 no registered Aboriginal sites in the solar project investigation area, with the closest site (#43-3-0201, isolated artefact) located in the Buronga Substation site, adjacent to the southern boundary of the project investigation area.

Table 6.5 Summary of AHIMS sites in the locality

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

- Private landholding
- Solar farm development corridor
- Solar farm investigation area

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
- Victoria

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

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AHIMS sites

Gol Gol Solar Farm
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.

Squadron Energy will seek to avoid impacts to Aboriginal heritage sites wherever possible. Due to the nature of solar 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. 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 prepared and is included in Appendix C. The PVIA evaluates the surrounding residences, roads, rails and other publicly accessible places to identify locations that will be visually impacted by the project.

This PVIA is a requirement of the *Large-Scale Solar Energy Guideline* (2022) implemented by the NSW Department of Planning, Housing and Infrastructure (DPHI), formerly Department of Planning and Environment (DPE). The assessment is undertaken with reference to:

- *Large-Scale Solar Energy Guideline* (DPE 2022) (the Guideline)
- *Technical Supplement – Landscape and Visual Impact Assessment* (DPE 2022) (Technical Supplement).

i Existing environment

a Landscape character

The landscape within and surrounding the project can be described as low rolling terrain. Land within the project investigation area is mostly cleared of native vegetation and used for grazing and cropping. Native woodland is visible surrounding the study area. The PVIA identified four landscape character categories that will be refined and characterised in greater detail in the EIS stage of the project. The categories 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, Lake Gol Gol. • 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	Agricultural Pastures	• Extensive land modified for dryland cropping and irrigated agriculture. • Vegetation primarily exists in patches, serving as windbreaks or screening. • Large areas adapted for pastoral farming and irrigated agriculture. • This LCU is commonly observed within and surrounding the project investigation area.
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

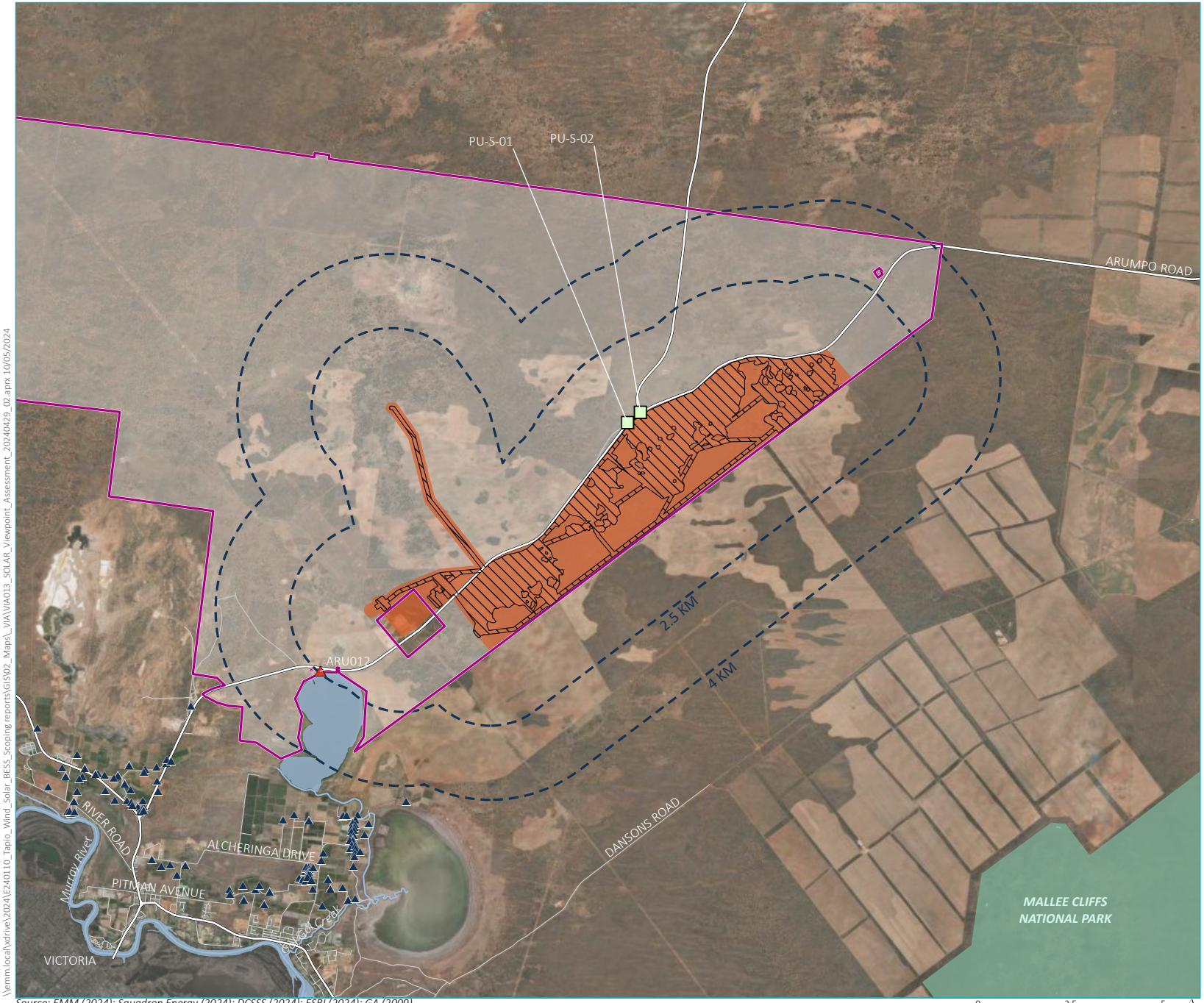
b Sensitive receivers and viewpoints

Viewpoints provide a representation of the likely changes a project will have on the landscape from a specific location. Viewpoint selection has been based on the Solar Guidelines, which identifies three types of viewpoints:

- Roads and rail viewpoints – locations along roads and rail lines that have views into the project. The Solar Guideline limits these viewpoints to within 2.5 km of the development.
- Public viewpoints – locations that are publicly accessible (parks, trails, shopping areas) and offer views into the project. These views are limited to a 4 km distance from the development.
- Private viewpoints – locations that are not accessible to the public (mainly residences) and have views into the project. These views are limited to a 4 km distance from the development.

The selection of the viewpoints is based on the locations of residences and public areas. This was overlaid with the viewshed mapping to determine which locations had the potential for visual impacts from the project. Viewpoints selected satisfy both criteria; falling within the affected Zone of Visual Influence (ZVI) and characterised as a private or public viewpoint.

Table 6.7 lists the viewpoints selected for the private and public (road) receivers for this preliminary assessment and the rational for the selection. Figure 6.3 illustrates where the viewpoints are located.



KEY

- Private landholding
- Solar farm development corridor
- Solar farm investigation area
- Solar farm visual assessment buffer
- 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
- NPWS reserve
- Victoria

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

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Solar farm visual receptors and viewpoints

Gol Gol Solar Farm
Scoping Report
Figure 6.3

EMM
creating opportunities

Table 6.7 Selected viewpoints for preliminary assessment

Viewpoint reference	Viewpoint type	Location	Representative receptors	Rationale for selection
ARU012	Rural dwelling	Gol Gol Lake 664 Arumpo Road, Wentworth 2648	Local Residents	Associated residence with potential view within 4 km of the project.
PU-01	Local Road	Arumpo Road, Buronga	Road users	Road location with views of the site along the eastern boundary where the site entrance is located. Within 2.5km of the site.
PU-02	Local Road	Wamberra Road, Buronga	Road users	Road intersection between Wamberra Road and Arumpo Road. Within 2.5km of the site.

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.

Viewpoint reference ARU012 has not been assessed in the PVIA as this is an associated residence. For the two public viewpoints (PU-01 and PU-02), the preliminary assessment tools specified by the Technical Supplement were then applied. This included consideration of both vertical and horizontal field of view and relative height differences, detailed further in Appendix C.

The PVIA identified that the two public viewpoints (roads) in the community and landscape surrounding the project do require further detailed assessment as part of the EIS. The one associated viewpoint is not required to be assessed.

iii Assessment approach

A landscape and visual impact assessment (LVIA) will be prepared for the EIS that addresses impacts from the project and will include:

- landscape character assessment
- visual magnitude and sensitivity assessment
- night light impact assessment
- glint and glare 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.

The LVIA will be prepared in accordance with the *State Significant Development Guidelines* (DPE 2022) and the *Large-Scale Solar Energy Guidelines – technical Supplement for LVIA* (DPE 2022).

6.2.4 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 initial phase of the SIA process (Phase 1 social impact scoping and initial assessment) is an exercise to determine the main issues of concern and the interested and affected parties for a particular planned intervention. The objective is to ensure that proportionate depth and scope is given to potentially significant social impacts of the project.

Key tasks of the scoping phase include defining the project's social locality, initial analysis of key social characteristics and trends within the project's social locality, and preliminary identification and evaluation of social impacts through completion of the SIA Scoping worksheet (DPE, 2023a). The SIA scoping worksheet is included in Appendix D.

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 being advanced. Nearby development is detailed in Section 2.2.

a Key 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	• 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

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
during construction and operations	• 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 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 construction access roads and associated vegetation clearing	• Changes to visual amenity, lifestyle and environmental values	• Local communities • Traditional Owners and Aboriginal communities	Local area
	• 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 usage of renewable energy	• Local and regional communities	Local area Regional area Nearby townships
	• Change in perceptions of safety and hazard risks	• Local communities • Landholder and surrounding neighbours	Local area Nearby townships
Decommissioning of the project	• Change to amenity and community values	• Project area • Local • Regional	Community values and perceptions Health and wellbeing Land use
	• Change to employment and business opportunities	• Project area • Local • Regional	Existing employment and businesses
	• Uncertainty in future decision making	• Project area • Local • Regional	Strategic context

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 is located entirely within Wentworth SAL (excluding Ellerslie SAL and Pomona SAL) which encompasses a large land area. 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.
Key townships	Buronga and Gol Gol townships	UCL 112013 Mildura-Buronga (Buronga Part)	Buronga and Gol Gol are the nearest townships to the project, about 10 km south
	Mildura regional city	UCL 212003 Mildura-Buronga (Mildura Part)	Mildura is the nearest regional city to the project, located approximately 12 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.
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. The locality is considered the gateway to Outback NSW and situated on traditional lands of the Barkindji People (Murdi Paaki Regional Assembly, 2019). Land use across Wentworth locality is largely made up of 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).

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 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. Historically, Gol Gol was a pivotal horse drawn coach stop and changeover location while Buronga was part of the Federal Government's large Tapio run in the 1840's (Experience Wentworth, 2024).

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 area (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.

Table 6.10 Key relevant social characteristics and trends

Social themes	Social characteristics and trends
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.
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).

Table 6.10 Key relevant social characteristics and trends

Social themes	Social characteristics and trends
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 (DPE, 2023c) which is provided as Appendix D.

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 D) 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	Impact significance		
Negative impacts								
Increased competition for construction labour and services in local and regional areas due to increased demand generated by the Project	• Livelihoods	Construction	• Local and regional businesses • Local and regional economic and industry groups	Almost certain (A)	Moderate (3)	High (B3)	• 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
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
Changes to road and traffic conditions resulting in reduced connectivity of local roads, and potential frustration of road users	• Access • Way of life	Construction	• Local residents • Local government	Likely (B)	Moderate (3)	High (B3)	• Advanced notice of construction timeframes including changed road use • Traffic Management Plan	Detailed
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

Social impact	Impact category	Project phase	Affected stakeholder group	Preliminary impact significance			Potential mitigation measures	Phase 2 assessment level
				Likelihood	Magnitude	Impact significance		
Potential disturbance or changes to sites or landscapes of tangible and intangible cultural heritage significance	• Culture	Construction	• Traditional Owners and Aboriginal communities • Local and regional communities	Possible (C)	Moderate (3)	Medium (C3)	• Ongoing 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
Change to local community cohesion due to temporary influx of construction workers	• Culture • Way of life	Construction	• Local and regional communities	Possible (C)	Minor (2)	Medium (C3)	• Ongoing community and stakeholder engagement • Community benefit and investment program	Detailed
Reduced sense of place and rural lifestyle values due to changes to the visual landscape, amenity and environmental values	• Community • Surroundings • Way of life	• Construction, • Operation	• Landholders • Surrounding neighbours • Local communities	Possible (C)	Moderate (3)	Medium (C3)	• Visual impact assessment and mitigations • Ongoing community and stakeholder engagement • Community benefit and investment program	Detailed
Perceived devaluation of adjacent or nearby properties	• Livelihoods Surroundings	• Construction, • Operation	• Landholders • Surrounding neighbours	Possible (C)	Moderate (3)	Medium (C3)	• Visual impact assessment and mitigations • Ongoing community and stakeholder engagement • Community benefit and investment program	Standard
Disruption to existing agricultural operations and land 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	Standard

Social impact	Impact category	Project phase	Affected stakeholder group	Preliminary impact significance			Potential mitigation measures	Phase 2 assessment level
				Likelihood	Magnitude	Impact significance		
Perceived deterioration of health outcomes due to noise, dust and traffic generated by Project	• Health and wellbeing	Construction, Operation, Decommissioning	• Local residents • Landholders • Surrounding neighbours	Possible (C)	Moderate (3)	Medium (C3)	• Air quality and acoustic management measure • Advanced notice of residents on timing of construction activities.	Standard
Reduced agricultural productivity from increased weed introduction and biosecurity risk during construction	• Livelihoods	• Construction, Operation	• Landholders • Surrounding neighbours	Possible (C)	Moderate (3)	Medium (C3)	• Ongoing meaningful engagement with landholder / neighbouring landholders • Property-specific management agreements	Standard
Increased uncertainty associated with decommissioning.	• Livelihoods • Decision-making systems	Decomissioning	• Landholders • Surrounding neighbours	Possible (C)	Moderate (3)	Medium (C3)	• Ongoing meaningful engagement with landholder / neighbouring landholders • Property-specific management agreements	Standard
Positive impacts								
Generation of employment opportunities for local and regional workers, including Aboriginal people and young people	• Way of life • Health and wellbeing • Livelihoods	Construction	• Local communities • Regional communities • Traditional Owners and Aboriginal communities • Local and regional economic and industry groups	Possible (B)	Moderate (3)	Medium (C3)	• Engage with local employment and training service providers to establish local capacity and maximise opportunities for local skills development and employment. • Development of an Aboriginal Participation Plan to maximise income and training opportunities for those in the local Aboriginal community.	Standard

Social impact	Impact category	Project phase	Affected stakeholder group	Preliminary impact significance			Potential mitigation measures	Phase 2 assessment level
				Likelihood	Magnitude	Impact significance		
Socio-economic benefits associated with project employment, training, and procurement opportunities.	• Livelihoods	Construction	• Local communities • Regional communities • Traditional Owners and Aboriginal communities • Local and regional economic and industry groups	Possible (B)	Moderate (3)	Medium (C3)	• Engage with local employment and training service provides on employment opportunities and workforce development strategies. • Development of an Aboriginal Participation Plan to maximise income and training opportunities for those in the local Aboriginal community. • Commitment to use local contractors and supplier where feasible.	Standard
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)	• Advanced notification to local service providers on timing of construction activities and anticipated workforce ramp up.	Standard
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)	• Community benefit and investment program	Standard
Increased opportunity for economic diversification for landholders and neighbours operating agricultural businesses	• Livelihoods	Operation	• Local and regional communities • Social infrastructure and community service providers	Possible (B)	Minor (3)	Medium (B2)	• Community benefit and investment program	Standard

Social impact	Impact category	Project phase	Affected stakeholder group	Preliminary impact significance			Potential mitigation measures	Phase 2 assessment level
				Likelihood	Magnitude	Impact significance		
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 for renewable energy projects	Standard

b Summary

The SIA scoping process and completion of the SIA Scoping worksheet (Appendix D) identified 19 potential social impacts (both positive and negative), of which:

- 16 require a detailed level of assessment
- 3 require a standard level of assessment
- no impacts require a minor level of assessment.

Key predicted negative social impacts of the project include:

- changes to local visual amenity
- lifestyle and amenity impacts during construction (noise, vibration, dust)
- potential disturbance of cultural heritage significance
- changes/disruptions to local and regional traffic conditions (access, connectivity, traffic volumes)
- increase in demand for local housing, short-term accommodation, and services
- disruption to existing agricultural operations and land use
- perceptions of increased fire risk and associated safety concerns
- uncertainty associated with regulatory decision-making and future land use plans at project decommissioning.

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

- generation of employment, training, and procurement opportunities across the project lifecycle
- improved/enhanced social outcomes from the project supporting community initiatives
- contribution towards the NSW renewable energy transition and circular economy objectives.

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.

6.2.5 Traffic and access

i Existing environment

The solar project investigation area is adjacent to Arumpo Road, which is generally a one lane each way sealed Regional Road under the care and control of Wentworth Shire Council (Plate 6.1). The investigation area extends both the east and west of Arumpo Road. The speed limit on Arumpo Road is restricted to 80 km/h.

The development corridor would be accessed directly from Arumpo Road, from which, multiple site access points are proposed. Access to Arumpo 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 6.4.

Source: Google Maps 2024

Plate 6.1 Arumpo Road near potential northern access (looking south)

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

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Transport and haulage routes

Gol Gol Solar Farm
Scoping Report
Figure 6.4

EMM
creating opportunities

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 Arumpo 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. All internal access tracks will be unsealed. 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 6.4, 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 will be carried out to investigate potential impacts associated with the project. The traffic impact assessment will include:

- projections of traffic volumes (both light and heavy vehicles) 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 Amenity - Noise and vibration

i Existing environment

The project is situated in a location that is rural in nature with limited human activity, mostly dominated by natural sounds. In terms of the definitions of the NSW Noise Policy for Industry (NPfI) it would be considered rural and could expect minimum L_{A90} background noise thresholds of 35 dB during the day and 30 dB during the evening and night.

The Buronga Substation is currently being constructed adjacent to the project investigation area, that may currently be a source of noise emissions. Construction of the substation is expected to be complete prior to construction of the Gol Gol Solar Farm project and construction would not impact background noise levels at that time, although its operation may contribute minor background noise.

Considering the likely L_{A90} thresholds, the monitoring of existing ambient background noise is likely not to be warranted for the project.

The nearest sensitive receiver is approximately 4.2 km south from the proposed project development corridor, however this receiver is associated with the development. The nearest non-associated receiver is approximately 4.8 km south of the proposed development corridor, all other sensitive receivers are further from the site. Under the NPfI, noise from a development of industry is assessed at a the most sensitive noise location at or within 30m of a dwelling. It is assumed that if noise goals are met at these closest locations, they will also be met at other sensitive locations further away.

ii Assessment criteria and potential impacts

a Construction noise

Construction noise is assessed under the NSW Interim Construction Noise Guideline (ICNG). The ICNG typical recommends that construction activities be restricted to 'standard' daytime hours of 7.00 am to 6.00 pm Monday to Friday, and 8.00 am to 1.00 pm on Saturdays. Under standard construction hours, noise is to be limited, where feasible and reasonable to a level not more than 10 dB above the background noise level, which is L_{Aeq} 45 dB for this project. The ICNG provides an extensive list of standard mitigation measures and practices to be adopted for construction sites.

Based on the distance from nearest non-associated receivers, it is unlikely that any construction works occurring on Saturday afternoon, Sundays or public holidays would cause audible noise impacts to sensitive receivers, so if this flexibility is required, it would be assessed in the EIS.

b Operational noise

Operational noise from solar farms are assessed under the procedures and guidelines of the NPfI. In the application of the NPfI in development of project noise trigger levels (PNTL) for the project, we would anticipate that the project would be subject to baseline noise criteria of $L_{Aeq,15min}$ 40 dB during the day and $L_{Aeq,15min}$ 35 dB during the evening and night.

A typical scaled schedule of plant and equipment anticipated for the project considering a 600 MW solar farm is detailed in Table 6.12. The anticipated noise sources in Table 6.12 and baseline NPfI noise criteria enable determination of the likely minimum offset distances for noise sources.

Table 6.12 Operational noise source sound power levels

Noise source	L_{Aeq} sound power per unit, dB[1]	Total L_{Aeq} sound power, dB
Solar tracker motors (x17351)[2]	74	105
PV power conversion units/inverters (x182)	93	116
Substation	105	105
Total		**116**

1. The combined noise levels will be subject to final quantity, configuration and layout of equipment as well as any noise attenuating measures.
2. Solar tracker motor assumed operation of 1 minute per 15 minute period.

As part of this preliminary assessment, a simple noise model of the site was developed using the ISO9613 algorithm in proprietary noise modelling software iNoise. The ISO9613 algorithm predicts noise levels assuming meteorological conditions of light source-to-receiver winds or moderate temperature inversions, hence while not assessing a worst-case scenario, is representative of typical operational noise impacts.

Predicted noise levels were below 30 dB $L_{Aeq,15min}$ at all sensitive receivers, including the closest associated receiver. Operational noise at all noise sensitive receivers is highly-likely to be within NPfI noise limits.

c Road traffic noise

Road traffic noise for the project would be assessed under the NSW Road Noise Policy (RNP). Subject to proposed routes the assessment would need to consider receiver locations and nearest road category. Baseline noise criteria for the project is summarised Table 6.13.

Table 6.13 Road traffic noise assessment criteria for residential land uses

Road category	Type of project/development	Assessment criteria – dB	
		Day (7 am to 10 pm)	Night (10 pm to 7 am)
Local roads	Existing residences affected by additional traffic on existing freeway/arterial/sub-arterial roads generated by land use developments.	$L_{Aeq,1hr}$ 55 (external)	$L_{Aeq,1hr}$ 50 (external)

Road traffic noise from construction and operation of the project is unlikely to result in any significant noise impacts that would constrain the project.

iii Assessment approach

As part of the EIS submission, a detailed noise and vibration impact assessment (NVIA) would be undertaken in accordance with NSW *Interim Construction Noise Guideline* (ICNG), NSW *Noise Policy for Industry* (NPfI) and NSW *Road Noise Policy* (RNP).

Based on the currently available project information, there is unlikely to be any significant noise impacts from the proposed solar farm.

6.3.2 Historic heritage

i Existing environment

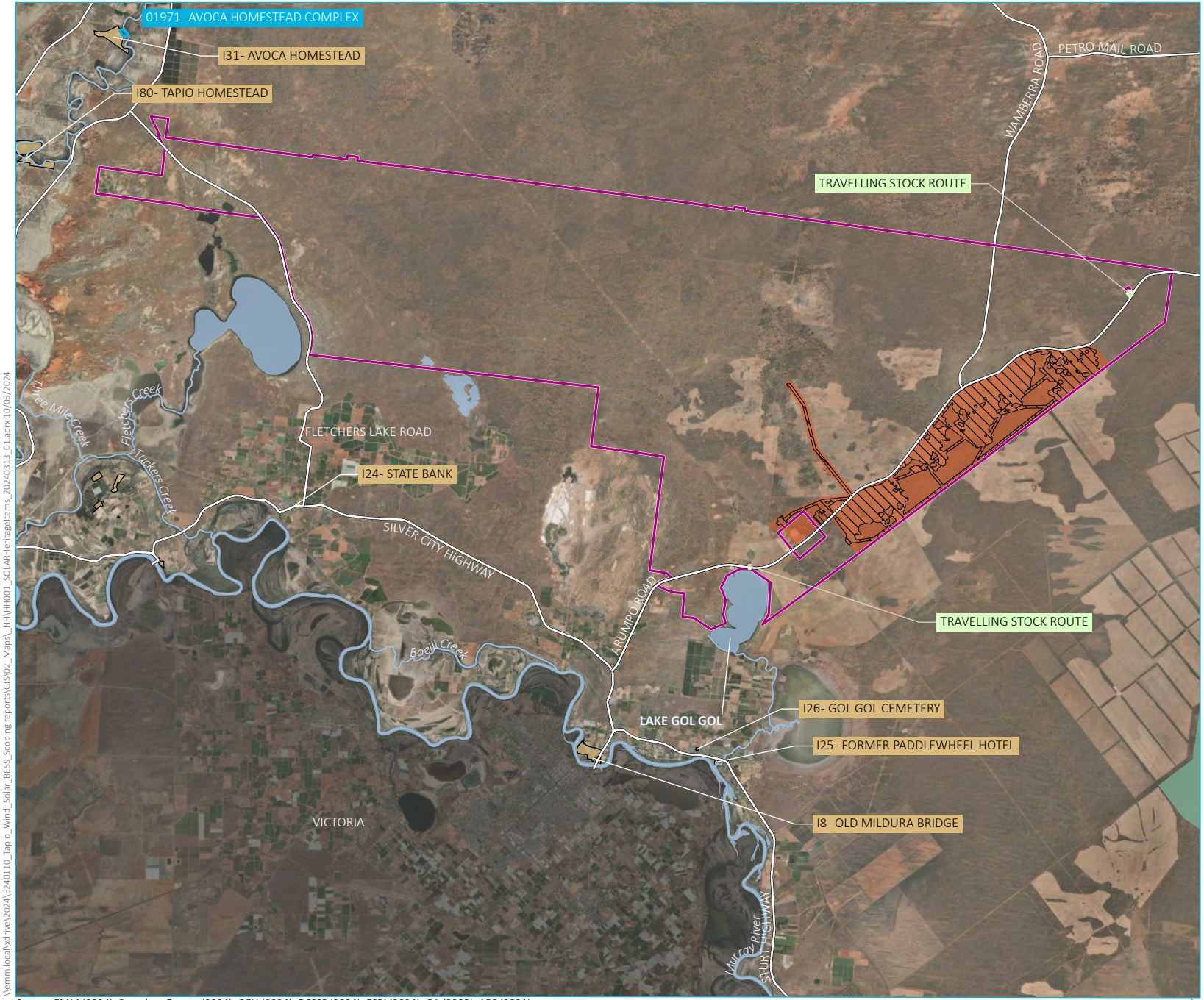
The project lies within the Murray Darling Depression Bioregion, which covers 19,717,651 ha over New South Wales, Victoria and South Australia (NPWS, 2003, DEECCW, 2020). The region has been subject to land clearing to make way for pastoral activities, but substantial tracts of remnant vegetation remain.

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

No listed heritage items are identified in the project investigation area of National, State or local historical heritage significance or any items on non-statutory registers. Heritage items in the vicinity of the project investigation area are outlined in Table 6.14 and Figure 6.5.

Table 6.14 Heritage register search results

Jurisdiction	Heritage Register	Within solar investigation area	Within 5 km of solar 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	Nil
Local	Wentworth Local Environmental Plan 2011	Nil	Nil
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
	Travelling Stock Reserves (TSRs)	Nil	R86545 SWP1035-Gol Gol Well, 2km south of solar investigation area, along Arumpo Road. R76669 SWP1036-Tapio Tank, 2 km north of solar investigation area, along Arumpo Road.



KEY

- Private landholding
- Solar farm development corridor
- Solar farm investigation area
- Travelling stock route
- State heritage register

Wentworth Local Environmental Plan 2011

- Item- General

Existing environment

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

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

0 5 10 km

GDA2020 MGA Zone 54

N

Listed heritage items

Gol Gol Solar Farm
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Figure 6.5

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ii Potential impacts

The preparation of the landscape for the project 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

It is possible that the project development corridor may contain archaeological resources related to farming activities, 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 investigation area should the desktop analysis yield information that clearly suggests the presence of historical sites.

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.

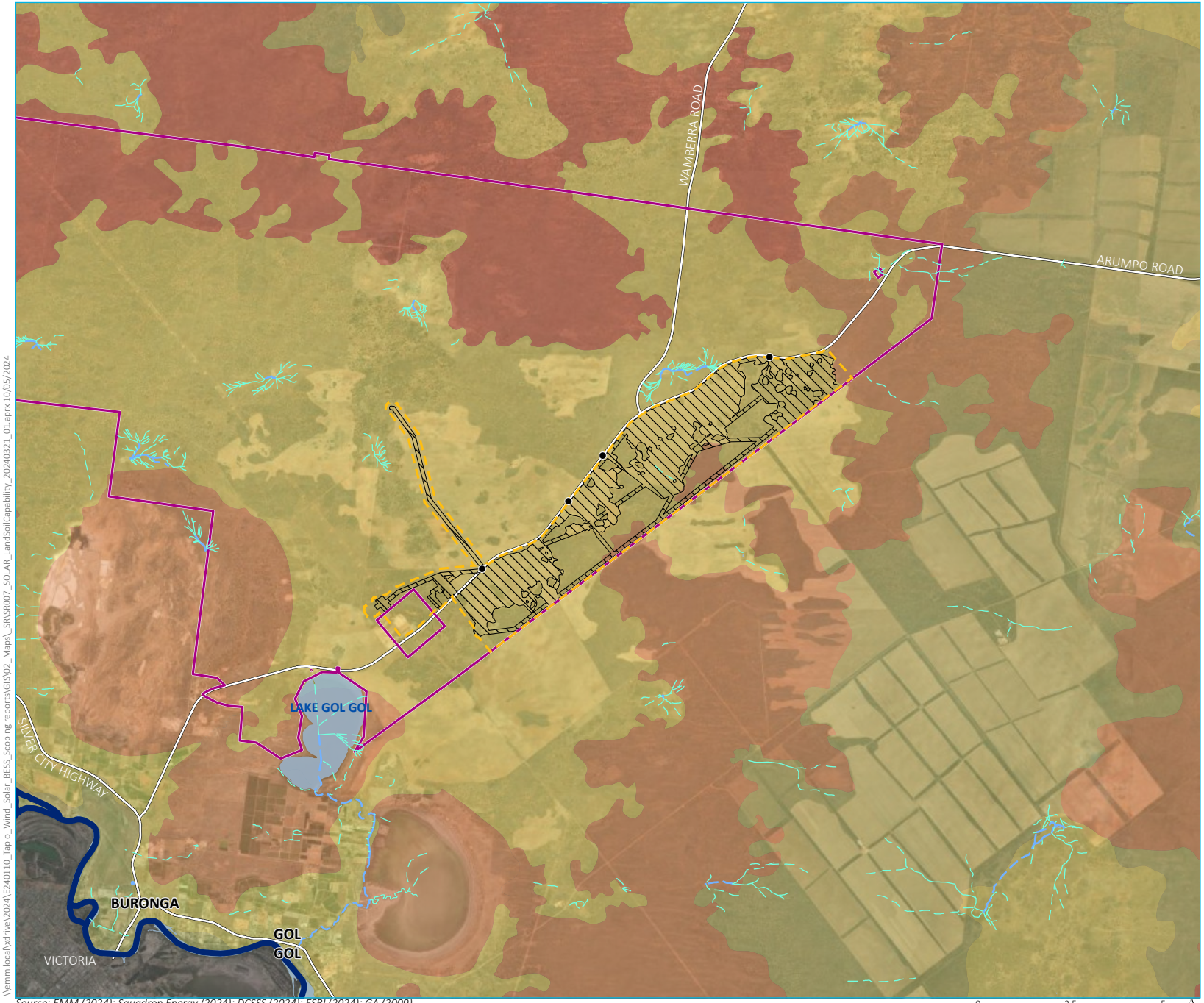
6.3.3 Land

i Existing environment

The land within the project investigation area is zoned RU1 Primary Production under the Wentworth LEP. The development corridor is largely disturbed and currently used for agricultural purposes. 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 shown on Table 6.15 and Figure 6.6.

Table 6.15 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
Calcareous sands	Tenosols	Low	7



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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 6.6

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Soils are consistent across the Australian soil classification (ASC) and land soil capability (LSC) associations, and the project investigation area is mapped as either LSC Class 5 (severe limitations) or LSC Class 5 (extremely severe 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:

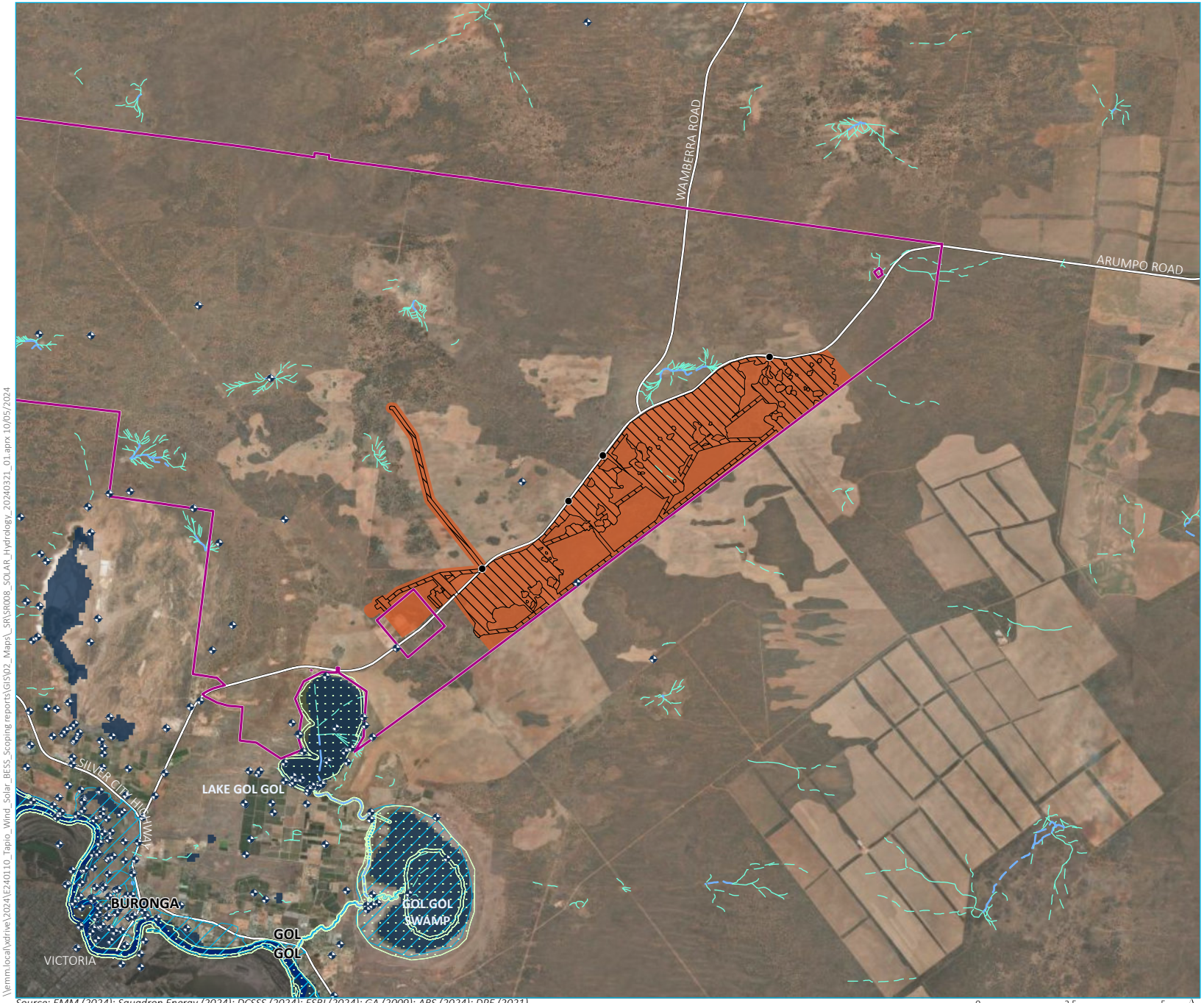
- a description of the biophysical environment (including soil landscapes and LSC class)
- an erosion hazard analysis
- an impact assessment of the project on soil types, LSC class and agricultural productivity
- in accordance with the *Large-Scale Energy Guideline* (DPE 2022a), a Level 1 - agricultural impact assessment, due to the solar farm being adjacent to land zoned RU1: Primary Production Land
- recommendations for site decommissioning and rehabilitation to restore disturbed land back to agriculture.

6.3.4 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 9 km south of the southern project investigation area. Two nationally important wetlands, Lake Ranfurly and Kings Billabong Wetlands, are located approximately 14 km south of the project.

Several significant waterbodies, including Lake Gol Gol and Gol Gol Swamp are located approximately 2 km south of the project investigation area, however within the project investigation area, there are no mapped waterways or waterbodies. See Figure 6.7 for mapped hydrological features in and around the project investigation area.



KEY

- Private landholding
- Solar farm development corridor
- Solar farm investigation area
- 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)

0 2.5 5 km

GDA2020 MGA Zone 54

N

Hydrology

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Figure 6.7

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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).

6.3.5 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 south of 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 Solar 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.

6.3.6 Hazards and risk

i Preliminary hazard analysis

A preliminary risk screening will be completed in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP). A PHA will also be prepared in accordance with *Hazardous Industry Planning Advisory Paper No. 6 Hazard Analysis* (DoP 2011a) and *Multi-level Risk Assessment* (DoP 2011b).

The PHA will consider all recent standards and codes and verify separation distances to on-site and off-site receptors to prevent fire propagation and compliance with *Hazardous Industry Advisory Paper No. 4 Risk Criteria for Land Use Safety Planning* (DoP 2011c). The PHA will address the fire risks associated with the PV and supporting infrastructure.

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*.

ii Bushfire

The project investigation area is mapped as Vegetation Category 1 and 2 bushfire prone land, with some cleared areas mapped as 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 6.8.

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

iii Unexploded ordnance risk

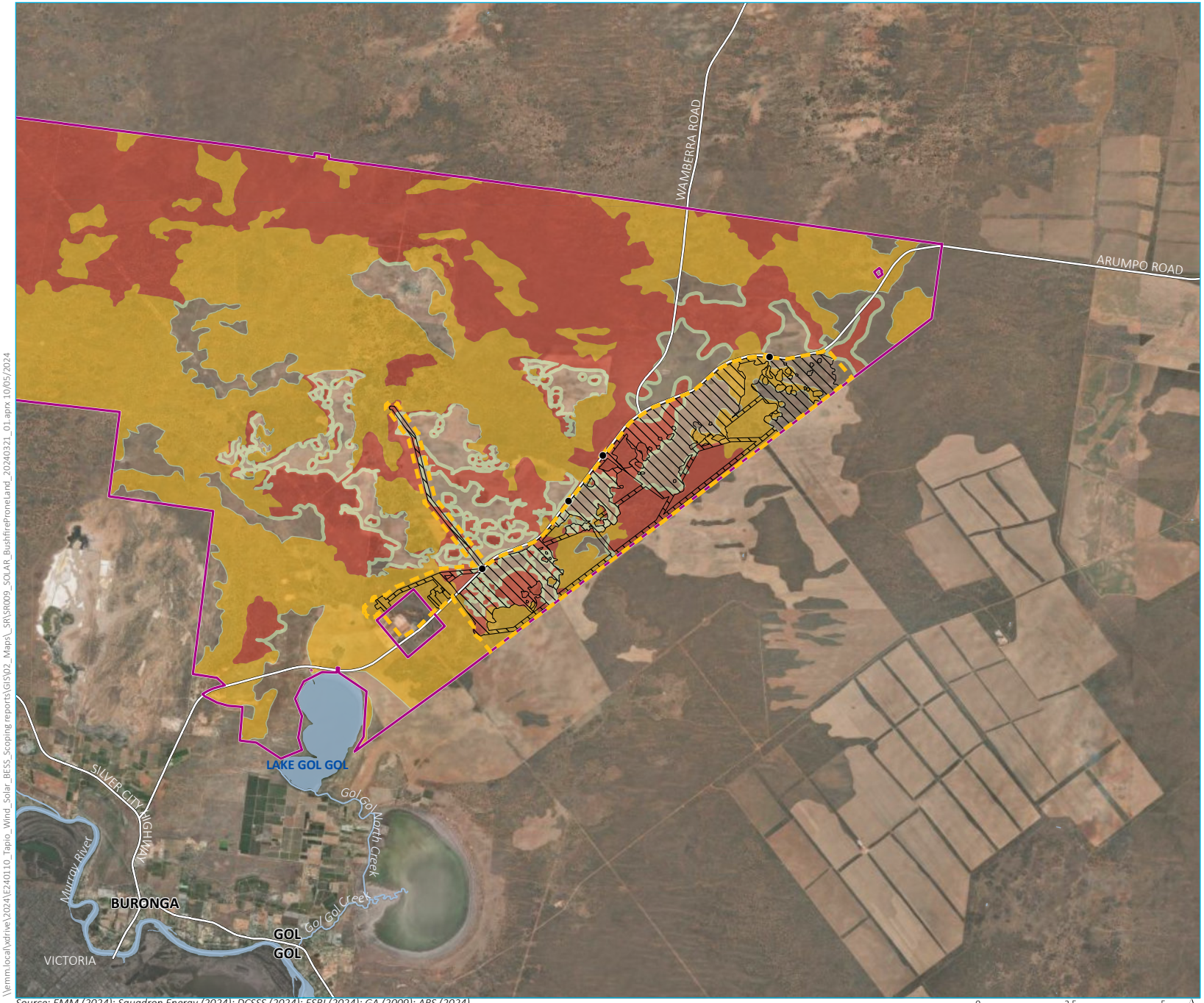
A review of the Department of Defence (Defence) UXO Mapping Application identified areas directly adjacent to the project investigation area as being mapped as having both ‘slight potential’ and ‘substantial potential’ for the presence of unexploded ordnance devices (UXO).

Despite much of the development corridor having been continuously grazed and cropped since the 1940’s without instance, due to adjacent properties 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.

iv 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.



KEY

- Private landholding
- Solar farm development corridor
- Solar farm investigation area
- Site access

Bushfire prone land

- Vegetation buffer
- Vegetation category 1
- Vegetation category 2

Existing environment

- Major road
- Named watercourse
- Named waterbody
- Victoria

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

0 2.5 5 km

GDA2020 MGA Zone 54

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Bushfire prone land

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Figure 6.8

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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.

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 Aquatic biodiversity

There are no key fish habitats (KFHs) or threatened aquatic species predicted by the Fisheries NSW Spatial Data Portal to occur within the project investigation area. The PMST predicted six threatened fish species may occur within 10 km of the project investigation area, however as there are no waterways within the project investigation area and the nearest mapped waterway is 3 km south of the project, none of these species are considered to have habitat within the project investigation area.

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

Squadron Energy is also proposing to develop separate Wind Farm (Gol Gol Wind Farm) and BESS (Gol Gol BESS) projects within the same overall landholding and adjacent to and partially overlapping the Gol Gol Solar 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 A) 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 E.

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 Renewable Energy Developments Pty Ltd (Squadron Energy) proposes to develop the Gol Gol Solar Farm project approximately 12 km north east of Mildura in the Wentworth LGA in the Western Murray Region of New South Wales.

The project will include the installation of solar photovoltaic (PV) panels as well as transmission, substations, ancillary and temporary infrastructure. The project will have an installed capacity of up to approximately 600 megawatts (MW). The proposed location of this project is within the South West REZ and will contribute to renewable power being provided to the National Electricity Market (NEM).

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

- landowner appetite for hosting the solar 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 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
- 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
PCU	power conversion unit
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

Appendix A
Scoping summary table

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A.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).	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). • *Guidance Note for Landscape and Visual Assessment* (Australian Institute of Landscape Architects 2018). • *Large-Scale Solar Energy Guideline DPIE (DPE 2022)* • *Large Scale Solar Energy Guideline; Technical Supplement for Landscape and Visual Impact Assessment (DPE 2022)*	Section 6.2.3
	Social	Yes	Specific	• *Social Impact Assessment Guideline for State Significant Projects* (DPE 2023).	Section 6.2.4
	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 6.2.5

Level of assessment	Matter	Cumulative impact assessment	Engagement	Relevant policies and guidelines	Scoping report reference
Standard	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).	Section 6.3.1
	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 6.3.2
	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 6.3.3
	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 6.3.4
	Air quality	No	General	• *Approved Methods and Guidelines for the Modelling and Assessment of Air Pollutants in New South Wales* (DECC, 2005)	Section 6.3.5
	Hazards and risk	No	General	• 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 6.3.6

Level of assessment	Matter	Cumulative impact assessment	Engagement	Relevant policies and guidelines	Scoping report reference
	Aquatic	No	General	• *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI 2013)	Section 6.3.8

Appendix B
Preliminary Biodiversity Assessment

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Preliminary Biodiversity Assessment

Gol Gol Solar Farm

Prepared for Squadron Energy

May 2024

Preliminary Biodiversity Assessment

Gol Gol Solar Farm

Squadron Energy

E240110 RP21

May 2024

Version	Date	Prepared by	Reviewed by	Comments
1	24 April 2024	Nicole Damaggio	Maya Potapowicz / Mark Trudgett	Issued to client
2	10 May 2024	Nicole Damaggio	Maya Potapowicz / Mark Trudgett	

Approved by

Maya Potapowicz
Associate
10 May 2024

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Appendices

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1 Introduction

Squadron Renewable Energy Developments Pty Ltd (Squadron Energy) (the Applicant), proposes to develop the Gol Gol Solar Farm (the project) approximately 10 kilometres (km) north of Mildura in the Western Murray Region of New South Wales.

The project will include energy generation through solar photovoltaic (PV) panels, transmission, ancillary and temporary infrastructure. The project will have an installed capacity of up to approximately 600 MW.

To accommodate the solar farm, Squadron Energy have identified a suitable area along Arumpo Road and north of the future Buronga Substation for the development of the project. The final extents, layout and capacity of the solar farm will be selected based on environmental constraints identification, further landowner engagement, engineering assessments and detailed design of project infrastructure.

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) is 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.

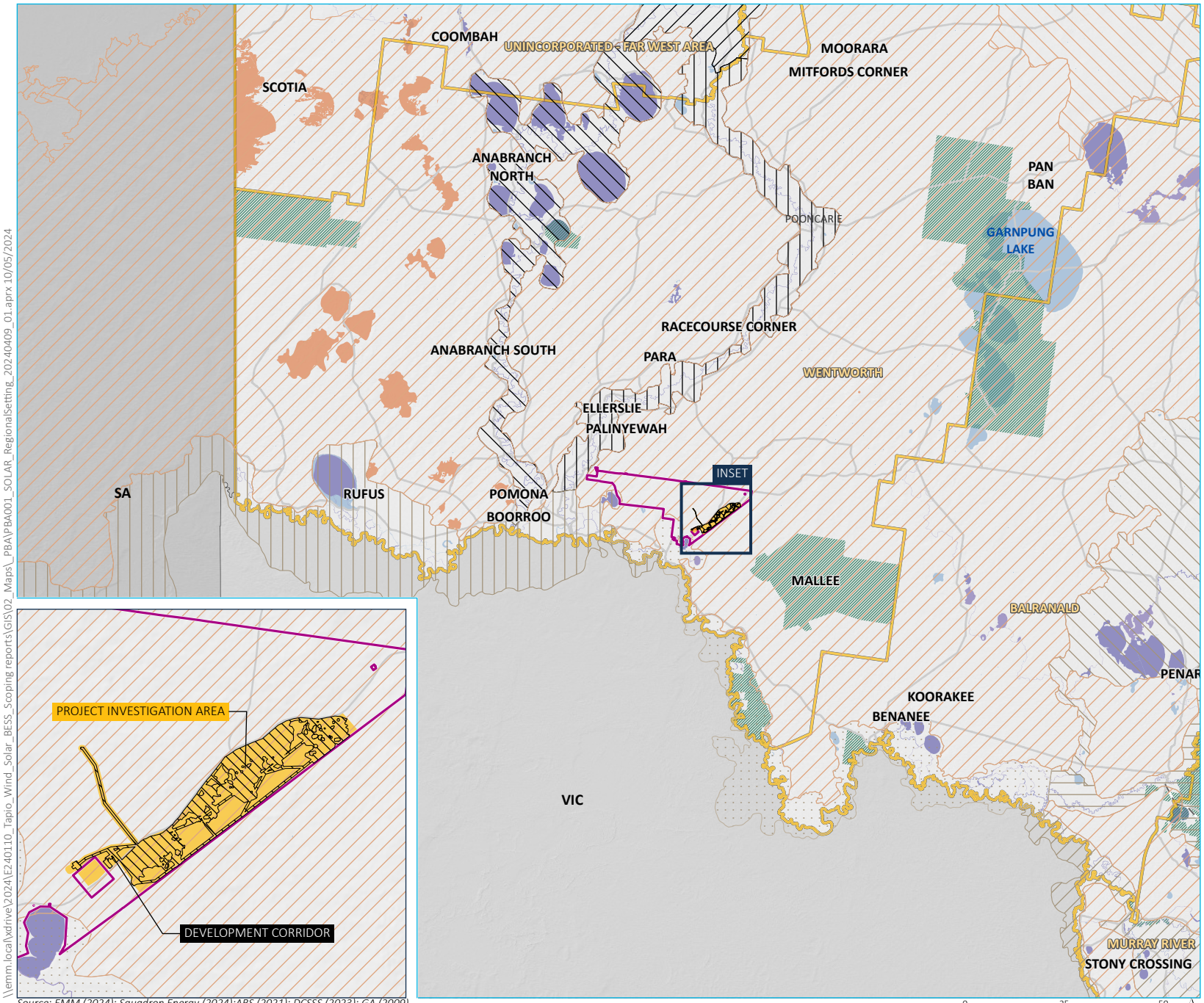
2 Site context

The project is located within a single freehold land parcel that is predominantly used for agricultural activities. A smaller section of this landholding has been investigated for the purpose of locating the solar farm, in the eastern part of the landholding. This area is termed the project investigation area. The extents of the freehold land parcel and the solar farm project investigation area are shown in Figure 2.1.

Within the project investigation area is the proposed development corridor, the land within which all elements of the solar farm are proposed to be located.

The project investigation area is located within the Murray Darling Depression Interim Biogeographic Regionalisation for Australia (IBRA) and the South Olary Plain IBRA sub-region. It is situated 9 km north of the Murray River and 29 km east of the Darling River. Two nationally important wetlands, Lake Ranfurly and Kings Billabong Wetlands, are located 12 km south of the project area, just south of the Murray River. Several significant waterbodies, including Lake Gol Gol and Gol Gol Swamp are located south the project investigation area. Mallee Cliffs National Park is located approximately 13 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.

The project investigation area is predominantly previously cleared and includes Category 1 and Category 2 land with patches of remnant vegetation and disturbed native vegetation. There are no areas mapped on the NSW Government Biodiversity Values Map occurring within the project investigation area.



KEY

- Private landholding
- Solar farm development corridor
- Solar farm investigation area
- LGA boundary

Biodiversity values

- Biodiverse riparian land
- Threatened species or communities with potential for serious and irreversible impacts

IBRA subregion

Darling Riverine Plains
- Great Darling Anabranch
- Menindee
- Pooncarie-Darling

Riverina
- Lachlan
- Murray Fans
- Murray Scroll Belt
- Murrumbidgee
- Robinvale Plains

Murray Darling Depression
- Darling Depression
- South Olary Plain

Existing environment
- Major road
- Waterbody
- NPWS reserve
- State forest

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

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Regional setting

Gol Gol Solar 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 are 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) (Department of Planning and Environment, 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 (Department of Planning and Environment, 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 the following:

- 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 site scale. Field surveys will be required to validate the actual vegetation communities present on the project investigation area
- 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 two 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
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 (and PCT species associations), BV Map and Bionet records

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 Category 2 regulatory 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. PCTs are shown on Figure 4.1.

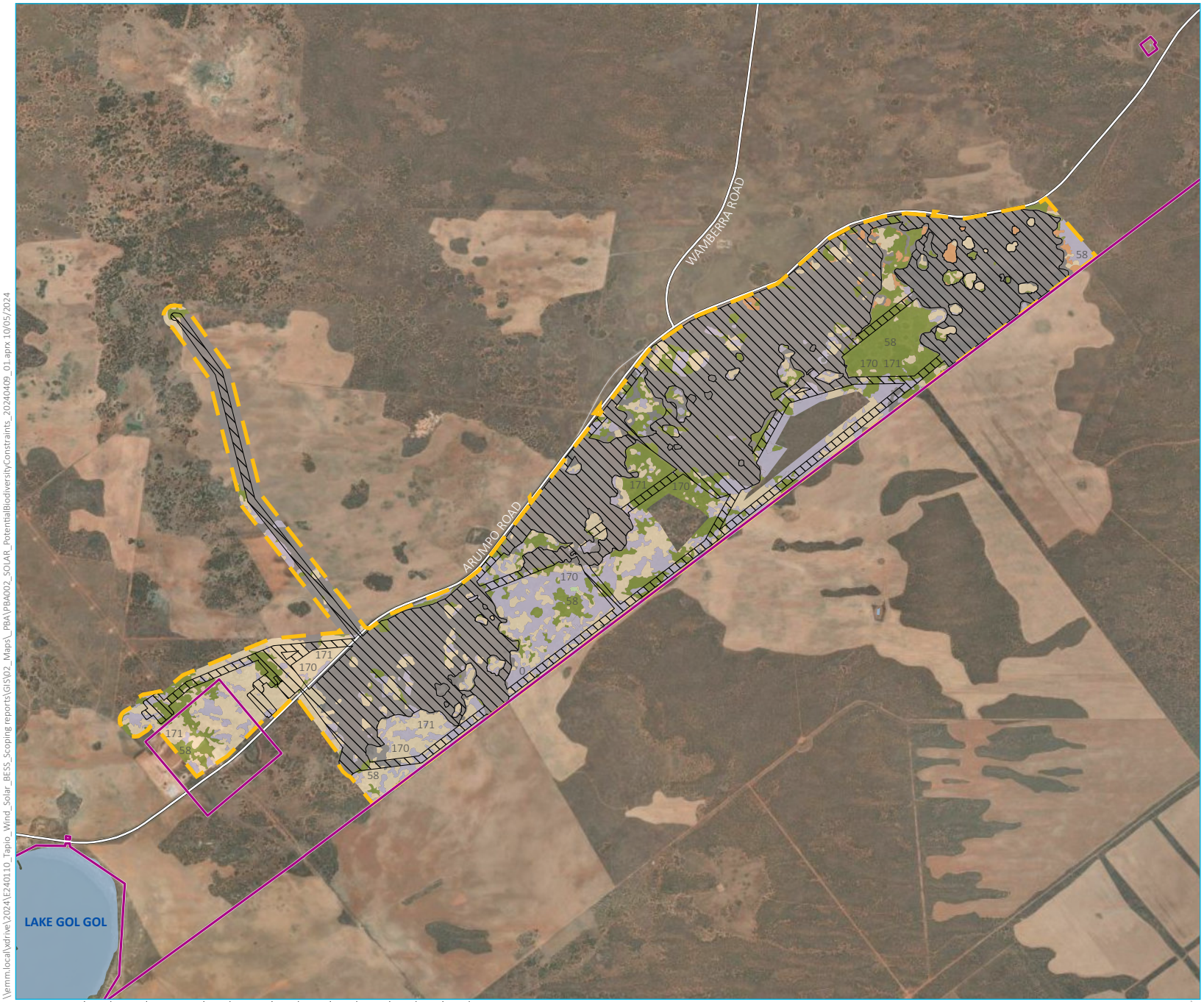
4.3 Native vegetation

A total of six native Plant Community Types (PCTs) are predicted to occur in the project investigation area by the NSW SVTM. 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.

Table 4.2 PCTs predicted in the project investigation area

Plant community ID	Plant community name	Predicted in project investigation area?
0	Not classified – non-native vegetation	Yes
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)	Yes
43	Mitchell Grass grassland - chenopod low open shrubland on floodplains in the semi-arid (hot) and arid zones	Yes
58	Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Yes
154	Pearl Bluebush low open shrubland of the arid and semi-arid plains	Yes
170	Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Yes
171	Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	Yes



KEY

- Private landholding
- Solar farm development corridor
- Solar farm investigation area

Plant community type ID

- 0 (Cleared)
- 11
- 43
- 58
- 154
- 170
- 171

Existing environment

- Major road
- Minor road
- Named waterbody

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

0 2.5 5 km

GDA2020 MGA Zone 54

N

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Potential biodiversity constraints

Gol Gol Solar Farm
Preliminary Biodiversity Assessment
Figure 4.1

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4.4 Threatened ecological communities

Six 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, three are considered with a moderate to high likelihood of occurring in the project investigation area:

- *Acacia loderi shrublands*
- *Acacia melvillei shrublands in the Riverina and Murray-Darling Depression bioregions*
- *Mallee Bird Community of the Murray Darling Depression Bioregion.*

Table 4.3 Threatened Ecological Communities – Likelihood of Occurrence

Threatened Ecological Community	BC Act	EPBC Act	Associated PCTs	Likelihood of occurrence in project investigation area
Acacia loderi shrublands	E	-	58, 170	**Moderate**. This community is known to occur in the South Olary Plain IBRA Subregion and is associated with two PCTs that occur within the project investigation area.
Acacia melvillei shrublands in the Riverina and Murray-Darling Depression bioregions	E	-	58, 170	**High**. This community is known to occur in the South Olary Plain IBRA Subregion and is recorded directly south of the project investigation area.
Artesian Springs Ecological Community in the Great Artesian Basin	CE	-	-	**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, 171	**High**. This TEC is associated with mallee habitats mapped within the project investigation area.
Plains mallee box woodlands of the Murray Darling Depression, Riverina and Naracoorte Coastal Plain Bioregions	-	CE	170	**Low**. This TEC primarily occurs in a region south of the site. Similarly, surveys for the nearby 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.
Allocasuarina luehmannii (Buloke) Woodlands of the Riverina and Murray-Darling Depression Bioregions	E	E	-	**Low.** The community is known from the South Olary Plain IBRA in which the project is located but no associated PCTs are predicted to occur within the project investigation area.

E = Endangered, CE = Critically Endangered

4.5 Threatened and migratory species

In total, 104 threatened and migratory species listed under the BC Act or EPBC Act were identified with potential to occur with 10 km of the project investigation area, including 20 plants, 51 birds, 6 fish, 13 mammals, 12 reptiles and 2 frogs.

Of these species, 36 (2 flora and 34 fauna) species are known to occur on or nearby the project investigation area, according to NSW Bionet Atlas database records. These species are listed in Table 4.4.

Table 4.4 Threatened species known to occur in the project locality

Species	Conservation status (BC Act)	Conservation status (EPBC Act)	Class of credit
Bardick (*Echiopsis curta*)	Endangered	Not listed	Ecosystem
Bitter Quandong (*Santalum murrayanum*)	Endangered	Not listed	Species
Black Falcon (*Falco subniger*)	Vulnerable	Not listed	Ecosystem
Black-breasted Buzzard (*Hamirostra melanosternon*)	Vulnerable	Not listed	Species/ecosystem
Bolam's Mouse (*Pseudomys bolami*)	Endangered	Not listed	Ecosystem
Chestnut Quail-thrush (*Cinclosoma castanotum*)	Vulnerable	Not listed	Ecosystem
Crowned Gecko (*Lucasium stenodactylum*)	Vulnerable	Not listed	Species
Harrow Wattle (*Acacia acanthoclada*)	Endangered	Not listed	Species
Hooded Robin (*Melanodryas cucullata cucullata*)	Vulnerable	Endangered	Ecosystem
Gilbert's Whistler (*Pachycephala inornata*)	Vulnerable	Not listed	Ecosystem
Grey Falcon (*Falco hypoleucos)*	Vulnerable	Vulnerable	Ecosystem
Inland Forest Bat (*Vespadelus baverstocki*)	Vulnerable	Not listed	Ecosystem
Jeweled Gecko (*Strophurus elderi)*	Vulnerable	Not listed	Ecosystem
Little Eagle (*Hieraeetus morphnoides*)	Vulnerable	Not listed	Species/ecosystem
Little Pied Bat (*Chalinolobus picatus*)	Vulnerable	Not listed	Ecosystem
Major Mitchell's Cockatoo (*Lophochroa leadbeateri*)	Vulnerable	Endangered	Species/ecosystem
Mallee Worm Lizard (*Aprasia inaurita*)	Endangered	Not listed	Ecosystem
Malleefowl (*Leipoa ocellata*)	Endangered	Vulnerable	Ecosystem
Marble-faced Delma (*Delma australis*)	Endangered	Not listed	Ecosystem
Painted Honeyeater (*Grantiella picta*)	Vulnerable	Vulnerable	Ecosystem
Pied Honeyeater (*Certhionyx variegatus*)	Vulnerable	Not listed	Ecosystem
Purple-gaped Honeyeater (*Lichenostomus cratitius)*	Vulnerable	Not listed	Ecosystem
Redthroat (*Pyrrholaemus brunneus*)	Vulnerable	Not listed	Ecosystem
Regent Parrot (*Polytelis anthopeplus monarchoides*)	Endangered	Vulnerable	Species/ecosystem
Scarlet-chested Parrot (*Neophema splendida)*	Vulnerable	Not listed	Ecosystem
Southern Ningaui (*Ningaui yvonneae*)	Vulnerable	Not listed	Ecosystem
South-eastern long eared bat (*Nyctophilus corbeni*)	Vulnerable	Vulnerable	Ecosystem
Southern Scrub-robin (*Drymodes brunneopygia*)	Vulnerable	Not listed	Ecosystem
Southern Whiteface (*Aphelocephala leucopsis*)	Vulnerable	Vulnerable	Not yet determined
Spotted Harrier (*Circus assimilis*)	Vulnerable	Not listed	Ecosystem
Square-tailed Kite (*Lophoictinia isura*)	Vulnerable	Not listed	Species/ecosystem

Table 4.4 Threatened species known to occur in the project locality

Species	Conservation status (BC Act)	Conservation status (EPBC Act)	Class of credit
Varied Sitella (*Daphoenositta chrysoptera*)	Vulnerable	Not listed	Ecosystem
Western Blue-tongued Lizard (*Tiliqua occipitalis*)	Vulnerable	Not listed	Ecosystem
Western Pygmy Possum (*Cercartetus concinnus*)	Endangered	Not listed	Ecosystem
White-bellied Sea-eagle (*Haliaeetus leucogaster*)	Vulnerable	Marine	Species/ecosystem
Yellow-tailed Plain Slider (*Lerista xanthura*)	Vulnerable	Not listed	Ecosystem

4.6 Candidate entities for serious and irreversible impacts

No candidate entity for serious and irreversible impacts (SAII) under the BC Act have been recorded within the locality, however, there is the potential for the A burr-daisy (*Calotis moorei*) to be present on site.

The nearest mapped SAII species or communities are shown on Figure 2.1. *Allocasuarina luehmannii* (Buloke) Woodland in the Riverina and Murray-Darling Depression Bioregions is an SAII entity but, as addressed in Table 4.3, is unlikely to occur within the project investigation area.

4.7 Key fish habitat and aquatic species

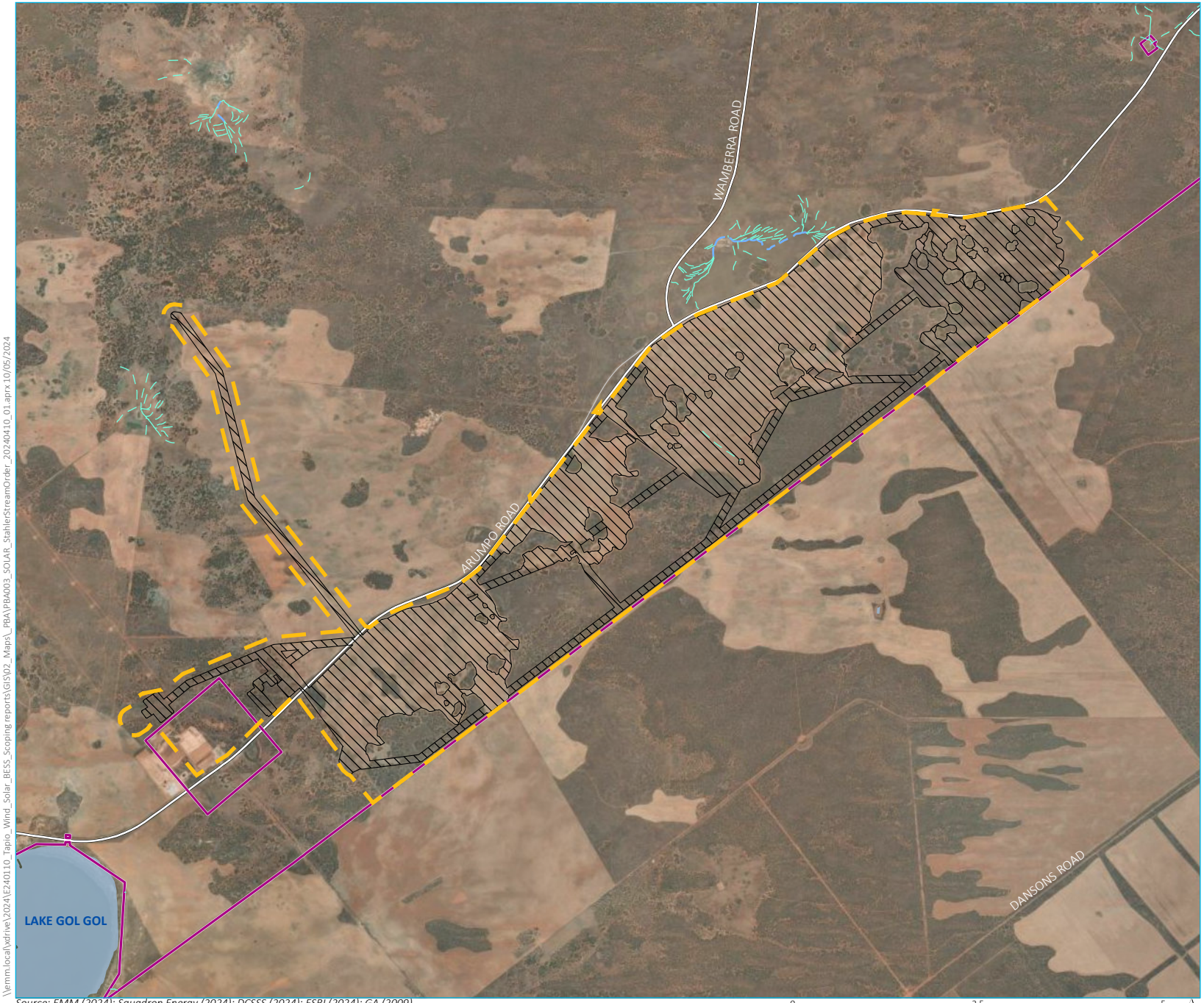
There are no key fish habitats or threatened aquatic species predicted by the Fisheries NSW Spatial Data Portal (https://www.dpi.nsw.gov.au/fishing/fisheries-research/spatial-data-portal) to occur within and in proximity to the project investigation area.

The PMST predicted six threatened fish species may occur in the project investigation area buffered by 10 km (Table 4.5). Of these species, two have a low potential to occur in the project investigation area.

Table 4.5 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.** Occurs in slow-flowing lowland rivers and wetlands, which are ephemeral in the project investigation area.
Murray Hardhead (*Caterocephals fluviatilis*)	Critically Endangered	Endangered	**Low.** Occurs in lowland reaches of the Murray River and tributaries.
Murray Cod (*Maccullochella peelii*)	Not listed	Vulnerable	**Nil.** May occur given the species wide distribution and habitat requirements, however, would require deep pools >5 m and snags to occur which are not found within the project investigation area.
Silver Perch (*Bidyanus bidyanus*)	Vulnerable	Critically Endangered	**Nil.** The species requires fast-flowing upland streams which do not occur in the project investigation area.
Macquarie Perch (*Macquaria australasica*)	Endangered	Endangered	**Nil.** This is an upland species, while the project is in a lowland area.
Trout Cod (*Maccullochella macquariensis)*	Endangered	Endangered	**Nil.** The species requires fast-flowing streams with rocky and gravel bottoms which do not occur in the project investigation area.

Potential fish habitat within the project area is limited to a small, ephemeral first order drainage line (Figure 4.2). Flooding events may provide temporary habitat for threatened fish species within the project area.



KEY

- Private landholding
- Solar farm development corridor
- Solar farm investigation area

Strahler stream order

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

Existing environment

- Major road
- Minor road
- Named watercourse
- Named waterbody

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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Strahler stream order

Gol Gol Solar Farm
Preliminary Biodiversity Assessment
Figure 4.2

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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, 170	Permanent removal, loss of habitat, fragmentation
Acacia melvillei shrublands in the Riverina and Murray-Darling Depression bioregions	58, 170	Permanent removal, loss of habitat, fragmentation
Mallee Bird Community of the Murray Darling Depression Bioregion	170, 171	Permanent removal, loss of habitat, fragmentation, turbine strike

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 area are outlined in Table 5.2.

Table 5.2 Potential threatened species impacts

Threatened taxa	Threatened species	Potential impacts
Hollow-dependent birds	Major Mitchell's Cockatoo (*Lophochroa leadbeateri*), Regent Parrot (*Polytelis antopeplus monarchoides*), Scarlet-chested Parrot (*Neophema splendida)*	Loss of hollow-bearing trees, loss of breeding and foraging habitat
Threatened birds	Chestnut Quail-thrush (*Cinclosoma castanotum*), Hooded Robin (*Melanodryas cucullata cucullata*), Gilbert's Whistler (*Pachycephala inornata*), Malleefowl (*Leipoa ocellata*), Painted Honeyeater (*Grantiella picta*), Pied Honeyeater (*Certhionyx variegatus*), Purple-gaped Honeyeater (*Lichenostomus cratitius),* Redthroat (*Pyrrholaemus brunneus*), Southern Scrub-robin (*Drymodes brunneopygia*), Southern Whiteface (*Aphelocephala leucopsis*), Varied Sitella (*Daphoenositta chrysoptera*)	Potential direct and indirect impacts on woodland, shrubland and mallee vegetation.
Threatened ecological communities	Mallee Bird Community of the Murray Darling Depression Bioregion; Acacia loderi shrublands, Acacia melvillei Shrublands in the Riverina and Murray-Darling Depression Bioregion	Potential direct and indirect impacts on mallee vegetation
Threatened mammals	Bolam's Mouse (*Pseudomys bolami*), Southern Ningaui (*Ningaui yvonneae*), Western Pygmy Possum (*Cercartetus concinnus*)	Habitat loss and fragmentation
Threatened plants	Bitter Quandong (*Santalum murrayanum*) and Harrow Wattle (*Acacia acanthoclada*)	Potential direct and indirect impacts on specimens of this species through vegetation clearing or long term disturbance such as dust from vehicles.
Threatened microbats	Corben's Long-eared Bat (*Nyctophilus corbeni*), Little Pied Bat (*Chalinolobus picatus*), Inland Forest Bat (*Vespadelus baverstocki*)	Loss of hollow-bearing trees, loss of breeding and foraging habitat

Table 5.2 Potential threatened species impacts

Threatened taxa	Threatened species	Potential impacts
Threatened raptors	Black Falcon (*Falco subniger*), Black-breasted Buzzard (*Hamirostra melanosternon*), Grey Falcon (*Falco hypoleucos),* Little Eagle (*Hiteraeetus morphnoides*), Spotted Harrier (*Circus assimilis*), Square-tailed Kite (*Lophoictinia isura*), White-bellied Sea-eagle (*Hieraeetus mophnoides*)	Loss of mature trees, loss of breeding and hunting habitat
Threatened reptiles	Bardick (*Echiopsis curta*), Crowned Gecko (*Lucasium stenodactylum*), Jeweled Gecko (*Strophurus elderi),* Mallee Worm Lizard (*Aprasia inaurita*), Marble-faced Delma (*Delma australis*), Western Blue-tongued Lizard (*Tiliqua occipitalis*) and Yellow-tailed Plain Slider (*Lerista xanthura*)	Habitat loss and fragmentation

5.3 Potential impacts to candidate entities for SAII

As detailed in Appendix B, there is a potential for one SAII entity, the A burr-daisy (*Calotis moorei*), to be present on site, which will require further investigation during the preparation of the BDAR and EIS.

5.4 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 5.3).

Table 5.3 Potential MNES impacts

MNES	Threatened biodiversity	Potential impacts
Threatened ecological communities	Mallee Bird Community of the Murray Darling Depression Bioregion	Potential impacts on mallee-dependent bird species in PCTs 170 and 171.
Threatened plants	Purple-wood Wattle (*Acacia carneorum),* A saltbush (*Atriplex infrequens*), A Spear-grass (*Austrostipa metatoris),* Mossgiel Daisy (*Brachyscome papillosa),* A burr-daisy *(Calotis moorei),* Winged Peppercress *(Lepidium monoplocoides),* Menindee Nightshade *(Solanum karsense),* Slender Darling Pea *(Swainsona murrayana),* Yellow Swainson-pea (*Swainsona pyrophila)*	Potential direct and indirect impacts on woodland, wetland, shrubland and mallee vegetation.
Threatened birds	Murray Mallee striated grasswren (*Amytornis striatus howei*), Southern Whiteface (*Aphelocephala leucopsis*), Australasian Bittern *(Botaurus poiciloptilus*) Sharp-tailed Sandpiper (*Calidris acuminata*), Curlew Sandpiper (*Calidris ferruginea*), Grey Falcon (*Falco hypoleucos*), Latham's Snipe *(Gallinago hardwickii*), Painted Honeyeater (*Grantiella picta*), Swift Parrot (*Lathamus discolor*), Malleefowl (*Leipoa ocellata*), Major Mitchell's Cockatoo (*Lophochroa leadbeateri*), Black-eared Miner (*Manorina melanotis*), Red-lored Whistler (*Pachycephala rufogularis*), Plains-wanderer (*Pedionomus torquatus*), Regent Parrot (eastern subspecies) (*Polytelis anthopeplus monarchoides*), Australian Painted Snipe (*Rostratula australis*), Mallee Emu-wren (*Stipiturus mallee*), Common Greenshank (*Tringa nebularia*)	Potential direct and indirect impacts on woodland, wetland, shrubland and mallee vegetation.

Table 5.3 Potential MNES impacts

MNES	Threatened biodiversity	Potential impacts
Migratory birds	Common Sandpiper (*Actitis hypoleucos*), Fork-tailed Swift (*Apus pacificus*), Sharp-tailed Sandpiper (*Calidris acuminata*), Pectoral Sandpiper (*Calidris melanotos*), Latham's Snipe *(Gallinago hardwickii*), Yellow Wagtail (*Motacilla flava*), Common Greenshank (*Tringa nebularia*)	Potential indirect and direct impacts to mallee and woodland habitat and indirect impacts to limited wetland habitat within project investigation area.
Threatened mammals	South-eastern long eared bat (*Nyctophilus corbeni*)	Potential direct and indirect impacts on woodland, shrubland and mallee vegetation.
Threatened amphibians	Sloane's Froglet (*Crinia sloanei*), Southern Bell Frog (*Litoria raniformis)*	Potential direct and indirect impacts on limited habitat within project investigation area.
Threatened reptiles	Grey Snake (*Hemiaspis damelii)*	Potential direct impacts on limited habitat within project investigation area.
Threatened fish	Flathead Galaxias (*Galaxias rostratus*), Macquarie Perch (*Macquaria australasica*), Murray Cod *(Maccullochella peelii*), Murray Hardyhead (*Craterocephalus fluviatilis*), Silver Perch (*Bidyanus bidyanus*), Trout Cod (*Maccullochella macquariensis*)	Potential direct and indirect impacts to limited habitat within project investigation area.

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
- conduct field-based threatened species habitat assessments
- 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 separable MNES
- conduct BAM calculations and prepare BDAR for lodgement.

As the project has potential to impact MNES, a referral will be lodged with DCCEEW Commonwealth. The referral would address the MNES outlined in Section 5.4 and 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

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

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

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

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

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: -34.03 West: 142.25 East: 142.41 South: -34.13] returned a total of 191 records of 65 species.

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Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Limnodynastidae	3063	*Limnodynastes tasmaniensis*		Spotted Grass Frog	P		1	
Animalia	Amphibia	Limnodynastidae	3086	*Neobatrachus sudellae*		Sudell's Frog	P		1	
Animalia	Reptilia	Diplodactylidae	2077	*Diplodactylus vittatus*		Wood Gecko	P		2	
Animalia	Reptilia	Diplodactylidae	2109	*Lucasium damaeum*		Beaded Gecko	P		8	
Animalia	Reptilia	Gekkonidae	2092	*Gehyra variegata*		Tree Dtella	P		1	
Animalia	Reptilia	Pygopodidae	2143	*Aprasia inaurita*		Mallee Worm-lizard	E1,P		1	
Animalia	Reptilia	Pygopodidae	2167	*Delma butleri*		Unbanded Delma	P		6	
Animalia	Reptilia	Pygopodidae	2170	*Lialis burtonis*		Burton's Snake-lizard	P		1	
Animalia	Reptilia	Scincidae	2340	*Ctenotus atlas*		Southern Mallee Ctenotus	P		20	
Animalia	Reptilia	Scincidae	2342	*Ctenotus brachyonyx*		Short-clawed Ctenotus	P		1	
Animalia	Reptilia	Scincidae	2913	*Ctenotus olympicus*			P		5	
Animalia	Reptilia	Scincidae	2374	*Ctenotus regius*		Pale-rumped Ctenotus	P		7	
Animalia	Reptilia	Scincidae	2379	*Ctenotus schomburgkii*		Barred Wedgesnout Ctenotus	P		1	
Animalia	Reptilia	Scincidae	5154	*Lerista muelleri*		Wood Mulch-slider	P		21	
Animalia	Reptilia	Scincidae	2499	*Lerista punctatovittata*		Eastern Robust Slider	P		5	
Animalia	Reptilia	Scincidae	2519	*Menetia greyii*		Common Dwarf Skink	P		7	
Animalia	Reptilia	Scincidae	2583	*Tiliqua rugosa*		Shingle-back	P		4	
Animalia	Reptilia	Agamidae	2185	*Ctenophorus fordi*		Mallee Military Dragon	P		3	
Animalia	Reptilia	Agamidae	2199	*Ctenophorus pictus*		Painted Dragon	P		2	
Animalia	Reptilia	Agamidae	5059	*Diporiphora nobbi*		Nobbi Dragon	P		3	
Animalia	Reptilia	Agamidae	2204	*Pogona vitticeps*		Central Bearded Dragon	P		2	
Animalia	Reptilia	Elapidae	2711	*Brachyurophis australis*		Coral Snake	P		2	
Animalia	Reptilia	Elapidae	T033	*Pseudonaja sp.*		Unidentified Brown Snake	P		1	
Animalia	Aves	Anatidae	0207	*Tadorna tadornoides*		Australian Shelduck	P		1	
Animalia	Aves	Columbidae	0043	*Ocyphaps lophotes*		Crested Pigeon	P		4	
Animalia	Aves	Columbidae	0034	*Phaps chalcoptera*		Common Bronzewing	P		2	
Animalia	Aves	Phalacrocoracidae	0100	*Microcarbo melanoleucos*		Little Pied Cormorant	P		1	
Animalia	Aves	Ardeidae	T179	*Ardea/Egretta sp.*		Unidentified Egret	P		1	
Animalia	Aves	Ardeidae	8703	*Ixobrychus dubius*		Australian Little Bittern	P		18	
Animalia	Aves	Accipitridae	0221	*Accipiter fasciatus*		Brown Goshawk	P		2	
Animalia	Aves	Accipitridae	0218	*Circus assimilis*		Spotted Harrier	V,P		1	
Animalia	Aves	Accipitridae	0230	*^^Lophoictinia isura*		Square-tailed Kite	V,P,3		1	
Animalia	Aves	Accipitridae	0229	*Milvus migrans*		Black Kite	P		1	
Animalia	Aves	Falconidae	0240	*Falco cenchroides cenchroides*		Nankeen Kestrel	P		5	
Animalia	Aves	Falconidae	0237	*Falco peregrinus*		Peregrine Falcon	P		1	
Animalia	Aves	Psittacidae	0294	*Barnardius zonarius*		Australian Ringneck	P		1	
Animalia	Aves	Psittacidae	0297	*Northiella haematogaster*		Blue Bonnet	P		1	
Animalia	Aves	Strigidae	9922	*Ninox novaeseelandiae*		Southern Boobook	P		1	
Animalia	Aves	Maluridae	0535	*Malurus leucopterus*		White-winged Fairy-wren	P		3	
Animalia	Aves	Acanthizidae	0484	*Acanthiza reguloides*		Buff-rumped Thornbill	P		1	
Animalia	Aves	Acanthizidae	0481	*Acanthiza uropygialis*		Chestnut-rumped Thornbill	P		3	
Animalia	Aves	Pardalotidae	0976	*Pardalotus striatus*		Striated Pardalote	P		1	
Animalia	Aves	Meliphagidae	0608	*Gavicalis virescens*		Singing Honeyeater	P		1	
Animalia	Aves	Meliphagidae	0635	*Manorina flavigula*		Yellow-throated Miner	P		1	
Animalia	Aves	Meliphagidae	0634	*Manorina melanocephala*		Noisy Miner	P		1	
Animalia	Aves	Pomatostomidae	0446	*Pomatostomus ruficeps*		Chestnut-crowned Babbler	P		1	
Animalia	Aves	Pachycephalidae	0401	*Pachycephala rufiventris*		Rufous Whistler	P		1	
Animalia	Aves	Artamidae	0700	*Cracticus nigrogularis*		Pied Butcherbird	P		3	
Animalia	Aves	Artamidae	0705	*Gymnorhina tibicen*		Australian Magpie	P		2	

Animalia	Aves	Rhipiduridae	0364	*Rhipidura leucophrys*	Willie Wagtail	P	2	
Animalia	Aves	Corvidae	0930	*Corvus coronoides*	Australian Raven	P	3	
Animalia	Aves	Monarchidae	0415	*Grallina cyanoleuca*	Magpie-lark	P	1	
Animalia	Aves	Corcoracidae	0675	*Struthidea cinerea*	Apostlebird	P	2	
Animalia	Aves	Locustellidae	0509	*Cincloramphus mathewsi*	Rufous Songlark	P	1	
Animalia	Aves	Hirundinidae	0358	*Cheramoeca leucosterna*	White-backed Swallow	P	1	
Animalia	Aves	Hirundinidae	0357	*Hirundo neoxena*	Welcome Swallow	P	2	
Animalia	Mammalia	Tachyglossidae	1003	*Tachyglossus aculeatus*	Short-beaked Echidna	P	1	
Animalia	Mammalia	Dasyuridae	1055	*Ningaui yvonneae*	Southern Ningaui	V,P	3	
Animalia	Mammalia	Dasyuridae	1061	*Sminthopsis murina*	Common Dunnart	P	5	
Animalia	Mammalia	Burramyidae	1151	*Cercartetus concinnus*	Western Pygmy Possum	E1,P	1	
Animalia	Mammalia	Molossidae	1324	*Austronomus australis*	White-striped Freetail-bat	P	1	
Animalia	Mammalia	Molossidae	1946	*Ozimops petersi*		P	1	
Animalia	Mammalia	Vespertilionidae	1349	*Chalinolobus gouldii*	Gould's Wattled Bat	P	1	
Animalia	Mammalia	Vespertilionidae	1362	*Scotorepens greyii*	Little Broad-nosed Bat	P	1	
Animalia	Mammalia	Vespertilionidae	1379	*Vespadelus vulturnus*	Little Forest Bat	P	1	

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: 20-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:	2
Listed Threatened Species:	36
Listed Migratory Species:	8

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:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	15
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:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	1
EPBC Act Referrals:	8
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	150 - 200km upstream from Ramsar site	In feature area
Riverland	100 - 150km 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 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
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	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
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 may 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
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may 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 likely to occur within area	In buffer area only
FISH			
Bidyanus bidyanus Silver Perch, Bidyan [76155]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
Craterocephalus fluviatilis Murray Hardyhead [56791]	Endangered	Species or species habitat likely to occur within area	In buffer area only
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Maccullochella peelii			
Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Macquaria australasica			
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In buffer area only
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 may occur within area	In buffer area only
PLANT			
Lepidium monoplocoides			
Winged Pepper-cress [9190]	Endangered	Species or species habitat may 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 may 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 buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[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
Migratory Wetlands Species			
[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
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat may occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely 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
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Corporation [16073]	NSW	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
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
Chalcites osculans as Chrysococcyx osculans			
Black-eared Cuckoo [83425]		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
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
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
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely 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
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely 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

Protected Area Name	Reserve Type	State	Buffer Status
Southern Mallee	NRS Addition - Gazettal in Progress	NSW	In buffer area only

Nationally Important Wetlands [Resource Information]

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

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
EnergyConnect NSW - Eastern Section	2020/8766		Post-Approval	In feature area
Mallee Wind Farm	2023/09500		Assessment	In feature area
Controlled action				
Electricity Transmission Line	2001/380	Controlled Action	Completed	In buffer area only
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				
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
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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Appendix B
Likelihood of threatened MNES occurrence

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Common name	Scientific name	BC Act Status[1]	EPBC Act Status1	SAII Entity	Likelihood of occurrence
Amphibians					
Southern Bell Frog	*Litoria raniformis*	E	V	No	Moderate
Birds					
Murray Mallee Striated Grasswren	*Amytornis striatus howei*	E	E	No	Moderate
Southern Whiteface	*Aphelocephala leucopsis*	V	V	No	High
Australasian Bittern	*Botaurus poiciloptilus*	E	E	No	Moderate
Sharp-tailed Sandpiper	*Calidris acuminata*	-	V, Mi	No	Low
Common Sandpiper	*Actitis hypoleucos*		Mi	No	Low
Curlew Sandpiper	*Calidris ferruginea*	E	CE, Mi	Yes	Low
Fork-tailed Swift	*Apus pacificus*		Mi	No	Moderate
Pectoral Sandpiper	*Calidris melanotos*		Mi	No	Low
Yellow Wagtail	*Motacilla flava*		Mi	No	Moderate
Grey Falcon	*Falco hypoleucos*	V	V	No	High
Latham's Snipe	*Gallinago hardwickii*	-	V, Mi	No	Low
Painted Honeyeater	*Grantiella picta*	V	V	No	High
Swift Parrot	*Lathamus discolor*	E	CE	No	Moderate
Malleefowl	*Leipoa ocellata*	E	V	No	High
Major Mitchell's Cockatoo	*Lophochroa leadbeateri*	V	E	No	High
Black-eared Miner	*Manorina melanotis*	CE	E	No	Low
Red-lored Whistler	*Pachycephala rufogularis*	CE	V	No	Moderate
Plains-wanderer	*Pedionomus torquatus*	E	CE	No	Moderate
Regent Parrot (eastern subspecies)	*Polytelis anthopeplus monarchoides*	E	V	No	High
Australian Painted Snipe	*Rostratula australis*	E	E	No	Low
Mallee Emu-wren	*Stipiturus mallee*	-	E	No	Low
Common Greenshank	*Tringa nebularia*	-	E, Mi	No	Low
Mammals					
South-eastern long eared bat	*Nyctophilus corbeni*	V	V	No	High
Reptiles					
Grey Snake	*Hemiaspis damelii*	E	E	No	Low

Common name	Scientific name	BC Act Status[1]	EPBC Act Status1	SAII Entity	Likelihood of occurrence
Plants					
Purple-wood Wattle	*Acacia carneorum*	V	V	Yes	Moderate
A saltbush	*Atriplex infrequens*	V	V	No	Moderate
A spear-grass	*Austrostipa metatoris*	V	V	No	Moderate
Mossgiel Daisy	*Brachyscome papillosa*	V	V	No	Moderate
A burr-daisy	*Calotis moorei*	E	E	Yes	High
Winged Peppercress	*Lepidium monoplocoides*	E	E	No	High
Menindee Nightshade	*Solanum karsense*	V	V	No	High
Slender Darling Pea	*Swainsona murrayana*	V	V	No	Moderate
Yellow Swainson-pea	*Swainsona pyrophila*	V	V	No	High

Notes: CE = Critically endangered; E = Endangered; V = Vulnerable; Mi = Migratory.

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Appendix C
Preliminary Visual Impact Assessment

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Gol Gol Solar Farm

Preliminary Landscape and Visual Assessment

Prepared for Squadron Energy Pty Ltd

May 2024

Gol Gol Solar Farm

Preliminary Landscape and Visual Assessment

Squadron Energy Pty Ltd

E240110 RP22

May 2024

Version	Date	Prepared by	Approved by	Comments
1	30 April 2024	Simon Lacey	Mark Trudgett	Draft for client review
2	10 May 2024	Simon Lacey	Mark Trudgett	

Approved by

Mark Trudgett
Associate
10 May 2024

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1 Project description

1.1 Overview

Squadron Renewable Energy Developments Pty Ltd (Squadron Energy), proposes to develop the Gol Gol Solar Farm (the project) approximately 12 kilometres (km) north of Mildura in the Wentworth LGA, in the Western Murray Region of New South Wales. Figure 1.1 illustrates the location of the project in a regional context.

The project will include the installation of solar photovoltaic (PV) infrastructure, including transmission, collector substations, ancillary and temporary infrastructure, with an installed capacity of up to approximately 600 megawatts (MW).

The project is located within a single freehold land parcel that is predominantly used for agricultural activities, as shown in Figure 1.2. A smaller section of this landholding has been investigated for the purpose of locating the solar farm and is referred to as the project investigation area. Within the project investigation area is the proposed development corridor, the land within which all elements of the Solar Farm are proposed to be located.

The identified development corridor is about 2,500 ha and will be subject to ongoing design refinement. The final development corridor will be presented in the Environmental Impact Statement (EIS).

All the required project infrastructure can be contained within the development corridor, which has been sized with sufficient flexibility to accommodate amendments and micro-siting during the detailed design phase. It is noted that the areas being investigated as part of the scoping phase are conservative areas for early assessment purposes and the proposed disturbance area may be smaller, subject to further detailed assessments and design.

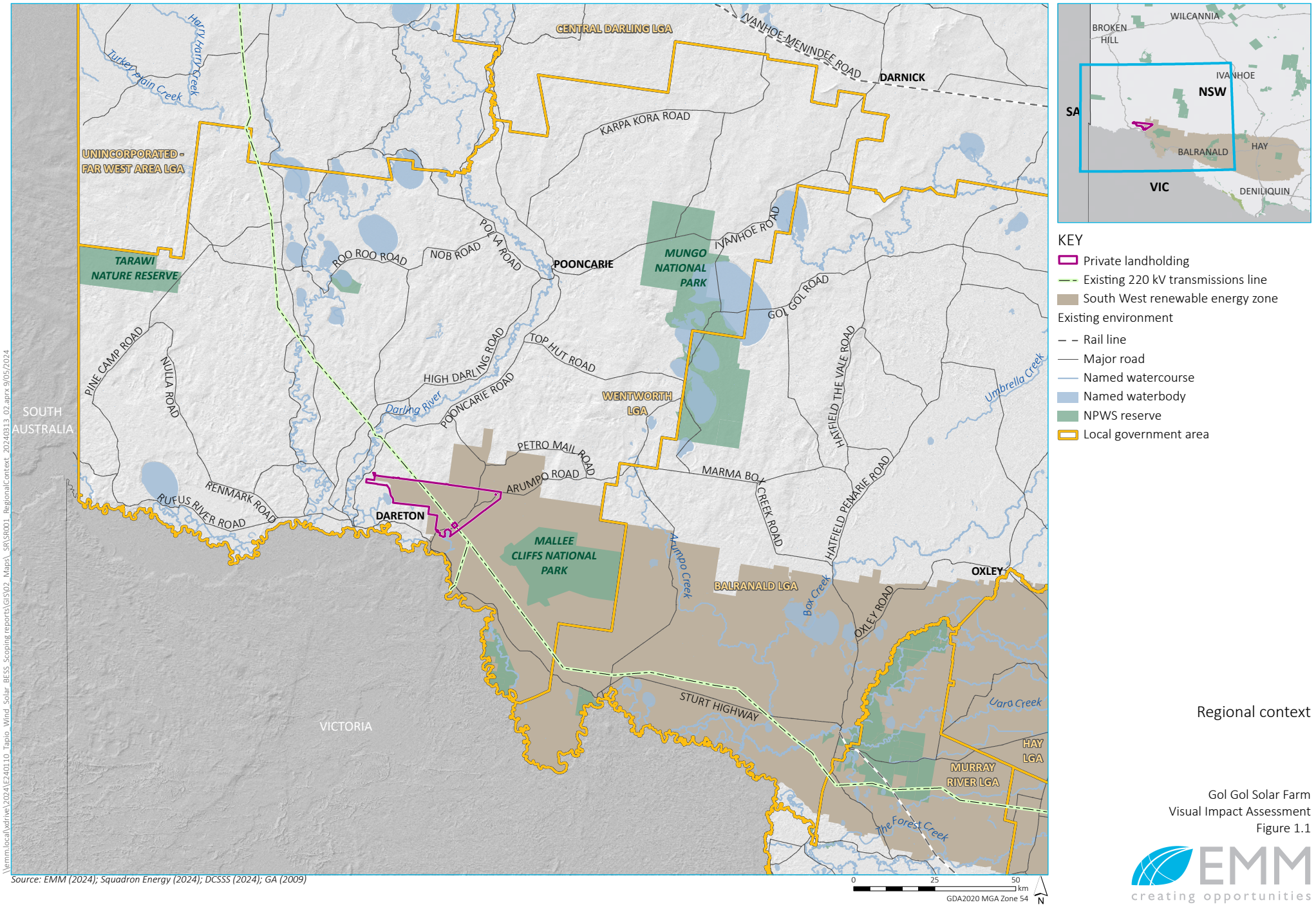
1.2 Solar photovoltaic infrastructure

A solar farm with PV panels is proposed with a generation capacity of up to 600 MW. The project will include the installation of PV modules mounted on tracking systems that will be configured in rows positioned to maximise the use of the available solar resource. PV modules will be fixed to and supported by ground-mounted framing.

The PV modules will be up to 2.5 m from the ground when in the horizontal position, while the lower edge of each PV module will be no less than 0.3 m from the ground or above the flood depth level at the maximum tilt angle. The maximum height of the modules to the higher edge from ground level at the maximum tilt angle is expected to be approximately 4.7 m, which is assuming a ‘2 in portrait’ (2P) configuration (i.e. worst-case assumption for visual impact assessment).

As shown in Figure 1.3, PV modules will be installed in the eastern section of the project investigation area, east of Arumpo Road and north of the Buronga Substation, which is currently under construction. The PV modules will be installed in parallel rows within each section, with an indicative spacing of approximately 5–10 m between each row. The rows of PV modules will be aligned in a north-south direction, allowing the modules to rotate from east to west during the day, tracking the sun’s movement.

DC cables will be strung underneath the PV modules, housed in cable trays, or be passed through the tracker tubes before being connected to the power conversion units (PCUs). The PCUs convert the DC electricity generated by the PV modules into AC form, which is compatible with the electricity grid. The exact dimensions and configuration of the PCUs will be determined during detailed design.



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

Regional context

Gol Gol Solar Farm
Visual Impact Assessment
Figure 1.1

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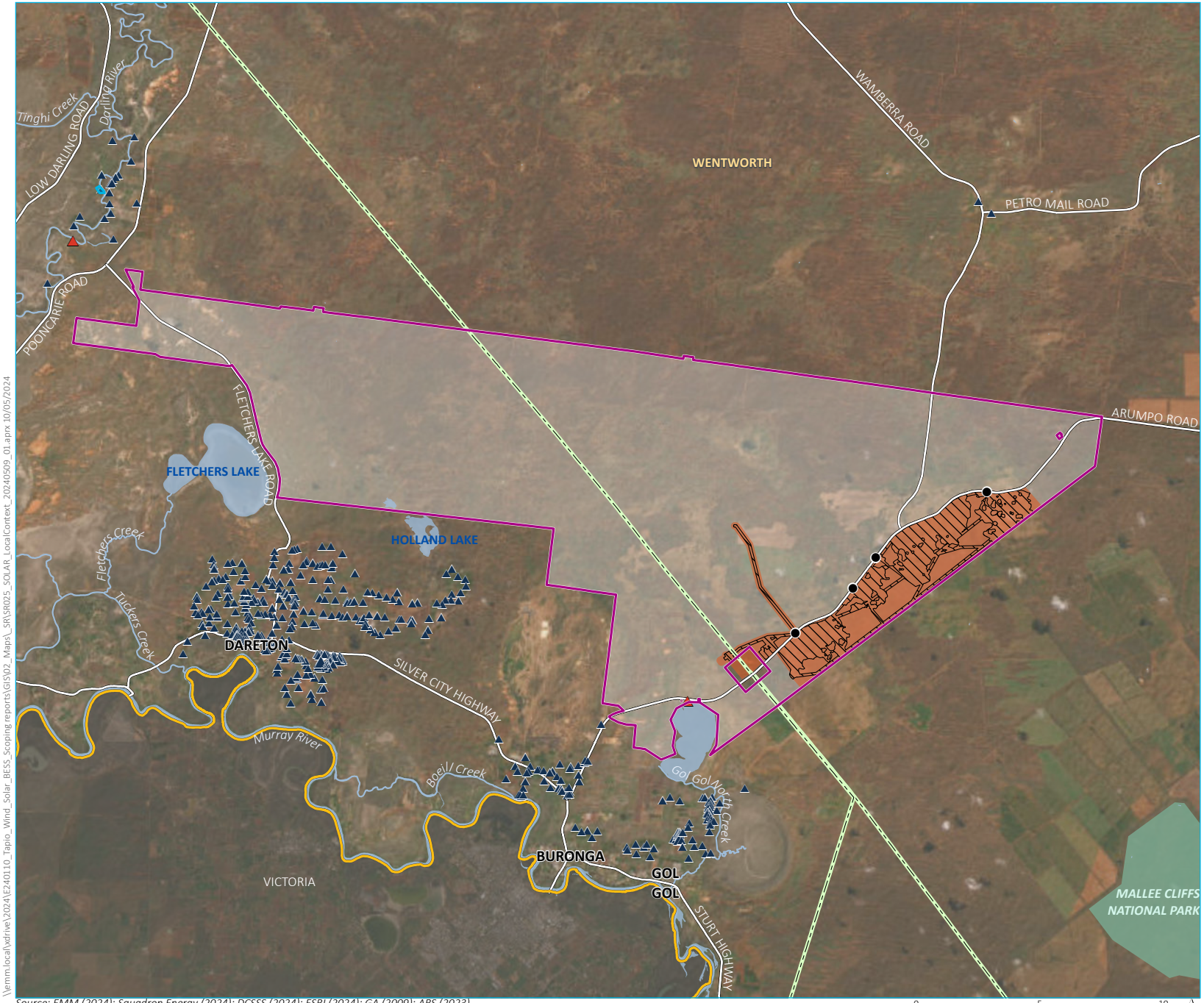

KEY

- Private landholding
- Solar farm development corridor
- Existing 220 kV transmission line
- Solar farm investigation area
- Site access

Sensitive receiver

- Dwelling associated with the project
- Dwelling not associated with the project
- State heritage register

Existing environment

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

N

Local context

Gol Gol Solar Farm
Visual Impact Assessment
Figure 1.2

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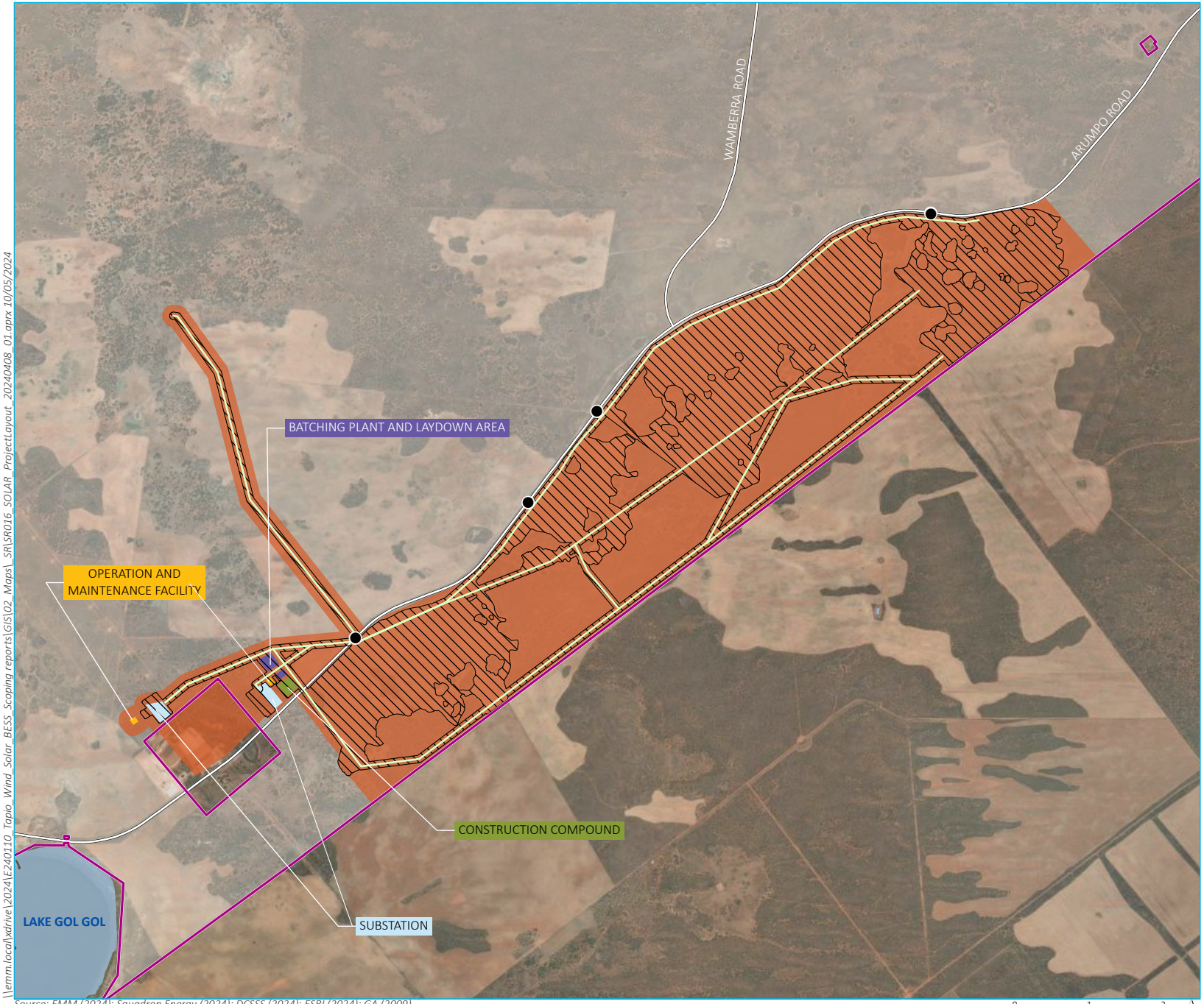

KEY

- Private landholding
- Site access
- Overhead transmission line
- Solar farm development corridor
- Solar farm investigation area
- Batching plant and laydown area
- Construction compound
- Operation & maintenance facility
- Substation

Existing environment

- Major road
- Named watercourse
- Named waterbody

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

0 1 2 km
GDA2020 MGA Zone 54

N

Project layout

Gol Gol Solar Farm
Visual Impact Assessment
Figure 1.3

EMM
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2 Assessment methodology

The purpose of the PVIA is to identify locations around the solar components of the project that have the potential for visual impacts. Visual impacts are changes to the existing landscape that can be seen by people. These potential impacts must be assessed and assigned a rating of high, moderate, low, or negligible. To make an assessment, a specific location must be used so the scale of change can be measured. These specific locations are viewpoints, and each viewpoint represents the views from the general area in which it is located.

The PVIA evaluates the surrounding residences, roads, rails and other publicly accessible places to identify locations that will be visually impacted by the project. These locations become viewpoints that will be assessed in detail in later chapters of this report.

This PVIA is a requirement of the *Large-Scale Solar Energy Guideline* (2022) implemented by the NSW Department of Planning, Housing and Infrastructure (DPHI), formerly Department of Planning and Environment (DPE). The assessment is undertaken with reference to:

- *Large-Scale Solar Energy Guideline* (DPE 2022) (the Guideline)
- *Technical Supplement – Landscape and Visual Impact Assessment* (DPE 2022) (Technical Supplement).

2.1 Viewpoint selection

An initial step of the assessment is to identify the viewpoints that will be analysed. For the PVIA, viewpoints are limited by distance to the proposed development. For the purposes of the preliminary assessment, there are three types of viewpoints:

- Roads and rail viewpoints – locations along roads and rail lines that have views into the project. The technical supplement limits these viewpoints to within 2.5 km of the development.
- Public viewpoints – locations that are publicly accessible (parks, trails, shopping areas) and offer views into the project. These views are limited to a 4 km distance from the development.
- Private viewpoints – locations that are not accessible to the public (mainly residences) and have views into the project. These views are limited to a 4 km distance from the development.

The number of viewpoints can be refined where there is an excessive number of potential viewpoints. Representative viewpoints may be selected and assessed in lieu of dwellings that are clustered together in residential areas, villages and urban areas.

2.2 Field of view

The PVIA relies on the relative size of the project when compared to the observer's field of view (FOV). It assumes an item taking up more of the FOV will have more of a visual impact than an item that takes up a smaller portion of the FOV. For example, a solar farm that occupies 10% of the FOV will have more of a visual impact than if it occupied 4% of the FOV.

Based on the above criteria, the preliminary assessment first identifies viewpoints from which the project will be visible. It then calculates the relative size of the project vertically in the FOV and repeats the relative size calculation horizontally in the FOV.

Finally, the vertical and horizontal relative sizes are combined using the preliminary assessment tool to rate the potential impact and determine whether a detailed assessment is required for that viewpoint. The detailed assessments for viewpoints identified will be performed in the Landscape and Visual Impact Assessment during the EIS stage of the project.

2.2.1 Vertical field of view

This portion of the assessment requires the vertical FOV to be calculated for each viewpoint. The calculations for this assessment are based on the development corridor, which is the area occupied by solar modules and other project infrastructure.

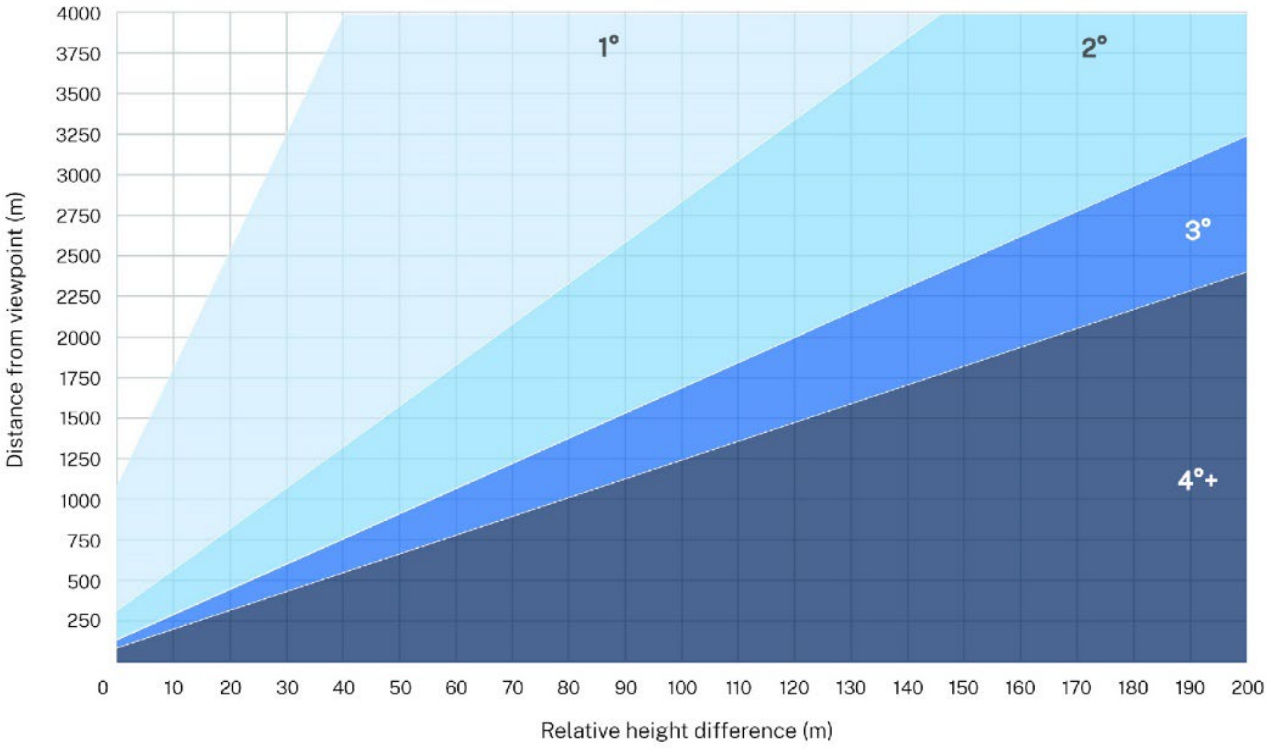
Determining the vertical FOV requires that a relative height difference be calculated. There are three methods to calculate the height difference depending on the elevation of the viewpoint relative to the solar modules.

1. Project is located above and below the viewpoint – subtract the lowest point of the development from the highest point of the development.

2. Project is located above the viewpoint – subtract the viewpoint height from the highest point of the development.

3. Project is located below the viewpoint – subtract the lowest point of the development from the viewpoint elevation.

The resulting height difference for each viewpoint is plotted against the distance of the viewpoint from the development. Figure 2.1 provides the assessment tool for the vertical FOV.



Source: Technical Supplement – Landscape and Visual Impact Assessment.

Figure 2.1 Vertical field of view assessment tool

The resulting indicative vertical FOV determined by the assessment tool is expressed as either 1, 2, 3 or 4+ degrees. This result for each viewpoint is assessed against the horizontal FOV, as shown in Table 2.1.

2.2.2 Horizontal field of view

The horizontal FOV is measured by mapping the project and calculating the extent of the development (in degrees) in relation to the viewpoint. The Technical Supplement requirement is to “measure the worst-case horizontal field of view of the project from each viewpoint (not considering topography or vegetation).” This

calculation is performed by drawing lines from the extents of the solar modules to the viewpoint and measuring the angle formed by the two lines. The result is assessed against the vertical FOV in the preliminary assessment tool, as shown in Table 2.1.

2.2.3 Preliminary assessment tool

The preliminary assessment tool is used to determine if a viewpoint needs to be assessed in detail during the EIS stage of the project. It is designed to eliminate the need to assess viewpoints that are likely to experience very low impacts. It combines the horizontal FOV with the vertical FOV to determine if further assessment is required.

Table 2.1 Preliminary assessment requirements tool

Horizontal FOV of project	1° vertical FOV	2° vertical FOV	3° vertical FOV	4+° vertical FOV
1-10°	No assessment required	No assessment required	No assessment required	No assessment required
11-20°	No assessment required	No assessment required	No assessment required	Assessment required
21-30°	No assessment required	No assessment required	Assessment required for all viewpoints except rail/road	Assessment required
31-40°	No assessment required	Assessment required for all viewpoints except rail/road	Assessment required for all viewpoints except rail/road	Assessment required
41-50°	No assessment required	Assessment required for all viewpoints except rail/road	Assessment required	Assessment required
51-60°	No assessment required	Assessment required for all viewpoints except rail/road	Assessment required	Assessment required
61-70°	No assessment required	Assessment required	Assessment required	Assessment required
71-130°	Assessment required for all viewpoints except rail/road	Assessment required	Assessment required	Assessment required
130°+	Assessment required	Assessment required	Assessment required	Assessment required

Source: Technical Supplement – Landscape and Visual Impact Assessment.

2.3 Viewshed mapping

Viewshed mapping is used to supplement the FOV assessment. 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.

This study uses a Zone of Visual Influence (ZVI) to map the viewshed (refer to Chapter 4). It is generated using geographic information system (GIS) and is used to simulate the project's visibility from the surrounding landscape. The ZVI has been restricted to a 4 km distance from the project as this is the distance specified in the Section 2.1.

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 significant for viewpoints that are located behind vegetation or buildings and have no views of the proposed development yet are assessed as having a potential impact in this PVIA.

2.4 Sensitive receivers

Sensitive receivers refer to people who have potential views of the project. They are represented and assessed using the locations of dwellings that surround the project. The Solar Guideline limits the assessment of sensitive receivers to a distance of 4 km from the project boundaries. Therefore, only dwellings that are located within the 4 km distance of the solar components are considered in this PVIA. Sydney, New South Wales

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 north-east of Adelaide and 550 km north of Melbourne. 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, 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 Solar Farm and is located within the South West REZ and 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.

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 Eucalyptus 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.*).

3.3 Land use

The Solar Farm is located on freehold land owned by a single landowner who undertakes agricultural operations within the land. The Solar Farm project investigation area is a smaller subset of the larger landholding and predominately consists of land used for cropping and grazing, with some native vegetation within and surrounding the site. Pasture dominates the project investigation area, punctuated by scattered paddock trees, while portions of intact native vegetation can be found in the northern, northeastern, and southwestern corners.

The study area is zoned predominantly RU1 Primary Production under the Wentworth Local Environmental Plan 2011 (Wentworth LEP), with smaller parcels of land, outside the project investigation area, zoned C2 Environmental Conservation. The land use surrounding the project investigation area is shown in Figure 3.1.

RU1 Primary Production

The project investigation area is zoned RU1 – Primary Production. The Wentworth LEP 2011 states the following objectives for the RU1 – Primary Production zone:

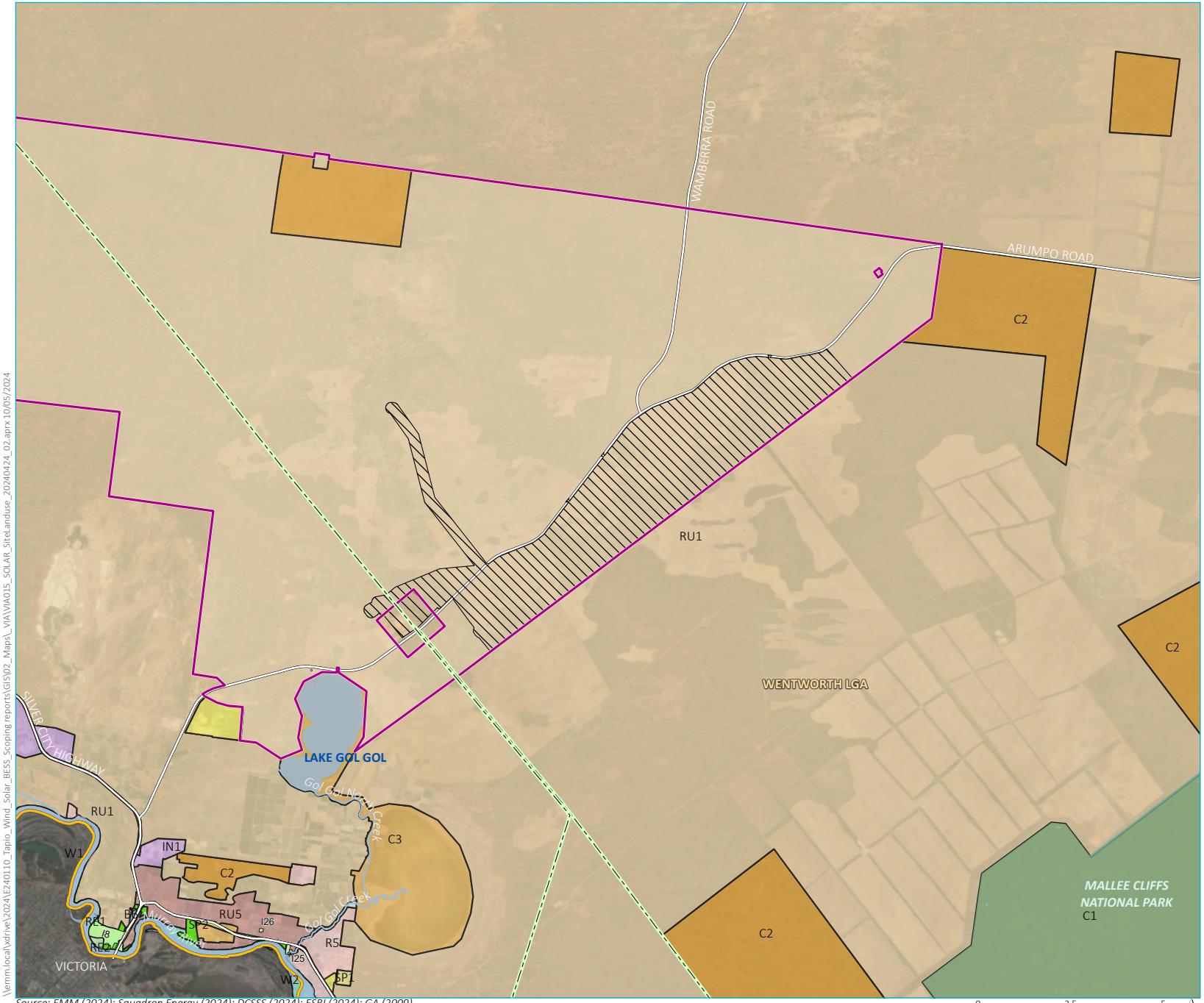
- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between 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 nearby 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.



KEY

Private landholding

Solar farm investigation area

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

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 Solar Farm
Visual Impact Assessment
Figure 3.1

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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creating opportunities

3.4 Roads

Access to the site will be via Arumpo Road, that bisects the project investigation area. Access to Arumpo Road will be predominantly via the Sturt Highway and Silver City Highway to the south of the project. Internal access tracks will be established to link infrastructure components back to Arumpo Road.

3.5 Surrounding developments

Several State Significant Development (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

This preliminary review of the landscape character is based upon desktop analysis and a field visit. Documenting the scenic value of the landscape has been undertaken through identifying the landscape character units (LCU's)

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 neighbouring Mallee Cliffs National Park and Associated Nature Reserves. Four 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 the technical supplement.

Nearby natural features and beyond the study area include:

i Murry 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, 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 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.

iii Recreational Associations and Points of Interest

Recreational opportunities in the wider Study Area are limited. Rivergardens Holiday Park (9 km south of the project investigation area) is the nearest public recreational spot for enjoying the surrounding landscape. Given its proximity to the project beyond the 4 km study area, further assessment is not required.

3.7 Landscape character units and scenic quality

Table 3.1 below offers an overview of the site's character and its surrounding landscape, including an initial assessment of scenic quality. The landscape character units and scenic quality ratings will be refined in the EIS phase of the project.

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, Lake Gol Gol. • 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	Agricultural Pastures	• Extensive land modified for dryland cropping and irrigated agriculture. • Vegetation primarily exists in patches, serving as windbreaks or screening. • Large areas adapted for pastoral farming and irrigated agriculture. • This LCU is commonly observed within and surrounding the 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

The following photographs help to describe the above landscape character units.

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 and other activities.

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 – Agricultural pastures

The agricultural pastures (Photograph 3.3) make up the majority of the landscape across the regional area. The woodland has been cleared to provide pastures for grazing and fields for dry cropping and irrigated crops. The topography is flat with low rises divided by watercourses.

There are occasional corridors of remnant woodland along watercourses, roads, and property boundaries. Visually, the pastures are vast, flat fields of crops that are punctuated by remnant trees.

Scenic quality rating: Low

Photograph 3.3 Characteristic modified and expansive farmlands with sparse or no vegetation

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 3.4). This is in sharp contrasted with adjacent cleared paddocks and roadways that cut through the woodlands.

Scenic quality rating: Moderate

Photograph 3.4 Low stemmed eucalyptus (Mallee) woodlands and shrublands dominate the landscape

4 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. 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.

4.1 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.

The ZVI diagram is created utilising a digital elevation model (DEM) provided by Squadron Energy, encompassing the project boundaries. 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 (eg 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.

The ZVI is presented in Figure 4.1 and uses colour to indicate high visibility and low visibility. Highly visible areas show locations on the ground from which all or most solar panels would be visible. Low levels of visibility are locations where small numbers of project elements are visible. No colour within the study area would indicate locations where no project elements are predicted to be visible.

The ZVI is used to select viewpoints by indicating areas that are predicted to have views into the solar project. Conversely, it indicates areas that are not predicted to have any views of the solar 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 is shown in Figure 4.1 and illustrates:

- the topography of the region does little to limit views into the project within the study area (4 km)
- visibility is evenly spread across the study area with the locations central to the study area (within 2.5 km) having greater visibility of the solar panels than areas at the edge of the study area
- road users have opportunities for direct views into the project as they travel along Arumpo Road and Wamberra Road
- there is one (1) associated residence and no non-associated residences are within the study area that are likely to have visibility of the project.

A reverse viewshed analysis was not conducted because no non-associated receptors were identified within the 4 km of the project elements.

KEY

- Private landholding
- Solar farm buffer
- Solar farm development corridor
- Solar farm investigation area

Sensitive receiver

- Associated residence
- Dwelling not associated with the project

Visibility of solar farm

- Highly visible
- Not very visible

Existing environment

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

Zone of visual influence: solar

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

0 5 10 km

GDA2020 MGA Zone 54

N

Gol Gol Solar Farm
Visual Impact Assessment
Figure 4.1

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4.2 Viewpoint identification

4.2.1 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.

The roads near the project with potential views into the solar components are:

- Wamberra Road
- Arumpo Road.

These two road locations have been identified as offering potential views into the solar project and are considered preliminary road viewpoints.

There are no railways near the project.

4.2.2 Preliminary public viewpoints

Public viewpoints include a number of various types of locations. They include public gathering areas like parks, sporting fields and walking trails in the surrounding community. They also include 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.

The are no public locations within the project study area with potential views.

4.2.3 Preliminary private viewpoints

Private viewpoints 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 viewpoints 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 in the EIS. 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.

The residences identified with potential visual impacts are shown in Table 4.1.

4.2.4 Selected viewpoints

The selection of the viewpoints is based on the locations of residences and public areas. This was overlaid with the viewshed mapping to determine which locations had the potential for visual impacts from the project. Viewpoints selected satisfy both criteria; falling within the affected ZVI and characterised as a private or public viewpoint.

This assessment also uses representative viewpoints to that combine several viewpoints that are clustered together and have similar views of the project. This allows a reduction in the number of viewpoints while maintaining representation for each residence, public area, and roadway.

Table 4.1 lists the viewpoints selected for the private and public receivers for this assessment and the rational for the selection. Figure 4.2 shows the locations of the preliminary viewpoints.

Table 4.1 Selected viewpoints for assessment

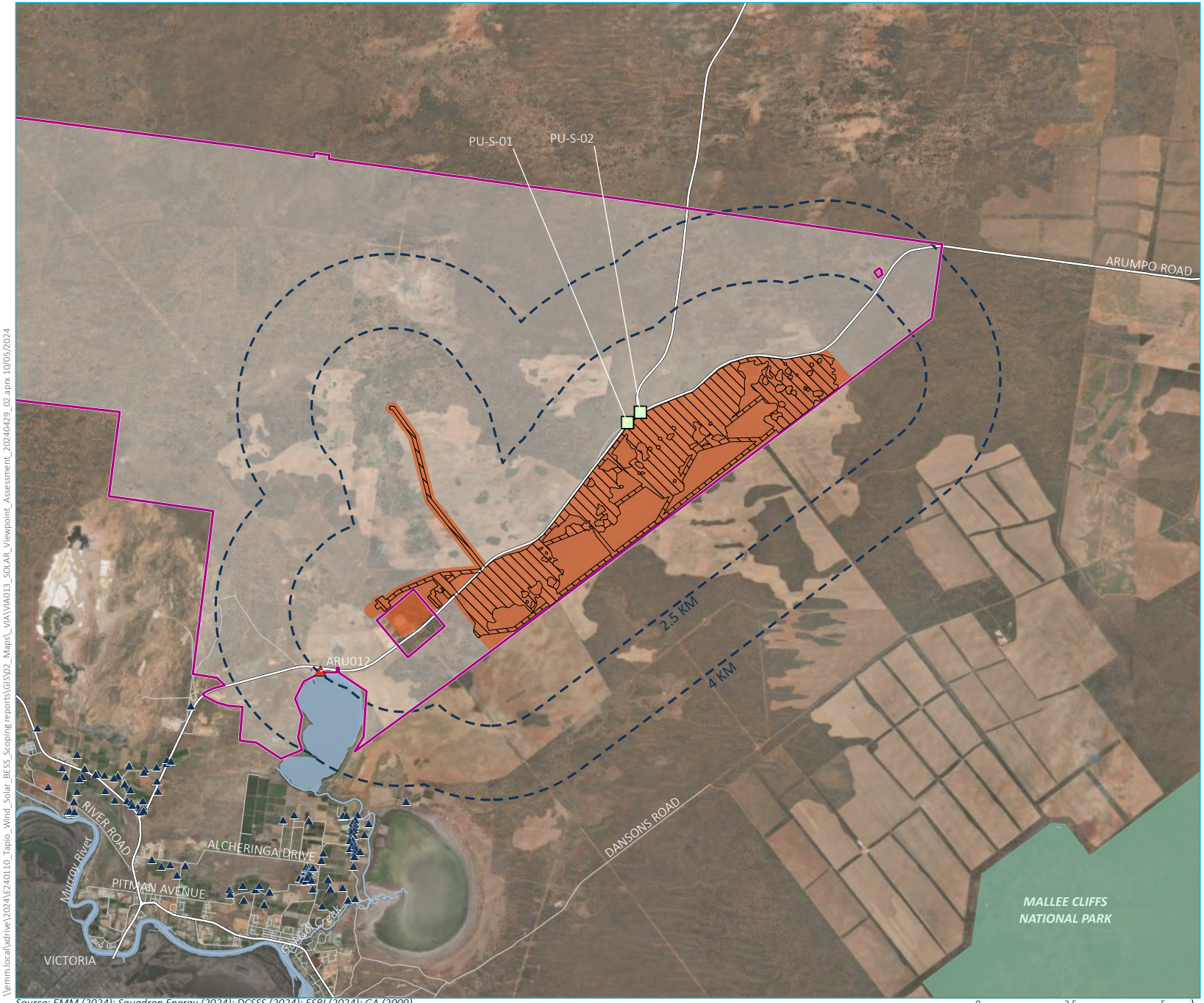
Viewpoint reference	Viewpoint type	Location	Representative receptors	Rationale for selection
ARU012	Rural dwelling	Gol Gol Lake 664 Arumpo Road, Wentworth 2648	Local Residents	Associated residence with potential view within 4 km of the project.
PU-01	Local Road	Arumpo Road, Buronga	Road users	Road location with views of the site along the eastern boundary where the site entrance is located. Within 2.5 km of the site.
PU-02	Local Road	Wamberra Road, Buronga	Road users	Road intersection between Wamberra Road and Arumpo Road. Within 2.5 km of the site.

4.3 Preliminary viewpoint assessment

The preliminary assessment tools specified by the Technical Supplement have been applied to each selected viewpoint. Viewpoint reference ARU012 has not been assessed as this is an associated viewpoint. The assessment criteria and results are listed in Table 4.2.

Table 4.2 Preliminary viewpoint assessment

Viewpoint reference	Viewpoint type	Distance to solar project (m)	Relative height difference (m)	Vertical FOV (degrees)	Horizontal FOV (degrees)	Detailed assessment required
PU-01	Public	50	20	4	181	Yes
PU-02	Public	75	20	4	152	Yes



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

Solar farm visual receptors and viewpoints

Gol Gol Solar Farm
Visual Impact Assessment
Figure 4.2

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5 Conclusion

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 investigation area and surrounding it.

The landscape within and surrounding the study area can be described as low rolling terrain. Land within the solar project investigation area is mostly cleared of native vegetation and used for grazing and cropping. Native woodland is visible surrounding the study area. The PVIA identified four 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 – Agricultural Pastures
- LCU04 – Mallee Woodlands and Shrublands.

This preliminary assessment identified two (2) public viewpoints in the community and landscape surrounding the project were identified as needing further assessment as part of the EIS. The one (1) associated viewpoint is not required to be assessed.

The project, comprising of solar 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 Solar 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 D
Social impact scoping worksheet

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	Social Impact Assessment (SIA) Worksheet		Date: April 2024					
PROJECT ACTIVITIES	**CATEGORIES OF SOCIAL IMPACTS**	**POTENTIAL IMPACTS ON PEOPLE**	**ASSESSMENT LEVEL FOR EACH IMPACT**				**PROJECT REFINEMENT**	**MITIGATION / ENHANCEMENT MEASURES**
Which **project activity / activities** could produce social impacts ?	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		
Free Text	Categories in SIA guideline	Free text	Detailed, Standard, Minor, Nothing further on this impact	Free Text			Yes No	Free Text
Construction, Operation	Community; Surroundings; Way of life	Reduced sense of place and rural lifestyle values due to chnages to the visual landscape, amenity and environmental values	Detailed	Required - Visual Amenity Assessment	Targeted SIA consultation	Targeted research	Yes	•Visual impact assessment •Ongoing community and stakeholder engagement
Construction; Operation	Way of life; Livelihoods	Disruption to existing agricultural operations and land use	Detailed	Required	Targeted SIA consultation	Targeted research	No	Landholder agreements to reasonably compensate for disruptions to existing operations/land use
Construction, Operation	Livelihoods	Reduced agricultural productivity from increased weed introduction and biosecurity risk during construction	Standard	Required	Broad EIS consultation	Targeted research	No	•Landholder agreements to reasonably compensate for disruptions to existing operations/land use
Construction	Community; Surroundings	Reduced rural lifestyle values for local area residents due to land clearing and potential for loss of habitat	Detailed	Required	Broad EIS consultation	Targeted research	No	•Visual impact assessment and mitigation measures •Ongoing community and stakeholder engagement
Construction, Operation, D	Health and wellbeing	Percevied deterioration of health outcomes due to noise, dust and traffic generated by Project	Standard	Required	Broad EIS consultation	Targeted research	No	•Air quality and acoustic management measure •Advanced notice of residents on timing of construction activities.
x	Livelihoods	Increased competition for construction labour and services in local and regional areas due to increased demand generated by the project	Detailed	Required	Targeted SIA consultation	Targeted research	No	Engage with relevant stakeholder to understand local and regional skills gaps and development opportunities. •Provision of skills development and training initiatives by the project.
Construction	Way of life; Accessibility	Changes to road and traffic conditions resulting in reduced connectivity of local roads and potential frustration of road users	Detailed	Required	Targeted SIA consultation	Targeted research	No	•Advanced notice of construction timeframes including changed road use •Traffic Management Plan
Pre-construction, Construc	Way of life; Livelihoods	Percevied devaluation of adjacent or nearby properties	Standard	Required	Broad EIS consultation	Targeted research	No	•Visual impact assessment and mitigations •Ongoing community and stakeholder engagement Community benefit and investment program
Construction	Community	Reduced community cohesion in local area and nearby urban centres due to influx of construction workers	Detailed	Required	Targeted SIA consultation	Targeted research	No	•Ongoing community and stakeholder engagement •Community benefit and investment program

PROJECT ACTIVITIES	CATEGORIES OF SOCIAL IMPACTS	POTENTIAL IMPACTS ON PEOPLE	ASSESSMENT LEVEL FOR EACH IMPACT				PROJECT REFINEMENT	MITIGATION / ENHANCEMENT MEASURES
Which **project activity / activities** could produce social impacts ?	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		
Construction	Way of life, Accessibility	Potential increase in demand and strain on local/regional services and infrastructure due temporary population increase attributed to project workforce	Detailed	Required	Targeted SIA consultation	Targeted research	No	•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
Construction	Way of life; Accessibilty	Increased demand for local housing (rentals) and short term accommodation	Detailed	Required	Targeted SIA consultation	Targeted research	No	•Development of a Workforce Accommodation Strategy
Construction	Culture	Potential disturbance or changes to sites or landscapes of tangible and intangible cultural heritage significance	Standard	Required	Targeted SIA consultation	Targeted research	No	•Ongoing 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
Construction, Operation	Way of life; Health and wellbeing; Livelihoods	Generation of employment opportunities for local and regional workers, including Aboriginal people and young people	Detailed	Required	Targeted SIA consultation	Targeted research	No	•Engage with local employment and training service providers to establish local capacity and maximise opportunities for local skills development and employment. •Development of an Aboriginal Participation Plan to maximise income and training opportunities for those in the local Aboriginal community.
Construction	Livelihoods	Socio-economic benefits associated with project employment, training, and procurement opportunities.	Detailed	Required	Targeted SIA consultation	Targeted research	No	•Engage with local employment and training service provides on employment opportunities and workforce development strategies. •Development of an Aboriginal Participation Plan to maximise income and training opportunities for those in the local Aboriginal community. •Commitment to use local contractors and supplier where feasible.
Construction	Livelihoods	Increase in trade and revenue for local businesses in key townships due to patronage/expenditure by the project workforce.	Detailed	Required	Targeted SIA consultation	Targeted research	No	Advanced notification to local service providers on timing of construction activities and anticipated workforce ramp up.
Operation	Community, Way of life	Contribute to intergenerational equity through provision of infrastructure that enables the transition to renewable energy generation.	Detailed	Required	Targeted SIA consultation	Targeted research	No	• **Employment strategies to build workforce skills for renewable energy projects**
Construction, Operation	Community	Improved/enhanced local/regional social outcomes due to project's community investment initiatives.	Detailed	Required	Targeted SIA consultation	Targeted research	No	Community benefit and investment program
Decomissioning	Livelihoods; Decision-making systems	Increased uncertainty associated with decommissioning.	Detailed	Required	Broad EIS consultation	Targeted research	No	Panel recycling throughout life of project Decomissioning activities detailed as part of EIS Ongoing engagement with government and regulatory bodies.
Pre-construction, Constru	Community; Surroundings; Decision-making systems	Enhanced community cohesion for landholders and local area residents due to increased interaction with neighbours as a result of the Project	Detailed	Required	Broad EIS consultation	Targeted research	No	Community benefit and investment program

Appendix E
Cumulative impact scoping

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E.1 Cumulative impact scoping

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: 5. Impacts are well understood. 6. Impacts are relatively easy to predict using standard methods. 7. Impacts are capable of being mitigated to comply with relevant standards or performance measures. 8. The assessment is unlikely to involve any significant uncertainties or require any detailed cumulative impact assessment.
N/A	9. No potential overlap in impacts between a future project and the proposed project that would warrant any consideration in the cumulative impact assessment.

Table E.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
Mallee Solar Farm	Adjacent	Proposed – EIS in preparation	Impacting similar PCTs (<50km)	Local context	Local visual catchment	Possible construction overlap	Construction workforce	Possible construction overlap
Mallee Wind Farm	8 km east	Proposed – EIS in preparation	Impacting similar PCTs (<50km)	Local context	Local visual catchment	Possible construction overlap	Construction workforce	Possible construction overlap
Project EnergyConnect	Adjacent	Approved – under construction	Impacting similar PCTs (<50km)	Local context	Local visual catchment	No construction timing overlap	No construction timing overlap	No construction timing overlap
Buronga Landfill Expansion	9 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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