Scoping report: Wilan Wind Farm

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Glossary

Term	Definition
AEMO	Australian Energy Market Operator
BC Act	*Biodiversity Conservation Act 2016*
CER	Clean Energy Regulator
CSES	Community and Stakeholder Engagement Strategy
DPE or DPIE	NSW Department of Planning and Environment or NSW Department of Planning, Industry and Environment
Environmental Impact Statement (EIS)	An environmental impact statement prepared by or on behalf of the applicant to accompany an SSD Development Application.
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
Grid Connection	Area of project that contains the transmission line which connects to PEC Transmission line
ISP	Integrated System Plan
LGC	Large-scale Generation Certificate
Local Environmental Plan (LEP)	An environmental planning instrument made under part 3 of the EP&A Act.
LRET	Large-scale Renewable Energy Trust
MNES	Matters of national environmental significance
NDC	Nationally Determined Contribution
NEM	National Energy Market
NIS	2022 Draft Network Infrastructure Strategy
NSW Roadmap	The NSW Electricity Infrastructure Roadmap
NSW Strategy	The NSW Transmission Infrastructure Strategy
Original project area	The land shown in Figure 2
PEC transmission line	Transgrid Project EnergyConnect (PEC) transmission line
Planning Secretary	The Secretary of the Department
Project area	The land shown in Figure 3
Secretary's Environmental Assessment Report (SEARs)	The Planning Secretary's environmental assessment requirements for the preparation of an EIS for an SSD project.

Term	Definition
SEPP	State Environmental Planning Policy
SIA Guidelines	Social Impact Assessment Guidelines for State Significant Projects (DPIE, 2021)
South-West REZ	South-West Renewable Energy Zone
SSD Scoping Report Guidelines	State Significant Development Guidelines – Preparing a Scoping Report: Appendix A to the State Significant Development Guidelines (DPIE, 2021)
State significant development (SSD)	Development that is declared to be State significant development under section 4.36 of the EP&A Act.
The Paris Agreement	The United Nations Paris Agreement on Climate Change (COP21)
The Project	Wilan Wind Farm
The Proponent	Kilara Energy
UNFCCC	United Nations Framework Convention on Climate Change
Wind Energy Guidelines	NSW Wind Energy Guideline for State Significant Wind Development (DPE, 2016)
Wind farm site	Area of project that contains wind turbines and supporting infrastructure

1 Introduction

1.1 Introduction

Kilara Utilities Pty Ltd (ACN 645 842 315) of 5/125 High Street, Prahran, Victoria 3181, trading as "Kilara Energy" (Kilara or the Proponent) proposes to develop the Wilan Wind Farm (the Project) at a site located within the South-West Renewable Energy Zone (South-West REZ). Kilara will be responsible for the construction, operation and decommissioning of the Project. The Project will comprise wind turbines, grid connection and possibly a battery energy facility.

The Project will be developed on land approximately 25 kilometres east of Balranald, 40 kilometres north of Moulamein and 80 kilometres west of Hay (the Project area or site) in New South Wales (NSW). The Project area comprises the main wind farm (turbine array and associated infrastructure) (wind farm site) and the land required for the transmission line to connect the wind farm to the EnergyConnect transmission line (grid connection). Property details of the Original Project area are provided below in Table 1.

Table 1 Project area property details

Reference Property Name	Lot	DP
Gayini	13	DP 751220
	17	DP 751220
	3	DP 1019337
	2	DP 1019337
	1	DP 751168
	2	DP 751211
	3	DP 751211
Willowvale	5	DP 751229
	7	DP 751231
	100	DP 1155525
Loorica	6	DP751215
	7	DP751215
	8	DP751215
	52	DP751215
	53	DP751215
	54	DP751215
	55	DP751215

The Project area is owned by several landholders. The wind farm site is owned by three landholders, the Grid connection land is controlled by up to two landholders. The main wind farm is currently utilised for agricultural purposes, primarily grazing activities and the Grid connection land is mainly used for road access.

The preliminary project design based on studies carried out by and on behalf of the Proponent to date includes up to 138 wind turbines, having an installed total capacity of approximately 800 megawatts of wind generation infrastructure across the 16,000 hectares of available land on the revised Project area. The preliminary Project design also includes a Battery Energy Storage System (BESS) of up to 200MW / 800 MWh. Detailed site studies and surveys during the EIS phase of work will further inform adaptation of the Project to ensure minimisation and mitigation of potential impacts.The wind resource measured at site is significant and presents a unique opportunity to realise a major renewable energy project, contributing to the clean energy transition in Australia.

This scoping report is made in support of a Proponent request for the Secretary's Environmental Assessment Requirements (SEARs) from the Secretary of the NSW Department of Planning and Environment (DPE). Further, once issued the SEARs will provide scope coverage for onward, detailed studies within the Environmental Impact Statement (EIS) phase of the Project development work.

1.2 Proponent

Kilara is an Australian owned and operated developer of renewable energy projects with a particular focus on wind energy.

Kilara is responding to the global climate challenge in bringing together proven commercial and technical expertise and long-term impact capital to develop utility scale renewable energy facilities. Kilara prides itself on ensuring the inclusion and participation of First Nations and rural communities in the full project lifecycle of activities, from inception and feasibility through to operations and eventual decommissioning work.

Kilara's activities are underpinned by deep knowledge and experience across the entire project cycle. Backed by "patient capital" and a long-term mindset, Kilara is well placed to contribute to the continued expansion of Australia's renewables industry and the clean energy transition as a whole.

1.3 Project overview

The Project is within the South-West REZ, in an area with exceptional wind resource and very low population density comprising pastoral lands used for sheep and cattle grazing.

The northern part of the of the Project area is located on the lands of the Nari Nari people, traditional custodians with a connection to country going back millennia. The Nari Nari Tribal Council is one of three project landholders of the wind farm site and a partner to the Proponent in the development of the Project.

Wind measurements at the site demonstrate an excellent resource with strong complementarity with the broader energy mix being developed in NSW and particularly with solar energy. Wind energy generation which occurs throughout the hours of day and night, generally increases during the hours of low light and darkness, when solar energy output wanes. Based on the current study data, the Project preliminary design anticipates up to 138 wind turbines with a generation capacity of approximately 800 megawatts.

Additionally, it is envisaged that the Project may include a grid connected Battery Energy Storage System. The configuration of the storage facility (size and technology) will be optimised to meet Project and Financial Value Merit Criteria under the Access Scheme tender process being administered by the Consumer Trustee (AEMO Services) under the *Electricity Investment Act 2020*.

The southern boundary of the Project area is adjacent to the Sturt Highway, providing good access to major transportation routes, linking to international marine ports suitable for receiving heavy and outsized deliveries bound for the Project.

The Project is located 8 kilometres to the north of the proposed Transgrid Project EnergyConnect (PEC) transmission line. It is conceived that a minimal impact, efficient alignment will be achieved that connects the Project to the PEC line. The Proponent is focussing on engaging with stakeholders for a connection corridor running in close association with Keri Keri Road.

1.3.1 Project objectives

The Project seeks to:

- Identify and assess all potential for environmental impacts resulting from activities associated with the Project and to mitigate through careful design, potential project impacts during all phases of the project lifecycle.
- Contribute zero carbon electricity into the Australian National Electricity Market, supporting the NSW State and Australian national sustainability targets and future energy requirements.
- Establish a benchmark for the Australian renewable energy industry with respect to creating genuine engagement of First Nations peoples in the energy transition that drives long term, sustainable economic, cultural and social benefits.
- Be an employer of choice to local and regional specialists, tradespeople, and contractors, providing meaningful and rewarding work through the planning, construction, operations, and decommissioning/repowering phases of the project lifecycle.
- In collaboration with other project proponents, contribute more broadly to the development of economic diversification in the local region and having a net positive effect on communities hosting and neighbouring the project.

1.3.2 Purpose of this report

This Scoping Report supports a request for SEARs for the Project. The SEARs will guide the preparation of an EIS to support a State Significant Development (SSD) application under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). This Scoping Report has been prepared in accordance with the following guidelines:

- State Significant Development Guidelines – Preparing a Scoping Report: Appendix A to the State Significant Development Guidelines (DPIE, 2021) (SSD Scoping Report Guidelines).
- NSW Wind Energy Guideline for State Significant Wind Development (Department of Planning and Environment, 2016) (Wind Energy Guidelines).
- Social Impact Assessment Guidelines for State Significant Projects (Department of Planning Industry and Environment, 2021) (SIA Guidelines).
- A more detailed summary of relevant government plans, policies and guidance is included at Appendix 1.

2 Strategic context

2.1 Site setting and features

2.1.1 Regional context

The site is located between the towns of Balranald, Moulamein, Maude and Hay as shown in Figure 1. The westernmost boundary of the Project footprint is approximately 25 kilometres east of Balranald in south-west NSW. The Project is on the border of Murray River Council and Hay Shire Council, within the NSW Government's South-West REZ.

The Project comprises two major components: the main wind farm containing the wind farm array, where wind turbine generators will be located and secondly, the grid connection which will comprise transmission and electrical connection infrastructure to connect to the grid.

The existing Balranald-Darlington Point 220kV Transgrid transmission asset is located approximately 8 kilometres south of the wind farm. The new 330kV PEC transmission line between Robertstown, South Australia and Wagga Wagga, NSW will run adjacent and to and on the northern side of the existing transmission infrastructure.

700000
750000
800000
850000
6200000
6150000
6100000

Wilan Wind Farm Project Area
Proposed Site Access Point
South West NSW (REZ)
Energy Connect Powerline
LGA Boundary
NPWS Estate

RENEWABLE ENERGY ZONE - SOUTH WEST NSW

BALRANALD
MAUDE
HAY
MOULAMEIN
VICTORIA

BALRANALD SHIRE COUNCIL
HAY SHIRE COUNCIL
MURRAY RIVER COUNCIL
EDWARD RIVER COUNCIL

Yanga National Park
Yanga Nature Reserve
Yanga State Cons. Area

Wilan Wind Farm
A

WAUGORAH
CORRONG
ONE TREE
HAY SOUTH
YANGA
KERI KERI
KYALITE
GOODNIGHT
MOOLPA
TOORANIE
STONY CROSSING
MALLAN
DILPURRA
SPEEWA
CUNNINYEUK
DHURAGOON
NIEMUR
BOOROORBAN

WAUGORAH ROAD
NAP NAP ROAD
WARWAEGA E ROAD
STURT HIGHWAY
BALRANALD ROAD
KERI KERI ROAD
MAUDE ROAD
WINTHOE ROAD

Project EnergyConnect

Figure 1: Regional Context Plan

KILARA

PROJECT: Wilan Wind Farm		
DATE: 22/11/2022	STATUS: APPROVED	PRODUCED: CM
SCALE: 1:500,000 at A3	DATUM: GDA 1994 MGA Zone 54	APPROVED: IG
FILE: SEARS_001_C_RegionalContext		REV: C

0 2.5 5 10 15 20 25 km

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South-West Renewable Energy Zone

The Project area is within the South-West REZ, now declared by the NSW Government The declaration is the first step in formalising the REZ under the *Electricity Infrastructure Investment Act 2020.* It sets out the intended network capacity (size), geographical area (location) and infrastructure that will make up the REZ.

The South-West REZ has been chosen due to the following factors:

- Proximity to the PEC transmission line (discussed below).
- Abundance of renewable energy resources.
- A strong pipeline of proposed renewable energy projects.
- Relative compatibility of land uses within the region.

Project EnergyConnect

The project area is in close proximity to PEC, a 330kV transmission line to be built between South Australia and NSW with a total length of 900 kilometres. This new transmission infrastructure will enable electricity generated by the proposed Wilan Wind Farm to be supplied to the National Energy Market (NEM).

Related projects

There are several renewable energy projects located in the region that are at various stages of the approvals process. Table 2 provides a summary of the publicly available information on existing projects and those projects under development that have formally submitted a request for SEARs.

Table 2 Existing projects

Project name	Development Type	Operative	Current Status	Proposed capacity (megawatts)
Sunraysia Solar Farm	Solar	Maoneng	Completed and operational	255 MW
Burrawong Wind Farm	Wind	Windlab	SEARs issued, preparing EIS	750 MW
Limondale Sun Farm	Solar	RWE	Completed and operational	349 MW
Keri Wind & Solar Farm	Wind/Solar	Acciona	SEARs issued, preparing EIS	1000 MW
Baldon Wind Farm	Wind	Goldwind Australia and Lacour Energy	SEARs issued, preparing EIS	1000 MW

2.1.2 Local Context

2.1.3 The project area

The wind farm site occupies an area comprising three separate landholdings, each of which are utilised for pastoral grazing activities. These include:

- 'Loorica'
- 'Willowvale'
- An area in the south of 'Gayini'.

2.1.4 Chronology of refining the project footprint

The Proponent was invited by the Nari Tribal Council to work in collaboration to develop a wind energy project 'on-country', specifically at the property known as 'Gayini'. The early project footprint was therefore initiated on an area of land along the southern boundary of the 82,000 Hectare Gayini property. Two properties adjacent and to the south including 'Loorica' and 'Willowvale' were included subsequently.

The Proponent commenced early feasibility assessments of a broader study (Original project area) area described in Figure 2 below in autumn 2021. That work has progressed steadily with the support of appropriate specialists covering in particular, the assessment of potential constraints associated with biodiversity values, cultural heritage and hydrology. During 2022, site studies have broadened to include the additional specialist assessments to inform the project development.

Commencing in the winter period of 2022, the Proponent began bird and bat utilisation studies and ecological surveys on the Original project area with the aim of further defining constraints prior to finalising the preliminary design and Project Scoping Report. The results and observations of this work have led to the Proponent proactively making significant adjustments to the Original project area and preliminary wind turbine layout and refining the Project area as shown in Figure 3. The revised Project area overlain with the Preliminary wind turbine Layout is now shown in Figure 4. The project design philosophy is predicated on flexibility and adaptation and it is anticipated that further revisions will continue to be made to ensure minimisation and mitigation of impacts.

Current Wilan Wind Farm Project Area
Area removed from the project area
Proposed Grid Connection Route
EnergyConnect Powerline
Cadastral Boundary

Nap Nap Road
Nap Nap Road
Warwaegae Road
Maude Road
Nap Nap Road
Warwaegae Road
Loorica Road
Sturt Highway
Sturt Highway
Maude Road
Kerri Kerri Road
Project EnergyConnect

Figure 2: Project Area (Original)

KILARA

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PROJECT: **Wilan Wind Farm**		
DATE: 7/11/2022	STATUS: APPROVED	PRODUCED: CM
SCALE: 1:140,000 at A3	DATUM: GDA 1994 MGA Zone 54	APPROVED: AT
FILE: SEARS_002_B_ProjectArea 1		REV: **B**

0 1 2 3 4 5 km

Current Wilan Wind Farm Project Area
Proposed Grid Connection Route
EnergyConnect Powerline
Cadastral Boundary

Waugorah Road
Nap Nap Road
Warwaegae Road
Nap Nap Road
Maude Road
Nap Nap Road
Warwaegae Road
Loorica Road
Sturt Highway
Sturt Highway
Maude Road
Kerri Kerri Road
Project EnergyConnect

Figure 3: Project Area (Revised)

KILARA

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PROJECT	Wilan Wind Farm		
DATE	STATUS	PRODUCED	
7/11/2022	APPROVED	CM	
SCALE	DATUM	APPROVED	
1:140,000 at A3	GDA 1994 MGA Zone 54	AT	
FILE		REV	
SEARS_003_B_ProjectArea 2		B	

0 1 2 3 4 5 km

745000 750000 755000 760000 765000 770000 775000 780000 785000 790000

6170000 6165000 6160000 6155000 6150000 6145000

Wilan Wind Farm Project Area
Indicative Turbine Location
Site Access Point
Construction Compound & Laydown Area
Substation
Site Office & Maintenance Facility
Battery Enegy Storage System (BESS) Area
Grid Connection Study Corridor
EnergyConnect Powerline
LGA Boundary
NPWS Estate

WARWAEGAE RD

Construction Compound & Laydown Area

Substation

HAY SHIRE COUNCIL

Wilan Wind Farm

STURT HIGHWAY

A

MURRAY RIVER COUNCIL

KERI KERI

Construction Compound & Laydown Area

Substation

Battery Energy Storage System (BESS) Area

Site Office & Maintenance Facility

A

Project EnergyConnect

KERI KERI ROAD

Figure 4: Project Area Plan/Preliminary Layout

KILARA

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PROJECT	Wilan Energy Park	
DATE 23/11/2022	STATUS APPROVED	PRODUCED AC
SCALE 1:120,000 at A3	DATUM GDA 1994 MGA Zone 54	APPROVED IG
FILE SEARS_004_E_ProjectAreaPlan		REV E

0 1 2 3 4 5 km

2.2 Strategic Framework

2.2.1 Federal objectives

United Nations Framework Convention on Climate Change Conference of Parties (COP21) – The Paris Agreement

The United Nations Paris Agreement on Climate Change (COP21) (Paris Agreement) outlines a framework for all countries to take climate action. The aim of the Paris Agreement is to limit emissions globally to net zero in the second half of this century. Australia is one of 195 countries that signed on to the Paris Agreement.

The Australian Government in June 2022 updated its 'Nationally Determined Contribution' (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC) secretariat. The updated NDC:

- Adopts a target of net zero emissions by 2050.
- Commits to Australia's 7 low emissions technology stretch goals.
- Reaffirms Australia's target to reduce emissions by 26 - 28% below 2005 levels by 2030.
- Adds that Australia will exceed this by up to 9 percentage points.

Australia now has a target to achieve net zero emissions by 2050 and a detailed and comprehensive technology-led plan to achieve it. Central to this plan is the transformation of Australia's electricity system to zero emissions renewable energy (outlined further in the summary of the Integrated Systems Plan).

Large Scale Renewable Energy Target

The Large-scale Renewable Energy Target (LRET) incentivises the development of renewable energy power stations in Australia through a market involving the creation and sale of certificates known as Large-scale Generation Certificates (LGCs). Power stations accredited under the LRET can create LGCs for the electricity generated from renewable energy sources, which can then be sold to liable entities that must meet compliance obligations under the LRET. Liable entities are predominantly electricity retailers which are required to surrender these certificates to the Clean Energy Regulator (CER) on an annual basis to demonstrate their compliance with annual targets. Selling LGCs provide accredited power stations with another source of revenue in addition to the revenue from the electricity generated (Australian Government Clean Energy Regulator 2018).

The current target under the LRET is for 33,000 gigawatt hours of additional renewable energy to be generated annually. The current targets, accreditation of power stations, and creation of LGCs will remain until the end of the scheme in 2030.

2.2.2 National Electricity Market

Australia's National Electricity Market (NEM) incorporates around 40,000 kilometres of transmission lines and cables, connecting electricity consumers to generators across five states - Queensland, New South Wales (including the Australian Capital Territory), Victoria, South Australia, and Tasmania, and providing around 200 terawatt hours of electricity to businesses and households each year to approximately nine million customers.

The Australian Energy Market Operator (AEMO) under the Step Change Scenario forecasts that by 2030, 14 gigawatts of the current 23 gigawatts of coal fired generating capacity will be retired. Alternative generators will be required to fill capacity lost by the retiring coal facilities, meeting this requirement, it is expected that

the market will respond with an increasing online capacity of grid scale wind and solar generation[1]. Moreover, coal-fired generation is anticipated to withdraw from the market faster than anticipated, with 60% of capacity expected to be withdrawn by 2030.

Integrated System Plan

The Integrated System Plan (ISP) prepared by the AEMO provides an integrated roadmap for the development of the National Electricity Market over the next 20 years. The latest draft of the ISP was released in 2022 (AEMO 2022).

The key objectives of the ISP are to design low cost and reliable energy systems through both new and existing technologies, and to identify ISP projects to achieve power needs. The ISP also serves the broader purpose of informing policymakers, investors, and consumers. It draws on stakeholder engagement and industry expertise in order to maximise the value and benefits to electricity consumers. The ISP identifies the locations of proposed Renewable Energy Zones (REZs) in Australia, in consultation with State and Local governments, that can connect to existing transmission networks, including the South-West REZ.

2.2.3 State Objectives

NSW Electricity Infrastructure Road Map

The NSW Electricity Infrastructure Roadmap (NSW Roadmap), released in November 2020, is the NSW Government's plan to transform the NSW electricity sector to be cleaner, cheaper and more reliable (DPIE 2020). The NSW Roadmap builds on the NSW Electricity Strategy (2019) and the NSW Transmission Infrastructure Strategy (2019), and emphasises the need for NSW to transition to renewable energy. It aims to replace NSW's ageing coal-fired power stations with a coordinated portfolio of energy generation, storage and network investment. As part of this Roadmap, the NSW Government commits to REZs which will expand transmission and generation capabilities in strategic areas across NSW including the South-West region of NSW. The Roadmap reinforces the key role of these REZs in delivering renewable energy, transitioning from coal fired power generation, and providing regional growth and investment in regional NSW.

NSW Transmission Infrastructure Strategy

The NSW Transmission Infrastructure Strategy (NSW Strategy) promotes private sector investment in priority energy infrastructure projects which can deliver least cost energy to customers to 2040 and beyond (DPE 2018). The Strategy forms part of the government's broader plan to make energy more affordable, secure investment in new power stations and network infrastructure and ensure new technologies deliver benefits for consumers. The aims of the Strategy include increasing NSW's connections with Victoria, South Australia and Queensland, and increasing NSW's energy capacity through the prioritisation of Energy Zones in the Central-West, South West and New England regions of NSW.

[1] 2022 Integrated System Plan, AEMO 2022 "**Expected energy transition to 2050 Optimal development path (ODP) ('Step Change' scenario)**"

The 2022 Draft Network Infrastructure Strategy (NIS) outlines the State's approach to developing and assessing the merits of intra and inter REZ transmission augmentation options. The goals of the NIS are to coordinate system planning, to provide clear signals to investors and to consult with all stakeholders to ensure maximum benefit and minimum impact of transmission development. The approach adopted by the NIS is to develop a range of transmission and distribution network augmentation options in collaboration with sector stakeholders and communities. The intention is that these early insights as to possible future system configuration provide investment and locational signals to renewable energy project proponents. Following consultation with stakeholders, the options are then assessed to ensure least cost and impact renewable energy with maximum benefits to communities.

NSW Electricity Strategy (DPIE, 2019)

The NSW Electricity Strategy is the NSW Government's plan to provide more reliable, affordable, and sustainable electricity across in NSW (DPIE 2019). The Strategy encourages approximately $8 billion of new private investment in NSW's electricity system over the next decade, including $5.6 billion in regional NSW. It aligns closely with the NSW Government's Net Zero Plan Stage 1: 2020– 2030, and supports a new affordable and reliable energy system through a number of important initiative.

In December 2020, the NSW *Electricity Infrastructure Investment Act 2020* was enacted into law. Together with the Electricity Infrastructure Roadmap, this legislation is intended to (DPIE 2020):

- Attract up to $32 billion in private investment for regional energy infrastructure by 2030.
- Support 6300 construction jobs and 2800 ongoing jobs, mostly in regional NSW.
- Save around $130 a year on the average NSW household electricity bill.
- Help reduce NSW electricity emissions by 90 million tonnes by 2030.

The NSW Climate Change Policy Framework

The NSW Climate Change Policy Framework was introduced in 2016 (OEH 2016), with an aspirational long-term objective of achieving net zero emissions by 2050. The NSW Renewable Energy Action Plan was also introduced in 2013 (NSW Trade & Investment 2013), and the Proposal is consistent with the three goals of the plan which are:

1. Attract renewable energy investment and projects.
2. Build community support for renewable energy.
3. Attract and grow expertise in renewable energy.

In March 2020, the NSW State Government also introduced the Net Zero Plan Stage 1: 2020-2030, which was subsequently updated in September 2021. The updated plan sets an interim target of reducing emissions by 50% by 2030 (in comparison to 2005 levels).

2.2.4 Regional and Local Objectives

Regional and Local Government objectives with respect to Hay and Murray River Shire policies are outlined in the following documents:

1. Hay Community Strategic Plan (2022-23) which aims to promote environmental sustainability along with sustainable economic prosperity. Regarding renewable energy development, the community strategic plan emphasises greater usage and production of renewable energy as a strategic objective, considering business, education, and employment capacity growth.

2. Murray River Local Strategic Planning Statement 2020-2040 (MRC 2020), which seeks to 'promote local renewable energy projects by collaborating with energy providers' under Planning Priority 9.
3. Murray River Community Strategic Plan 2018-2028 (MRC 2018) and its objective to 'identify new opportunities and actively encourage investment in alternate and renewable energy' as part of Objective 4.1.
4. The Riverina Murray Regional Plan 2036 which is a 20-year blueprint for the Riverina Murray's future that aspires to strengthen regional communities. The plan focuses on economic, social, and environmental challenges in order to ensure the long-term viability of LGA's such as Hay and Murray River.

2.2.5 Summary of strategic benefits

Table 3 summarises the projects contributions in relation to the Federal, State, Regional and Local objectives above.

Table 3 Summary of strategic benefits - Federal, State, Regional and Local

Strategic Framework	Project contribution
Federal	
UNFCCC – Paris Agreement	The Project will make a positive contribution to meeting Australia's commitments via the generation of renewable energy (wind) and resultant annual reduction in greenhouse gas emissions.
Renewable Energy Target	Once operational, the Project will generate up to approximately 2930 gigawatt hours of electricity annually. The Project will contribute significantly in meeting the LRET target for 33,000 gigawatt hours of additional renewable energy to be generated annually.
National Electricity Market Integrated Systems Plan	The Project is located within the South-West REZ which is identified as a REZ in the ISP. The ISP's strategy is underpinned by strategic investments into transmission infrastructure upgrades and expansion. One such strategic initiative includes the transmission development PEC. The Project is proposed to connect to PEC.
State	
NSW Electricity Infrastructure Roadmap	The Project will support the NSW Government's emissions reduction targets, NSW's energy generation and storage requirements and NSW's energy transition. The Project will also contribute to the development of the South-West REZ.
NSW Transmission Infrastructure Strategy	The Project supports the Strategy by contributing to important initiatives including the PEC transmission line and NSW's linkages with neighbouring states along with the development of the South-West REZ, leading to an increase to NSW's clean energy capacity and lower cost of energy.
2022 Draft Network Infrastructure Strategy	The Project is aligned with the 2022 Draft Network Infrastructure Strategy, the purpose of which is to coordinate project connection infrastructure implementation. Wilan Wind Farm is located within the recently declared South-West REZ, covered by the draft NIS. Network

Strategic Framework	Project contribution
	configuration options 7A and 7B, contemplated within the document appendices, would accommodate project connection.
NSW Electricity Strategy	The Project supports the Strategy as it provides renewable energy generation and storage capacity that combined with other projects in the South-West REZ is expected to result in lower cost of energy putting downward pressure on wholesale electricity prices and contributing to greater energy resilience through the use of energy storage stabilisation technologies.
NSW Climate Change Policy Framework	The Proposal would generate up to 2930 gigawatt hours per year, saving approximately 1.5 million tonnes of carbon dioxide per year, thereby contributing to the achievement of the target.
Regional	
Riverina Murray Regional Plan 2036	The regional plan highlights the promotion and diversification of energy supplies through renewable energy generation which should align and compliment utility infrastructure investment. The Project closely supports this objective. The plan also highlights that Aboriginal communities' economic self-determination should be enhanced. The Project area includes as a key landholder, the Nari Nari Tribal Council thereby providing direct economic benefit to local First Nations communities. The Project will seek to promote indigenous engagement, procurement and capacity building.
Local	
Hay Community Strategic Plan (2022-23)	The Project supports the plan by contributing directly to economic diversification, employment, and through the generation of renewable energy in the LGA and long-term implications for environmental sustainability with respect to climate change.
Murray River Local Strategic Planning Statement 2020-2040	The Project supports the Planning Statement through the development of a renewable energy facility in the LGA.
Murray River Community Strategic Plan 2018-2028	The Project supports the plan by contributing directly to economic diversification, employment, and via long-term benefits arising for environmental sustainability with respect to climate change.

2.2.6 Project benefits

The Project will enable direct and secondary benefits at the Australian national, state and regional, and local levels across the following areas:

Environmental

Supporting the Australian energy transition from hydrocarbon-based fuel sources to naturally occurring renewable energy, resulting in a reduction in greenhouse gas emissions.

Social and economic

The Project will further enhance the opportunities available to the people of neighbouring towns and regional communities in and around the Hay Plains. It is anticipated that local people, including in particular, local First Nations peoples, businesses and service providers will experience a beneficial increase in activity as the Project progresses through the development, construction, operational and decommissioning/repowering phases of its lifecycle.

With an indicative capital cost of up to $2.1 billion (subject to final project design and scale), it is anticipated that the project will generate approximately 400 jobs during construction and a further 10-15 ongoing, permanent jobs during operations.

2.2.7 Site suitability

The site is well suited to the proposed development:

- It is located within the South-West REZ and an area of outstanding wind resource.
- Has very low population density with no townships within a 25 kilometres radius and no non-involved dwellings within 8 kilometres.
- Is in close proximity to a major new energy transmission infrastructure (PEC Transmission line).
- Is uniquely located 'on-country' being on the lands of traditional custodians, the Nari Nari.
- Is in a location that provides for ready access via the Sturt Highway (immediately adjacent to the project southern boundary) and Loorica Road and Kerri Kerri Road.
- Is co-located with other viable renewable energy developments creating scope for development of a connection hub and shared connection infrastructure thereby reducing project costs.
- Is compatible with existing extensive pastoral grazing activities being the predominant land use and existing RU1 zoning.

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3 The Project

3.1 Project area

3.1.1 Project description and layout

The Project area lies within the Riverina region and straddles the local authority areas of Murray River to the west and Hay Shire to the east. The closest township is Balranald lying some 25 kilometres to the west of the eastern most boundary of the project area, although the project area itself does not have footprint within the Balranald Shire.

The Project layout is shown in Figure 4. It is anticipated that the Project will consist of the following components:

- Up to 138 wind turbine generators.
- Ancillary electrical equipment and operations and maintenance facilities.
- Energy storage system.
- Grid connection infrastructure.
- Access route upgrades.

A more detailed explanation of the components and construction activities area outlined below.

The wind turbine layout presented in Figure 4 is preliminary in nature and reflects an upper limit on what might be considered appropriate given the current level of knowledge of the Project area. The site area comprises approximately 16,000 hectares. It is anticipated that up to 1000 hectares of the total site area may be disturbed during construction and operation phases, subject to the final project design. The development plan will include provision to remediate areas subject to temporary disturbance during the construction phase.

With detailed specialist field survey work and site studies ongoing, the definition of the development footprint remains dynamic at the time of applying for Project SEARs. In particular, specific elements of potential impact that will continue to be assessed include:

- Stakeholder and community feedback,
- Biodiversity values (see preliminary impact discussion in Section 6.2),
- Cultural and historic heritage,
- Site hydrology and flood risk,
- Landscape and visual amenity, and
- Noise.

Further adaptation to site constraints and revision and refinement of the project preliminary design will continue through to the EIS phase of study.

3.1.2 Wind turbines

The latest generation of horizontal axis wind turbine generator technology will be installed at the Project. The specific model and dimensions of the turbines have not yet been determined. This is common given the current status of the Project and will be confirmed as further site and wind data are collected.

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Modern wind turbines consist of the following main components:

- Foundation – typically consisting of an excavated area, into which is poured concrete reinforced with steel. Depending on the geotechnical conditions at site, piles are sometimes driven to stabilise foundations. The foundation size varies with hub height and rotor diameter.
- Hardstand – an area is cleared and compacted adjacent to each turbine foundation to accommodate the cranes and to stage turbine equipment for lifting and assembly during construction.
- Tower – typically manufactured from tubular steel and includes ladders, personnel lift and cables.
- Rotor nacelle assembly – this is mounted at the top of the tower and typically houses the drive shaft, gear box (if relevant), generator and transformer as well as ancillary motors, gearboxes and control equipment.
- Blades – modern wind turbines typically have three blades, fitted with lightning protection.

An indicative specification for candidate turbines being considered for the Project is provided below in Table 4.

Table 4 Indicative specification for turbines

Turbine component	Indicative dimension
Capacity (per turbine)	Up to 7.5 megawatts
Hub height	Up to 200 metres
Rotor diameter	Up to 200 metres
Upper tip height	Up to 300 metres
Lower tip swing	No less than 50 metres

3.1.3 Ancillary infrastructure

Access tracks will be constructed to transport turbine components and cranes to each turbine location to facilitate erection. During the operations phase, wind farm access tracks are used to facilitate turbine inspection and maintenance tasks.

Energy generated by the turbines will be exported via the wind farm internal reticulation system to internal substations. Internal reticulation may take the form of underground or overhead lines. Lines will typically be routed adjacent to access tracks but may take alternate routes through the wind farm project area depending on the final electrical design.

The purpose of the substations is to transform up the voltage to allow export to the grid via the main switching station which will connect into the PEC transmission line. Each substation may occupy a fenced area of approximately 200 square metres and will consist of medium and high voltage systems, circuit breakers, control and protection systems, communication systems, transformer and fire suppression.

The wind farm will comprise operational and maintenance buildings which will consist of offices, car parking, welfare facilities, control rooms, workshops and spares storage facilities. Additionally, up to three permanent meteorological masts will be installed to monitor site climatic conditions, to enable turbine performance measurement and generation forecasting.

During the construction phase, additional temporary facilities will be required such as offices, welfare facilities, construction staff accommodation, material lay down areas, aggregate quarries, concrete batching

plants. The location and extent of these facilities is being developed as the Project design matures and based on consultation with landowners and local communities.

3.1.4 Energy storage system

An energy storage system is contemplated as part of the Project. Under the *Electricity Infrastructure Investment Act 2020* and associated regulation, tender processes will be conducted for the supply of electricity and energy storage. The inclusion of an energy storage system is intended to meet State infrastructure requirements.

The configuration of the energy storage system will facilitate the storage of wind generated electricity during times of surplus. The system will enable the dispatch of this electricity at a time when the grid has capacity to receive it and/or provide grid support services for the correction of frequency and voltage deviations.

There is a range of energy storage technologies, each with distinct operational features and limitations. The most common is lithium-ion technology which, due to its operational characteristics, is often used for short duration storage and grid support services. Other technologies such as flow batteries are better suited to medium duration storage. The type and configuration of energy storage technology implemented at the Project will be confirmed as State requirements evolve and following further techno-economic modelling. The system is expected to occupy a small portion of the overall Project footprint and to be situated adjacent to one of the Project substations.

3.1.5 Grid connection

The electrical energy generated from the Project will be exported to the National Electricity Market via the PEC transmission line, which is planned to run in a west – east direction 8 kilometres to the south of the Project through the Yanga State Conservation Area. The connection from the southern edge of the wind farm site is anticipated to be made using a connection corridor easement occupying a north-south linear route utilising the road reserve of Keri Keri Road and the eastern edge of Yanga State Conservation Area.

3.1.6 Access routes

The Project benefits from being located within a reasonable delivery range of all major South-eastern Australian shipping ports. An overview is provided within the Access section later in this report.

3.1.7 Ancillary activities

In addition to the Project features detailed within the preceding sections of this report, it is will also be necessary to construct a range of supporting ancillary site facilities. These could include (but are not limited to):

- Temporary construction workers accommodation.
- Aggregate and raw materials storage.
- Laydown and parking facilities for project related components and equipment.
- Maintenance yards.

The extent and impact of the associated ancillary activities will be assessed in detail during the EIS phase of Project development.

3.2 Staging

It is likely that the most efficient construction phase activity would entail a single mobilisation and execution of wind turbines and associated infrastructure. However, it is recognised that flexibility in scheduling of

deployment may be required and as such flexibility to take a staged approach may be contemplated in the future.

3.3 Phases

It is expected that the Project will complete development application workstreams towards the end of 2024 and move directly into construction phase during early 2025. The construction period is estimated to take 24 to 30 months.

Following successful delivery of the Project, the operational lifetime of a windfarm is typically 25 to 30 years in duration.

3.3.1 Construction Phase

It is anticipated that the windfarm construction will be approximately two years in duration, subject to final design considerations. The initial construction phase works is expected to start in late 2024 following successful completion of the design and consents phases. The workforce involved during construction phase will be approximately 400.

3.3.2 Operational Phase

Windfarm operations are expected to commence during late 2026 to early 2027. Operational life of the asset is anticipated to be 25 to 30 years and the full-time workforce will be between 10 to 15 individuals.

3.3.3 Decommissioning / Repowering Phase

Decommissioning of the facility will be designed to be safe and with minimal impact on the local environment and amenity. In many cases, decommissioning of existing generating equipment is the first step towards a "repowering" of the windfarm with the next generation of wind turbine equipment.

3.4 Alternatives

3.4.1 Site locations

The Riverina region lying within the South-West REZ, has many aligning, attractive project features. Other locations for wind energy development were considered in the region. The proposed Project area has been selected on the basis of:

- Being located within the South-West REZ.
- Close proximity to PEC transmission line.
- Sparse population density with no non-involved dwellings located within 13 kilometres of the nearest proposed wind turbine.
- High quality wind resource.
- Unique opportunity to create genuine engagement with First Nations peoples in the energy transition being located on the lands of the Nari Nari.
- Compatibility with existing land uses (being sheep and cattle grazing).
- Large available area for development enabling scope to adapt the project design in response to site constraints.
- Positive response to the proposal by local communities.

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3.4.2 Do nothing option

The analysis of the "do nothing" alternative would require the continued use of hydrocarbon-based fuels in the Australian energy supply mix. This alternative scenario does not align with the NSW or the Australian Federal objectives and would result in continued greenhouse gas emissions from electricity generation. The Project will bring additional economic benefits to the local towns and the region generally, should the "do nothing" scenario prevail, this would not be the case.

4 Statutory context

4.1 Introduction

This section outlined the key statutory requirement for the Project under the EP&A Act and Environmental Planning and Assessment Regulations 2000 (EP&A Regulations) and other NSW and Commonwealth legislation.

A more detailed outline of additional statutory requirements will be addressed in the EIS.

4.2 Power to grant consent

Approval for the Project will be sought under Part 4, Division 4.7 of the EP&A Act which applies to development deemed to be SSD. Section 4.36(2) of the EP&A Act provides that:

> *A State environmental planning policy may declare any development, or any class or description of development, to be State significant development.*

Relevant SEPPs include:

- *State Environmental Planning Policy (Planning Systems)* 2021 (Planning Systems SEPP).
- *State Environmental Planning Policy (Transport and Infrastructure*) 2021 (Transport and Infrastructure SEPP).

'Electricity generating works' are defined at Clause 2.35 of the Transport and Infrastructure SEPP as a building or place (excluding a solar energy system) used for the purpose of making or generating electricity or electricity storage.

Clause 2.6(1) of the Planning Systems SEPP states that development is classified as SSD if:

> *a) The development on the land concerned is, by the operation of an environmental planning instrument, not permissible without consent under Part 4 of the Act, and*
>
> *b) The development is specified in Schedule 1 or 2*

Schedule 1, Clause 20 of the Planning Systems SEPP states that 'electricity generating works' to be SSD if the following criteria is met:

> *Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofiel, distillate, waste, hydro, wave, solar or wind power) that:*
>
> *a) Has a capital investment value of more than $30 million*

The Project meets that definition and has a capital investment value of more than $30 million, as such the project is classified as SSD under Part 4 of the EP&A Act.

4.2.1 Permissibility

The permissibility of wind farm development is determined through the Transport and Infrastructure SEPP.

Clause 2.36 (1) of the Transport and Infrastructure SEPP states that 'electricity generating works' may be carried out with development consent on land prescribed rural, industrial or special use zone.

The Project area is zoned as RU1 – Primary production under the Hay LEP and Wakool LEP (which applies in the Murray River Shire) and may intersect parts of C1- National Parks and Nature Reserve along the grid connection. As RU1 is a prescribed rural zone, the project is permissible with consent under the provisions of the Transport and Infrastructure SEPP.

Figure 5 shows the planning zones.

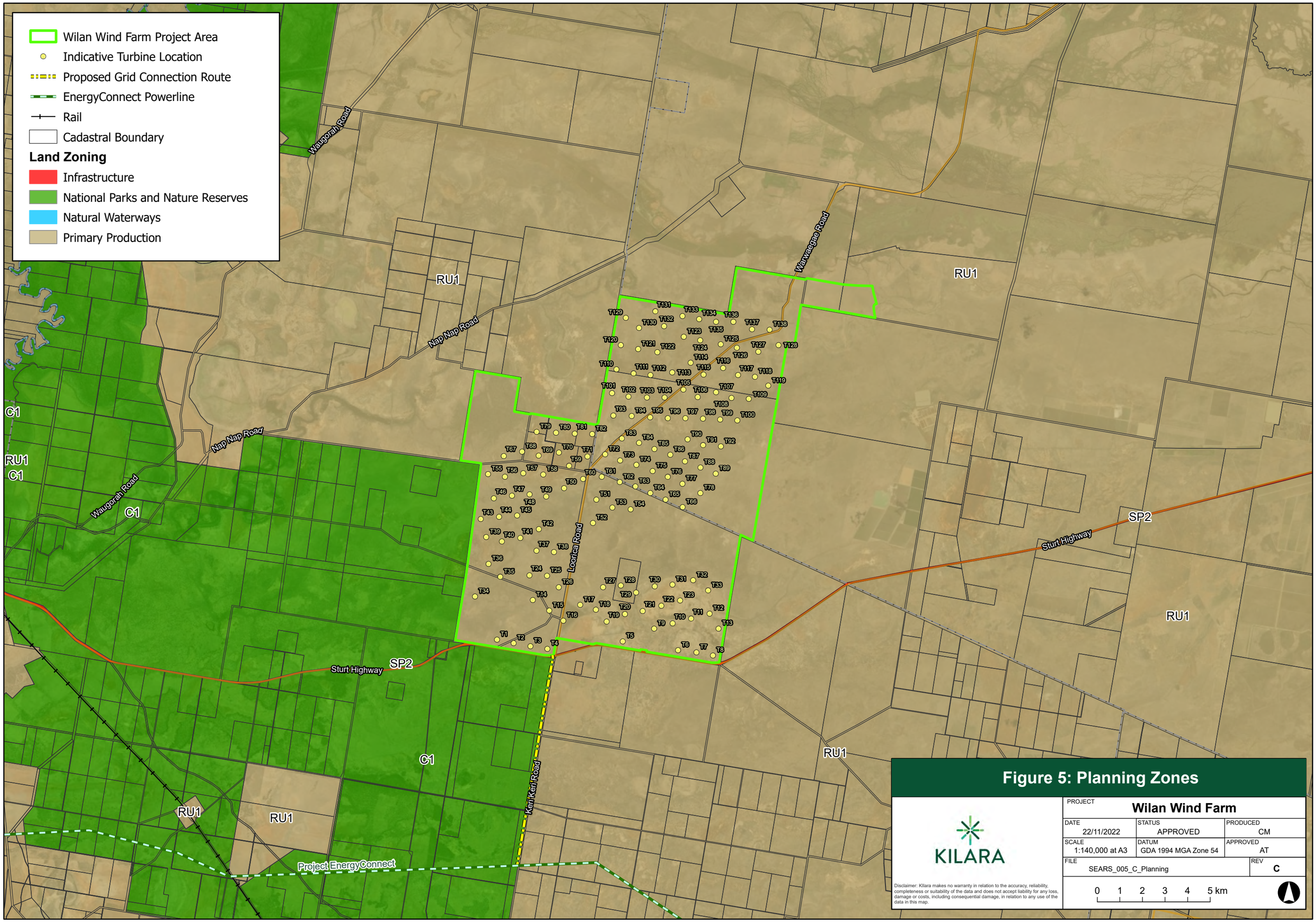

Figure 5: Planning Zones

KILARA

Disclaimer: Kilara makes no warranty in relation to the accuracy, reliability, completeness or suitability of the data and does not accept liability for any loss, damage or costs, including consequential damage, in relation to any use of the data in this map.

PROJECT	Wilan Wind Farm	
DATE 22/11/2022	STATUS APPROVED	PRODUCED CM
SCALE 1:140,000 at A3	DATUM GDA 1994 MGA Zone 54	APPROVED AT
FILE SEARS_005_C_Planning		REV C

0 1 2 3 4 5 km

4.3 Other approvals

A number of other approvals will be required under NSW and Commonwealth legislation.

Section 4.42 of the EP&A Act lists authorisation that cannot be refused if necessary to carry out an SSD. Any approval must be consistent with the terms of the SSD approval. For this project the section 4.42 approvals are likely to include:

- Consent under s 138 of the *Roads Act 1993* for works on public roads from the appropriate roads authority.
- An Environment protection licence (EPL) under schedule 1, Clause 17 of *Protection of the Environmental Operations Act 1997* (POEO Act) for electricity works (wind farms).
- Approval for works over Crown Land under the *Crown Land Management Act 2016.*

Section 4.41 of the EP&A Act states that the following approvals and permits are not required for approved SSD:

- The following approvals will not be required under the *Fisheries Management Act 1994* (FM Act):
  - Dredging or reclamation work permit under section 201
  - Passage of fish not to be blocked permit under section 139
- The following approvals will not be required under the *Heritage Act 1977*:
  - Part 4 approval to carry out an act, matter or thing as defined in section 57(1)
  - Excavation permit under section 137
- An Aboriginal heritage impact permit will not be required under section 90 of the *National Parks and Wildlife Act 1979*.
- A bushfire safety authority will not be required under section 100B of the *Rural Fires Act 1997*.
- The following approvals will not be required under the *Water Management Act 2000*:
  - Water use approval under section 89
  - Water management work approval under section 90
  - Activity approval (except for aquifer interference approval) under section 91.
- The following approvals will not be required under the *Water Management Act 2000*:
  - Water use approval under section 89
  - Water management work approval under section 90
  - Activity approval (except for aquifer interference approval) under section 91.

4.4 Commonwealth legislation

4.4.1 Environment Protection and Biodiversity Conservation Act 1999

Referral, assessment and approval may be required under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for any action like to have significant impact on any matters of national environmental significance (MNES). These are actions which are referred to as 'controlled actions'.

The following MNES are identified in the EPBC Act includes:

- World heritage properties
- National heritage properties
- Ramsar wetlands of international significance
- Threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining)
- Water resources (in relation to coal seam gas development and large coal mining development)

The preliminary assessments indicate that the Project could have an impact on MNES (listed threatened species and communities and migratory species) and therefore referral will be required. It is intended to conduct a pre-referral meeting with the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) prior to lodging an EPBC referral. If the project is deemed a Controlled Action, assessment will be undertaken according to the assessment and approval bilateral agreements where these are in place with NSW government.

4.5 Native Title Act and Land Rights

The *Native Title Act 1994* (NSW) was introduced in conjunction with the *Native Title Act 1993* (Cth) recognises and protects native title rights in Australia. The Act recognises that Aboriginal people had a system of law and ownership of lands. Native title is recognised where there is a connection to land and waters that has been maintained (where government acts have not extinguished the rights).

Everick Heritage (2022) conducted a search of the National Native Title Tribunal on 19 July 2022, but no claims were noted.

Aboriginal Land Councils were established under the *Aboriginal Land Rights Act 1983* (NSW) (ALR Act). The Project area crosses the boundary of the Balranald and Hay LALC.

4.6 Mandatory matters for consideration

The consent authority is required to consider the following mandatory matters when deciding whether to grant consent (Table 5).

Table 5 Mandatory considerations

Statutory reference	Mandatory considerations
EP& Act and Regulations	
Section 1.3 – Objects of Act	The objects of this Act are as follows— *(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 promote the delivery and maintenance of affordable housing,* *(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,* *(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),* *(g) to promote good design and amenity of the built environment,* *(h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,* *(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,* *(j) to provide increased opportunity for community participation in environmental planning and assessment.*

Section 4.15 - Evaluation	The consent authority is required to take the following matters into consideration:
	• Relevant environmental planning instruments, including:
	  ○ SEPP (Resilience and Hazards) 2021
	  ○ SEPP (Transport and Infrastructure) 2021
	  ○ Hay Local Environment Plan (LEP)
	  ○ Wakool LEP (which applies in Murray River Shire)
	• The likely impacts of that development, including environmental impacts on both the nature and built environments, and social and economic impacts in the locality.
	• The suitability of the site for development.
	• Any submissions made in accordance with the EP&A Act or regulations.
	• The public interest.
	These matters will be considered in the EIS.

Other legislation	
***Biodiversity Conservation Act 2016* (BC Act) – Section 7.14**	Required to take into account the impact of development in biodiversity as assessed in the BDAR. The Minister may (but is not required to) further consider under the Act the likely impact of the proposed development on biodiversity values.
Relevant EPIs	
SEPP (Resilience and Hazards) 2021	Resilience and Hazards SEPP assesses the potential hazards associated with the proposed development by providing definitions and guidelines for hazardous industry, offensive industry, hazardous storage establishments, and offensive storage establishments.

Statutory reference	Mandatory considerations
	In accordance with Clause 3.7 of the Resilience and Hazards SEPP, consideration will be given to current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development, including: • Hazardous Industry Planning Advisory Paper No 3 – Risk Assessment • Hazardous Industry Planning Advisory Paper No 12 – Hazards In addition, a preliminary risk screening assessment will be undertaken for the Project at the EIS phase in accordance with the Resilience and Hazards SEPP. Under Clause 4.6 of the Resilience and Hazards SEPP, a consent authority is required to consider whether a proposed development site is affected by soil or other contaminants before granting consent. An assessment will be prepared as part of the EIS to determine the potential contamination risk associated with the Project. Noting the agricultural land use across the Project Area, the assessment will take into consideration historical land use that may have resulted in contamination within and surrounding the Project Area.
Wakool Local Environmental Plan 2013	The portion of the project area located in Murray Shire council is zoned RU1 the EIS will address relevant components of the LEP, including: Clause 1.2 – Aims of Plan Land Use Table - Objectives and permissible uses of the Zone RU1 – Primary Production zone. The grid connection corridor is located on the border of Yanga State Conservation Area. The EIS will address the relevant components of the LEP, including: Land Use Table - Objectives and permissible uses of the Zone C1 - National Parks and Nature Reserves
Hay Local Environment Plan 2011	The portion of the project area located in Murray Shire council is zoned RU1 the EIS will address relevant components of the LEP, including: Clause 1.2 – Aims of Plan Land Use Table - Objectives and permissible uses of the zone RU1 – Primary Production zone.

5 Community and stakeholder engagement

5.1 Community and stakeholder engagement strategy

From Project inception, the Proponent has worked to understand, map and categorise the breadth of stakeholders associated with the Project area and the potential for impacts (both positive and negative) through the project value chain.

A Community and Stakeholder Engagement Strategy (July 2022) (CSES) was prepared by Consentium (2022a) to identify how stakeholders will be engaged up until the lodgement of the EIS. Detailed mapping of stakeholders, the aspects, impacts and management strategies of the Project are elaborated within the Social Impact Assessment Scoping report completed in October 2022 (Consentium 2022b) (SIA Report).

Consentium has been engaged by the Proponent to work as part of an integrated, multidisciplinary project team. Consentium will lead engagement activities and work closely with the project team to ensure that stakeholder feedback meaningfully supports the development and refinement of the EIS.

The engagement program was design to comply with:

- Clean Energy Council's Best Practice Charter and Guidelines.
- Wind Energy Guidelines.
- NSW Government's State Significant Development Consultation Guidelines.
- SEARs.
- NSW Government's Aboriginal cultural heritage consultation requirements for proponents.
- Best practice principles championed by the International Association of Public Participation (IAP2).

The CSES comprises the following elements:

- Communications and engagement.
- Stakeholder analysis to identify specific stakeholder interests relating to the project.
- Analysis of communications and engagement risks.
- Key messages and an outline of engagement activities to mitigate the risks.
- An evaluation methodology.

After the EIS is lodged, a communications plan will be prepared to support announcements about the assessment process.

5.2 Scoping phase engagement

The Project scoping phase engagement activities have been planned in the CSES. The CSES includes direct liaison with key stakeholder groups, an online survey for interested parties to communicate views, a broad telephone survey, community "think tanks" and other direct outreach activities. Activities will be supported by project communications materials to promote engagement opportunities and provide accurate information about the planning process, the planning proposal and engagement outcomes.

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5.2.1 Engagement objectives

The engagement objectives for this Project are to:

- Share relevant information in a timely and accessible way.
- Engage a wide cross section of community members and other stakeholders.
- Engage stakeholder and community expectations and provide clear information about the levels of influence that they can realistically have on the project.
- Demonstrate accountability in project decision making by identifying how stakeholder and community influence has been considered in the design of the project.
- Understand community ideas and aspirations for renewable energy solutions and the sustainable and sympathetic integration of these into the landscape.
- Understand stakeholder issues and concerns in relation to the project.
- Contribute to positive planning outcomes for the project and the State.
- Ensure the community and stakeholder voice is represented.
- Meet the NSW Government study requirements for the SSD site.

5.2.2 Government and key stakeholders identified

Table 6 below lists the government agencies and key stakeholders the Proponent has met with in the preparation of the Scoping report. This early-stage engagement indicates generally positive sentiment towards the project within the communities of relevance. Section 6.6.2 provides a summary of specific insights gained to date from that work. In addition to this, meetings with local Councils and elected representatives have presented further opportunities for consultation and engagement and all of which suggest supportive attitudes towards the proposed project and the wind industry more broadly. For the sake of completeness, it is noted that meetings with other relevant organisations including Energy Co and Transgrid were initiated during 2021 and remain ongoing. Meetings with Department of Planning and Environment officers have also occurred as part of preparing this Scoping Report and to inform biodiversity impact assessments and surveys (see Table 6).

Table 6 Stakeholder and agency meetings

Date	Stakeholder	Nature of Engagement	Outcomes of Engagement
Ongoing since August 2020	Project landowners including NNTC	In person meetings, phone calls, emails and information sessions	Information sharing and supportive
July 2022	Neighbours within 30kms of Project (noting there are no neighbours within 10km)	Phone calls and in person meeting with Factsheet and Project Overview	Information sharing and supportive
1st August 2022	Murray River Council	Project presentation followed by Q&A session	Supportive
2nd August 2022	Balranald Shire Council	In person meeting	Supportive
3rd August 2022	Hay Shire Council	In person meeting	Supportive

Date	Stakeholder	Nature of Engagement	Outcomes of Engagement
11th August 2022	ABC Riverina	Live interview	Information sharing
W/c 8th August 2022	The Guardian and The Riverine Grazier	Project update	Information sharing
15th August 2022	Hay Community	Community "drop-in" session	Supportive
16th August	Moulamein Community including Moulamein Community Development Inc and Moulamein Public School.	Community "drop-in" session	Supportive
17th August	Balranald Community including Balranald Central School, Balranald Inc, Balranald LiveBetter Services and Balranald Shire Growing Business and Tourism Advisory Council.	Community "drop-in" session	Supportive
25th August 2022	Helen Dalton, MP (Parliament of NSW, Member of the Legislative Assembly Member for Murray)	Meeting with representative from office of Helen Dalton	Information sharing for briefing purposes
15th September 2022	DPE Biodiversity Conservation Division	Discuss targeted surveys methods for large wind and solar projects in South-West REZ	BCD indicated their expectations regarding surveys to be in accordance with the BAM Guidelines.
27th September 2022	Hay Shire Councillors	Council sessions meeting – presentation to elected members	Information sharing for briefing purposes
18th October 2022	Sussan Ley, MP (Parliament of Australia, House of Representatives, Member for Farrer)	Virtual meeting	Information sharing for briefing purposes
19th October 2022	DPE Energy Assessments Team - Planning and Assessment	Scoping report discussion with DPE	DPE Planning and Assessment team indicated standards and expectation for Scoping Report content

5.3 EIS phase of stakeholder engagement

The SIA Report includes a Scoping Worksheet (Appendix 2 in the SIA Report) which provides a preliminary scope of likely social impacts that will require further assessment. It has been informed by secondary data research cross-referenced with initial primary data gathered from 15-17 August 2022.

Community feedback on mitigation and enhancement measures has been noted in the Scoping Worksheet. Phase 2 of the social impact assessment will seek to further analyse the likely impacts and examine measures informed by community to enhance or mitigate potential impacts.

Further investigation of the potential impacts identified in early consultation and the potential for additional impacts identified through analysis of 2021 ABS data for the locality will be investigated during the EIS phase of the project and will be reported in the final SIA report.

Consultation with the community will include:

- Ongoing consultation with Project landowners.
- Ongoing outreach and consultation with Project neighbours.
- Letter drops, 1800 number feedback channel, door knocks and community pop-ups.
- The delivery of demographically representative and targeted Focus Groups to deeply investigate potential issues.
- Community 'Think Tanks', comprising targeted community members, interested community members and subject matter experts, providing opportunities for the community to collaborate with the project to discuss, understand and formulate strategies to mitigate or enhance social impacts.
- Solutions posited by the Think Tanks will be shared with the broader community, affected stakeholders and community leaders to ground-truth the viability of options and consider how these may lead to or reduce further positive or negative impacts. Feedback from these open discussions will then be returned for further evaluation and refinement by the Think Tanks.

The EIS phase of engagement activities are described in detail Appendix 3 (Communications and Stakeholder Engagement Strategy).

Consentium's early investigation and analysis indicate that cumulative impacts of the many projects in planning across the social locality and broader South-West REZ is still being understood by communities. Further consultation with the community will include references to cumulative impact, where these are known, as far as possible to ensure consideration of the impacts from this perspective.

5.3.1 Social Impact Monitoring Plan

Findings from technical reports undertaken during the EIS phase and continued community and key stakeholder consultation will inform the Social Impact Monitoring Plan, which will be a dynamic document for the life of the project.

The monitoring plan will be developed to help manage:

- Impact mitigation measures for construction and operations, and
- Potential benefit enhancement strategies from project construction and operations.

6 Proposed assessment of impacts

6.1 Amenity

6.1.1 Visual

A Preliminary Visual Impact Assessment (Moir Landscape Architects, dated 31/10/22) (PVIA Report or PVIA) has been prepared to consider the landscape and visual impacts of the Project (Moir Landscape Architecture 2022). The PVIA was prepared initially prepared on the basis of the Original project area, however Moir assumed that turbines would be positioned on the proposed Main wind farm site (PVIA study area).

The PVIA was prepared in accordance with the *Wind Energy: Visual Assessment Bulletin 2016* and included an assessment of the project activities and associated infrastructure. This is the first stage in the process and will be followed by more detailed visual assessment as part of the EIS.

In addition to the existing receptors within the broad vicinity of the Project area, a search of pending Development Approvals (DA) was conducted for Hay Shire, Murray River and Balranald Shire. No developments were noted within 20 kilometres of the Project. The closest relevant development was a proposal to modify an existing accommodation facility DA at Balranald. This development lies approximately 24 kilometres directly west of the closest boundary of the Project.

The project team completed community consultation to inform the PVIA, in accordance with the *Visual Assessment Bulletin: community consultation.* The purpose of community consultation was to:

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

The landscape and visual assessment undertaken to date has given consideration to existing landscape maps and public viewing points in the region with fieldwork also informed by consideration of potential cumulative impacts given multiple projects being proposed in the region. Public viewing points are relatively limited in the area with the Willowvale Rest Area and the Willows Campground and Willows Visitors Access Trail being located within proximity of the Project site, both of which were assessed. A further 21 viewing locations were assessed as a part of the Landscape and Visual Assessment including the St Paul's and Ravensworth Rest Areas (located 16.5 kilometres and 28 kilometres respectively to the east of the site).

The project community consultation questionnaire asks respondents to rate the scenic value of key landscape features including grazing land, bushland areas, rivers and creeks, vegetation, plains and townships. The questionnaire will remain ongoing throughout the EIS phase of project development to further inform the Landscape and Visual Impact Assessment. Community members engaged during the Scoping Phase noted that they appreciate:

- The open vista of the Hay Plains.
- The uninterrupted view of the sky, which they describe as 'big sky'.

These elements are seen as tourist attractions in the area and are valued highly. There is some uncertainty about how wind turbines might impact on the vista, noting that in this scoping phase turbine locations are preliminary and indicative. Consultation with the community will continue as site technical studies during the EIS phase of work progress and will contribute to ongoing evolution of the project design. This will include continued engagement with:

- The closest sensitive receivers to the project area.
- Site landowners (including the NNTC).
- Focus Groups comprising tourism operators amongst others.
- Think Tanks, where appropriate to provide opportunities for collaboration with communities to provide insights into how to mitigate potential impacts.

Community engagement will continue through the EIS Phase and provide the community with further opportunities to provide input into the Visual Baseline Study of the LVIA.

Additionally, in keeping with the SIA Guidelines, during the in-person consultation sessions, consideration was given to "the built or natural features on or near the project that could be affected, and the tangible and intangible values that people may associate with these features, such as a sense of place or belonging, rural character, connection to Country and value of stories within the cultural landscapes, community cohesion, and use of natural areas and resources", and was evaluated in the context of how people experience the 'surroundings'. This gave recognition to the different ways in which people perceive their visual experience of the area.

Existing conditions

The key landscape features in the PVIA study area include:

- Geology and landform – the region is made up of Quaternary alluvial fine textures sediments with shallow and small depressions. These depressions form dry lakes and in some cases large scale swamps.
- Vegetation character – Lack of water and dry, arid conditions support scattered stands or belah trees, saltbushes and speargrass communities.
- Creeks, dry lakes and swamps – given the usually dry and arid conditions in the region, the lakes and creeklines remain dry through most of the year. The most significant features are the Abercrombie Creek, the Forest Creek, Dry Lake and Gunyah Swamp.
- National Parks and reserves – Yanga National Park, Nature Reserve and State Conservation Area (SCA) are located to the west of the Project area.

Figure 6 shows these landscape features.

Community consultation outcomes

In accordance with the Bulletin, ongoing community consultation was undertaken by the Project engagement team through in-person information sessions in August 2022. Ongoing stakeholder and community engagement will continue throughout the EIS phase of the Project through online surveys, targeted face-to-face meetings with key stakeholders, key community representative organisations and community leaders, drop-in and pop-up sessions, targeted focus groups, online web forms, emails and phone calls.

At this stage, community sentiment appears to be positive and supportive. In those instances where concerns have been expressed, it has related to 'Visual impact and a potential change to how people currently experience the Hay Plains'. Concerns regarding the visual amenity and potential impact on the experience 'while travelling across the Hay Plains during construction' were also expressed.

"I worry a bit about how it will change the look of the Hay Plains as you drive through it, but I think any negative impacts would be outweighed by the benefit the project construction workforce would bring to the town" – Hay respondent.

Some respondents expressed concerns over the transitioning land uses such as farming and grazing to also include renewable energy production. However, economic benefits to the region from the Project outweighed all other concerns relating to a negative impact.

"If the landowners are happy, we are happy with it being put up" – Hay respondent

Where possible, the existing landscape features and key viewpoints have been discussed in Section 5.0 of the PVIA. Further responses will be gathered during the EIS phase to assist in informing the Scenic Quality Rating of Landscape Character Units.

Preliminary assessment outcomes

The PVIA report identified that within the Preliminary Zone of Visual Influence for the Project:

- The surrounding topography is relatively flat, as a result the majority of turbines proposed are likely to be visible from more of the areas around the Project.
- Certain areas to the north east and south west of the Project area are characterised by shallow topographical changes by embankments along dry creek beds and dry lakes. These areas will have limited views due to topographical differences.
- The majority of dwellings are likely to view the Project in its entirety (within 8 Kilometres of the turbines). This is based on the consideration of topography and does not consider intervening elements such as vegetation and existing structures.

Based on the current Project area there are no non-involved dwellings which require further assessment in accordance with the Bulletin. Involved and non-involved dwellings are identified in Figure 6.

750000

800000

6150000

Wilan Wind Farm Project Area
Indicative Turbine Location
Site Access Point
Grid Connection Study Corridor
EnergyConnect Powerline
LGA Boundary
NPWS Estate

Associated Residence
Non-associated Residence
Uninhabited Building

Visual Magnitude
4,000m from nearest turbine
5,900m from nearest turbine
8,000m from nearest turbine

WAUGORAH
MAUDE
BALRANALD
YANGA
KERI KERI

Yanga National Park
Yanga Nature Reserve
Yanga State Conservation Area

BALRANALD SHIRE COUNCIL
HAY SHIRE COUNCIL
MURRAY RIVER COUNCIL
EDWARD RIVER COUNCIL

IVANHOE ROAD
WAUGORAH ROAD
NAP NAP ROAD
WARWICK EGAN RD
STURT HIGHWAY
MAUDE ROAD
BALRANALD ROAD
KERI KERI ROAD
Project EnergyConnect

A

Figure 6: Visual Magnitude

KILARA

Disclaimer: Kilara makes no warranty in relation to the accuracy, reliability, completeness or suitability of the data and does not accept liability for any loss, damage or costs, including consequential damage, in relation to any use of the data in this map.

PROJECT: Wilan Wind Farm		
DATE: 22/11/2022	STATUS: APPROVED	PRODUCED: AC
SCALE: 1:250,000 at A3	DATUM: GDA 1994 MGA Zone 54	APPROVED: IG
FILE: SEARS_006_D_Visual		REV: D

0 1 2 3 4 5 6 7 8 9 10 km

Moir Landscape Architects completed preliminary assessments and determined that there were no non-involved dwellings within 8,000 metres of the nearest turbine.

The Multiple Wind Turbine Tool provides a preliminary indication of potential cumulative impacts arising from the Project. To establish whether the degree to which dwellings or key public viewpoints may be impacted by multiple wind turbines, the proponent must map into six sectors of 60° any proposed turbines, and any existing or approved turbines within 8 kilometres of each dwelling or key public viewpoint.

One (1) key public viewpoint was identified within 8 kilometres of the nearest turbine being the Willowvale Rest Area. The Willows Campground and Picnic Area and Willows Visitor Centre are located approximately 9 kilometres south-west of the proposed turbines. Other key public viewpoints are located along Sturt Highway outside of 8 kilometres of the nearest turbine are St Pauls Rest Area and Ravensworth Rest Area.

Moir prepared a preliminary assessment from 23 public viewpoints. These points were selected to illustrate the varying landscape character typologies throughout the Study area (Refer to Appendix A and Figure 14 in PVIA).

Grid connection corridor

In addition to the proposed wind turbines, the associated infrastructure is likely to contrast with the existing visual landscape. Due to the large scale and relatively flat topography of the Project area, it is likely that the grid connection corridor has the potential to alter the existing visual landscape. Potential visual impact resulting from other associated infrastructure and project components will be assessed in detail during the EIS phase once the design has been refined.

An existing 19.1kV overhead grid connection runs along Keri Keri Road. The Proponent is focussing on confirming a connection corridor running in close association with Keri Keri Road, utilising up to 330kV transmission infrastructure to connect to the new PEC Transmission line, to be located 8 kilometres south of the Project. The transmission towers will be located with a separation of 500 metres span with a total height of 65 metres. The structure is likely to be a 330kV single circuit steel pole. The PVIA provides an overview of the potential visual impacts resulting from the ancillary structures that will be required to manage the Project operations.

Proposed mitigation methods to be considered during detailed design phase for any potential grid connection include:

- Where possible underground cabling is to be used to connect wind turbines to project site collector stations or to the electricity grid if feasible.
- Utilise existing transmission lines where possible.
- The route for any proposed overhead transmission lines should be chosen to reduce visibility from surrounding areas.
- Plan route to minimise vegetation loss.
- Plan route to minimise linear run of built asset, reducing the risk of bird and bat collisions.
- Use of subtle colours and a low reflectivity surface treatment on power poles to ensure that glint is minimised.

Cumulative

The existing landscape character of the region allows for optimum harvest of wind energy due to the flat terrain and large expanses of uninhabited land with minimal obstructions in the landscape. These characteristics are beneficial to the output of wind energy and as such, it is highly likely that over time the

area will be utilised for the development of multiple wind farm projects. Figure 7 below shows the wind farms that are currently proposed within the extents of the South-West REZ.

750000

800000

850000

6200000

6150000

6100000

Wilan Wind Farm Project Area

A Proposed Site Access Point

South West NSW (REZ)

State Significant Development

Energy Connect Powerline

LGA Boundary

NPWS Estate

RENEWABLE ENERGY ZONE - SOUTH WEST NSW

CORRONG

ONE TREE

WAUGORAH

Yanga National Park

WAUGORAH ROAD

NAP NAP ROAD

MAUDE

HAY

HAY SOUTH

STURT HIGHWAY

WARWAEGA ROAD

HAY SHIRE COUNCIL

BALRANALD SHIRE COUNCIL

BALRANALD

Yanga State Cons. Area

YANGA

MURRAY RIVER COUNCIL

Wilan Wind Farm

A

Kerri Kerri WF

KERI KERI

Baldon WF

KERIKERI ROAD

MAUDE ROAD

Project EnergyConnect

EDWARD RIVER COUNCIL

Bullawah Wind Farm

BALRANALD ROAD

Burrawong

GOODNIGHT

KYALITE

MOOLPA

TOORANIE

STONY CROSSING

MOULAMEIN

MALLAN

DILPURRA

SPEEWA

CUNNINYEUK

DHURAGOON

NIEMUR

BARRATTA

BOOROORBAN

WILLURAH

VICTORIA

Figure 7: South-West REZ Proposed Projects

KILARA

PROJECT: Wilan Wind Farm		
DATE: 23/11/2022	STATUS: APPROVED	PRODUCED: CM
SCALE: 1:500,000 at A3	DATUM: GDA 1994 MGA Zone 54	APPROVED: IG
FILE: SEARS_007_C_Projects		REV: C

0 2.5 5 10 15 20 25 km

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The re-occurrence of wind farms within a region has the potential to alter the perception of the overall landscape character, irrespective of being viewed in a single viewshed. It is important to determine whether the effect of multiple wind farms and other major infrastructure within the region would combine to become the dominant visual element, altering the perception of the general landscape character.

Due to the flat topography of the region and lack of obtrusive elements, it is likely that there will be areas from which multiple projects will be visible simultaneously.

Assessment approach for the EIS

Moir has identified the additional visual assessment which will be required as part of the EIS. From a landscape character perspective the following steps will need to be completed:

- Utilise the landscape character assessment to prepare a detailed Visual Baseline Study.
- Identify any additional key features, key viewpoints valued by the community through ongoing consultation.
- Refine the Landscape Character Units and allow the community to provide feedback on the relative scenic quality ratings of LCUs.
- Determine the Zone of Visual Influence (ZVI) of key viewpoints and assess against the objectives outlined in the Visual Assessment Bulletin.

In addition, based on identified sensitive receptors the following assessment of visual impacts on dwellings and key viewpoints need to be completed:

- Ground-truthing of all identified non-involved dwellings.
- Undertake site inspection and detailed dwelling assessment at sensitive non-involved dwellings.
- The LVIA will assess each 'sensitive receptor' in detail to take into account topography, vegetation and other screening factors.
- Determine the potential visual impact of each sensitive receptor and provide mitigation methods to reduce potential visual impacts.

The ZVI needs to be reviewed to illustrate the potential visibility of the Project:

- The LVIA will require further detailed assessment from areas identified as having potential visibility in the Preliminary ZVIs.
- Graphic representations of the Project using GIS technology including wire frame diagrams and photomontages will be provided in the EIS phase.

Further assessment of the cumulative visual impact will be detailed in the EIS, along with a description of the mitigation and management measures being employed to reduce impacts.

6.1.2 Noise

Marshall Day Acoustics has prepared *Wilan Wind Farm Preliminary Noise Assessment* (18 October 2022) (Noise report) (Marshall Day Acoustics 2022).

A preliminary assessment of operational noise for the Project has been carried out in accordance with the NSW Department of Planning and Environment's *Wind Energy: Noise Assessment Bulletin -For State significant wind energy development,* dated December 2016 (the NSW Noise Assessment Bulletin).Preliminary results

Noise modelling was carried out based on a candidate turbine model currently available in the market with a blade tip height of 232 metres, as nominated by the Proponent, with a generation capacity of 6.0 MW being

representative of the size and type of turbine being considered for the Project. Modelling was conducted using the maximum sound power level of the nominated wind turbine calculated under worst case noise propagation conditions using International Standard ISO 9613-2: 1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation (ISO 9613-2)

The results of the modelling demonstrate that the Project can be designed and operated to comply with the operational noise requirements of the NSW Noise Assessment Bulletin.

Cumulative noise levels associated with concurrent operation of the Project, the nearby Keri Keri Wind Farm and Baldon Wind Farm projects have also been considered. An assessment of the predicted noise levels for each wind farm has demonstrated that potential cumulative noise effects need to be considered but do not affect the compliance outcomes for any of the assessed projects.

Assessment approach for the EIS

Detailed noise assessments will be required for the Project as part of the EIS to demonstrate compliance with specific noise requirements as defined in the SEARs. Whilst SEARs specific to the Project are yet to be issued, typical requirements include assessment of:

- Operational wind turbine noise.
- Ancillary infrastructure noise.
- Construction noise.
- Construction traffic noise.
- Construction vibration.
- Consideration of cumulative impacts with other nearby wind farm projects.

Environmental noise considerations relating to construction and ancillary infrastructure would be addressed at the EIS phase of the assessment once the project specific SEARs have been released.

Further detailed assessment work may involve background noise monitoring at key receivers to determine the applicable criteria in accordance with the NSW Noise Assessment Bulletin. The results of any background noise monitoring would be documented in the noise assessment report prepared to accompany the EIS for the Project.

The NSW Noise Assessment Bulletin specifies additional criteria relating to special characteristics, defined as tonality and low frequency. While tonality cannot be readily predicted, in relation to low frequency noise, the bulletin states that:

> *Noise assessments for proposed wind energy projects shall assess the potential for non-associated residential receiver locations to experience low frequency noise levels exceeding 60 dB(C).*

Low frequency noise characteristics are highly specific to the turbine being considered, and its assessment can involve detailed modelling using alternative procedures to those used for A-weighted noise levels. In accordance with the NSW Noise Assessment Bulletin, this modelling data is to be provided as part of an application to develop a wind farm. Accordingly, this modelling is to be undertaken and reported at the SSDA phase of the assessment.

6.2 Biodiversity

Biodiversity values were documented in the Project area (main wind farm site and grid connection) through a combination of reviewing existing reports, database searches, inspection of state-wide vegetation/wetland modelling and preliminary field visits. Biosis completed desktop and field assessments for the wind farm site, and OzArk Environment and Heritage completed desktop assessments only for the grid connection. Appendix 2 provides lists of threatened flora, fauna and ecological communities known, or predicted, to occur within or near the Project area.

6.2.1 Biodiversity desktop and field survey effort

Biodiversity assessment effort to inform project planning, Scoping Report preparation and begin EIS-phase studies has included:

- September 2021 – desktop biodiversity assessment of original Project area (Biosis).
- July/August 2022 – NSW government state-wide Plant Community Type (PCT) modelling review and field mapping/validation (Biosis).
- August 2022 – Winter bird utilisation surveys (Year 1 winter surveys) (Biosis).
- September 2022 – Grid connection preferred option PCT mapping (OzArk).
- September 2022 – Threatened flora targeted surveys (Biosis).
- October 2022 – Threatened flora targeted surveys (Biosis).
- November 2022 – Spring bird utilisation surveys (Year 1 spring surveys) (Biosis).

6.2.2 Existing environment (wind farm site)

The wind farm site is situated within the Riverina Interim Biogeographic Regionalisation for Australia (IBRA) region between Balranald and Hay in south-west NSW. It encompasses an area of private land spanning across three properties Willowvale, Loorica and Gayini (Nimmie-Caira) along with land associated with the transmission corridor.

The wind farm site encompasses heavy-textured grey, brown and red clays and is dominated by derived and native Chenopod shrublands, grasslands, Lignum wetlands, Aeolian shrublands and small stands of Black Box woodland. The climate is semi-arid with cool winters and hot summers and low rainfall predominantly occurring in winter. The multiple rural properties within the wind farm site are typically subject to light to moderate grazing. Large portions of land within the wind farm site have also previously been altered for irrigated cropping, some of which has been restored as floodplain wetlands on the Gayini/Nimmie-Caira property on the north-eastern extent of the original conceived project site as part of the Nimmie-Caira Enhanced Environmental Watering Scheme. The western extent of the windfarm site is located adjacent to the Yanga State Conservation Area (Yanga SCA) which is managed by NSW National Parks and Wildlife Service (NPWS). This conservation area has been reserved since 2007 and covers an area of 34,557 hectares. The Yanga SCA is itself adjacent to the Yanga National Park and Yanga Nature Reserve.

6.2.3 Vegetation (wind farm site)

Desktop mapping and analysis confirmed 21 potential Plant Community Types (PCT), of which 12 are considered more likely based on previous ground-truthed studies in the broader locality, included sections of Gayini property. This includes five which are associated with Threatened Ecological Communities (TEC) within in the project area (Tozer 2003, EES 2021) in a natural and modified state. Plant Community Types fit broadly into a range of vegetation classes from floodplain shrublands and woodlands, riverine sandhills to chenopod

communities on Aeolian rises (Table 7, Figure 9). Areas of non-native vegetation occur and Category 1 land occur in places subject to previous irrigated and dryland cropping or heavy grazing.

Table 7 Plant Community Types recorded within the wind farm site

Plant Community Type	Condition State
PCT 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	High
PCT 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	High/Moderate
PCT 17 - Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	High/Moderate
PCT 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones	Moderate
PCT 157 - Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion	High/Moderate
PCT 159 - Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)	High/Moderate
PCT 160 - Nitre Goosefoot shrubland wetland on clays of the inland floodplains	High/Moderate
PCT 163 - Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	High/Moderate
PCT 164 - Cotton Bush open shrubland of the semi-arid (warm) zone	High/Moderate
PCT 165 - Derived corkscrew grass grassland/forbland on sandplains and plains in the semi-arid (warm) climate zone	Low (derive native grassland)
PCT 166 - Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	Moderate/Low (derived PCT)
PCT 216 - Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	Moderate/Low
PCT 236 - Derived Giant Redburr low shrubland on alluvial plains of the semi-arid (warm) climate zone	Moderate/Low (derived PCT)

6.2.4 Threatened biota (wind farm site)

Background searches identified eight threatened flora species and 39 threatened fauna species recorded (EES 2021) or predicted to occur (Commonwealth of Australia 2021) within 25 kilometres of the wind farm site.

6.2.5 Threatened Ecological Communities

Threatened Ecological Communities (TECs) that are known or predicted to occur that are considered to have a medium or greater likelihood of occurrence include:

- *Allocasuarina luehmannii* Woodland in the Riverina and Murray-Darling Depression Bioregions BC Act endangered), syn. Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions (EPBC Act endangered).
- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (BC Act endangered), syn. Weeping Myall Woodland (EPBC Act endangered).
- *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions (BC Act endangered).
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions (BC Act endangered).

6.2.6 Threatened flora

Threatened species known or predicted to occur that are considered to have a medium or greater likelihood of occurrence include:

- A spear-grass *Austrostipa metatoris* (EPBC Act vulnerable, BC Act vulnerable).
- Mossgiel Daisy *Brachyscome papillosa* (EPBC Act vulnerable, BC Act vulnerable).
- Chariot Wheels *Maireana cheelii* (EPBC Act vulnerable, BC Act vulnerable).
- Winged Peppercress *Lepidium monoplocoides* (EPBC Act endangered, BC Act endangered).
- Menindee Nightshade *Solanum karsense* (EPBC Act vulnerable, BC Act vulnerable).
- Slender Darling Pea *Swainsona murrayana* (EPBC Act vulnerable, BC Act vulnerable).

Mossgiel Daisy and Chariot Wheels have been recorded in the project area during targeted flora surveys in September 2022.

6.2.7 Threatened fauna

Threatened fauna species known or predicted to occur that are considered to have a medium or greater likelihood of occurrence include:

- Australian Bittern *Botaurus poiciloptilus* (EPBC Act endangered, BC Act endangered).
- Australian Bustard *Ardeotis australis* (BC Act endangered).
- Australian Painted Snipe *Rostratula australis* (EPBC Act endangered, BC Act endangered).
- Black Falcon *Falco subniger* (BC Act vulnerable).
- Black-tailed Godwit *Limosa limosa* (BC Act vulnerable).
- Blue-billed Duck *Oxyura australis* (BC Act vulnerable).
- Brolga *Grus rubicunda* (BC Act vulnerable).
- Brown Treecreeper *Climacteris picumnus victoriae* (eastern subspecies) (BC Act vulnerable).
- Corben's Long-eared Bat *Nyctophilus corbeni* (EPBC Act vulnerable, BC Act vulnerable).
- Curlew Sandpiper *Calidris ferruginea* (EPBC Act Critically endangered, BC Act endangered).
- Diamond Firetail *Stagonopleura guttata* (BC Act vulnerable).
- Dusky Woodswallow *Artamus cyanopterus cyanopterus* (BC Act vulnerable).

- Freckled Duck *Stictonetta naevosa* (BC Act vulnerable).
- Grey-crowned Babbler (eastern subspecies) *Pomatostomus temporalis temporalis* (BC Act vulnerable).
- Little Eagle *Hieraaetus morphnoides* (BC Act vulnerable).
- Magpie Goose *Anserans semipaimata* (BC Act vulnerable).
- Major Mitchell's Cockatoo *Lophochroa leadbeateri* (BC Act vulnerable).
- Painted Honeyeater *Grantiella picta* (EPBC Act vulnerable, BC Act vulnerable).
- Redthroat *Pyrrholaemus brunneus* (BC Act vulnerable).
- Scarlet Robin *Petroica boodang* (BC Act vulnerable).
- Southern Bell Frog *Litoria raniformis* (EPBC Act vulnerable, BC Act endangered).
- Spotted Harrier *Circus assimilis* (BC Act vulnerable).
- Square-tailed Kite *Lophoictinia isura* (BC Act vulnerable).
- Varied Sittella *Daphoenositta chrysoptera* (BC Act vulnerable).
- White-bellied Sea-eagle *Haliaeetus leucogaster* (BC Act vulnerable).
- White-fronted Chat *Epthianura albifrons* (BC Act vulnerable).
- White-throated Needletail *Hirundapus caudacutus* (EPBC Act vulnerable).
- Yellow-bellied Sheathtail-bat *Saccolaimus flaviventris* (BC Act vulnerable).

Additional threatened fauna not returned from database searches that will require consideration and may occur in the Project area include:

- Inland Forest Bat *Vespadelus baverstocki* (BC Act vulnerable).
- Little Pied Bat *Chalinolobus picatus* (BC Act vulnerable).
- Western Blue-tongued Lizard *Tiliqua occipitalis* (BC Act vulnerable).

6.2.8 Existing environment (grid connection)

A desktop assessment considering the biodiversity values of six potential grid connection options was conducted in January 2022, of which option 1 (8 kilometre Keri Keri Road aligned corridor) has been considered most feasible and has been presented in this summary of biodiversity values. A preliminary field assessment, including PCT mapping along the preferred grid connection, was also completed by OzArk Environment and Heritage in September 2022.

The preferred grid connection includes an 8 kilometre alignment heading south parallel with Keri Keri Road from the Sturt Highway at the southern extent of the wind farm site. The western side of the grid connection alignment includes part of Murrumbidgee Valley (Yanga) State Conservation Area, and the eastern side is private land subject to light to moderate grazing. The alignment consists of and/or is surrounded by slight sandy rises where shrublands are present, undulating with depressions and drainage lines where Black Box woodland may be present, interspersed with *Acacia* patches, Black Oak patches, grassland and derived saltbush shrubland. Soils vary from red aeolian and alluvial to grey, brown and red clay.

6.2.9 Vegetation (grid connection)

According to State Vegetation Type Maps for the Riverina and the Western District, five PCTs were found to intersect with the preferred grid connection option, two of which are associated with TECs (Table 8). Once

ground-checking was undertaken it was determined that eight PCTs occur along the preferred grid connection alignment. These PCTs were recorded in a range of condition states including remnant, derived grassland and very high to low condition states by OzArk. The highest quality native vegetation was recorded in the Yanga State Conservation Area.

Table 8 Plant Community Types along the preferred grid connection option

Plant Community Type	Approx. Length from OzArk desktop study	Ground-checked PCTs by OzArk (Sept 2022)
PCT 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not specified	Confirmed in the field
PCT 15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not specified	Confirmed in the field
PCT 17 - Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not specified	Not identified in the field
PCT 26 - Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion.	Not identified in desktop assessments	Confirmed in the field
PCT 46 – Curly Windmill Grass – speargrass – wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	6.8 kilometres	Not identified in the field
PCT 77 - Yarran shrubland of the NSW central to northern slopes and plains.	Not identified in desktop assessments	Confirmed in the field
PCT 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones.	Not identified in desktop assessments	Confirmed in the field
PCT 159 - Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW).	Not identified in desktop assessments	Confirmed in the field
PCT 163 - Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones	1.4 kilometres	Confirmed in the field
PCT 164 - Cotton Bush open shrubland of the semi-arid (warm) zone.	Not identified in desktop assessments	Confirmed in the field

6.2.10 Threatened biota (grid connection)

The lists of threatened biota including TECs, threatened flora and threated fauna likely to occur along the preferred grid connection option are considered to be very similar to those present for the wind farm site. Plant Community Type 77 identified above by Ozark could correspond to the *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions (BC Act endangered). Plant Community Type 26 corresponds with Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions (EPBC and BC Act endangered).

6.2.11 Migratory species (Project area)

Known habitats for migratory species occur in the Project area and local landscape. The Lowbidgee wetlands and surrounding conservation reserves (Yanga National Park and State Conservation Area) are recognised as an important system for migratory species, and are listed in the Directory of Important Wetlands in Australia. While the project area and local landscape's value to internationally and nationally migratory species will vary from year to year, the presence of permanent and semi-permanent water sources could provide a resource when conditions are unfavourable in the broader landscape. Individually, the project area is generally of limited value to migratory species at a continental level, however, it may form part of a network of suitable habitats associated with the Lowbidgee wetlands which may be utilised collectively by a significant number of migratory species.

6.2.12 Potential biodiversity impacts

The development and operation of the wind farm creates the potential to negatively impact threatened species and TECs listed under the BC Act and EPBC Act through direct impacts on habitat and collision risk with turbines and powerlines. The main potential impacts regarding the construction and operation of the Project that require assessment include:

- Clearing of TECs and the associated impacts to native species, in particular threatened and migratory species.
- Collision risk to birds and bats associated with wind turbines and powerlines.
- Increased habitat fragmentation.
- Injury and mortality to fauna from vegetation clearing and vehicle strikes.
- Changes to floodplain and wetland hydrology and function.
- The Project area currently supports a mix of native vegetation cover subject to broad-acre grazing, and Category 1 land that has been subject to previous irrigated cropping practices and/or heavy livestock grazing. Impacts on native vegetation, native fauna and terrestrial ecosystems are likely to occur as a result of the Project. The construction of wind turbine infrastructure, access roads and associated facilities for the operation of the Project would require clearing of vegetation and some reshaping of the topography and landscape. These activities may result in a direct and long-term impact on the occurrence, extent and coverage of native vegetation, including threatened species habitat and ecological communities. Indirect impacts including the loss of feeding, refuge and breeding habitat for native fauna, particularly threatened fauna, may also occur, including habitat fragmentation and the loss of habitat connectivity.

Direct and indirect impacts during the construction phase may include clearing, changes to water flow/floodplains, sedimentation, dust deposition, erosion, weed introduction and / or spread, vehicle / machinery strike, light and noise pollution, shading and vibration from the movement of equipment and

vehicles. Cumulative impacts may also occur in the context of development in the broader area, with other wind projects proposed in the local landscape within the South-West REZ.

Vegetation and ground disturbance impact estimates have been calculated based on the current 138 turbine conceptual layout. These estimates are preliminary only and use a conservative impact area of 150 metres radius disturbance footprint for each turbine. This preliminary footprint has been intersected with current PCT mapping to determine possible impacts on native vegetation from turbine development (Table 9). Civil works, reticulation and the grid connection are not included in these impact estimates due to the early planning and design phases of the project.

Table 9 Preliminary estimates of native impacts/disturbance for the 138 turbine layout using a 150 metres radius impact area around each turbine location.

Plant Community Type No.	Impact area (hectares)
153	70.9
157	7.1
159	13.6
160	39.2
163	99.8
164	266.6
166	24.3
216	2.3
236	84.2
TOTALS	**607.9**

Operational impacts are primarily associated with the risk of turbine collision and barrier effects to threatened and protected bird and bat species. Threatened species most at risk are considered to be those with potential for ongoing population impacts once the project is operational, such as:

- Raptors that may manoeuvre close to turbine blades to prey on carrion below. These species are at low density in the landscape and removal of even one breeding pair may be significant at a local level.
- Flocking birds e.g. Major Mitchell's Cockatoo.
- Migrating (local, regional, international) or nomadic waterbirds, which may be less able to manoeuvre around operational turbine blades and may also effect breeding viability, inclusive of large colonial nesting events.
- Resident or colonial roosting bats that may fly within the Rotor Swept area (RSA).

Generally, most woodland birds and bats forage and move within canopies and lower than turbine height and are considered a lower risk of impact.

Migratory and nomadic species (such as Australasian Bittern) represent an increased risk as one movement through the operational wind farm may have a local population-level impact on the species. Ongoing collisions may affect the population as a whole. Threatened species, such as the Dusky Woodswallow, and more common species such as Wedge-tailed Eagles and Kestrels, may appear in significant numbers at times during optimal environmental conditions. Barriers to local waterbird movement between wetlands on the

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Murrumbidgee River Floodplain (Lowbidgee wetlands) and other wetlands to the south will also need to be considered.

Offsite impacts of the windfarm site include potential indirect impacts of floodplain environments and wildlife populations in the adjacent Yanga State Conservation Area. Key considerations include the flow of floodwaters from the Fiddlers Creek system through the Project area and into the Yanga State Conservation area to the west and south-west.

6.2.13 Biodiversity impact avoidance and minimisation strategies

Biodiversity constraints have been considered at the preliminary design phase of the project. Constraints mapping was undertaken using PCT type and extent, setbacks from the Yanga State Conservation Area and wetland mapping to inform preliminary turbine layout (Figure 8). This mapping is focussed on the wind farm site and will be further applied to all project components during the EIS-phase, especially once the grid connection corridor is refined. Initial impact avoidance and minimisation strategies have considered the following design parameters and responses:

- Refining the current Project area to avoid high biodiversity and hydrological values identified in the original Project area.
- Focussing development on Category 1 land and non-native vegetation to minimise clearing.
- Considering wind turbine and power line exclusion zone buffers around floodplain wetlands, seasonal creek lines/flood runners and Black Box woodland patches.
- Minimising and/or avoiding development in areas of greater collision risk to resident birds, bats and migratory species.
- Establishing turbine free buffers to the adjacent Yanga State Conservation Area.
- Considering floodplain function and flooding events in project design to minimise hydrological disruption of the Fiddlers Creek system and other drainage systems that carry floodwaters through the site to adjacent land, including the Yanga State Conservation Area.
- Cross referencing biodiversity constraints with other site/value-based constraints – e.g. Aboriginal cultural heritage values and flood prone areas.
- Initial consultation by the Proponent with relevant stakeholders including University of New South Wales (UNSW) regarding ongoing research in the area (e.g. Gayini property).
- Investigating multiple grid connection options and selecting preferred options that have the shortest route to grid and smallest footprint.

6.2.14 Mitigation options

Mitigation strategies currently being investigated that will be fully addressed in the EIS include:

- Micro-siting of turbine placement to minimise native vegetation and threatened species habitat removal, and to minimise collision risk to birds and bats. Collision risk can be minimised during the design of the project by avoiding areas of highest constraint and including setbacks and buffers from national park estate, mapped wetland areas and woodland PCTs likely to contain habitat for birds and microbats. Avoidance of areas where bird and bat activity is likely to be highest will reduce potential curtailment requirements if strikes were to occur.
- Finalising a grid connection option that minimises impacts to native vegetation, threatened species habitat and the Yanga State Conservation Area, and that minimises powerline collision risk to birds and bats.

- Undertaking appropriate flood studies during the EIS phase to inform sensitive placement of infrastructure and to minimise disruption of the floodplain and hydrological connectivity.
- Operational mitigation options including bird/bat deterrence measures and curtailment options (programmed or on-demand curtailment) to minimise collision risks.

Wilan Wind Farm Project Area
Proposed Grid Connection Route
EnergyConnect Powerline
Cadastral Boundary

Civil construction biodiversity constraint

High
Moderate
Low

Nap Nap Road
Warwaegae Road
Loorica Road
Sturt Highway
Keri Keri Road
Project EnergyConnect

Figure 8: Wind Farm Site Biodiversity Constraints Mapping

KILARA

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PROJECT: **Wilan Wind Farm**		
DATE: 23/11/2022	STATUS: APPROVED	PRODUCED: CM
SCALE: 1:80,000 at A3	DATUM: GDA 1994 MGA Zone 54	APPROVED: AT
FILE: SEARS_008_B_Biodiversity		REV: **B**

0 1 1 2 2 3 km

6.2.15 Assessment approach for the EIS

Development of the wind farm will meet the criteria for SSD, triggering entry into the Biodiversity Offset Scheme (BOS). Field surveys and a Biodiversity Development Assessment Report (BDAR) will be required to address the BC Act, including the Biodiversity Assessment Methodology (BAM, 2020) and Commonwealth EPBC Act (See further discussion below). The BDAR will need to be prepared in accordance with the BAM detailing the project and the associated biodiversity values, how the project has avoided and minimised impacts to biodiversity, and an impact assessment for those residual impact that could not be avoided. This will include an impact assessment in accordance with the EPBC Act and FM Act.

The BAM 2020, pursuant to the BC Act 2016, is a highly prescriptive survey assessment methodology. The approach for the BDAR would be based on avoid and minimising impacts, with unavoidable residual impacts offset through the BOS.

A desktop report and preliminary field assessments have been completed however, detailed field assessment, data analysis and reporting as part of the scope of the BDAR will include:

- A review and update if required of background searches including:
  - NSW BioNet Atlas of NSW Wildlife for BC Act listed threatened entities.
  - Review of the Commonwealth's Protected Matters Search Tool.
  - Local Environmental Plan (LEP) and State Environmental Planning Policies (SEPP).
- Broad condition states assigned to develop vegetation zones in accordance with the BAM.
- Formalise a detailed land category assessment (LCA) with a review of land categorisation under the *Local Land Services Act 2013* (LLS Act). This would clarify the native vegetation management and land use regime and where applicable to do so, the potential for land to be mapped as Category 1 exempt land. Land mapped or determined as Category 1 exempt can be excluded from the BAM and is not required to be assessed, with exception to prescribed impacts. The LCA does not remove the requirement to address matters under the EPBC Act.
- Establishment of a BAM Calculator project for the current assessment to determine the requirements for threatened species survey.
- Undertake field investigation in accordance with the BAM, including floristic plot surveys and targeted searches for threatened flora and fauna species:
  - Targeted surveys have commenced for threatened flora in September-October 2022 and will continue according to seasonal requirements and through the EIS phase.
  - Bat utilisation studies in November 2022 will provide data on the presence of threatened bat species and inform any further targeted survey requirements to be conducted during the EIS phase.
  - Bird utilisation studies (August and November 2022) will provide initial data on waterbirds and woodland birds, and inform any targeted surveys to be conducted during the EIS phase.
- Identify any impact avoidance, mitigation and offset measures necessary for the Project area.
- Undertake analysis of field data to determine impacts to threatened species and native vegetation, and calculate any offset requirement in accordance with the BAM.
- If required, engage species experts, as required, where field surveys could not sufficiently determine the presence/absence of candidate species credit species, due to constraints such as seasonal survey restrictions or requirements for replicate surveys follow weather events etc.

- Bird and Bat Utilisation Surveys (BBUS), operational risk assessments and Collison Risk Modelling (CRM) are required to inform potential operational risk of the wind farm and to support ecological assessments required under the BC Act, inclusive of Section 8.3.5 of the BAM and the EPBC Act. This information would be used to inform a Bird and Bat Adaptive Management Plan (BBAMP) that would likely to be required as a condition of approval. This would be prepared to provide an overall strategy for managing and mitigating any significant bird and bat strikes arising from the operation of the wind energy facility.

The BDAR will be conducted in accordance with relevant guidelines including:

- *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).

6.2.16 Biodiversity offsets

Triggering the BOS results in the requirement for biodiversity assessment in accordance with the BAM, preparation of a BDAR, and as a resultant biodiversity offset liability for unavoidable impacts to native vegetation, threatened species, and in some cases protected (non-threatened) species as a result of BAM prescribed impacts.

In NSW, biodiversity offsets are calculated as biodiversity credits, using the BAM, with the type and number of credits required directly dependent on the type and extent of a project's impacts. The type of biodiversity credits required is based on the impacted entities (PCTs and / or listed threatened species), and the quantum of offsets is based on a combination of total area of impact and the condition of the vegetation / habitats impacted. This quantum is calculated using the online BAM Credit Calculator based on mapped impact areas (hectares) and BAM floristic plot data captured on site. The project's offset requirement is a critical component of the BDAR, and will form part of project approvals.

Once approved, the project's offset liability will need to be secured prior to the commencement of construction. There is some scope to stage the security of biodiversity offsets, whereby only the offset liability for each stage needs to be secured prior commencement of that stage, this however requires some detailed planning to be undertaken at a later date.

To secure the offset liability for the project there are three broad options that will be investigated:

- Payment to the Biodiversity Conservation Fund (the Fund) managed by the Biodiversity Conservation Trust (BCT).
- Purchase of credits from the open market.
- Establish a Biodiversity Stewardship Site(s) to generate credits for offsetting the project specifically.

Each of these options will be explored in detail as the project design progresses and offset requirements are clearly understood through the BDAR process during the EIS phase.

6.2.17 Commonwealth - Matters of National Environmental Significance

A referral in relation to Matters of National Environmental Significant (MNES) under the EPBC Act is being prepared and will be lodged in late 2022. Matters of National Environmental Significance would be assessed

within the BDAR as a streamlined assessment under the Commonwealth / NSW Bilateral Agreement. Based on biodiversity surveys undertaken in the project planning phase, the MNES most relevant to the project include threatened species, threatened ecological communities and migratory species, particularly:

- Mossgiel Daisy *Brachyscome papillosa* (EPBC Act vulnerable).
- Chariot Wheels *Maireana cheelii* (EPBC Act vulnerable).
- Southern Bell Frog *Litoria raniformis* (EPBC Act vulnerable).
- Australian Bittern *Botaurus poiciloptilus* (EPBC Act endangered).
- Corben's Long-eared Bat *Nyctophilus corbeni* (EPBC Act vulnerable).

An assessment of the significance of potential impacts on these species will be provided in the EPBC referral documentation to inform the assessment pathway for the project and the need for any Commonwealth offsets (which may align with the BAM if the project is assessed as a Controlled Action under the Commonwealth / NSW Bilateral Agreement).

Wilan Wind Farm Project Area
Proposed Grid Connection Route
EnergyConnect Powerline
Cadastral Boundary

Plant Community Type ID, Name

- 0, Urban Native/Exotic
- 13, Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- 15, Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- 17, Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
- 26, Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion
- 45, Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
- 46, Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion
- 77, Yarran shrubland of the NSW central to northern slopes and plains
- 153, Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones
- 157, Bladder Saltbush shrubland on alluvial plains in the semi-arid (warm) zone including Riverina Bioregion
- 159, Old Man Saltbush shrubland mainly of the semi-arid (warm) climate zone (south western NSW)
- 160, Nitre Goosefoot shrubland wetland on clays of the inland floodplains
- 163, Dillon Bush (Nitre Bush) shrubland of the semi-arid and arid zones
- 164, Cotton Bush open shrubland of the semi-arid (warm) zone
- 165, Derived corkscrew grass grassland/ forbland on sandplains and plains in the semi-arid (warm) climate zone
- 166, Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
- 216, Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
- 236, Derived Giant Redburr low shrubland on alluvial plains of the semi-arid (warm) climate zone

Warwaegae Road
Nap Nap
Loorica Road
Keri Keri Road
Sturt Highway
Project EnergyConnect

Figure 9: Plant Community Type

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PROJECT: Wilan Wind Farm		
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SCALE: 1:80,000 at A3	DATUM: GDA 1994 MGA Zone 54	APPROVED: AT
FILE: SEARS_009_A_PCT		REV: A

0 1 1 2 2 3 km

6.3 Heritage

6.3.1 Aboriginal cultural heritage

A *Desktop Aboriginal Heritage Assessment and Predictive Model was* prepared for the wind farm (Everick Heritage, August 2022) (Aboriginal Cultural Heritage report). That assessment considered the Original project area, which has since been refined.

Desktop assessment

The broader Murrumbidgee Provence has been subject to archaeological assessments over the last 30 years which have contributed to the characterisation the archaeological potential of the Project area. Gayini, which makes up the northern most portion of the project area has been subject to extensive survey and archaeological investigation.

The results of the desktop assessment have identified one hundred and sixty-seven (167) Aboriginal Heritage Information Management System sites are located within the original Project area across all mapped land systems. The most common site type being Earth Mound, then Artefact, or a combination Earth Mound and other AHIMS features. Due to the assessed sensitivity of the Project area to contain Aboriginal cultural sites, a programme of survey, consultation and the production of a final Aboriginal Cultural Heritage Assessment is proposed to be included within the EIS for the Project.

Aboriginal cultural material can be found at any place in the landscape, although certain landscape units and features may have a higher potential for retaining cultural material than others. Table 10 describes the predictive model for the Project.

Table 10 Summary of predictive modelling outcomes

Site Type	Site description and material traces	Potential to occur within the Project Area	Landscape feature
Earth Mounds	Cooking ovens constructed over multiple events, or generations. Constructed of burnt or ashy sediment, clay termite, calcrete or stone heat retainers, raised earth, animal bones, freshwater mussel. Human burials may occur within these. Other evidence of habitation, such as camp sites and stone artefacts may be present.	Very likely to occur due to proximity to water sources – particularly within eastern end of Gayini along the Original Project area. The remains of earth mounds may be large, or eroded in deflated scalded landscapes. Impact from agriculture partially has destroyed a number of mounds recorded on Gayini.	Rivers and water sources Murrumbidgee Channels and Floodplains Murrumbidgee Lakes, Swamps and Lunettes
Hearths	Heaths are generally formed as the result of a single cooking event. Comprised of burnt or ashy sediment, clay termite, calcrete or stone heat retainers, charcoal, animal bones and stone artefacts	High, numerous hearths have already been identified within the Project Area. Surface location of hearths can assist with the location of artefact scatters.	Anywhere
Middens	Freshwater mussel, fish bones, waterfowl bones, animal bones, refuse.	Low-moderate: most likely to occur on the margins of permanent water bodies	Lunettes, source bordering dunes, rivers
Culturally modified trees	Black box and yellow box, which have had barked removed for shelters, canoes, shields, coolamons, food, animal hunting or burial huts	Previously recorded within the Project Area. May occur in areas where mature trees are present/ have not been cleared.	Shallow ground water, surface water available – Murrumbidgee Channels and Floodplains
Burials	Treatment and internment of the dead. Could consist of raised earth mounds, raised ridges of earth, grave cuts in sand, ashy or burnt sediment.	Moderate: burials are recorded within the Project Area. Biosis (2018) recorded 74 burials, ranging from isolated skeletal fragments to one intact burial. Predominately located within earth mound or within a sand hill elevated above floodplain.	Lunettes, source bordering dunes, within earth mounds. Can occur anywhere in the landscape. Murrumbidgee Channels and Floodplains

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Site Type	Site description and material traces	Potential to occur within the Project Area	Landscape feature
Stone artefacts	Artefact scatters can vary from high density concentrations of flaked or ground stone to low density scatters with less than one artefact per 10 square metres or isolated finds. Hay Plain mounds contain high density scatters, but elsewhere site composition is for small sized silcrete and quartz debitage (Witter 2004).	Very Likely to occur anywhere, but associated with elevated landforms near sources of water, including levees, sandy rises having a higher potential.	All
Stone quarries	Raw stone material procurement sites	Low within the Project Area. The nearest known stone source is within the Great Cumbungi Swamp, to the North of the Project Area	Great Cumbungi swamp is the most notable raw material, it is located 41 kilometres to the north
Potential Archaeological Deposit (PAD)	Potential sub surface deposits of cultural material	Moderate in areas which have not been subject to ground disturbance	Located adjacent to water sources and elevated ground in undisturbed landforms - Murrumbidgee Channels and Floodplains

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Assessment approach for the EIS

It is proposed that an Archaeological Survey Report (ASR) be prepared for the wind farm and the connection to grid corridor.

The ASR will be prepared in accordance with the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (the Guide) (OEH 2011) and will include preliminary consultation with Balranald Local Aboriginal Land Council, and members of the Mutthi Mutthi and Nari Nari groups for inclusion in the survey. Final reporting for this grid will be included within the final Aboriginal Cultural Heritage Assessment Report.

Aboriginal Cultural Heritage Assessment Report

The ASR will form the basis for test excavation if required an Aboriginal Cultural Heritage Assessment Report (ACHAR) in accordance with the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (the Guide) (OEH 2011) and the Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW 2010c). The ACHAR will support the submission of EIS for the Project.

Communication with the traditional owners

Everick Heritage and the Proponent have proposed to undertake a proactive and collaborative approach to engaging with traditional knowledge holders. As part of the ACHAR process, the presentation and discussion of results at an Aboriginal Focus Group Meeting is proposed.

6.3.2 Historic heritage

A desktop assessment of historic heritage values in the Project area has been conducted using publicly available datasets via the NSW Government SEED online resource, (https://www.seed.nsw.gov.au/).

Existing conditions

European first contact

European contact with First Nations peoples in the project area commenced around the time Sturt (1829) and Mitchell (1836) began their explorations along the Murrumbidgee River. Smallpox had spread ahead of the European exploration parties and Aboriginal groups in the region had already suffered significant losses.

In 1846, Robinson wrote his observations of large gatherings at Lake Tala, located to the north-west of the project area and noted that many had travelled to the lake from different areas. It is likely that communal gatherings were held in such locations due to the high amount of resources available in these areas. Others such as Beveridge made observations of the substantial presence of camps and villages along the Murrumbidgee and across the Lowbidgee flood plain.

Early Land use history post European contact

The predominant usage of the Project area post-European contact has been for agricultural grazing. The first agricultural stations were established in the area during the 1830s and 1840s, with the primary stock being cattle. Charles Sturt had described the area as a treeless plain with good water sources, which had encouraged many graziers to occupy these plains and set up stations. By the 1860s sheep had become the primary stock being grazed in the area.

The northern part of the project area located on Gayini was previously part of the Tala and Nap Nap stations. In 1872 Nap Nap station was running approximately 30,000 sheep and 4,000 cattle. The Project area also includes the Willow Vale and Loorica Stations (Everick Heritage 2022).

The development of townships

Being the closest township to the Project area, Balranald some 30 kilometres to the west was first investigated as the site of a township in 1848, when George James MacDonald, The Commissioner for Crown Lands for the Lower Darling District arrived in the region. The township of Balranald was formally gazetted in April 1851 and the first land sale held on 14 January 1852, with thirty-five lots submitted to public auction.

Also in proximity to the project area is the township of Maude approximately 32 kilometres to the north-east which was originally established in the 1860s. Located on an area of the Pin Pan Pa Reserve which had been gazetted in 1852 as a crossing place along the Murrumbidgee for stock and drays, land at Maude was offered for sale in 1865 (*Balranald, a brief early history*, n.d.).

Statutory Heritage Register Searches

Commonwealth Heritage Register

The Commonwealth Heritage List includes natural, Indigenous and historical heritage places owned or controlled by the Australian Government. Items on the list have satisfied the minister as having one or more Commonwealth Heritage values.

There are no Commonwealth Heritage listed places within or in proximity to the Project Area.

National Heritage List

The Australian National Heritage List contains natural, historic, and Indigenous places deemed to be of outstanding heritage significance to Australia. Before a site is placed on the list a nominated place is assessed against nine criteria by the Australia Heritage Council.

There are no National Heritage listed places within or in proximity to the Project Area.

State Heritage Register

A search of the NSW State Heritage Register (SHR) was conducted on 13 October 2022.

The search revealed that there are no SHR-listed items within or in close proximity to the Project Area.

Hay Local Environmental Plan 2011

A search of the Hay Local Environmental Plan (LEP) 2011 was conducted on 13 October 2022. The search identified no locally heritage listed sites within the Project Area or in close proximity.

Wakool Local Environmental Plan 2013

A search of the Wakool Local Environmental Plan (LEP) 2013 was conducted on 13 October 2022. The search identified no locally heritage listed sites within the Project Area.

The search noted one listed heritage item of local significance, located approximately 40 kilometres from the project area being the Old Courthouse and footbridge at Billabong Creek, Moulamein.

Section 170 Heritage Registers

Section 170 of the *Heritage Act* 1977 requires all NSW state agencies to identify, conserve and manage the heritage assets owned, managed and occupied by that agency. In order to facilitate this, Section 170 heritage registers were established for all NSW government agencies. These registers are held and maintained by each state agency and updated as assets are acquired, altered, or decommissioned.

A search of the relevant Section 170 registers was undertaken on 13 October 2022. No Section 170 heritage places are located within or in close proximity to the Project Area.

Non-Statutory Considerations

National Trust of Australia (NSW) Heritage Register

The National Trust of Australia maintains a register of landscapes, townscapes, buildings, industrial sites, cemeteries and other heritage places which the Trust determines to have cultural significance. This register is non-statutory but provides an indication of places considered significant by the wider community.

Register of the National Estate

The Register of the National Estate (RNE) is a non-statutory archive of natural, historic and Indigenous places and incorporates over 13,000 places. Originally compiled between 1976 and 2003 by the Australian Heritage Commission, the register is now maintained by the Australian Heritage Council.

Following amendments to the *Australian Heritage Council Act 2003*, the RNE was frozen on 19 February 2007, which means that no new places can be added, or removed. Since February 2012 the RNE has been maintained as a non-statutory listing.

A search of the Australian Heritage Database was undertaken on 13 October 2022. This search identified no RNE listed places within the Project Area. The database did however note the presence of the Yanga Nature Reserve being located adjacent to the south-west corner of the project area.

Assessment Approach for the EIS

Desktop assessments undertaken to date have shown that there are no historic heritage items within the Project Area listed on National, State or Local statutory heritage registers. The closest registered historic heritage item the Old Courthouse and footbridge at Billabong Creek, Moulamein located approximately 40 kilometres south of the Project Area.

Whilst no registered historic heritage items are located within the Project area, the non-Indigenous heritage assessment report will consider any intangible values held by the community or relevant stakeholders. Preparation of the non-Indigenous heritage report would involve detailed historical research, including analysis of historical aerial imagery, physical inspection of the relevant areas of the Project Area, and consultation with the Hay Historical Society and any other relevant stakeholders.

6.4 Access

6.4.1 Traffic and parking

Existing environment

The existing road network will provide adequate access during the project assessment phase work. The project area is located immediately to the north of the Sturt Highway, having the southern portions of the project area intersected by Loorica Road. Loorica Road becomes Warwaegae Road as it turns on a north east heading.

Internal Access

Figure 10 shows proposed internal access routes at the site.

740000 750000 760000 770000 780000 790000 800000 810000

6180000 6170000 6160000 6150000 6140000

Proposed Site Access Point
Wilan Wind Farm Project Area
Internal Transport Route
Sturt Highway

Waugorah
Maude
Yanga Nature Reserve
Keri Keri
Yanga
STURT HIGHWAY
WARWAEGAE ROAD
LOORICA ROAD
A

Figure 10: Freight Route Options

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PROJECT: Wilan Wind Farm		
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FILE: SEARS_010_A_FreightRoute		REV: A

0 1.5 3 4.5 6 7.5 km

External Access (Routes for international importation of oversize components)

The project area benefits from proximity to a number of large ports with potential to receive and dispatch large components required for windfarm construction. These include (but not limited to) the following port facilities:

- Port of Adelaide
- Geelong
- Port Botany.

Potential impacts

During the construction phase of the Project, it is expected that local road and intersection upgrades will be required to accommodate an increase in construction traffic. Heavy vehicles will be required to transport the wind turbine components and other lighter vehicle movements are expected to increase during this phase.

Given the international nature of the majority of wind turbine manufacturing and supply lines, transport logistics to and from the site will be assessed for suitability as part of the EIS.

- Swept path for long loads, for example tower sections and turbine blades.
- Height restrictions that occur on the route.
- Payload mass, in particular the capacity of bridges that must be passed during delivery.

The delivery of larger components of the wind turbines would occur via one of the three OSOM networks outlined above.

During the operational phase it is expected that there would be minimal traffic associated with the project. It would include only light vehicles for personnel accessing the site. There may be an occasional requirement for a heavier vehicle to access the site for maintenance or repair.

Assessment approach for the EIS

A Traffic and Transport Impact Assessment (TTIA) will be undertaken as part of the EIS to inform road upgrades and traffic management appropriate to the Project. The TTIA would be prepared in accordance with the relevant guidelines and standards, including:

- Austroads Guidelines for Road Design (Austroads).
- Austroads Guidelines for Traffic Management (Austroads).
- Guide to Traffic Management – Part 3 Traffic Studies and Analysis (Austroads 2013).

The scope of the TTIA is expected to include:

- Review of any previous traffic impact assessments conducted in the surrounding area of the site.
- Preparation of construction, operational and decommissioning traffic impact assessments.
- Detailed haulage routes for OSOM components delivered from ports to site - including swept path analysis, traffic flows and required augmentations.
- Consultation with relevant stakeholders including councils, government agencies and regulators
- Traffic volume assessment, for both light and heavy vehicles, in the surrounding area of the site for the various phases of the project's lifetime.

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- Assessment of the existing road network's capacity to accommodate the type and volume of traffic produced by the project during construction, operation and decommission (including road upgrades and additions if necessary).
- Assessment of ongoing road maintenance and traffic control measures where necessary.
- Schedule of potential impact identification and mitigation strategies where necessary.

6.5 Built environment

6.5.1 Public land

Yanga Nature Reserve and State Conservation Area (SCA) are located to the immediate west of the Project area, and may intersect some parts along the grid connection. This public land is zoned C1- National Parks and Nature Reserves. Yanga National Park lies further to the west of the project area on the western side of the SCA.

The *Yanga National Park, State Conservation Area and Nature Reserve Plan of Management* (NPWS 2020) (Management Plan), notes that the parks signify 'a unique transition between landscapes formed by fluvial processes to the east and aeolian processes to the west'. The SCA's landscape, biological, cultural and educational values include:

- *Due to the varying landscape processes that occurred in the area, an unusual landform, vegetation and soil types sit side-by-side.*
- *The parks are one of the most biologically diverse areas in the Riverina region most famous for the large scale river red gum conservation in NSW. Other prominent vegetation includes black box woodlands, lignum shrublands, nitre goosefoot shrubland and three endangered ecological communities.*
- *Rich Aboriginal associations highlight the cultural significance of the parks. Recorded Aboriginal heritage sites include burial sites, modified trees, artefacts, middens, earth mounds, spiritual sites and creation stories.*
- *The parks form a risk cultural landscape which have multi-layered historical associations - both indigenous and colonial – in the form of historic structures, plants, managed woodlands and recreational areas. Community values of the parks continue to thrive with various recreational associations in Yanga Lake and Murrumbidgee River/Valley surrounds.*
- *The region provides immense opportunity for environmental restoration, education and continuing research into recovery processes.*

Existing environment

National parks

The SCA exhibits characteristics of the Riverina Bioregion's Murrumbidgee subregion. The SCA and Nature Reserve are one of the examples of undisturbed patch of dense belah, mallee, rosewood and sugarwood communities with abundant grasses and dillon bush (NPWS 2003, NPWS 2020). A combination of these remnant native vegetation patches forms the Murrumbidgee Valley Parks that are a testimony to the endemic landscape characteristics of the western Riverina region. The region also has significant historic and cultural associations such as Aboriginal burial sites, middens, spiritual sites, woolsheds and other structures established during colonial settlement. The parks also host biologically diverse areas that provide habitat for 24 threatened species (NPWS 2020).

Recreational areas and points of interest

Recreational associations occur mostly within the extents of the Yanga National Park, Nature Reserve and State Conservation Area (SCA). The Willows Campground and Willows Visitor Access Trail is the closest recreation spot which offers opportunities for short bushwalks and birdwatching. Dense mallee, belah and rosewood communities dominate the region. Yanga Lake and Homestead a relocated further about 10 kilometres south west of the Project Area. Gayini Sunrise Campground (closed at the time of Fieldwork) is located approximately 11 kilometres west of the Project.

The Keri Keri Merino stud is another key landmark located south of the Project Area and is one of the oldest sheep breeding stations that has been instrumental in providing livestock to many farmlands in the Riverina and other regions of NSW. Other areas of interest include the Willowvale Rest Area, St Pauls Rest Area and Ravensworth Truck Parking Area on Sturt Highway. These areas serve as important resting spots for commuters travelling towards the towns of Hay or Balranald. For the purposes of this PVIA, an assessment of impacts from all these rest areas will be relevant due to its close proximity to the Project Area.

Preliminary assessment

Moir has prepared preliminary assessments from a number of public viewpoints on public land (PVIA report). (VP04 and VPO5).

View point VP04 (Appendix A in PVIA report) was taken from the Willows Picnic Area & Campground in the Yanga SCA. During the preliminary assessment it was determined that existing vegetation would limit views to the proposed turbines, even with the relatively flat terrain.

View point VPO05 (Appendix A in PVIA report) was taken from the Sturt Highway which runs through the Yanga SCA. It was determined that due to the flat terrain, there would be clear views to the Project, but that some of the views would be filtered by vegetation in the SCA.

Assessment approach for the EIS

A detailed assessment of the impact of the Project on public land will be conducted as part of the EIS. The assessment will consider the impacts of the Project on the values of the public land, which include landscape, ecological and cultural values. This work will be informed by stakeholder consultation and inputs from technical specialists.

6.6 Social

Consentium has prepared *Wilan Wind Farm Social Impact Assessment Scoping Report* (14 October 2022) (SIA Scoping Report) on behalf of the proponent.

The SIA Scoping Report has been prepared in accordance with the SIA Guidelines (2021), including the *Engaging with Aboriginal Communities Social Impact Assessment* Practice Notes, and reports on the preliminary identification, prediction, and evaluation of the positive and negative social impacts of the new wind farm on individuals, households, groups, communities, or organisations.

6.6.1 Social baseline

The SIA Scoping Report describes the 'Social Baseline' (development context, First Nations, Geography, governance and demographics, Economic and land use overview and Tourism), which is primarily based on ABS census data from 2016 to 2021, as well as information provided by the LGAs of Murray River, Hay Shire and Balranald Shire.

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This information provided a platform to profile and a baseline to inform the collection of further primary data from the different stakeholders the project might impact. In addition, a review of local media, regional and local government plans and strategies was also undertaken. This has established a level of knowledge about community's experience within the area, their vision and aspirations for the future and how they perceive the project might impact them.

Development context

As outlined earlier in this Scoping report, the Project is located within one of the five REZs, the South-West REZ, traverses the areas of Hay, Balranald and Buronga in the South-West region of NSW. The South-West REZ is set to be developed after the planning and procurement of the Central-West Orana REZ and expects transmission upgrades, such as PEC, to support the REZ over the coming years. EnergyCo will be the infrastructure planner for the South-West REZ, making assessment decisions and recommendations on the infrastructure projects proposed and developed in the area.

First National peoples

The project is situated in an area in South-West NSW referred to broadly as the Hay Plains. Across the Hay Plains are lands attributed to the local Traditional owners, the Nari Nari. Historians contend the Nari Nari are a conglomerate of tribes from the surrounding areas (*Aboriginal Heritage: The Nari Nari Tribe*, n.d.).

Cultural heritage surveys conducted across selected areas on Gayini to date have demonstrated a range of important heritage features including mounds, burials, modified trees, hearths and artefacts. It should be highlighted that more information concerning the First Nations groups in the area is subject to further enquiry. This preliminary information reflects secondary data accessed through ABS Census, Government, Agency, Council, media and First Nations databases and primary data gathered from a meeting with the Nari Nari Tribal Council (NNTC).

Cultural Heritage Advisors, Everick Heritage Pty Ltd have undertaken selective consultation with local Aboriginal Parties and will issue a call for Registered Aboriginal Parties following the request for SEARs. Consultation with other affected First Nations peoples to understand cultural and spiritual connection and potential for loss will be carried out during the preparation of the EIS and reported on in the final SIA.

The initial conversation, held with the NNTC on Monday 15 August 2022 indicates a strong cultural and spiritual connection to the land in this region, particularly the Gayini Lands.

Geography (Source: Consentium 2022b)

The Hay LGA (population 2,882 and area 11,326 square kilometres) is in south-western New South Wales' Riverina region and is governed by Hay Shire Council. The Sturt, Midwestern and Cobb Highways connect Hay, Booligal, and Maude. Hay LGA, the "cradle of irrigation" for the Murrumbidgee River, is known for its agriculture and tourism. It is considered one of the best wool-growing merino regions in Australia and one of the three flattest places on Earth (The Hay Plains). The LGA has three main towns the project may impact: Hay, which includes Hay and Hay South, Maude in Hay Plains, and Booligal on the Lachlan River north of Hay. The LGA's towns are known for their history, heritage buildings, streetscapes, and unique inland landscapes.

The Balranald LGA (population 2,208) is governed by Balranald Shire Council and is located in New South Wales' western Riverina region. Known for agriculture and tourism, Balranald is surrounded by spectacular riverscapes and national parks, including the Murrumbidgee River, parts of the Yanga National Park, and the World Heritage-listed Mungo National Park, which boasts spectacular bird life and fauna and heritage sites such as the Yanga Wool Shed and Yanga Homestead, which are both in close proximity to the LGAs Centre town Balranald. Particularly the town is Notably, since 2020, Balranald Shire Council has been placed under

administration. The NSW Government appointed Michael Colreavy as Administrator, with a term of more than four years to end with the September 2024 local government elections.

The Murray River LGA (population 12,850) is located south of the project and has a significantly larger population than Hay and Balranald LGAs in the project area. The Murray River LGA encompasses an area of 11,865 square kilometres. Greater Murray Ward, Greater Wakool Ward, and Moama Ward are the three 'Wards' that constitute the LGA, and each Ward has three Councillors representing the residents of their respective areas. The natural assets of the LGA serve as the backdrop for many recreational activities such as fishing, river cruises and heritage hikes and are a major draw for the local and visiting populations for the fresh air, open spaces, cycling trails, Kayaking, walking tracks, national parks, golf courses and camping spots on the Wakool, Edward and Niemur rivers, River Murray Reserve, parts of the Yanga Parks and Wildlife and parts of the Murrumbidgee. Murray River Council is regarded as a fast-growing region, centred on tourism, industry, and is a great place to "slow down, unwind and soak in all the natural beauty [the] River Country has to offer – [their] fresh air, blue skies, sunny days and starry nights" (Murray River Council 2022).

Demography (Source: Consentium 2022b)

ABS data retrieved maps an impression of vulnerability across the project's social locality. Specifically investigated was the incidence of employment and unemployment, childcare, disability, and the LGA's Socio-Economic Indexes for Areas (SEIFA). Refer to tables 4-3 and 4-4 in the SIA Scoping Report.

These variables aid in understanding the socioeconomic position, health behaviours, and social infrastructure in communities, as well as their demand. We can see that all LGAs and the Murray Region have more health problems than the state of NSW, implying that access to health infrastructure may not be as good as in counterpart areas in NSW. This suggests that a large influx of people may have an impact on the health system, making vulnerable people less able to access important health services.

Noticing that the LGAs have a smaller proportion of people who provided unpaid care to family members or others, the implication may be that there are enough care services or home support, indicating the community has a strong support network. Furthermore, we found that voluntary work through an organisation or group was substantially greater in the Murray and NSW areas, meaning that there may be a large number of community members who join in a common-interest association, society, or working groups to achieve a goal.

6.6.2 Potential social impacts

Community drop-in sessions held between 15 and 18 August 2022 in Hay, Moulamein and Balranald, and targeted meetings with community leaders indicated general support for the project with community and key stakeholders indicating a higher tendency toward feedback promoting positive social impacts than negative social impacts.

A summary of responses under key impact themes is provided below and in Table 11.

Way of life

Generally, respondents raised that their overall way of life is more likely to be positively affected than suffering negative impacts arising from the Project.

Commentary primarily focused on how people interacted with each other on a day-to-day basis and included a positive outlook on how increased employment opportunities may lead to improved opportunities for connection across communities.

Community

Comments within this theme related mainly to the movement of transient workforce populations currently influencing population composition. Overall, social cohesion was considered to be insignificantly impacted by these groups who generally moved into and out of towns according to seasonal work availability. There was comment raised about the construction workforce for nearby energy renewables and for mining, with feedback generally noting a positive influence brought about by their attendance. Some negative impacts drawn from past experience with temporary workforces attributed to the nearby renewables and mining are discussed further in generally relating to housing availability and to impacts on family budgets.

Community, including NNTC, and Council officers were keen to understand the distribution of wealth and potential for community benefit programs, relating these back to the influence on community cohesion.

Accessibility

Despite ABS data indicating otherwise, community perceived a lack of housing supply in the region and raised concerns around the ability to accommodate permanent and/or temporary workforces and their families. Some businesses considered this an opportunity for diversification and expansion, while other community members saw the perceived short-supply as a potential threat to marginalized (low-income, single parent families and/or culturally diverse) community members. Existing perceived low housing supply was considered a threat to the ability to secure key workers such as teachers and police, with community leaders indicating that an increase in competition for available housing could have a negative impact on essential service continuity and growth.

Similarly, a lack of childcare and after school hours care was raised as a current concern across all towns visited in the initial community consultation. Community respondents noted the impact that the current short-supply of these services could have on employment of women in the construction and operational phases of the project. All school principals spoken to considered an increased workforce, where workers brought family members with them as an opportunity to increase school student populations and improve educational outcomes through the attraction of an increased teaching workforce.

The potential for increased traffic volumes within the social locality was not considered to be of significance due to the high number of heavy vehicle movements already taking place. Further, past experience with temporary workforces showed that developers managed the transfer of workers to and from site using mini-buses, therefore reducing the likelihood of an increase in private vehicle use while also providing opportunities for local transport supply chain involvement and benefit.

Culture

Overall, respondents note that they are proud of where they live, and are deeply connected to the locality. NNTC notes an increase in cultural and spiritual connectedness to the Gayini lands through work being done to reconnect youth and to return the land to environmental diversity and health.

Culturally and Linguistically Diverse (CALD) community members already existing in the locality are well settled and have started to integrate with non-CALD communities. Community members predict that any increase in the size and diversity of the CALD community is likely to be considered a positive impact.

A resistance to change was noted in conversations with two community members. This was perceived as a threat to acceptance of the project and had potential to impact on community cohesion, and values.

Generally, reference to the impacts of other projects was positive, however, some concerns were raised by Council around waste management during construction, particularly the potential for environmental damage, a loss of visual amenity and potential impact on community ability to enjoy the experience of travelling across the Hay Plains during construction.

Health and wellbeing

While ABS data indicates that health and wellbeing in the locality sits at a lower level than the broader NSW state, community respondents noted little issues. An increase in the use of illicit drugs was noted and some incidence (anecdotal only) was raised as a current issue facing communities. Access to public services and support services is scattered with many needing to travel considerable distances to access health services. The project is not considered by community as an opportunity to improve the placement of services due to the short-term nature of the construction phase and limited impact of staffing required for the operational phase of the project.

Surroundings

NNTC considered that there will be no impacts to the current Connection to Country program they provide on Gayini. They raised concerns that tracks built and maintained to service turbines may lead to an increase in ground dwelling predator access to fauna. One Council officer raised a concern about the implications on agriculture arising from the changed land use from grazing to renewable energy production but contended that the economic benefit of the project to the region may outweigh the impact.

Limited comments were raised around visual impacts from the construction of wind turbines; however, opinion was divided between whether this would be a positive or a negative impact. Noise concerns were raised, however, most respondents noted that the location of the turbines away from sensitive receivers was likely to mitigate any impact.

Livelihoods

This theme drew the most commentary. Overall, community, including First Nations and Council officers, anticipate a significant positive local and regional economic boost from the project due to an increase in job diversification, employment prospects and opportunities, increases in trade and business diversification, and opportunities for local supply chain involvement. A recent downturn in tourism, attributed by respondents to COVID impacts and the effect of significant weather systems, was noted. Feedback received notes a potential for the project to generate tourism opportunities for the region, particularly in light of cumulative impacts from the placement of renewable energy infrastructure for multiple projects.

A key aspiration of respondents is the development of community capacity, both on-site and within the locality. Development of community capacity is considered a positive impact should it lead to the ongoing opportunity for diversification, innovation and community and business wellbeing.

Limited concerns were raised around the impact of infrastructure lease arrangements on family wealth and relationships between neighbours, while there was anticipation of improved outcomes for families and individuals arising from increased income levels paid to highly skilled labour force.

Decision-making systems

One respondent noted the importance of continued community consultation. She praised the project for the initial outreach and recommended a continued program to engage communities, raise the possibility for discussion to ensure community benefit programs were fit-for-purpose and community-informed.

Table 11 Summary of social impact themes

Social impact summary		
Impact theme and frequency of public comment		
Impact theme	**Impact issue**	**Frequency of comments**
Way of life	How people live, work and play	22
	How people interact with each other	22
Community	Composition	25
	Cohesion	22
Accessibility	Housing impacts	11
	Childcare and education	4
Culture	Connection to land, places and buildings	6
	Values and stories	8
	CALD communities	2
	Resistance to change	1
Health and wellbeing	Domestic violence/family tension	3
	Disability	3
	Health issues	2
	Access to public services	3
Surroundings	Visual amenity	9
	Noise impacts	3
	Current land use	1
	Environmental impacts fauna	1
	Cumulative impacts	1
	Transport routes	9
Livelihoods	Employment	23
	Business capacity	28
	Tourism	7
	Regional/local economic growth	7
	Family budget	3
Decision -making Systems	Ability to influence decisions	1

6.6.3 Assessment approach for the EIS

The Scoping worksheet (Appendix 2 of the SIA Scoping Report), provides a preliminary scope of likely social impacts that will require assessment informed by secondary data research cross-referenced with initial primary data gathered from 15 to 17 August 2022. Community feedback on mitigation and enhancement measure have been noted in the scoping worksheet.

Further investigation of the impacts identified in early consultation, the potential for impact identified through analysis of ABS data for the locality and new and emerging likely impacts will be investigated during the EIS phase of the Project and will be reported in the final SIA report.

Consentium's early investigation and analysis indicate that cumulative impacts of the many projects in planning across the social locality and broader South-West REZ have not yet been considered by communities. This is an essential element of future SIA work for this project that will need to be addressed in the EIS.

6.7 Hazards

Noting that a detailed and comprehensive preliminary hazard assessment will be made during the Project EIS phase, the following sub-sections provide an overview of the nature of risks identified at the SEARs stage and the proposed approach to further assessment.

6.7.1 Aviation

Existing environment

An initial desktop assessment was carried out of airports lying within the proximity of the Project area.

Balranald, Swan Hill and Hay Airports are the closest regional airports to the Project. It is noted that there are a number of small scale, private use airstrips in the broader region.

The scale and relative remoteness of the agricultural activity in the region means that private air transport and aeronautical applications within business are anticipated and will require the Proponent to undertake more detailed consultation and examination during the subsequent work phase.

Preliminary assessment

The potential risks to aviation from the project that will need to be assessed include:

- Physical obstruction, particularly when aircraft are close to the ground during take-off.
- Interference with safe flight.
- Reduction in the areas available for pilots to use in the event of an emergency landing.
- Electrical transmission interference with technical equipment (from the electromagnetic field generated from the grid connection and turbines) - discussed in more detail below.
- Aerial baiting and culling in the National Park.
- Aerial spraying of agricultural land.
- Emergency service access.

Assessment approach for the EIS

During the EIS phase of further study, consultation with the Civil Aviation Safety Authority (CASA) will take place in addition to engagement with other relevant stakeholders. Dependent upon the risk and the prevailing advice from CASA, the following are examples of considerations that will be considered with respect to aviation:

- Safety lighting and markings on structures.
- Agricultural and other commercial flight operations.
- Air traffic routes an any potential for impacts of wake and/or turbulence.
- Emergency landing provision.
- Potential for other access interruptions presented by the proposed infrastructure.
- Operational impacts on the management of the Yanga SCA and National Reserve.

The assessment in the EIS will take account of the applicable requirements included in the Civil Aviation Regulation 1988, Civil Aviation Safety Regulations 1998, *National Airports Safeguarding Framework Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation* (DITRDC, 2019), and associated Manuals of Standards.

6.7.2 Telecommunications – EMI

Existing conditions

The Proponent conducted a search of the Australian Communication and Media Authority (ACMA) web-based register of radiocommunication licences was carried out of the Project area (Figure 11).

Wilan Wind Farm Project Area
ACMA Site Marker (with no assignments)
ACMA Site Marker (having at least one assignment)
ACMA Site Links
25km Project Buffer

Burke Wills Road
Ivanhoe Road
Waugorah Road
Toopuntul Road
Oxley Road
Eastern Boundary Trail
Thelangerin Road
Darcoola Main Road
Nap Nap Road
Yanga National Park
Waugorah
Hickeys Trail
Warwaegae Road
Balranald
Top Fingre Board Trail
Maude
A20
Sturt Highway
Red Hill Road
Glenhope Road
Romani Road
Windomal Road
Yanga Nature Reserve
Railway Trail
Abercrombie North Trail
Keri Keri
Yanga State Conservation Area
Perekerton Alans Trail
Keri Keri Road
Balranald Road
Dusty Trail
Arundel Road
Maude Road
Yanga Way
Kyalite
Kyalite Road
Moolpa
135 m
151 m
Baldon Road

Figure 11: ACMA Radiocommunications

KILARA

PROJECT: Wilan Wind Farm

DATE	STATUS	PRODUCED
23/11/2022	APPROVED	CM
SCALE	DATUM	APPROVED
1:300,000 at A3	GDA 1994 MGA Zone 54	AT
FILE		REV
SEARS_011_A_ACMA		A

0 3 6 9 12 15 km

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Assessment approach for the EIS

The EIS will include an assessment of the telecommunication impacts.

The assessment will recommend appropriate mitigation measures and address relevant legislation and guidelines including the *Australian Radio and Communications Act 1992*, NSW Wind Energy Guideline for State Significant Wind Development (DPE 2016) and the Clean Energy Council Best Practice Guidelines (Clean Energy Council 2018).

The assessment will identify ACMA registrations associated with licences and point to point links that have the potential to be adversely affected by the Project.

6.7.3 Bushfire hazard

Existing environment

The NSW Rural Fire Service Bushfire Prone Land (NSW RFS n.d.) indicates that the Project is not located within an area of high risk of bush fires (Figure 12).

Wilan Wind Farm Project Area
Proposed Grid Connection Route
EnergyConnect Powerline
Cadastral Boundary
Bushfire Prone Land

Nap Nap Road
Maude Road
Waugorah Road
Warwaegae Road
Loorica Road
Sturt Highway
Keri Keri Road
Project EnergyConnect

Figure 12: Bushfire Prone Land

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PROJECT	Wilan Wind Farm	
DATE 23/11/2022	STATUS APPROVED	PRODUCED CM
SCALE 1:175,000 at A3	DATUM GDA 1994 MGA Zone 54	APPROVED AT
FILE SEARS_012_A_Bushfire		REV A

0 1 2 3 4 5 km

Assessment approach for the EIS

Further studies during the EIS phase of work will assess and document the risks and mitigation measures with respect to bushfires. The assessment will cover the potential impact and emergency plans associated with bushfires on the site personnel and infrastructure. Additionally, the assessment will consider the potential sources of ignition and management control measures associated with the various phases of the Project lifecycle.

The assessment will be prepared in consultation with the Rural Fire Service.

6.7.4 Energy storage facility

Technical and economic modelling will be undertaken to optimise the battery configuration (technology and sizing) to align with Access Scheme tender requirements. It is expected that the facility will comprise lithium ion technology and that the capacity and duration of the facility will be approximately 200MW/800MWh. Hazards associated with the energy storage facility will be assessed in detail at the EIS phase.

Assessment approach for the EIS

While energy storage facilities are not explicitly listed under State Environmental Planning Policy (SEPP) 33 Hazardous and Offensive Development guidelines, they can present hazards to technicians and third parties such as fire, explosion, chemical burns, exposure to chemicals, electric shock etc. The Project EIS will include an assessment of the storage facility under SEPP 33, including a Preliminary Hazard Analysis (PHA), to assess risks related to the storage system based on hazardous material quantities and boundary set-backs and separation between BESS units.

Furthermore, with the increased deployment of utility scale lithium-ion battery storage systems, international safety standards have been developed that specify requirements and tests for the safe operation of lithium cells and batteries in industrial applications. The EIS will draw on Australian regulation, international safety standards and industry guidelines and practice to manage risks including the implementation of appropriate separation distances between units. In addition, the fire service will be consulted in the development of the fire and emergency response plan as it relates to energy storage system incident mitigation.

6.7.5 Blade throw

Background

Blade detachment is the unintentional and uncontrolled disconnection of a blade from a wind turbine typically as a result of a failure of the bolt assembly connecting blade to hub. Blade throw occurs when the turbine is operational. There have been some occurrences of blade detachment both in the Australian market and globally. However, in aggregate, the instances are few when assessed in relation to the expanding global fleet of operational wind turbines.

There is a range of risk control measures employed to mitigate the harm that can result from blade detachment and throw. Risks to construction and operational site personnel as well as to third parties are managed in project design and as part of the construction and operational phase health and safety management plans.

Assessment approach for the EIS

The EIS will include a detailed assessment of potential blade throw impacts, including on the public land to the south west and adjacent to the Project area.

6.7.6 Electromagnetic fields (EMFs)

Background

Electromagnetic fields are created by electrical appliances including many common household items. On wind farms, EMFs are caused by electrical equipment such as transmission lines and substations. Magnetic field strength decreases with increased distance from the source. Various studies have been undertaken on the extent of EMF from wind farm equipment and the potential for harm. These conclude that there is no evidence of adverse health effects from exposure to EMR from wind farm equipment due to the extreme low frequency, typical distance of people from sources and minimal exposure time.

Assessment approach for the EIS

During the EIS an EMF assessment which considers the potential health issues and risks associated with EMF produced by the wind farm and associated electrical infrastructure will be undertaken.

6.7.7 Waste

Background

In particular during the construction phase, it is anticipated that on site-based activities are likely to have associated waste streams that will require timely and responsible management. The activities may include, but not necessarily be limited to:

- Accommodating work force.
- Operating and servicing machines.
- Receiving and unpackaging deliveries.

Detailed assessment of project waste arisings, technical categorisation, timing, volumes and management will be determined and documented as part of the EIS.

Assessment approach for the EIS

During EIS work, an assessment of the waste types and volumes arising from the different phases of the Project lifecycle will be made and compared to the available waste management facilities located within the surrounding area. From the above information, a Waste Management Plan will be developed that complies with regulatory requirements and industry best practice.

6.8 Water

6.8.1 Hydrology

Existing environment

The Project area is located to the south of the main channels of the Lowbidgee floodplain and approximately 22 kilometres from the Murrumbidgee River. A section of the Uara Creek (an effluent stream of the Murrumbidgee) traverses the northern most part of the project area.

During wet years, slow moving, shallow water flows can occur intermittently and over short durations along the Uara Creek and through a mid-section of the project area via a naturally defined drainage channel and a series of flood runners associated with the Fiddlers Creek. The development of irrigated agriculture from the 1980s included construction of irrigation bays, banks and channels. This has significantly altered and reduced natural flows in the local region and within the project area. In addition, reduced water availability due to

consumptive use and river regulation across Murrumbidgee Valley has also reduce natural flooding. All creeks and watercourses within the local area in proximity to the Project area are seasonal and primarily driven by riverine flooding events.

Key hydrological features and flood considerations include:

- A series of natural channels subject to riverine flooding during high events run through the centre of the project area from the north-east to the south-west. These channels have been variously blocked and diverted by irrigation infrastructure, public and farm roads.
- There are a number of irrigation channels present in the local region including the Abercrombie Channel traversing the southern section of the project area. This channel is no longer in use and has been decommissioned and replaced with a piped stock and domestic water supply system.
- There is a small section located on the western boundary of the project area which is mapped as an area of wetland inundation under the Wakool LEP. Other areas of wetland inundation are identified in the Wakool LEP south and west of the project area.
- The Hay LEP identifies an area of wetland inundation in the north of the project area and areas further north of the project area associated with the Lowbidgee floodplain.
- There are no natural lakes within the project area and the only permanent to semi-permanent water bodies include ground tanks (farm dams). Most surface water-fed ground tanks have recently been replaced with tank and trough systems for livestock use.
- Other notable water courses within the broader catchment area include the Abercrombie Creek, which is a watercourse located approximately 12 kilometres to the south of the Project area, the Edward River located approximately 32 kilometres to the south of the project area, and the Murray River being approximately 75 kilometres to the south of the project area.

A map of watercourses within the Project Area and its surrounding areas is provided in Figure 13.

Under the *Water Management Act* 2000, water access licences and controlled activity approvals are required for certain activities. The Project may require water access licences, however approval for controlled activities is not required for SSD projects.

Wilan Wind Farm Project Area
Proposed Grid Connection Route
EnergyConnect Powerline
Cadastral Boundary
Main Watercourse
Minor Watercourse

Strahler Stream Order within Project Extent

0
1
2
3
9

AVALON LAKE
AVALON LAKE
NOLANS CHANCE LAKE
TEATREE LAKE
Nap Nap Road
Uara Creek
Uara Creek
Warwaegae Road
Warwaegae Road
Loorica Road
Abercrombie Channel
Sturt Highway
Sturt Highway
KeTiKeTi Road
Project EnergyConnect
Abercrombie Creek

Figure 13: Site Hydrology

KILARA

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PROJECT	Wilan Wind Farm		
DATE 23/11/2022	STATUS APPROVED	PRODUCED CM	
SCALE 1:90,000 at A3	DATUM GDA 1994 MGA Zone 54	APPROVED AT	
FILE SEARS_013_A_Hydrology		REV A	

0 1 2 3 km

Assessment approach for the EIS

As a part of the EIS, a comprehensive assessment of both flooding and hydrology along with water impact assessments will be undertaken as follows:

Flooding and Hydrology

Flooding risk assessment and modelling will be carried out to establish the present surface water characteristics and behaviour during flood events. The assessment will include:

- Review of existing available hydrological data.
- LiDAR mapping across the project area to determine drainage and topographical characteristics at high resolution.
- Computer flood modelling utilising site-based data and other available datasets to determine water depth, location, velocity and resultant flood hazard categorisations.

Additionally, a post construction assessment will be performed to model the impacts of the built Project giving consideration to appropriate water management systems that will be required for safe, sustainable and compliant water management within the Project area. This will be important in the context of prevent changes to water flow across the land during natural and planned flood events (e.g. delivery of environmental water in the Lowbidgee system).

Water Management

A water impact assessment will be carried out including:

- Assessment of quantities and sources of local water resources to be utilised during construction and operation of the Project. This will include a review of water access licencing requirements under the *Water Management Act* 2000.
- Assessment of construction phase risks and the development of an erosion and sediment control plan to mitigate risks to watercourses arising from construction activities.

Assessment of any further hydrological studies required and of appropriate mitigation strategies to prevent any potential impacts of the Project on hydrology and groundwater.

6.9 Land and soil resources

6.9.1 Geology, geomorphology, soils and land capability

Existing environment

The NSW seamless surface geology map indicates the project area is predominantly underlain by Quaternary age floodplain deposits, with some Cenozoic age Shepperton formation towards the south of the development area. Some Cenozoic age sand dunes are mapped towards the north of the Loorica property, and towards the south of the Willowvale property. Description of the composition of these three units is limited on the NSW seamless geology map, however, the nearby 1:250,000 Balranald and Deniliquin geological map provides descriptions of units inferred to match those shown in the NSW seamless surface geology map. The geological mapping units used from youngest to oldest are:

- Quaternary floodplain deposits: Coonambigal Formation: fluvial lacustrine clay, sand and sandy clay.
- Cenozoic dune sands: Aeolian: lunette deposits; sand, silt, clay. The NSW seamless geology map notes that these sands are unconsolidated.

- Cenozoic Shepparton Formation: Fluvial silt, sand, minor gravel.

The project desktop heritage assessment by Everick provides a detailed description of the geomorphology and land systems.

The Australian Soil Classification (ASC) Soil Type map of NSW indicates the following three soil types occur in the project area (Source: The Central Resource for Sharing and Enabling Environmental Data in NSW) (Figure 14):

- **Vertosols** – this is the major soil type across the project area and includes Self-Mulching Grey/Black Vertosols and Crusting/Epipedal (not self-mulching) Grey/Black Vertosols. These Self-Mulching Vertosols occur extensively on the channelled plains with deep multiple branching or converging channels, and also on the lake beds. These areas of the alluvial plains are prone to occasional flooding. The Crusting/Epipedal Vertosols generally occur slightly higher in the landscape with the project area and are less prone to riverine flooding.
- **Rudosols** – this soil type includes brown or reddish sandy soils and occur on isolated ridges and lunettes associated with previous or current lake systems formed from wind-dispersed sediment. These sandy soils have minimal profile development often with only some minor organic matter accumulation on the surface. These soils are not prone to riverine flooding due to their elevated position in the landscape.
- **Chromosols** - this soil type includes greyish or brown soils with a clay loam or sandy clay loam surface soil that does not crack when dry but will tend to set hard. These soils occur in thin transition zones between the Vertosols on the floodplain and Rudosols on the elevated areas.

Land and soil capability has been assessed using the NSW Soil Capability Classification Scheme (OEH 2012).

Review of the NSW Land and Soil Capability Mapping indicates three classifications of Land and Soil Capability occur within the Project area (Figure 15) (Source: The Central Resource for Sharing and Enabling Environmental Data in NSW):

- **Class 4 - Moderate to severe limitations** – this is land with moderate to high limitations for high-impact land uses and dominates the project area. The inherent limitations will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology (OEH 2012).
- **Class 5 - Severe limitations** – this is land with moderate to low capability. The land has high limitations for high-impact land uses and is less common than class 4 but is still extensive across the project area. The inherent limitations largely restrict land use in class 4 to grazing and irrigated agriculture. The limitations need to be carefully managed to prevent long-term degradation (OEH 2012).
- **Class 6 - Very severe limitations** – This is low capability land that has very high limitations for high-impact land uses. This class occurs as small areas associated with lunettes and low ridges in the project area. Land use restricted is restricted to low-impact land uses such as grazing. Careful management of limitations is required to prevent severe land and environmental degradation (OEH 2012).

Soil types, land capability and the project area's position on the upper parts of the Lowbidgee floodplain mean it has been subject to a range of current and historical farming practices. The land is currently primarily used for sheep and cattle grazing but some areas have previously been developed for irrigated agriculture (e.g. northern part of Willowvale and extensive parts of Gayini). The land is not identified Biophysical Strategic Agricultural Land (BSAL) based on a review of mapping at a regional and state-wide scale.

A review of the ASRIS Acid Sulphate Soils (ASS) Reference Sites and National Atlas indicates the project area has an 'Extremely Low Probability' of containing acid sulphate soils. Other soil and land resource considerations include the presence of contaminated soils from agricultural chemical use and buried rubbish.

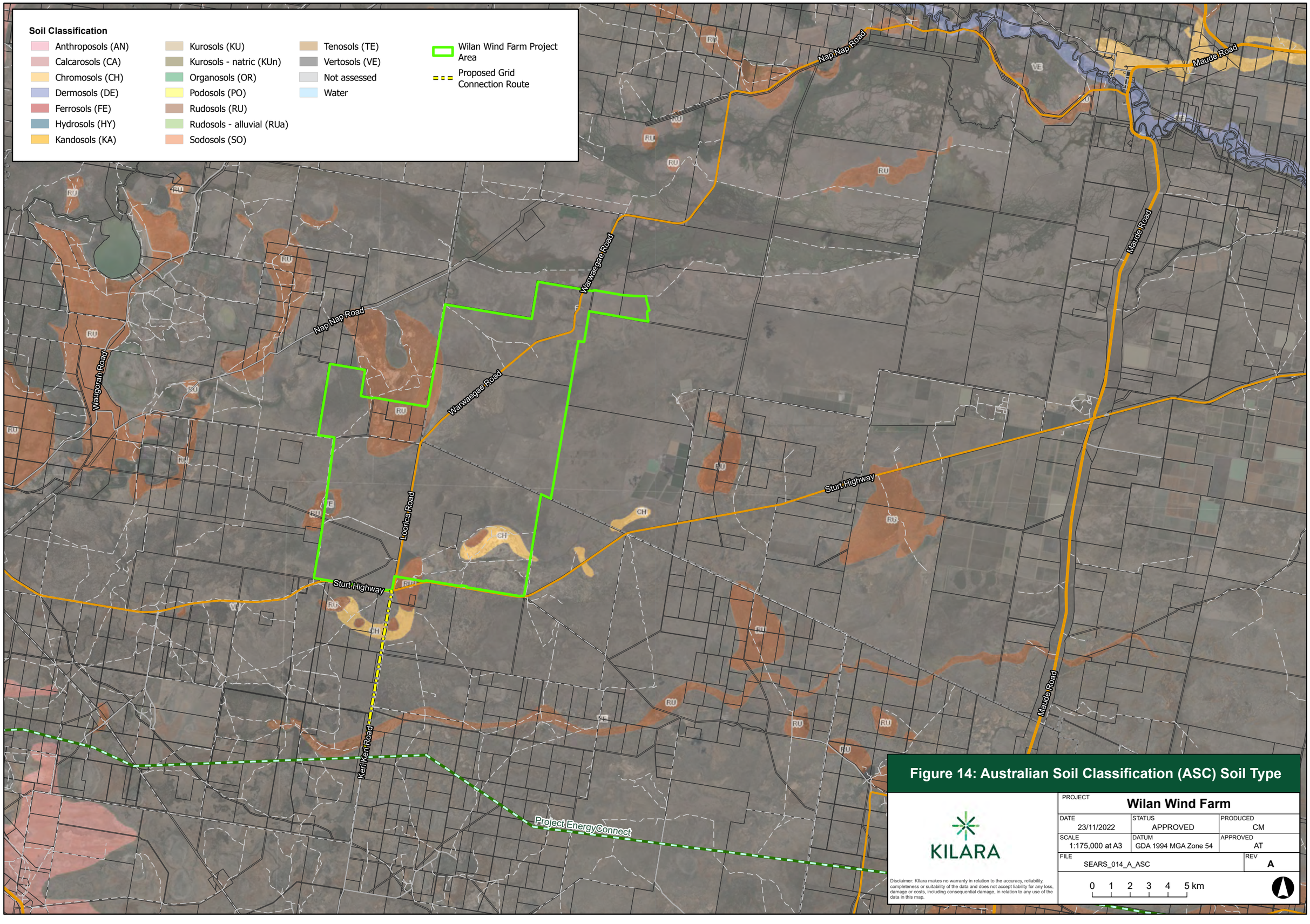

Figure 14: Australian Soil Classification (ASC) Soil Type

KILARA

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PROJECT	Wilan Wind Farm		
DATE	STATUS	PRODUCED	
23/11/2022	APPROVED	CM	
SCALE	DATUM	APPROVED	
1:175,000 at A3	GDA 1994 MGA Zone 54	AT	
FILE		REV	
SEARS_014_A_ASC		A	

0 1 2 3 4 5 km

Wilan Wind Farm Project Area
Proposed Grid Connection Route
EnergyConnect Powerline
Cadastral Boundary

Land & Soil Capability

4 - Moderate to severe limitations
5 - Severe limitations
6 - Very severe limitations
8 - Extreme limitations

Nap Nap Road
Warwaegae Road
Warwaegae Road
Loorica Road
Sturt Highway
Sturt Highway
Keri Keri Road
Project EnergyConnect
Maude Road

Figure 15: Land & Soil Capability Classes

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PROJECT		
Wilan Wind Farm		
DATE: 23/11/2022	STATUS: APPROVED	PRODUCED: CM
SCALE: 1:140,000 at A3	DATUM: GDA 1994 MGA Zone 54	APPROVED: AT
FILE: SEARS_015_B_LSC		REV: B

0 1 2 3 4 5 km

Assessment approach for the EIS

The EIS will address land and soil resources through a standard level of assessments that considers the impacts of soil disturbance, erosion and rehabilitation. It is unlikely that detailed soil mapping or land capability assessments will be required beyond the coarse mapping provided in the Australian Soil Classification Soil Type map and Land and Soil Capability Classification capability classes describe above. The known physical and chemical limitations of these soils, and the landscape more broadly, will be considered as part of detailed civil infrastructure design, construction environmental management planning and site rehabilitation. Soil contamination will be considered through a review of EPA's contaminated sites list and also at a site level with regard to buried agricultural waste or chemicals.

The impact on agricultural production in the locality and region would be assessed in the EIS as part of a Land Use Conflict Risk Assessment (LUCRA).

An Agricultural Impact Assessment will investigate the impact of the loss of agricultural land on agriculture in the region. As above, this may be informed by base line soil surveys to verify mapping for the project area.

6.10 Air quality

Existing conditions

The regional locality, low population and agricultural characteristics of the Project location can be assumed to elicit high air quality levels. Some variation would be expected from seasonal increases in activity and potentially the utilisation of traditional fuel types during the colder months (e.g. firewood burned to heat sporadically linked homesteads). Other changes in the air quality will occur from time to time as a result of naturally occurring bushfire smoke and dust storms.

The Project is not anticipated to have any significant impact on regional air quality once operational. Potential impacts may arise during construction and would relate to dust generation.

Assessment approach for the EIS

A detailed assessment of air quality will be conducted during the EIS phase of the Project development. The assessment will be qualitative and consider impacts and management strategies through the Project lifecycle.

6.11 Cumulative Impacts

Given that the Proposal is located within the proposed South-West REZ and along the proposed PEC transmission line route, there is expected to be other renewable energy projects within the region. A number of renewable energy projects are at different stages of approval within 100 kilometres of the Project (see Figure 7).

Preliminary assessment

Cumulative impacts have been considered in the Scoping Worksheet (Appendix 2 in SIA Report). Potential cumulative impacts may to include:

- Traffic movements and noise, particularly during the construction phase if activities occur concurrently.
- Visual impacts of the Project in combination with other renewable project proposals in the areas.
- Biodiversity impacts.

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- Increased demand on local facilities, goods, services particularly during the construction phase if this occurs concurrently.

Assessment approach for the EIS

The EIS will consider cumulative impacts. Community consultation will be undertaken during the EIS phase to understand any community concerns and ensure the EIS addresses these concerns. A Cumulative Impact Assessment will be undertaken in accordance with the Cumulative Impact Assessment Guidelines for State Significant Projects (DPIE 2021). The guideline includes a number of important steps including:

- Preliminary scoping of the assessment by the proponent,
- Requirements confirmed by the Department,
- Assessment completed as required, and
- Assessment shared with the local community with feedback provided and considered with project alterations considered by the proponent if necessary.

7 Conclusions

This Scoping Report outlines the Project proposed along with the results of preliminary environmental and technical assessments undertaken to date.

Being located within the South-West REZ and in particular, on the traditional lands of the Nari Nari, the proposed Project presents a unique opportunity to be inclusive of First Nations people in the energy transition and to create genuine and lasting economic, social and cultural benefits. The Project's high quality wind resource, very low population density and close proximity to major transport routes, the PEC transmission line and neighbouring projects in development align well with low cost, low impact outcomes.

The work undertaken to date for the project has identified a range of important constraints relating to biodiversity, cultural heritage and hydrological characteristics. The preliminary design outlined in this Scoping Report carefully considers each of these and significant adjustments to the original project conceptual design have been made to ensure low impact. This includes substantive adjustments to the original project footprint and the application of exclusion zones and buffers throughout the layout. It is anticipated that further modifications and adaptations to the design will be made as understanding of site constraints evolve, ensuring mitigation and minimisation of impacts.

Social stakeholder consultation carried out to date indicates a general level of support within local communities and authorities. The Project's Community Stakeholder Engagement Strategy ongoing through the EIS phase of development sets out a program for continued consultation, review and adaptation.

Appendix 1 includes a summary scoping table setting out the consideration of relevant matters. Detailed assessments are planned to be undertaken for key issues that have the potential for high impacts (high constraint) and include:

- Biodiversity.
- Cultural heritage.
- Visual amenity.
- Hydrology and flood risk.

Detailed assessments will also be undertaken for key issues that have the potential for moderate impacts (moderate constraint) including:

- Noise.
- Traffic impacts.
- Social impacts.
- Cumulative impacts.
- Telecommunications.
- Aviation.

It is anticipated that other issues would be addressed through desktop analysis in order to determine appropriate mitigation and/or management strategies.

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Biodiversity investigations to date indicate that an EPBC Act referral will be required. The Project will seek to have this need addressed under the existing bilateral arrangements between the State and the Commonwealth governments. An EPBC referral is currently being prepared ready for lodgement in late 2022.

The Project SEARs are requested on the basis of this Scoping Report.

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9 Appendices

Appendix 1 Scoping Summary Table

Table 12 Scoping summary table

Matter	Scoping report ref.	Scale of impact	Nature of impact	Level of assessment	CIA	Engagement	Relevant government plans, policies and guidance
Amenity - visual	6.1.1	High	Direct Cumulative Perceived	Detailed	Yes	Specific	Wind Energy: Visual Assessment Bulletin 2016
Amenity-Noise	6.1.2	High	Direct Cumulative Perceived	Detailed	Yes	General	State Environmental Planning Policy (Infrastructure) 2007 Wind Energy: Noise Assessment Bulletin 2016 (NSW Government) Noise Policy for Industry (2017) (NSW Environment Protection Authority) Interim Construction Noise Guidelines 2009 (Department of Environment, Climate Change) NSW Road Noise Policy 2011 (Department of Environment, Climate Change and Water) Assessing Vibration: A Technical Guideline 2006
Biodiversity	6.2	High	Direct Cumulative Perceived	Detailed	Yes	General	NSW Biosecurity Strategy 2013-2021 Biodiversity Assessment Method (BAM) (NSW Government, 2020)
Heritage - Aboriginal	6.3.1	High	Direct Indirect Cumulative Perceived	Detailed	Yes	Specific	Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW 2011 Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW 2010
Heritage - Historic	6.3.2	TBC	Direct Indirect	Standard	No	General	
Access – Traffic and Parking	6.4.1	Moderate	Direct Indirect Cumulative	Standard	Yes	Specific	Austroads Guidelines for Road Design (Austroads) Austroads Guidelines for Traffic Management (Austroads) Guide to Traffic Management – Part 3 Traffic Studies and Analysis (Austroads, 2013)

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Matter	Scoping report ref.	Scale of impact	Nature of impact	Level of assessment	CIA	Engagement	Relevant government plans, policies and guidance
Built environment – public land	6.5.1				Yes	General	NSW Wind Energy Guideline for State Significant Wind Development (Department of Planning and Environment, 2016)
Social	6.6	Moderate	Direct Indirect Cumulative Perceived	Detailed	Yes	Specific	Social Impact Assessment Guidelines for State Significant Projects (Department of Planning Industry and Environment, 2021)
Hazards - Aviation	6.7.1	Moderate	Direct	Standard	No	General	National Airports Safeguarding Framework Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation (DITRDC, 2019) Civil Aviation Regulation 1988, Civil Aviation Safety Regulations 1998,
Hazards – Telecommunications - EMI	6.7.2	Moderate	Direct	Standard	No	General	NSW Wind Energy Guideline for State Significant Wind Development (Department of Planning and Environment, 2016) Clean Energy Council Best Practice Guidelines (Auswind, 2006).
Hazards – Bushfire	6.7.3	Low	Direct Indirect	Standard	No	General	Planning for Bushfire Protection (NSW Rural Fire Service)
Hazards – Battery Energy Storage Facility	6.7.4	Low	Direct Perceived	Standard	No	General	State Environmental Planning Policy No 33—Hazardous and Offensive Development (1992 EPI 129) Hazardous and Offensive Development Application Guidelines: Applying SEPP 33 (Department of Planning, 2011) Assessment Guideline: Multi-level Risk Assessment (Department of Planning and Infrastructure, 2011) Hazardous Industry Planning Advisory Paper No 6: Hazard Analysis (Department of Planning, 2011)
Hazards – Blade throw	6.7.5	Low	Direct	Standard	No	General	Applicable international standards for design of wind turbine components
Hazards – EMF	6.7.6	Low	Direct Perceived	Standard	No	General	Latest advice of the National Health and Medical Research Council

Matter	Scoping report ref.	Scale of impact	Nature of impact	Level of assessment	CIA	Engagement	Relevant government plans, policies and guidance
Hazards - Waste	6.7.7	Low	Direct Perceived	Standard	No	General	Waste classification guidelines (DECCW, 2009)
Water – hydrology	6.8.1	Moderate	Direct Indirect	Detailed	No	General	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018) NSW Water and River Flow Objectives (NSW Government, 2006) Floodplain Risk Management Guidelines (Department of Environment and Climate Change, 2016) Floodplain Development Manual: The management of flood liable land (NSW Government, 2005) Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008) NSW State groundwater dependent ecosystem policy (Department of Land, Water and Climate, 2002)
Land and Soil Resources	6.9	Low	Direct	Standard	No	General	The Land and Soil Capability Scheme (Office of Environment and Heritage, 2012) Soil and Land Survey Handbooks Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom, 2004) Managing Urban Stormwater: Soils and Construction Volume 2 (Department of Environment and Climate Change, 2008) Agricultural Land Use Mapping Resources in NSW
Air quality	6.10	Low	Direct Indirect	Detailed	No	General	NSW Climate Change Policy Framework (Office of Environment and Heritage, 2016) National Greenhouse Accounts Factors (Australian Government, 2021)
Cumulative	6.11	Moderate	Direct Indirect Perceived	Detailed	N/A	Specific	Cumulative Impact Assessment Guidelines for State Significant Projects (Department of Planning Industry and Environment, 2021)

Appendix 2 Threatened flora, fauna and ecological communities

Table 13 Threatened ecological communities recorded / predicted to occur within 25 kilometres of the Project area

Scientific name	Conservation status		Likely occurrence in study area	Rationale for likelihood ranking
	EPBC	BC		
Acacia melvillei Shrubland in the Riverina and Murray-Darling Depression bioregions	--	EN	Medium	This ecological community generally occurs on aeolian sandhills and undulating sandplains, both of which are rare within the wind farm project area. This community may occur in the grid connection corridor.
Allocasuarina luehmannii Woodland in the Riverina and Murray-Darling Depression Bioregions	EN	EN	Medium	Buloke woodlands were not recorded in the wind farm part of the Project area but may occur within the grid connection corridor.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	EN	EN	Low	Grey Box trees or woodlands were not recorded in the wind farm part of the Project area and have a low likelihood of occurring in the grid connection corridor.
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	EN	EN	Medium	Habitat requirements for this community are present and the occasional Weeping Myall tree (*Acacia pendula*) exists within the Project area, however the origin of these trees requires confirmation as they may be planted specimens.
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	--	EN	Medium	This ecological community generally occurs on aeolian sandhills and undulating sandplains, both of which are rare within the wind farm project area. This community may occur in the grid connection corridor.

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Table 14 Threatened flora species recorded / predicted to occur within 25 kilometres of the Project area

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Austrostipa metatoris	A spear-grass	VU	VU	#		Medium	Habitat requirements for this may occur within the Project area	Perennial grass found growing in locations throughout the Murray Valley including Cunninyeuk Creek, Stony Crossing, Kyalite State Forest and Lake Benanee. Also found in scattered locations in Central NSW including Lake Cargelligo, east of Goolgowi, Condobolin and south-west of Nymagee. Grows on sandhills, sand ridges, undulating plains and mallee country in a variety of communities including Western Slopes Dry Sclerophyll Forest, Floodplain Transition Woodlands, Sand Plain Mallee Woodlands and Western Peneplain Woodlands. Grows in red to brown clay loam and sandy loam soils.
Brachyscome papillosa	Mossgiel Daisy	VU	VU	2017#		High/recorded	Habitat requirements for this species are found within the Project area and this species has been recorded in spring 2022 surveys.	Multi stemmed perennial herb endemic to NSW, primarily distributed throughout the Riverina bioregion with one site occurring in the South Western Slopes. Grows on Saltbush plains in a variety of communities including Aeolian Chenopod Shrublands, Inland Floodplain Shrublands, Riverine Plain Grasslands and Inland Saline Lakes. Grows in clay soils.
Lepidium monoplocoides	Winged Peppercress	EN	EN	2001#		Medium	Habitat requirements for this species are found within	Erect, annual herb with populations sparsely scattered throughout a widespread distribution spanning the semi-arid western plains. Historical records are numerous although recent records are confined to two collections from Broken Hill, in 1915 and 1950. Grows in areas receiving between 300 mm to 500 mm annual

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Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
							the Project area, species has previously been recorded within 25 km of the Project area.	rainfall on periodically inundated and waterlogged habitats in a variety of communities including Inland Floodplain Shrublands, Floodplain Transition Woodlands, Inland Saline Lakes, Sand Plain Mallee Woodlands and Western Peneplain Woodlands. Grows on waterlogged grey-brown clays
Leucochrysum albicans var. tricolor	Hoary Sunray	EN	--	2008		Negligible	Project area is out of this species range.	Small perennial herb endemic to south-east Australia with small, fragmented populations distributed from Tasmania to New South Wales. Populations within NSW occur throughout the Southern Tablelands and the South Eastern Highlands, Australian Alps and Sydney Basin Bioregions. Grows in disturbed areas and intertussock spaces in grasslands, woodlands and forests. Grows in a variety of soils including clays, clay loams, stony and gravelly.
Maireana cheelii	Chariot Wheels	VU	VU	2021#		High/recorded	Habitat requirements for this species are found within the Project area and this species has been recorded in spring 2022 surveys.	Small perrenial forb restricted to the southern Riverina region of NSW between Deniliquin and Hay. Also found on Fraser Island. Grows in shallow depressions, on eroded or scalded surfaces or on the edge of windswept claypans in association with Bladder Saltbush Atriplex vesicaria in a variety of communities including Riverine Chenopod Shrublands, Riverine Plain Grasslands, Gibber Transition Shrublands, North-west Floodplain Woodlands, and Inland Saline Lakes. Grows on heavy grey clays, brown to red-brown clay-loams, or hard cracking red clay soils.

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Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Solanum karsense	Menindee Nightshade	VU	VU	#		Medium	Species could potentially occur within Project area in restricted areas, species has not previously been recorded within 25 km of the Project area.	Small perennial herb, endemic to NSW, restricted to the far south-western plains spanning from the Darling River to the Menindee and Wilcannia districts. Found growing in flooded depressions and level river floodplains in a variety of communities including Aeolian Chenopod Shrublands, Riverine Chenopod Shrublands, Inland Floodplain Shrublands, Inland Saline Lakes and Inland Floodplain Woodlands. Grows in a variety of soils including grey clays, calcareous soils, brown soils, red sands, red-brown earths and loamy soils.
Swainsona murrayana	Slender Darling Pea	VU	VU	1973#		Medium	Habitat requirements for this species are found within the Project area however only species record within 25 km of the Project area is dated 1878.	Small sparsely downy forb distributed between Jerilderie and Deniliquin areas of the southern Riverine Plain as far north as Willandra National Park, near Broken Hill and between Dubbo and Mudgee. Found growing on level plains, floodplains and depressions in a variety of communities including Riverine Chenopod Shrublands, Semi-arid Floodplain Shrublands, Western Slopes Grasslands, Brigalow Clay Plain Woodlands, Riverine Plain Woodlands and Inland Saline Lakes. Grows in heavy clay based soils ranging from grey, red and brown cracking clays to red-brown earths and loams.
Swainsona pyrophila	Yellow Swainson-pea	VU	VU	#		Low	Habitat requirements for this species do not	Small erect perennial forb with a sparse distribution throughout the south-western regions of NSW and into South Australia and Victoria. Found growing amongst mallee scrub, disturbed woodlands, sheltered aspects,

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
							occur in the Project area and this species has not been recorded within 25 km of the Project area.	roadsides, claypans and edges of fire ash in Dune Mallee Woodlands and Sand Plain Mallee Woodlands. Grows in sandy or loamy soils.

Table 15 Threatened fauna species recorded, or predicted to occur, within 25 kilometres of the Project area

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
Mammals								
Nyctophilus corbeni	Corben's Long-eared Bat	VU	VU	0	#	Medium	Suitable habitat is present in the Project area (Black Box woodland).	Restricted to the Murray-Darling basin and western slopes. Found in a range of habitats including tall Eucalypt forests, mallee, open savanna and Black Box woodland, preferring habitats with a distinct canopy and cluttered, dense understorey. Roost in tree hollows and fissures and under exfoliating bark.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	--	VU	0	2014	Medium	Suitable woodland and shrubland habitat is present in the Project area.	Found throughout NSW in habitats including wet and dry sclerophyll forest, open woodland, acacia shrubland, mallee, grasslands and desert. They roost in tree hollows in colonies and have also been observed roosting in animal burrows, abandoned Sugar Glider nests, cracks in dry clay, hanging from buildings and under slabs of rock. Forages for insects above the canopy in forests.

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Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
Birds								
Anseranas semipalmata	Magpie Goose	--	VU	0	2019	High	Sufficient good quality habitat is present in Project area.	Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. They are often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes. Breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level. Nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW. Often seen in trios or flocks on shallow wetlands, dry ephemeral swamps, wet grasslands and floodplains; roosts in tall vegetation.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	--	VU	0	1990	High	Multiple previous local records occur for this species.	Primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.
Botaurus poiciloptilus	Australasian Bittern	EN	EN	0	2021#	High	Multiple previous local records occur for this species.	The Australasian Bittern is distributed across south-eastern Australia. Often found in terrestrial and estuarine wetlands, generally where there is permanent water with tall, dense vegetation including *Typha* spp. and *Eleoacharis* spp.. Typically, this bird forages at night on frogs, fish and invertebrates, and remains inconspicuous during the day. The breeding season extends from October to

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								January with nests being built amongst dense vegetation on a flattened platform of reeds.
Burhinus grallarius	Bush Stone-curlew	--	EN	0	2007	Low	Marginal habitat present (low quality and extent).	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Occurs in lightly timbered open forest and woodland, or partly cleared farmland with remnants of woodland, with a ground cover of short sparse grass and few or no shrubs where fallen branches and leaf litter are present.
Calidris ferruginea	Curlew Sandpiper	CR	EN	0	1996#	Medium	Habitat present within Project area however species found rarely inland.	Inhabits sheltered intertidal mudflats. Also, non-tidal swamps, lagoons and lakes near the coast. Infrequently recorded inland.
Circus assimilis	Spotted Harrier	--	VU	0	2015	High	Habitat requirements are present for this species within the Project area and this species has been previously recorded in the local area.	The Spotted Harrier is found throughout Australia but rarely in densely forested and wooded habitat of the escarpment and coast. Preferred habitat consists of open and wooded country with grassland nearby for hunting. Habitat types include open grasslands, acacia and mallee remnants, spinifex, open shrublands, saltbush, very open woodlands, crops and similar low vegetation. The Spotted Harrier is more common in drier inland areas, nomadic part migratory and dispersive, with movements linked to the abundance of prey species. Nesting occurs in open or remnant woodland and unlike other harriers,

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								the Spotted Harrier nests in trees.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	--	VU	0	2014	Medium	Suitable woodland and shrubland habitat is present in the Project area.	Lives in eucalypt woodlands, especially areas of relatively flat open woodland typically lacking a dense shrub layer, with short grass or bare ground and with fallen logs or dead trees present.
Daphoenositta chrysoptera	Varied Sittella	--	VU	0	2012	Medium	Suitable woodland and shrubland habitat is present in the Project area.	The Varied Sittella is a sedentary species which inhabits a wide variety of dry eucalypt forests and woodlands, usually with either shrubby understorey or grassy ground cover or both, in all climatic zones of Australia. Usually inhabit areas with rough-barked trees, such as stringybarks or ironbarks, but also in mallee and acacia woodlands, paperbarks or mature Eucalypts. The Varied Sittella feeds on arthropods gleaned from bark, small branches and twigs. It builds a cup-shaped nest of plant fibres and cobweb in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.
Epthianura albifrons	White-fronted Chat	--	VU	0	2021	High/recorded	Suitable habitat is present in the Project area and the species was recorded in spring 2022 surveys.	Sydney Metropolitan CMA: The White-fronted Chat occupies foothills and lowlands below 1000 m above sea level. In NSW it occurs mostly in the southern half of the state, occurring in damp open habitats along the coast, and near waterways in the western part of the state. The Whit—fronted Chat is found in damp open habitats, particularly wetlands containing saltmarsh

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								areas that are bordered by open grasslands or lightly timbered lands. Along the coastline, they are found in estuarine and marshy grounds with vegetation less than 1 m tall. The species is also observed in open grasslands and sometimes in low shrubs bordering wetland areas. Inland, the species is often observed in open grassy plains, saltlakes and saltpans that are along the margins of rivers and waterways. In Victoria White-fronted Chats have been observed breeding from late July through to early March. Nests are built in low vegetation and in the Sydney region nests have also been observed in low isolated mangroves. An Endangered Population occurs in the Sydney Metropolitan CMA area, at Newington Nature Reserve near Homebush and at Towra Point Nature Reserve.
Falco hypoleucos	Grey Falcon	VU	EN	0	#	Low	Potential habitat for species within site however the species is extremely rare.	Found over open country and wooded lands of tropical and temperate Australia. Mainly found on sandy and stony plains of inland drainage systems with lightly timbered acacia scrub.
Falco subniger	Black Falcon	--	VU	0	2020	High	Suitable woodland and shrubland habitat is present in the Project area.	Mainly occur in woodlands and open country where can hunt. Often associated with swamps, rivers and wetlands. Nest in tall trees along watercourses.

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
Grantiella picta	Painted Honeyeater	VU	VU	0	1989#	Medium	Suitable woodland and shrubland habitat is present in the Project area.	Found mainly in dry open woodlands and forests, where it is strongly associated with mistletoe. Often found on plains with scattered eucalypts and remnant trees on farmlands.
Grus rubicunda	Brolga	--	VU	0	2014	High	Suitable wetland habitat is present in the Project area.	The Brolga has been recorded on open wetlands, shallow swamps, floodplains, paddocks, farmland and salt flats. This species nest in shallow wetlands where there is shelter such as canegrass, lignum or sedge swamp. They feed in or near water and have often been observed foraging in grassland, dry wetlands and cultivated areas.
Haliaeetus leucogaster	White-bellied Sea-Eagle	--	VU	0	2021#	High	Suitable wetland/riverine habitat is present in the Project area.	A migratory species that is generally sedentary in Australia, although immature individuals and some adults are dispersive. Found in terrestrial and coastal wetlands; favouring deep freshwater swamps, lakes and reservoirs; shallow coastal lagoons and saltmarshes. It hunts over open terrestrial habitats. Feeds on birds, reptiles, fish, mammals, crustaceans and carrion. Roosts and makes nest in trees.
Hieraaetus morphnoides	Little Eagle	--	VU	0	2018	High	Suitable habitat and foraging areas are present in the Project area.	The Little Eagle is most abundant in lightly timbered areas with open areas nearby providing an abundance of prey species. It has often been recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. The Little Eagle nests in tall living trees within farmland, woodland and forests.
Leipoa ocellata	Malleefowl	VU	EN	0	#	Low	Habitat requirements for	The malleefowl occurs in tall, dense mallee with a mean annual rainfall of 300 to 450mm (NPWS 1996).

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
							species not found within site, however species has been previously recorded within 25 km of site.	This species prefers areas with a light sandy to sandy loam soil, a dense but discontinuous canopy cover, dense and variable herb layer and open ground for easy of movement (NPWS 1996).
Limosa limosa	Black-tailed Godwit	--	VU	0	1989	Medium	Suitable wetland habitat is present in the Project area.	The Black-tailed Godwit is a migratory wading bird that breeds in Mongolia and Eastern Siberia and flies to Australia for the southern summer, arriving in August and leaving in March. In NSW, it is most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. The species has been recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state.
Lophochroa leadbeateri	Major Mitchell's Cockatoo	--	VU	0	2020	High	Suitable habitat is present in the Project area.	Found mainly in semi-arid and arid regions, in dry woodlands, particularly mallee - casuarina assemblages. They breed in the hollows of large trees, often near watercourse.
Lophoictinia isura	Square-tailed Kite	--	VU	0	2011	Medium	Suitable habitat is present in the Project area.	Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated by *Eucalyptus longifolia, Corymbia maculata, E. elata,* or *E. smithii*. Individuals appear to occupy large hunting

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								ranges of more than 100 km2. They require large living trees for breeding, particularly near water with surrounding woodland /forest close by for foraging habitat. Nest sites are generally located along or near watercourses, in a tree fork or on large horizontal limbs.
Numenius madagascariensis	Eastern Curlew	CR	--	0	#	Low	Species rarely found within area.	Occurs in sheltered coasts, especially estuaries, embayments, harbours, inlets and coastal lagoons with large intertidal mudflats or sandflats often with beds of seagrass.
Oxyura australis	Blue-billed Duck	--	VU	0	2021	High	Suitable wetland habitat is present in the Project area.	The Blue-billed Duck is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only seen in coastal areas during summer. Prefers large permanent wetlands, feeding on the bottom of swaps.
Pedionomus torquatus	Plains-wanderer	CR	EN	0	2020#	Low	Habitat requirements within site likely rare however species has been found within 25 km of site.	Plains-wanderers live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. Habitat structure appears to be more important than plant species composition. Preferred habitat typically comprises 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses. They have been recorded in some agricultural land including unimproved pasture, and cropping on long rotation.
Polytelis anthopeplus monarchoides	Regent Parrot (eastern subspecies)	VU	EN	0	2013	Low	Low potential to occur within Project area due to lack of	In southeast Australia they are found in riparian or littoral River Red Gum forests, adjacent Black Box woodlands, and in nearby open mallee woodland or

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
							suitable woodland habitat in close proximity to riparian forests.	shrubland, as well as Belah, Buloke or Slender Cypress Pine. Moves between the riverine nesting habitat and foraging sites along corridors of natural vegetation.
Polytelis swainsonii	Superb Parrot	VU	VU	0	2021	Low	Low potential to occur within Project area due to lack of woodland habitat.	Found mainly in open, tall riparian River Red Gum forest or woodland. Often found in farmland including grazing land with patches of remnant vegetation. Forages primarily in grassy box woodland, feeding in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants.
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	--	VU	0	2014	High	Suitable woodland habitat is present in the Project area.	The eastern sub-species occurs on the western slopes of the Great Dividing Range, the western plains, woodlands in the Hunter Valley and locations on the north coast of NSW. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine, open Box Woodlands on alluvial plains and woodlands on fertile soils in coastal regions. Feeds on invertebrates and builds dome-shaped nests.
Pyrrholaemus brunneus	Redthroat	--	VU	0	1984	Medium	Suitable habitat is present in the Project area.	Occurs mostly in acacia and chenopod shrublands, often along watercourses or drainage lines in arid and semi-arid areas. Also in eucalypt woodalnds (including mallee), Belah, Lignum, spinifex eucalypt regrowth, Ti-tree and bluebush.
Rostratula australis	Australian Painted Snipe	EN	EN	0	1990#	High	Suitable wetland habitat is present in the Project area.	Usually found in shallow inland wetlands including farm dams, lakes, rice crops, swamps and waterlogged grassland. They prefer freshwater wetlands, but have been recorded in brackish waters.

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Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								Forages on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.
Stagonopleura guttata	Diamond Firetail	--	VU	0	2012	Medium	Suitable habitat is present in the Project area.	The Diamond Firetail is widely distributed, found in a range of habitat types including open eucalypt forest, mallee and acacia scrubs. Often occur in vegetation along watercourses. Feeds exclusively on the ground on ripe grass and herb seeds, green leaves and insects.
Stictonetta naevosa	Freckled Duck	--	VU	0	2021	High	Suitable wetland habitat is present in the Project area.	The Freckled Duck breeds in permanent fresh swamps that are heavily vegetated. Found in fresh or salty permanent open lakes, especially during drought. Often seen in groups on fallen trees and sand spits.
Frogs								
Litoria raniformis	Southern Bell Frog	VU	EN	0	2021#	High	Suitable wetland habitat is present in the Project area.	In NSW the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. Usually found in or around permanent or ephemeral swamps or billabongs with an abundance of bulrushes and other emergent vegetation along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. Outside the breeding season animals disperse away from the water and take shelter beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks.

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Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
Fish								
Bidyanus bidyanus	Silver Perch	VU	--	VU		Low	Habitat not present within Project area as most creeks are very seasonal in nature.	Silver Perch were once widespread and abundant throughout most of the Murray-Darling river system. They have now declined to low numbers or disappeared from most of their former range. Only one remaining secure and self-sustaining population occurs in NSW in the central Murray River downstream of Yarrawonga weir, as well as several anabranches and tributaries. Silver Perch have been found in a wide range of habitats and climates across the Murray-Darling Basin. They are generally found in faster-flowing water including rapids and races and more open sections of river. Spawning and recruitment success are both considered to be heavily dependent on high flows and overbank flooding.
Galaxias rostratus	Flathead Galaxias	CR	--	CE	#	Low	Wetlands within site unlikely to support this species as they rarely flood.	Flathead Galaxias are found in still or slow moving water bodies such as wetlands and lowland streams. The species has been recorded forming shoals. They have been associated with a range of habitats including rock and sandy bottoms and aquatic vegetation. Flathead Galaxias spawn in spring and lay slightly adhesive demersal eggs.
Maccullochella macquariensis	Trout Cod	EN	--	EN	#	Low	Habitat not present within Project area as most creeks are very seasonal in nature.	The Trout Cod is endemic to the southern Murray-Darling river system, including the Murrumbidgee and Murray Rivers, and the Macquarie River in central NSW. Trout cod are often found close to cover and in relatively fast currents, especially in fairly deep water

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								close to the bank, and often congregate around large woody debris (snags). They tend to remain at the one site and have small home ranges.
Maccullochella peelii	Murray Cod	VU	--	0	#	Low	Habitat not present within Project area as most creeks are very seasonal in nature.	The Murray Cods natural distribution extends throughout the Murray-Darling basin ranging west of the divide from south east Queensland, through NSW into Victoria and South Australia. It is found in the waterways of the Murray–Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers, billabongs and large deep holes. Murray Cod is entirely a freshwater species and will not tolerate high salinity levels.
Macquaria australasica	Macquarie Perch	EN	--	EN	#	Low	Habitat not present within Project area as most creeks are very seasonal in nature.	Macquarie Perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries
Gastropods								
Notopala hanleyi	Hanleys River Snail	CR	--	CE		Low	Rare species unlikely to be found within site.	Hanley's River Snail was once common and widespread in the Murray River catchment, including the Lachlan and Murrumbidgee Rivers. They are now virtually extinct throughout their natural range and living specimens have only been found from within irrigation pipelines in South Australia and Far South-

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in Project area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								West NSW.

Appendix 3 Social Impact Assessment Scoping Report

Appendix 4 Preliminary Visual Impact Assessment

Appendix 5 Preliminary Noise Assessment

Appendix 6 Desktop Aboriginal Heritage Assessment and Predictive Model