MAYFAIR SOLAR FARM

Environmental Impact Statement

Prepared for
ELGIN ENERGY PTY LTD
November 2024

URBIS

URBIS STAFF RESPONSIBLE FOR THIS REPORT WERE:

Director	Clare Brown
Associate Director	Richard Barry
Senior Consultant	Ben Davies
Consultant	Pablo Yague
Project Code	P0046824
Report Number	EIS – Final 06112024

Urbis acknowledges the important contribution that Aboriginal and Torres Strait Islander people make in creating a strong and vibrant Australian society.

We acknowledge, in each of our offices, the Traditional Owners on whose land we stand.

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SIGNED DECLARATION

Project details			
Project name	Mayfair Solar Farm		
Application number	SSD-60074458		
Address of the land in respect of which the development application is made	204 Jacksons Lane, Stubbo, New South Wales, 2852		
Applicant details			
Applicant name	Elgin Energy Pty Ltd		
Applicant address	Level 3, 50 Bridge Street, Sydney, New South Wales, 2000		
Details of people by whom this EIS was prepared			
Names and professional qualifications	Jennifer Cooper Bachelor Town Planning (Hons), (UNSW) NSW Registered Environmental Assessment Practitioner	Clare Brown Bachelor Town Planning (Hons), (UNSW) Bachelor of Law (UNSW) GAICD Diploma Circular Economy and Sustainability Strategy (Cambridge Judge Business School)	Richard Barry Bachelor Town Planning (Hons), (UNSW)
		Ben Davies BA (Hons) Town and Country Planning (UWE, UK) BTP (Bachelor of Town Planning) (UWE, UK)	Pablo Yague Master of Environment (Macquarie University) Master of Marine Science and Management (USYD)
Address	Level 8, Angel Place, 123 Pitt Street, Sydney, New South Wales, 2000		

Declaration	
The undersigned declares that this EIS: ▪ has been prepared in accordance with Schedule 2 of the *Environmental Planning and Assessment Regulation 2021*; ▪ has been prepared in accordance with Part 4 of the *Environmental Planning and Assessment Act 1979*; ▪ contains all available information relevant to the environmental assessment of the development, activity or infrastructure to which the EIS relates; ▪ does not contain information that is false or misleading; ▪ contains the information required under the *Registered Environmental Assessment Practitioner Guidelines*; ▪ addresses the Planning Secretary's environmental assessment requirements (SEARs) for the Project; ▪ identifies and addresses the relevant statutory requirements for the Project, including any relevant matters for consideration in environmental planning instruments; ▪ has been prepared having regard to the Department's *State Significant Development Guidelines - Preparing an Environmental Impact Statement*; ▪ contains a simple and easy to understand summary of the Project as a whole, having regard to the economic, environmental and social impacts of the Project and the principles of ecologically sustainable development; ▪ contains a consolidated description of the Project in a single section of the EIS; ▪ contains an accurate summary of the findings of any community engagement; and ▪ contains an accurate summary of the detailed technical assessment of the impacts of the Project as a whole.	
Signatures	
	
06.11.2024	Jennifer Cooper (REAP 84249)

GLOSSARY AND ABBREVIATIONS

Reference	Description
AADT	Annual Average Daily Traffic
ACHA	Aboriginal Cultural Heritage Assessment
ACM	Asbestos Containing Material
AEMO	Australian Energy Market Operator
AEP	Anderson Environment and Planning
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AHD	Australian Heritage Database
AHIMS	Aboriginal Heritage Information Management System
AIA	Arboricultural Impact Assessment
ANEF	Australian Noise Exposure Forecast
ANL	Amenity Noise Levels
AQIA	Air Quality Impact Assessment
ARI	Average Recurrence Interval
AS	Artifact Scatter
ASC	Australian Soil Classification
ASS	Acid Sulphate Soils
ATR	Archaeological Technical Report
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
B&C SEPP	*State Environment Planning Policy (Biodiversity and Conservation) 2021*
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BC Reg	*Biodiversity Conservation Regulation 2017*
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System

Reference	Description
BSAL	Biophysical Strategic Agricultural Land
CHL	Commonwealth Heritage List
CEEC	Critically Endangered Ecological Community
CDA	Concept Development Application
CEMP	Construction Environmental Management Plan
CIV	Capital Investment Value
CMP	Construction Management Plan
COPC	Contaminants of Potential Concern
Council	Mid-western Regional Council
CTMP	Construction Traffic Environmental Plan
CWOREZ	Central-West Orana Renewable Energy Zone
CWORP	Central-West and Orana Regional Plan 2041
DCP	Development Control Plan
DP	Deposited Plan
DPE	Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure
DPIE	Department of Planning, Industry and Environment
DSI	Detailed Site Investigation
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA Regulation	*Environmental Planning and Assessment Regulation 2021*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPC	Engineering Procurement and Construction
EPA	New South Wales Environment Protection Authority
EPI	Environmental Planning Instrument
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development

Reference	Description
FTE	Full-time Employees
GANSW	Government Architect New South Wales
GFA	Gross Floor Area
GHG	Greenhouse gases
GP	General Practitioner
GVA	Gross Value Added
GSV	Ground Surface Visibility
GTP	Green Travel Plan
GW	Gigawatt
GWh	Gigawatt hours
ha	Hectares
HIPAP	Hazardous Industry Planning Advisory Paper
HIS	Heritage Impact Statement
IF	Isolated Find
IPC	Independent Planning Commission
ISP	Integrated System Plan
kV	Kilovolt
Km	Kilometre
LAeq	A Frequency-weighted Equivalent Continuous Sound Level
LCZ	Land Character Zone
LEC	Land Environment Court of New South Wales
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Services
LSPS	Local Strategic Planning Statement
mG	Milligauss
MNES	Matters of National Environmental Significance

Reference	Description
MRA	MRA Consulting Group
MWRC	Mid-Western Regional Council
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
MW	Megawatts
MWac	Megawatts, alternating current
MWRCP	Mid-Western Region Community Plan: Towards 2040
NEM	National Electricity Marker
NHL	National Heritage List
NHVR	National Heavy Vehicle Regulator
NIA	Noise Impact Assessment
NML	Noise Management Level
NNTT	National Native Title Tribunal
NorBE	Neutral or Beneficial Effect
NPfI	Noise Policy for Industry
NRAR	Natural Resource Access Regulator
NSW	New South Wales
NVIA	Noise and Vibration Impact Assessment
NVR Map	Native Vegetation Regulatory Map
OEH	NSW Office of Environment & Heritage
OEMP	Operational Environmental Management Plan
OOHW	Out of Hours (Works)
OSOM	Oversize and/or Over Mass Vehicle
PAC	Physical Absorption Capacity
PAD	Potential Archaeological Deposit
PBP	*Planning for Bush Fire Protection 2019*
PCT	Plant Community Type
PCUs	Power Conversion Units

Reference	Description
Planning Systems SEPP	*State Environmental Planning Policy (Planning Systems) 2021*
PMF	Probable Maximum Flood
PMST	Protected Matter Seach Tool
PNTL	Project Noise Trigger Levels
POEO Act	*Protection of the Environment Operations Act 1997*
POM	Plan of Management
PSI	Preliminary Site Investigation
PV	Photovoltaic
R&H SEPP	*State Environmental Planning Policy (Resilience and Hazards) 2021*
RBLs	Rating Background Noise Levels
RET	Renewable Energy Target
REZ	Renewable Energy Zone
RFS	NSW Rural Fire Service
RNP	NSW Road Noise Policy
SAA	Solar Array Areas
SAII	Serious and Irreversible Impacts
SALIS	Soil and Land Information System (NSW)
SARs	Commonwealth Supplementary Assessment Requirements
SEARs	Secretary's Environmental Assessment Requirements
SEED	Sharing and Enabling Environmental Data
SEIFA	Socio-Economic Indexes for Areas
SEPP	State Environmental Planning Policy
SH	Standard Hours
SIA	Social Impact Assessment
SIDRA	Signalised & unsignalised Intersection Design and Research Aid
Site	Lot 2 in DP 528667 and Lot 2 in DP 734669
SSD	State Significant Development

Reference	Description
SSDA	State Significant Development Application
SSP	Single Superphosphate
TBDC	Threatened Biodiversity Data Collection
T&I SEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
TfNSW	Transport for New South Wales
TIA	Transport Impact Assessment
VIA	Visual Impact Assessment
VIS	Vegetation Integrity Score
VP	Viewpoint
Vpd	Vehicles per day
Vph	Vehicles per hour
WCM	Water Cycle Management
WHL	World Heritage List
WSP	WSP Global Inc.
WMP	Waste Management Plan
WSUD	Water Sensitive Urban Design

EXECUTIVE SUMMARY

This Environmental Impact Statement (**EIS**) has been prepared on behalf of Elgin Energy Pty Ltd (**the Applicant**) (**Elgin Energy**) in support of a State Significant Development Application (**SSDA**) for the construction and operation of the Mayfair Solar Farm (the **Project**) located at 204 Jacksons Lane, Stubbo (the **Site)**

The Project is for the purposes of 'electricity generating works' and has the capacity to generate 60MW and includes a 60MW battery energy storage system (**BESS**) with 240MWh (four hours storage). As the Project has an estimated development cost of more than $30 million, it is classified as a State Significant Development (**SSD**) under Schedule 1, section 20 of the *State Environmental Planning Policy (Planning Systems) 2021*.

This EIS has been prepared to address the Secretary's Environmental Assessment Requirements (**SEARs**) issued for the Project (**SSD-60074458**). This EIS concludes that the proposed development is suitable and warrants approval subject to the implementation of the following planning management and mitigation measures.

The Project seeks to deliver a best-practice solar farm and BESS to support the energy transition towards net zero in NSW. The Project has been carefully designed to avoid adverse environmental impacts on the surrounding landscape and nearby sensitive receivers, whilst capitalising on the existing transmission infrastructure that traverses the Site. The Project site is located within the Central-West Orana Renewable Energy Zone (**CWOREZ**). Specifically, the intended outcomes of the Project are to:

- Design, construct, and operate a utility-scale solar farm and BESS while minimising environmental, social, and cultural impacts upon the Site and adjoining land through adaptive design approaches.
- Generate and store electricity on the Site from renewable sources to reduce the amount of greenhouse gasses generated by the NSW power generation sector.
- Leverage the strategic location of the Site and utilise the existing transmission line infrastructure, minimising the reliance on the construction of new infrastructure within the CWOREZ.
- Encourage and enable community and stakeholder engagement and participation across the life of the Project.
- Provide local and regional employment opportunities and other social benefits during the construction and operation of the Project and contribute to the local and regional economies.

The Project includes a benefit-sharing offer to provide an annual monetary contribution of $850 per megawatt per annum for the life of the Project, consistent with the objectives of the NSW draft Energy Policy Framework (2023).

Feasible Alternatives

A range of Project alternatives were considered and informed the final Project layout, location and component elements. Alternatives considered included alternative site locations, development footprint, access locations, component parts and options for workers accommodation.

The Site and Project layout were selected as they represent the best possible outcome and balance between achieving the Project's objectives and avoiding as much environmental impacts as possible.

Development Description

The Project comprises the construction and operation of electricity generating works, including:

- Site preparation works.
- Construction and operation of a solar farm and battery and energy storage system (**BESS**) including:

  - Ground-mounted solar/photovoltaic (**PV**) modules. PV modules would be mounted on single-axis tracking systems with a maximum height up to 3.5 metres above ground
  - A series of power conversion units (**PCU**)/ inverters, with underground cabling connecting each PCU to the on-site substation
  - A hybrid BESS with approximately 60MW capacity and 240MWh (4 hours) storage.
  - An on-site 33/66 kilovolt (kV) substation to connect the Project to the distribution network via an existing overhead 66kV powerline
- Upgrade and sealing of Jacksons Lane from Barney's Reef Road to the Site access (approximately 1km), including replacement of the existing vehicle crossing over Slapdash Creek with a new culvert.
- Permanent supporting infrastructure and landscaping.
- Temporary construction facilities.
- Temporary workforce accommodation camp, with a capacity of up to 150 workers.
- The Project is to be constructed in a single stage.

Consultation

Community and stakeholder engagement has been undertaken by Urbis and the Project Team. This included direct engagement and consultation with:

- Adjoining landowners and occupants.
- Registered Aboriginal Parties (RAPs) including the Mudgee Local Aboriginal Land Council.
- State and Local Government, agency and utility stakeholders as listed within the SEARs.

The outcomes of the community and stakeholder engagement have informed the Project development and are discussed in detail at Section 5 of this EIS.

Justification of the Project

This EIS assesses the Project against relevant environmental planning instruments, guidelines and policies. The key issues identified in the SEARs have been assessed in detail, with specialist reports underpinning the key findings and recommendations identified in the Assessment of Impacts in **Section 6**.

It has been demonstrated that the likely impacts are either positive or where negative can be appropriately mitigated. Overall, the Project represents a positive development outcome for the Site and surrounding area for the following reasons:

- The Project is consistent with State and local strategic planning policies:
  - NSW Climate Change Act 2023 and Electricity Strategy.
  - Central-West and Orana Regional Plan 2041
  - Our Place 2040 Mid-Western Regional Local Strategic Planning Statement
- The Project satisfies the applicable local and State controls and legislative frameworks.
- The Project is permissible with consent and meets the statutory and policy requirements relevant to the development of electricity generating works.
- The Project design responds appropriately to the opportunities and constraints presented by the Site:
  - Biodiversity – The Project footprint avoids ecologically sensitive areas.

  - Hydrology – The Project includes measures to minimise, mitigate and monitor any potential water quality and stormwater impacts.
  - Social and Economics – The Project will include a temporary workforce accommodation camp on site to avoid impacts on local housing resources. The Project will generate economic value to the State and region including local employment opportunities.
  - Amenity – The mitigation measures incorporated into the Project will minimise potential adverse impacts on the community, such as noise and visual impacts.
  - Transport – Following detailed assessment, it is considered that the project will be able to accommodate traffic-related movements into the road network.
  - Heritage – The Project will avoid impacts on historical and aboriginal cultural heritage.
  - Agriculture – The Project will result in partial and temporary loss of agricultural land. Sheep grazing will be able to continue under the solar panels. Following decommissioning, the agricultural value will be returned in its entirety after the Project lifespan, with the exception of the substation which will be dedicated to Essential Energy.
- The Site is suitable for the Project:
  - The Project can be developed without significantly impacting surrounding land uses and the environment.
  - The Site has limited environmental values, and the Project seeks to avoid those present.
  - The existing 66kV line crossing the Site will allow the Project to capitalise on existing electrical infrastructure and deliver sustainable energy as soon as possible.
  - The physical nature of the Site has allowed for the inclusion of mitigation measures.
- The Project is in the public interest as it:
  - Is consistent with the relevant Commonwealth's Renewable Energy Target, NSW's *Climate Change Act*, NSW's *Climate Change Policy Framework* and *Net Zero Plan Stage 1: 2020-2030*.
  - Is consistent with the relevant planning controls, including the EP&A Act and relevant EPIs.
  - Will contribute 60MW of renewable, low-carbon energy to the National Electricity Market, including a 60MW/240MWh BESS. This will help achieve the Integrated System Plan 2024 long-term objectives.
  - Is located in the CWOREZ, declared by the Minister for Energy in 2022 under section 24(1) of the *Electricity Infrastructure Investment Act 2020.* Whilst located in the CWOREZ, the Project will utilise capacity in the existing transmission network, and will not rely on new infrastructure delivered by EnergyConnect. The Project is consistent with the objectives of the REZ, helping unlock additional reliable capacity in NSW.
  - The Site is appropriate, with good solar resources, available connection on the existing electricity network, consistent with the *Large-Scale Solar Energy Guideline*.
  - Will provide flow-on benefits to the local community, including 150 construction jobs at its peak, up to three operational jobs, and contributions to the Mid-Western Regional Council towards improved local services and infrastructure.
  - There will be broader benefits to the State and Commonwealth, with the injection of $200 million of capital into the NSW economy.
  - Will not result in any significant environmental, social and economic impacts. Residual impacts can be minimised, mitigated and/or offset where necessary.

The Project as presented in the EIS and SSD Application has significant merit and is able to be approved subject to the implementation of the mitigation measures described in this EIS and supporting documents.

1. INTRODUCTION

This section of the report identifies the applicant for the Project and describes the Site and Project components. It outlines the Site history and project background in the development of the Project.

1.1. APPLICANT DETAILS

The applicant details for the Project are listed in the following table.

Table 1 Applicant Details

Descriptor	Applicant Details
Full Name(s)	Elgin Energy Pty Ltd
Postal Address	Level 3, 50 Bridge Street, Sydney, New South Wales, 2000
ABN	95 629 627 416
Nominated Contact	Richard Barry (Urbis) Level 8, Angel Place, 123 Pitt Street, Sydney, NSW, 2000

Founded in 2009, Elgin is a leading international solar and storage company, with offices in Sydney, London, Dublin, and Munich. The Applicant's specialist teams manage each phase of renewable energy projects from origination through development and operation. The Applicant is currently operating across four markets: Australia, Ireland, the United Kingdom, and Germany, with an international pipeline of over 150 solar and storage projects, which will provide over 15GW of clean, renewable energy. This is enough green energy to power over 11 million homes.

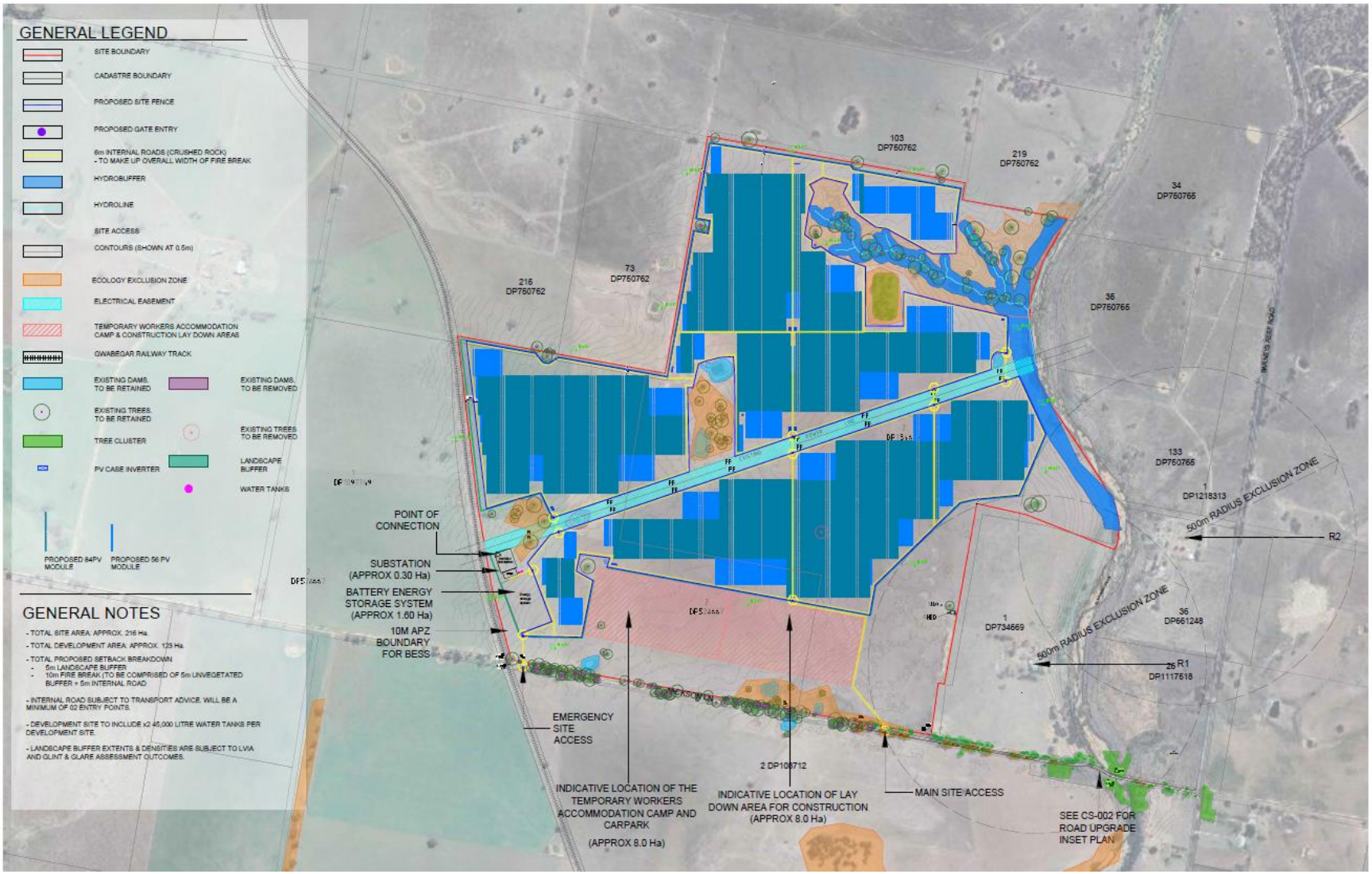
1.2. PROJECT DESCRIPTION

This Environmental Impact Statement (**EIS**) is submitted to the Department of Planning, Housing and Infrastructure (**DPHI**) on behalf of Elgin Energy Pty Ltd and in support of a State significant development application (**SSDA**). The SSDA seeks approval for the construction and operation of Mayfair Solar Farm located at 204 Jacksons Lane, Stubbo, including:

- Site preparation works including tree removal and earthworks.
- Construction and operation of a solar farm and BESS including:
  - Ground-mounted solar/photovoltaic (**PV**) modules. PV modules would be mounted on single axis tracking systems with a maximum height up to 3.5 metres above ground
  - A series of power conversion units (**PCU**)/inverters, with underground cabling connecting each PCU to the on-site substation
  - A hybrid battery and energy storage system (**BESS**) with approximately 60MW capacity and 240MWh (four hours) storage. The BESS would be in containerised modules adjacent to the on-site substation
  - An on-site 33/66kV substation to connect the Project to the distribution network via an existing overhead 66kV powerline
- Upgrade and sealing of Jacksons Lane from Barney's Reef Road to the Site access (approximately 1km), including replacement of the existing vehicle crossing over Slapdash Creek with a new culvert.
- Permanent supporting infrastructure including:
  - Internal access tracks.

  - Security fencing and lighting.
  - Operations and maintenance buildings.
  - Operational vehicle access points.
  - Water tanks.
  - Stormwater retention structures.
  - Landscaping.
- Temporary construction facilities including:
  - Construction compound.
  - Laydown area.
  - Construction materials storage.
  - Site office buildings, amenities.
  - Temporary workforce accommodation camp.
- The temporary workforce accommodation camp, with a capacity of up to 150 workers, will include:
  - Demountable, single-storey, two or four-person demountable air-conditioned buildings.
  - Various single-storey buildings for supporting facilities.
  - Temporary on-site utilities.
  - Workforce Car parking.
- The Project is to be constructed in a single stage (Figure 1).

Figure 1 Proposed Project Layout



Source: Urbis, 2024

1.3. PROJECT OBJECTIVES

The key objectives of the Project to:

- Construct and operate a utility scale solar farm and BESS while minimising environmental, social, and cultural impacts through adaptive design approaches.
- Generate and store electricity from renewable sources to reduce the amount of greenhouse gases generated by the NSW power generation sector.
- Leverage the strategic location of the Project site and utilise the existing transmission line infrastructure, minimising the reliance on construction of new infrastructure within the Central-West Orana Renewable Energy Zone (**CWOREZ**).
- Encourage and enable community and stakeholder engagement and participation across the life of the Project.
- Provide local and regional employment opportunities and other social benefits during construction and operation of the Project and contribute to the local and regional economies.

1.4. KEY MITIGATION STRATEGIES

The following key strategies have been adopted to avoid, minimise or offset the impacts of the Project:

- The Project would have an on-site electrical grid connection via the existing 66kV transmission line which traverses the Site. The existing transmission line removes the requirement to construct additional infrastructure for electrical grid connection and avoids additional potential environmental impacts.
- The Development Footprint has been selected to avoid areas of high biodiversity value, minimise impacts to natural drainage tributaries of Slapdash Creek within the Site. The Development Footprint has incorporated deliberate boundary setbacks in consideration of minimising the potential visual, and construction noise impacts to surrounding receivers. These constraints are shown on the Site Plan.
- Consideration was given to the requirements for Solar Energy Farms covered under Section 6.5 of the Mid-Western Regional Council Development Control Plan 2013 (Mid-Western DCP) in the selection of the Project site to minimise potential conflicts.
- Use of silencing equipment to avoid acoustic impacts on sensitive receivers.
- Proposed Aboriginal Cultural Management Plan during construction.
- Appropriate Asset Protection Zones (APZs), water tanks and other bushfire mitigation measures.
- Temporary Workforce Accommodation Camp and Plan to avoid and mitigate impacts on regional housing and resources.
- Proposed agrivoltaics during operation (sheep grazing) to minimise the partial loss of agricultural value.
- The preparation of a Waste Management Plan to avoid impacts on regional waste management facilities.
- The offsetting through ecosystem credits of direct impacts on native vegetation.
- Proposed conservation and revegetation efforts on retained native vegetation areas to achieve a nature-positive outcome.

1.5. RELATED DEVELOPMENT

No other related development is being proposed under a separate planning application. The SSDA includes all enabling works, including road upgrades and temporary workforce accommodation.

1.6. RESTRICTIONS AND COVENANTS

The following Easements and Restrictions are present on the Site.

- V400583 – Easement for Transmission Line on Lot 2 of DP 734669.
- T976576 – Easement for Transmission Line affecting the part of the land within described shown 45 metres wide in DP631312.
- DP734669 – Restriction(s) on the Use of Land Lot 2 of DP 734669. The terms of restrictions are as follows:
  - *No dwelling shall be erected on Lot 2 hereof without the consent of The Council of the Shire of Mudgee, but such consent will not be withheld if power is extended to Lot 2 by the local electricity authority at no cost to the Shire Council. Such power shall be extended prior to the submission of a building application on the said Lot.*

1.7. PROJECT TEAM

The EIS should be read in conjunction with the following plans and technical consultant reports:

Table 2 Supporting Documentation

Document Title	Consultant	Appendix
SEARs Compliance Table	Urbis	**Appendix A**
Detailed Maps and Plans	Urbis	**Appendix B**
Statutory Compliance Table	Urbis	**Appendix C**
Engagement Summary Table	Urbis	**Appendix D**
Mitigation Measures Table	Urbis	**Appendix E**
Biodiversity Development Assessment Report	AEP	**Appendix F**
Aboriginal Cultural Heritage Assessment	Urbis	**Appendix G**
Heritage Impact Statement	Urbis	**Appendix H**
Agricultural Impact Assessment	Premise	**Appendix I**
Landscape and Visual Impact Assessment	Urbis	**Appendix J**
Community and Stakeholder Engagement Outcome Report	Urbis	**Appendix K**
Noise Impact Assessment	WSP	**Appendix L**
Transport Impact Assessment	Urbis	**Appendix M**
Hydrology Assessment	WaterTechnology	**Appendix N**

Document Title	Consultant	Appendix
Preliminary Hazard Analysis	Riskcon	**Appendix O**
Bushfire Threat Assessment	AEP	**Appendix P**
Social and Economic Impact Assessment	Urbis	**Appendix Q**
Workforce Accommodation Plan	Accent Environmental	**Appendix R**
Waste Management Plan	MRA	**Appendix S**
Landowner’s Consent	-	**Appendix T**
Estimated Development Cost Report	MBM	**Appendix U**
Aquatic Ecology Report	AEP	**Appendix V**
Arborist Impact Assessment	AEP	**Appendix W**
Site Survey	Ryan Geospatial	**Appendix X**
VPA Letter of Offer to Council	Elgin	**Appendix Y**

2. STRATEGIC CONTEXT

This section of the EIS describes the way in which the Project addresses the strategic planning policies relevant to the Site, including the way in which potential conflicts with future surrounding land uses have been avoided or minimised. It identifies the key strategic issues relevant to the assessment and evaluation of the Project, each of which is addressed in further detail in **Section 7** of this EIS.

2.1. PROJECT NEED

The Project responds to international, national, state and regional needs to deliver reliable, low-carbon and sustainable energy into the electricity grid.

International Need

In December 2015, Australia became a signatory to the United Nations Paris Agreement on climate change. The main objectives of the Paris Agreement are to:

- Limit the increase in global temperatures to well below two degrees and pursue efforts to limit the rise to 1.5 degrees.
- Achieve net-zero emissions, globally, by the second half of the century.
- Differentiate expectations for developed nations, including Australia, that they will reduce their emissions sooner than developing nations.

The Australian Government has committed to reduce greenhouse gas emissions by 26-28% on 2005 levels by 2030. The Project would contribute to meeting the nation's international commitments to reduce greenhouse gas emissions and to Australia's effort to meet the Paris Agreement.

National Need

The Renewable Energy Target (**RET**) is an Australian Government scheme designed to reduce emissions of greenhouse gases (**GHG**) in the electricity generation sector and encourage additional renewable energy generation. The Large-scale RET scheme incentivises investment in renewable energy power stations such as solar farms. The scheme has an annual target of 33,000 gigawatt hours (**GWh**) until the scheme ends in 2030.

The Project would contribute to meeting the RET targets and provide an alternative power generation source resulting in reduced GHG emissions, contributing to meeting the Paris Agreement and aiding the transition towards cleaner electricity generation.

State Need

With the objective of delivering cheaper, cleaner, and more reliable electricity to support future growth across the state, the NSW government established the following policies:

- NSW Transmission Infrastructure Strategy (DPE, 2018).
- NSW Electricity Strategy (DPIE, 2019).
- NSW Electricity Infrastructure Roadmap (DPIE, 2020).
- NSW Climate Change (Net Zero Future) Act 2023.

These policies facilitate transitioning the state into a modern, global renewable energy superpower through privatisation and development of energy zones and renewable energy zone (**REZ**). The Project would contribute to this transition. This *NSW Climate Change (Net Zero Future) Act 2023* legislates the Net Zero Plan Stage 1: 2020-2030 (**Net Zero Plan**), which is the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050. It outlines the NSW Government's approach to balancing economic growth, creating jobs and helping to achieve NSW's objective to deliver a 70% cut in emissions by 2035 compared to 2005 levels.

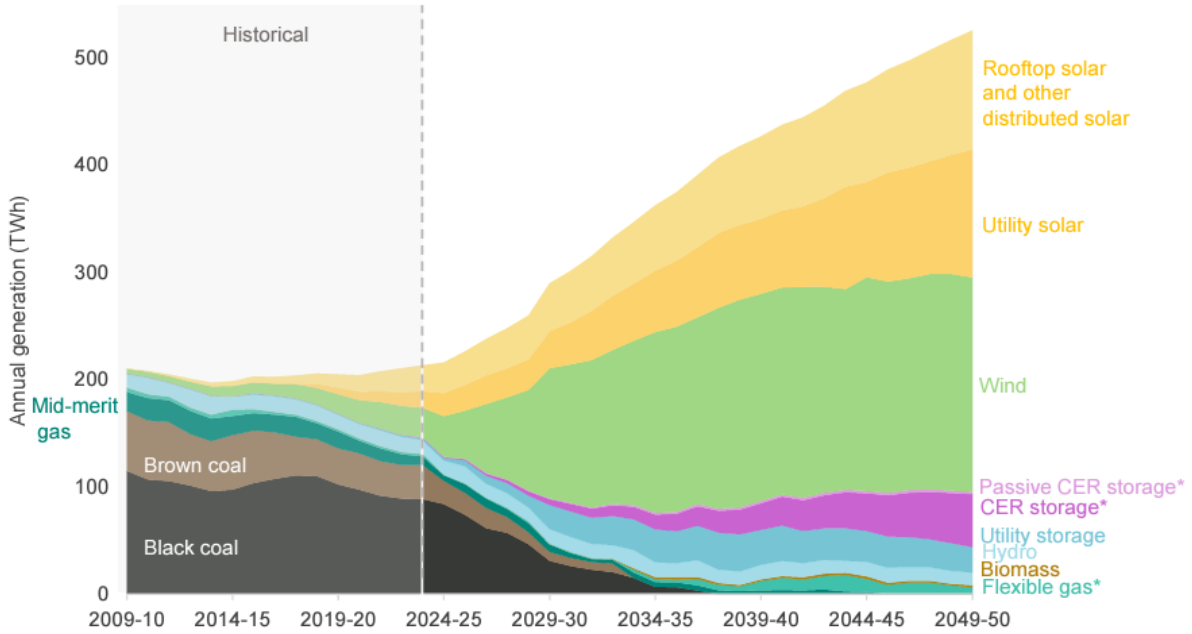
NSW is phasing out steadily coal-fired generation power stations, to which the state has historically relied upon. Federal Government policy is a 43% reduction in 2005-level emissions by 2030, with 82% of electricity in the National Electricity Market (**NEM**) supplied from renewable sources.

The energy transition underway is the biggest transformation of the NEM since it was formed 25 years ago. Wallerawang Coal Power Station closed in 2014, Lidell Coal Power Station closed in mid-2023 and other announced retirements include Eraring (2027), Vales Point (2029), Bayswater (2033) and Mt Piper (2040). With current planned closures and decommissioning this requires up to 10,240 MW of energy that would need to be replaced in the next fifteen years in NSW.

In parallel, future energy consumption from the NEM is projected to rise by approximately 108% by 2050, largely from business and industry. AEMO publishes every two years an updated Integrated System Plan (ISP). The 2024 Integrated System Plan was released in June 2024 and that the NEM must nearly seven-fold the current renewable energy capacity and increase drastically the firming capacity that can respond to a dispatch signal, using utility-scale batteries and other emerging technologies to a total of 56 GW/660 GWh of dispatchable storage systems by 2050.

The NSW Electricity Infrastructure Roadmap requires the equivalent annual generation of at least 12 GW of new renewable generation and at least 2 GW/16 GWh of long-duration storage by 2030, beyond 2019 levels. By 2050, the NEM forecasts 126 GW of combined renewable energy output. As such, large-scale renewable energy projects would need to continue expanding fast but sustainably to meet the long-term national and state needs (Figure 2).

Figure 2 Projected and Current Generation Mix in the NEM



Notes: Annual generation for 2023-24 has been estimated for the full financial year.
"Flexible gas" includes gas-powered generation and potential hydrogen capacity.
"CER storage" means consumer energy resources such as batteries and EVs.

Source: ISP, 2024

There is an imperative for renewable energy generation to be developed in advance of NSW's coal power plants ceasing operation. With the potential acceleration of coal-fired electrical generation being phased out faster than expected, with coal owners only required to give three-and-a-half years' notice of closure, there is an urgent need for the Project in the short-term.

Once operational, the Project not only would assist in fulfilling energy security and stabilising current and future electricity prices but would also help reduce greenhouse gas emissions by approximately 129,133 tonnes of CO2e per year.

Regional Need

The Central-West and Orana Regional Plan 2041 (**CWORP**) aims to facilitate sustainable growth in the NSW Central Western Region by adapting to challenges posed by climate change, the housing market, and the economy.

Objective 2 of the CWORP is to support the State's transition to net zero by 2050 and deliver the CWOREZ. In line with National and NSW objectives for cheaper, cleaner, and more reliable energy, and Australia's international commitments, the CWOREZ is one of at least five REZ to be rolled out across NSW and is expected to attract $5.2 billion in private investment to the region by 2030. As set out in the Electricity Infrastructure Investment Act 2020, the CWOREZ has an intended network capacity of 3 GW.

The Project would support Objective 2 of the CWORP by contributing to the CWOREZ network capacity and generating renewable energy to achieving net zero emissions by 2050.

Developed in 2022, the Mid-Western Region Community Plan: Towards 2040 (**MWRCP**) outlines Mid-Western Regional Council's (Council) development and community vision for the Mid-Western Region. The MWRCP outlines five themes that Council would work towards achieving by 2040 through plans and strategies including, but not limited to:

- Community Engagement Strategy.
- Delivery Program 2022/23 to 2025/26 and Operational Plan 2022/23.
- Workforce Strategy.

The Project would align with Theme 2: Protecting our Natural Environment of the MWRCP by introducing renewable energy into the electrical grid and reducing the consumption of fossil fuels. The Project would also align with Theme 3: Building a Strong Local Economy and the Workforce Strategy by creating work opportunities throughout the life of the Project and introducing visitors to the region. Overall, the Project would support the strategies outlined in the MWRCP.

The following criteria were applied in the Site selection process for Mayfair Solar Farm:

- Proximity to and capacity of connection infrastructure, with a 66kV transmission line running through the Site, providing cost-effective connection to the electrical grid.
- Good energy yield from high solar irradiance.
- Availability of suitably sized lots.
- Topography is relatively flat, minimising the need for extensive land clearing and earthworks.
- The Site is undeveloped and is predominantly open grassland mostly cleared of dense vegetation with only scattered riparian vegetation along drainage lines.
- Identified as having severe limitations for agricultural purposes and not identified as Biophysical Strategic Agricultural Land (**BSAL**).
- Ease of access to the Castlereagh Highway and other major transport connections for construction logistics.
- Expectation of low environmental and heritage constraints.

2.2. PROJECT JUSTIFICATION

The Project will deliver clean and renewable energy supply into NSW.

2.2.1. NSW State Priorities

Climate Change (Net Zero Future) Act 2023

The Climate Change (Net Zero Future) Act 2023 legislates the targets of the *Net Zero Plan Stage 1: 2020-2030* (**Net Zero Plan**), which has served as the foundation for NSW's action on climate change and goal to reach net zero emissions by 2050. It outlines the NSW Government's approach to balancing economic growth, creating jobs and helping to achieve the State's objective to deliver a 70% cut in emissions by 2035 compared to 2005 levels.

Priority 1 of the Net Zero Plan is to drive uptake of proven emissions reduction technologies. A primary contributor to this priority is supporting NSW's movement away from fossil fuel-based energy generation and committing to new forms of renewable energy generation. To do this, the NSW Government is fast-tracking the delivery of NSW's first Renewable Energy Zones (**REZs**). The REZs are to coordinate investment and support regions open to renewable energy industry. This will involve expanding transmission infrastructure into those regions to open new parts of the grid for renewable energy projects such as wind and solar farms.

The five zones in the Central-West, South-West, Illawarra, Hunter-Central Coast and New England will play a critical role in replacing retiring generators in NSW over the next two decades and bringing up to 17,700 megawatts of renewable energy into the grid.

The Site is located within the Central-West REZ, however, the Project will utilise existing transmission infrastructure rather than rely on new infrastructure delivered as part of EnergyConnect.

NSW Electricity Strategy

The NSW Electricity Strategy is the NSW Government's plan for a reliable, affordable and sustainable electricity future that supports a growing economy. The strategy encourages an estimated $8 billion of new private investment in NSW's electricity system over the next decade, including $5.6 billion in regional NSW. It will also support an estimated 1,200 jobs, mostly in regional NSW. The strategy aligns closely with the NSW Net Zero Plan.

The strategy supports the development of new transmission infrastructure to connect low-cost generation to the electricity system by developing REZs. The REZs will play a vital role in delivering affordable energy to help replace the state's existing power stations as they retire over the coming decades.

This translates into committed strategic planning for the area suitable for renewable energy, including securing access to transmission, holistic community engagement, and coordinating investment for infrastructure projects. It is therefore reasonable that the Site can leverage the resources and investment in the region and support the strategic priorities identified.

2.2.2. Central-West and Orana Regional Plan 2041

The *Central-West and Orana Regional Plan 2041* (Regional Plan) provides the overarching strategic plan for growth and change in the region. It is a 5-year plan with a 20-year vision that seeks to guide land use planning priorities and decision making in the Central-West and Orana region. It identifies key objectives for the region, aiming to secure its prosperity including leveraging the investment from major capital projects and supporting the State's transition to Net Zero by 2050.

The Regional Plan includes objectives and strategies for infrastructure and collaboration, liveability, productivity and sustainability. The following matters are relevant to the Project:

- *Objective 2: Support the State's transition to Net Zero by 2050 and deliver the Central-West Orana Renewable Energy Zone.*
  - By providing renewable energy supply into the State's electricity grid, the Project will directly contribute towards achieving this objective.

- *Objective 7: Plan for resilient places and communities.*
  - The Project will contribute to the energy supply of NSW, a key resilience action in preparation of the closure of fossil fuel based energy generation over the next decade. The Project is designed to be resilient to and manage potential climate shocks and stressors, through mitigation measures related to stormwater, bushfire and nature positive biodiversity outcomes on site. The resilience of the Stubbo and Gulgong community has also been taken into consideration, with key mitigation measures to minimise impacts on social infrastructure and local housing. The Applicant is also negotiating with Council to enter into a Planning Agreement for a community benefit sharing fund, so that monetary contributions can provide legacy positive outcomes for the community.

2.2.3. Our Place 2040 Mid-Western Regional Local Strategic Planning Statement

The *Mid-Western Regional Local Strategic Planning Statement* (**LSPS**) sets out the 20-year vision for land use planning within the local government authority to manage growth in the context of economic, social and environmental matters. The intent of the LSPS is to inform local strategic planning statements and local environmental plans, guiding the planning and support for growth and change across the district.

The LSPS contains strategic directions, planning priorities and actions that seek to implement the objectives and strategies within the Regional Plan at the district-level. The Structure Plan identifies the key centres, economic and employment locations, land release and urban renewal areas and existing and future transport infrastructure to deliver growth aspirations.

The planning priorities and actions likely to have implications for the Project are listed and discussed below:

- *Planning Priority 7: Support the attraction and retention of a diverse range of businesses and industries.*
  - The Project will contribute to the ongoing economic development within the Central Orana REZ and provide opportunity for local employment and secondary economic activity

2.2.4. Mid-Western Region Community Plan: Towards 2040

Developed in 2022, the *Mid-Western Region Community Plan: Towards 2040* outlines the development and community vision for the Mid-Western Region. It presents five themes to which the Mid-Western Regional Council would work towards achieving by 2040.

The Project is consistent with two of its themes:

- *Theme 2: Protecting our Natural Environment*
  - By increasing the production of renewable energy, the Project clearly aligns with this theme, particularly Goal 3.
- *Theme 3: Building a Strong Local Economy*
  - By leveraging the capital investment and employment opportunities, the Project aligns with this community theme.

2.3. THE SITE AND SURROUNDS

The Site is identified as 204 Jackson Lane Stubbo and is legally described as Lot 2 in Deposited Plan 528667 and Lot 2 in Deposited Plan 734669. The Site is located within the Mid-Western Regional Council local government area (**LGA**).

The key features of the Site are summarised in Table 3 which are illustrated in the Site photographs at Figure 3 and the aerial photograph at Figure 4. The regional context of the Site is shown in Figure 5.

Table 3 Key Features of Site and Locality

Descriptor	Site Details
Land Configuration	The total Site area is approximately 217 ha, while the development area/footprint would occupy 123 ha. The Site is irregular in shape, with a frontage of approximately 1.26km along Jacksons Lane on the southern boundary The Site is relatively flat, gently sloping towards Slapdash Creek in the south-east. The highest elevation of the subject area is approximately 440m above sea level near the Wallerawang Gwabegar Railway. The lowest elevation of the Site is approximately 420m adjacent to Slapdash Creek.
Land Ownership	The Site is in freehold ownership and the development area/footprint will be leased by the Applicant from the landowner for the life of the Project.
Existing Electrical Infrastructure	The Site is generally vacant agricultural land that has been used for grazing and cropping, and contains farm dams. A 66kV transmission line traverses the Site. The Project will connect to this line.
Local Context	The surrounding locality is described below: ▪ **North**: open grassland used for agriculture, predominantly clear of dense vegetation. ▪ **East**: Slapdash Creek adjoins the eastern boundary, flowing in a general north to south direction. Two properties are located adjacent to the southeast of the Site, known as 38 Jacksons Lane, and 491 Barneys Reef Road. The owners of these two properties have been key stakeholders during community engagement as documented in the Community Engagement Outcomes report. ▪ **South**: the Site is bounded by Jackson Lane to the south and open grassland used for agriculture purposes and is predominantly clear of native vegetation. ▪ **West**: the western boundary is defined by the Wallerawang Gwabegar Railway which historically connected Wallerawang to Gwabegar. Currently only a select number of stations remain operational and the railway line is active for freight purposes. ▪ Photographs of the surrounding land uses are provided as Figure 3**.**
Regional Context	The Site is located approximately 5km north of Gulgong, 30km north-east of Mudgee, and 220km west of Newcastle.

Descriptor	Site Details
Site Access	Site access is provided via Jackson Lane on the southern boundary of the site. Jacksons Lane, is a two-way, unsealed, unmarked, local road owned by Council.
Easements and Covenants	A transmission line and easement traverses the Site. ▪ V400583 – Easement for Transmission Line on Lot 2 of DP 734669. ▪ T976576 – Easement for Transmission Line affecting the part of the land within described shown 45 metres wide in DP631312.
Services	There are no identified services on Site.
Acid Sulphate Soils	The Site does not include land within the Acid Sulfate Soil Risk Mapping.
Contamination	No record of notice or list of notified sites are identified within the Site or in proximity to the Site. The soil assessment did not find any contamination as part of the previous agricultural activities.
Stormwater and Flooding	A flooding impact assessment has been undertaken as part of the Project and is included in Section 6. The assessment includes measures to minimise and mitigate potential flooding and stormwater impacts.
Bushfire Prone Land	The Site is not identified in the bushfire-prone land mapping. A bushfire threat assessment by AEP concluded that the Site is able achieve all the criteria outlined in the *Planning for Bushfire Protection 2019* Guidelines.
Flora and Fauna	The Site consists mainly of cleared land used for agriculture purposes with little dense vegetation. Scattered trees are primarily located along Slapdash Creek, the northern tributary and Jacksons Lane. Vegetation within the Subject Land was identified as PCT 201: *Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion* (Fuzzy Box Woodland). This PCT is associated with the *Biodiversity Conservation Act 2016* (**BC Act**) listed endangered ecological community (**EEC**): *Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions*.
Aboriginal Heritage	Aboriginal sensitive sites comprise artefact scatters located to the eastern edge of the Site, close to Slapdash Creek, and the isolated finds in the middle and to the west of the Site.

Descriptor	Site Details
European Heritage	There is no European or built heritage on the Site. Nor is the Site located within a conservation area. The closest heritage item is approximately 3.5km to the south-west of the Site.
National Parks	Approximately 10km to the north-west of the Site is Yarrobil National Park. Created in 2005, the park is made up of three disconnected areas totalling 1,846 ha.

Figure 3 Site Photographs

Picture 1 Westward view towards the Gwabegar Railway from within the Site.

Source: Urbis 2024

Picture 2 Transmission line traversing the Site.

Source: Urbis 2024

Picture 3 View eastward, taken from within the Site.

Source: Urbis 2024

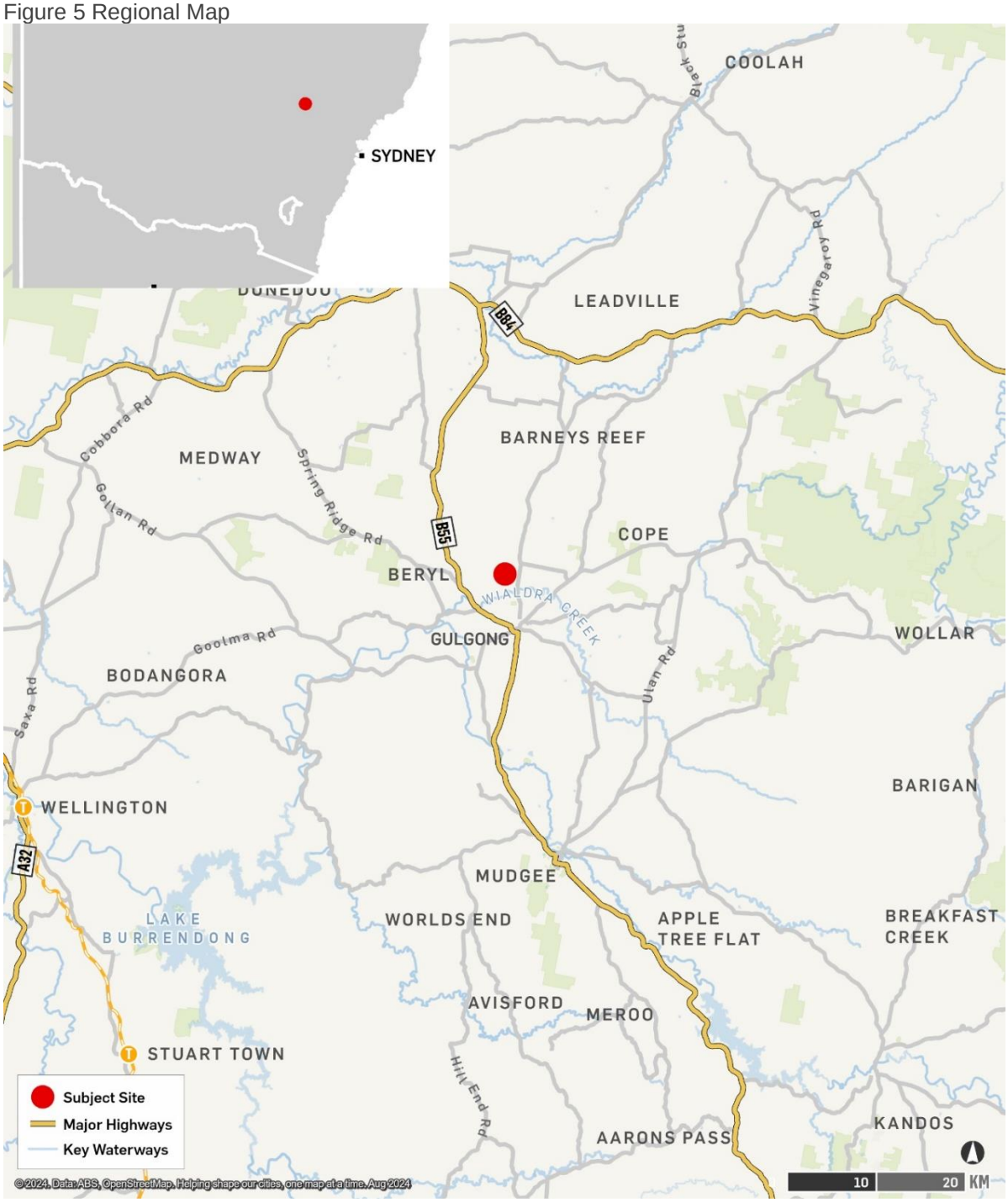
Picture 4 Existing eastern Site access from Jacksons Lane.

Source: Urbis 2024

Figure 4 The Site

Source: Urbis, 2024

Figure 5 Regional Map



Source: Urbis, 2024

2.4. NEARBY RENEWABLE ENERGY PROJECTS

The CWOREZ in which the Site is located has been attracting renewable energy and storage development proposals and investment since its creation by the NSW Government in 2021. The area was selected for a REZ due to a combination of environmental, infrastructure and economic factors, which makes it advantageous when considering its renewable energy resources including solar irradiance and wind power. As a result, local government and communities within the CWOREZ have been increasingly experiencing pressure on their local services, due to the cumulative impacts of the proposed developments in the region.

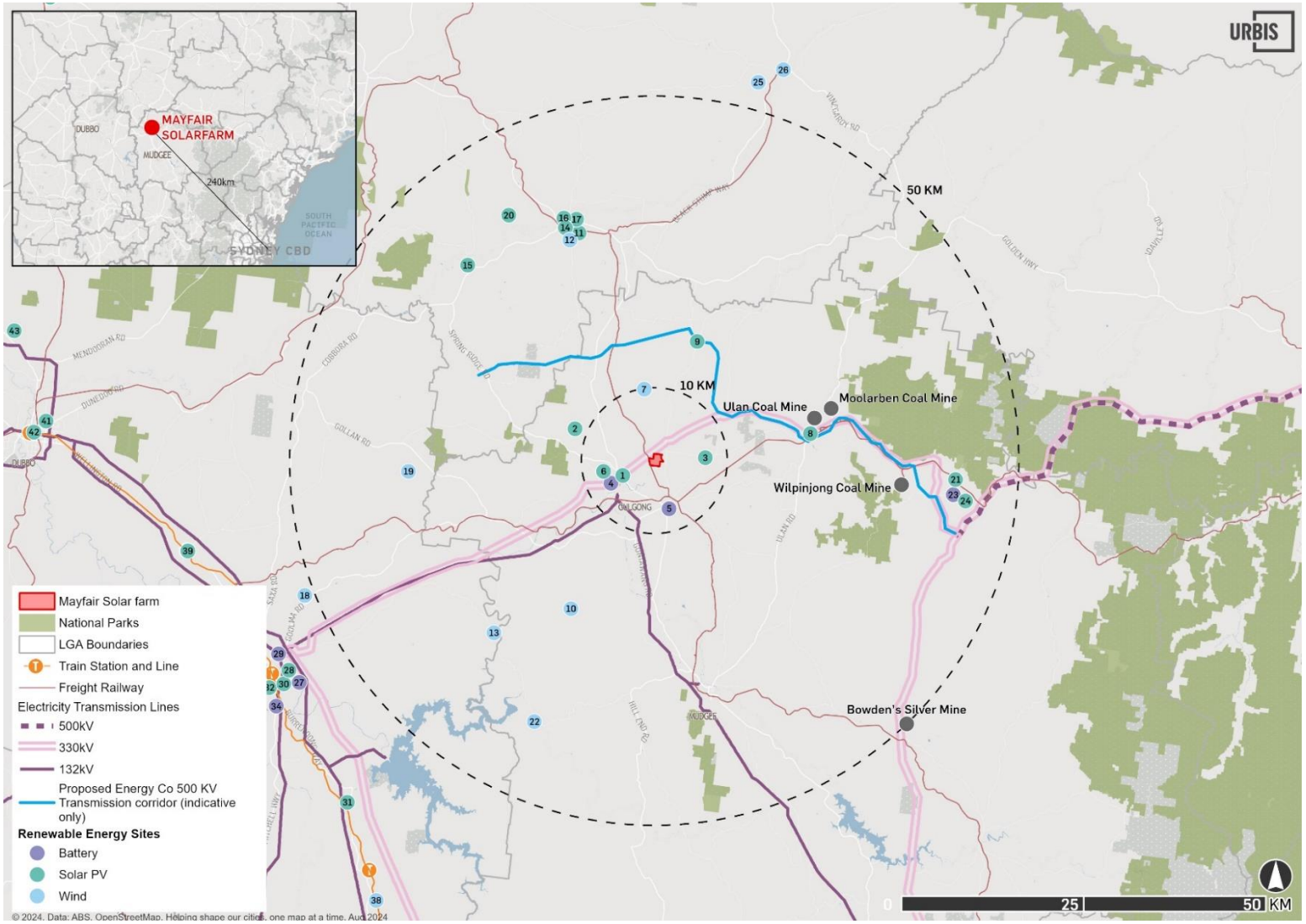
Approved and likely future developments which may be relevant in the cumulative impact assessment of the Project are summarised in Table 4 and Figure 6**.** A Cumulative Impact Assessment has been undertaken in Section 6.3.

Table 4 Approved and Likely Future State Significant Developments

ID	Project Name	Approximate Distance to Mayfair Solar Farm (km)	Status
1	Mavis Solar Farm	2	EIS Phase
2	Tallawang Solar Farm	2	Under Assessment
3	Stubbo Solar Farm	4	Under Construction
4	Bellambi Heights BESS	4	Approved
5	Beryl Battery Energy Storage System	7	EIS Phase
6	Beryl Solar Farm	7	Operational
7	Barneys Reef Wind Farm	9	Withdrawn
8	Ulan Solar Farm	13	EIS Phase
9	Narragamba Solar Farm	13	EIS Phase
10	Piambong Wind Farm	20	EIS Phase
11	Birriwa Solar Farm	20	Approved
12	Valley of the Winds	20	Under Assessment
13	Orana Wind Farm	21	EIS Phase
14	Uungula Wind Farm	22	Under construction
-	Ulan Coal Mine	22	Operational
-	Moolarben Coal Mine	23	Operational
15	Avonside Solar Farm	27	EIS Phase
16	Cobbora Solar Farm	28	EIS Phase
17	Dapper Solar Farm	30	EIS Phase

ID	Project Name	Approximate Distance to Mayfair Solar Farm (km)	Status
18	Sandy Creek Solar Farm	30	Response to Submissions
-	Wilpinjong Coal Mine	33	Operational
19	Bodangora Wind Farm	35	Operational
20	Spicers Creek Wind Farm	38	Under Assessment
21	Dunedoo Solar Farm	38	Approved
-	Central-West Orana Transmission line	40	Approved
22	Wollar Solar Farm	42	Under Construction
23	Burrendong Wind Farm	45	Response to Submissions
-	Yarrabin (Phoenix) Pumped Hydro	45	EIS Phase
-	Bowdens Silver	50	Under Construction

Figure 6 Nearby SSD Projects



Source: Urbis, 2024

The potential cumulative impacts of the Project are addressed in **Section 6.3** of this EIS in accordance with the NSW *Cumulative Impact Assessment Guidelines for State Significant Projects*.

2.5. AGREEMENTS WITH OTHER PARTIES

The SSDA and this EIS are accompanied by a Public Benefit offer of the Applicant which if accepted by the Council would result in the execution of a Planning Agreement between the Applicant and Council for the payment of annual contributions to a community benefit sharing scheme administered by Council.

The public benefit offer is seeking to deliver on the objectives of the draft *NSW Draft Energy Policy Framework Benefit Sharing Guidelines*, with a proposed benefit sharing rate of $850 per megawatt per annum paid over the life of the Project.

2.6. FEASIBLE ALTERNATIVES

Clause 192(c) of the *Environmental Planning and Assessment Regulation 2021* (**the Regulation**) requires an analysis of any feasible alternatives to the Project, including the consequences of not carrying out the Project.

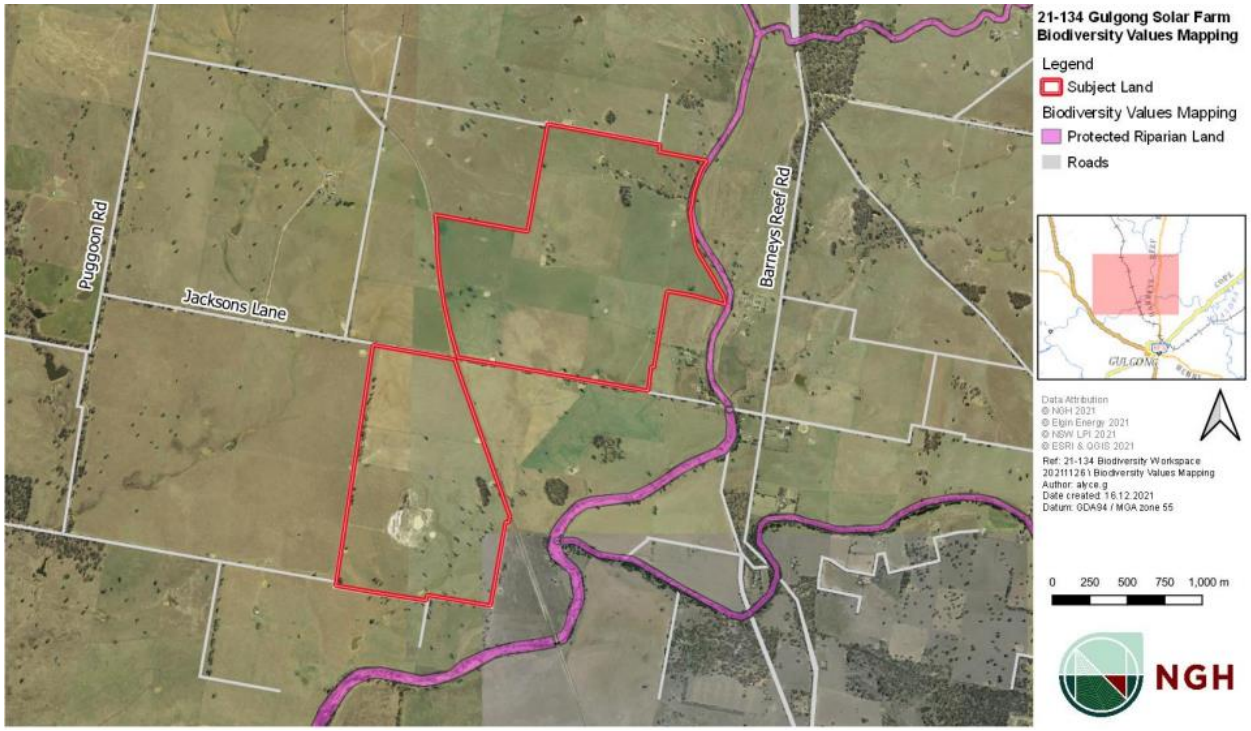
The Applicant identified several project alternatives which were considered in respect to the identified need for the Solar Farm. Each of these options is listed and discussed in the following table.

Table 5 Project Alternatives

Option	Assessment
Option 1 - Do nothing	The 'Do nothing' option would allow for the continued use of the Site for agricultural purposes. However, this would forgo the potential benefits of the Project. Considering the inexorable and potentially irreversible impacts that climate change would have on future land uses, biodiversity, and energy securities, among other effects; and the economic contributions to the region, it is considered that the benefits of the Project would constitute a significant overall net positive to the environment and the economy. Thus, the 'Do Nothing' approach is not deemed favourable.
Option 2 – Alternative site	The Applicant undertakes a detailed site suitability analysis and due diligence assessment to inform the selection of sites. This includes the use of GIS software and multi-criteria assessment (in accordance with the Large-Scale Solar Energy Guideline) to identify sites with high solar irradiance and minimal physical and environmental constraints. Several other sites were considered, however were considered unsuitable due to not satisfying criteria including: ▪ Topography. ▪ Biodiversity density and quality. ▪ Flooding. ▪ BSAL Land. ▪ Land size available. ▪ Proximity to existing electricity network with available capacity.

Option	Assessment
	▪ Proximity to dwellings and sensitive receivers. ▪ Suitable site access. The Project site was selected due to meeting the above criteria and allowing for a balanced approach to managing any identified potential constraints.
Option 3 – Alternative footprint; site comprised of northern and southern section	An alternative footprint included land to the south of Jacksons Lane. This option encompassed an area totalling 362ha in two sections. However, early findings from the preliminary biodiversity assessment, as well as logistical and planning constraints, concluded that this option would result in higher environmental and social impacts and was not pursued.
Option 4 – Alternative footprint; site comprised of northern section only, Development footprint closer to Barneys Reef Road.	The Site was reduced to the northern section only to limit potential impacts and maximise the distance between the Project and Gulgong (Figure 7). The Site included an arrangement of three distinct solar array areas (SAA) within the Site. This option avoided areas of high biodiversity values and drainage areas. However, this conceptual option was redesigned, and its SAA relocated to increase the distance to Barneys Reef Road and decrease potential sensitive receivers.
Option 5 –Workers' accommodation.	Multiple options for the provision of workers accommodation were investigated including short and long term accommodation options in nearby regional towns. Given the lack of secure and available accommodation within a 60km radius of the Site and Council's feedback, the option of on-site accommodation was explored and included within the proposal. The development footprint was modified to accommodate a site contained workers accommodation camp. This included measures for waste, water and electricity management as well as incorporating the accommodation into the transport and construction management plans.
Option 6 – Site Access	The upgrade of Jacksons Lane is required to facilitate the Project. An initial investigation was to seal the road and retain the existing lane width but provide passing bays, which would minimise impacts on existing vegetation adjacent to the road reserve. After careful transport assessment considerations and discussions with Council, it was concluded that the current road width would not be sufficient and that Jacksons Lane would need to be widened to 8 metres along Jacksons Lane, and the upgrading of the existing crossing over Slapdash Creek to a 9.5-metre wide culvert.
Option 7 – Increased BESS Capacity	The Project BESS capacity was doubled due to the selection of an improved battery technology. This change did not impact the Project boundary nor the environmental impacts of the Project, while leveraging its benefits and objectives.

Figure 7 Originally Inspected Areas



Source: NGH, 2021

3. PROJECT DESCRIPTION

The following sections of the EIS summarise the key numeric components of the Project and describe the Site preparation, construction and operational phases in further detail.

3.1. PROJECT OVERVIEW

The key components of the Project are summarised in **Section 3.2**. A copy of the detailed plans is provided in **Appendix B**.

Table 6 Project Details

Descriptor	**Project Details**
Project Description and Capacity	The Project is a solar farm and battery energy storage system with a capacity of approximately 60 MWac and a hybrid battery energy storage system of approximately 60MW capacity and 240MWh (four hours) storage. Approximately 113,640 panels will be installed to generate the proposed capacity. Associated infrastructure to be constructed as part of the Project includes a substation to connect the Project to the electricity network, all associated power conversion equipment such as inverters and transformers and internal access tracks
Project Area/Footprint	The Site has a total area of 217 hectares with a development area/footprint of 123 ha.
Site Description	Lot 2 in DP 528667 and Lot 2 in DP 734669, and part of Jacksons Lane.
Site Access	Jacksons Lane
Connection Point	Connection to the existing 66kV line traversing the Site
Associated Infrastructure	Installation of a 33/66kV substation, power conversion equipment including inverters and transformers connected via underground medium to low voltage transmission cables
Minor Ancillary Infrastructure	Ancillary development required to construct and operate the Project includes internal access tracks, security fencing and lighting, operations and maintenance buildings, operational vehicle access points, water tanks, stormwater retention works, landscaping.
Hours of Operation	24 hours a day, seven days a week
Estimated Development Costs (**EDC**)	$207,635,086 excluding GST
Construction Staging	The Project will be constructed in a single stage
Construction Period	Approximately twelve months
Operational Lifespan	Up to forty years

Descriptor	Project Details
Jobs	Construction: Approximately 150 full-time equivalent jobs at peak construction period. Operation: Up to three full-time equivalent jobs.

3.2. DETAILED DESCRIPTION

3.2.1. Physical Layout and Design

The Project includes the following components:

- Ground mounted PV modules, mounted on single axis tracking systems with a maximum height up to 3.5 metres above ground.
- A series of PCU/inverters, with underground cabling connecting each PCU to the on-site substation.
- A hybrid BESS with approximately 60MW capacity and 240MWh (four hours) storage. The BESS would be in containerised modules adjacent to the on-site substation and cover approximately 1.6 ha.
- An on-site 33/66kV substation to connect the Project to the distribution network via an existing overhead 66kV powerline.
- Upgrade and sealing of Jacksons Lane from Barney's Reef Road to the eastern most site access (approximately 1km), including replacement of the existing vehicle crossing over Slapdash Creek with a new culvert.
- Permanent supporting infrastructure including:
  - Internal access tracks.
  - Security fencing and lighting.
  - Operations and maintenance buildings.
  - Operational vehicle access points.
  - Two 45,000 litres water tanks.
  - Stormwater detention works.
  - Landscaping.
- Temporary construction facilities may include:
  - Construction compound.
  - Laydown area.
  - Construction materials storage.
  - Site office buildings, amenities and temporary workforce accommodation camp.
- The temporary workforce accommodation camp, with a capacity of up to 150 workers, will include:
  - Demountable, single-storey, two or four person demountable air-conditioned buildings.
  - Various single-storey buildings for supporting.
  - Temporary on-site utilities.
  - Car parking.

No works are proposed within 25 metres of the freight railway corridor. Following consultation with adjoining landowners, there are exclusion areas that include a 500-metres radius from neighbour properties. There are also extensive exclusion zones avoiding existing biodiversity values on-site. The combined exclusion areas total approximately 93 hectares.

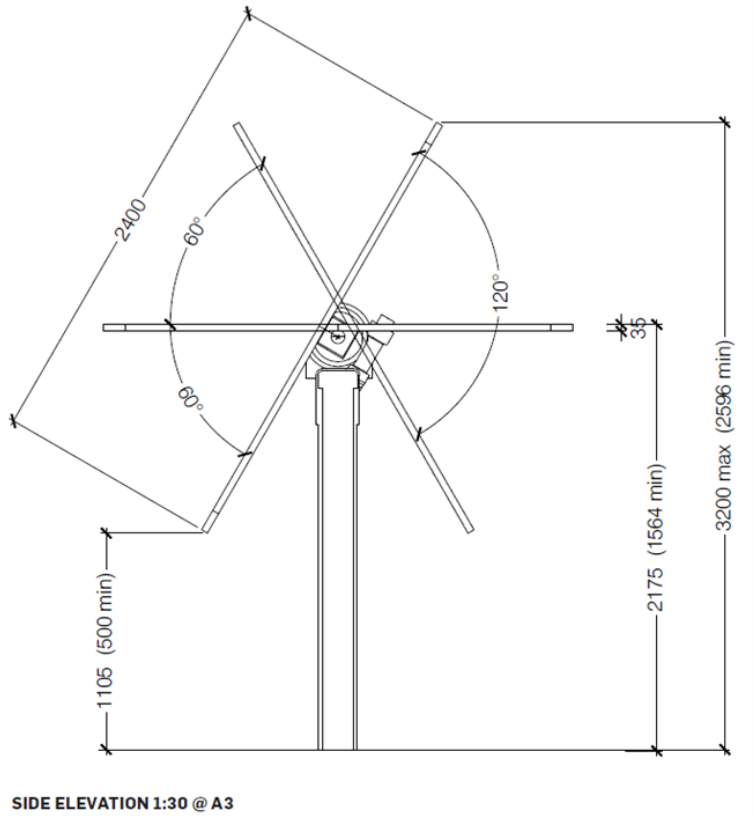
The final layout and design of the temporary workforce accommodation camp is subject to detailed design by an engineering, procurement and construction (**EPC**) contractor. This would be submitted to the Planning Secretary prior to construction in accordance with a condition of consent.

3.2.2. Solar Arrays

The development footprint/area of approximately 123 hectares will contain approximately 113,640 solar panels installed on the mounting system in an array of interconnected 'strings'. The solar panels will use industry standard technology; smooth glass with anti-reflective coating module technology. A solar panel is approximately 2.4 metres-long and 1.4 metres wide. The spacing between panel strings would be a minimum of 2.62 metres. Panels are likely to have a capacity of approximately 670W per panel, whose overall voltage would be adequate for the operating input voltage of the inverters and may be mono or bi-facial, however this is subject to the technology available at the time of procurement.

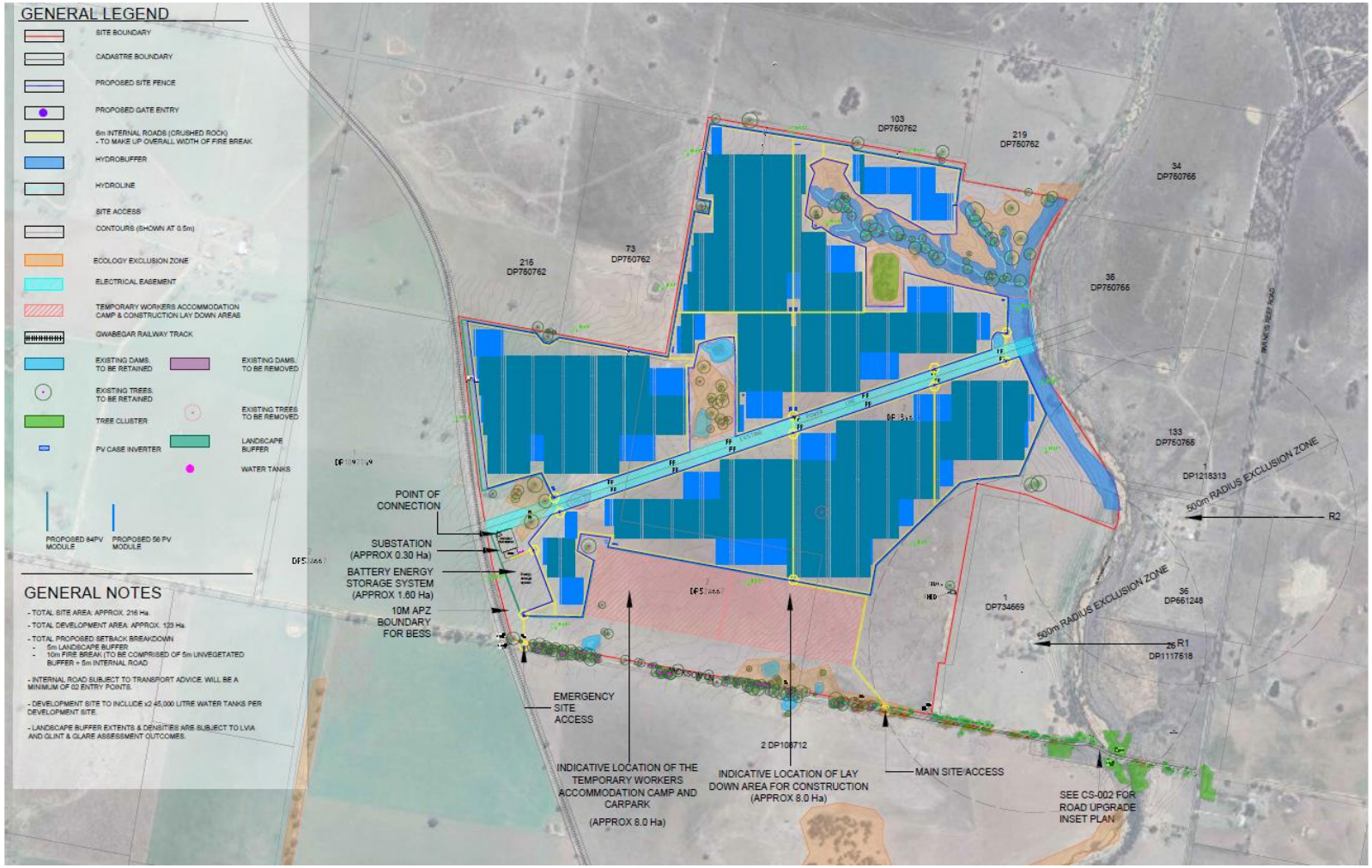
The panels will be mounted on single axis tracking technology, holding the panels in a portrait orientation. Piles will be screwed or driven into the ground to support the solar array's mounting system and solar panels.

Figure 8 Example of a PV Module on a Single-axis Tracker



Source: Elgin, 2024

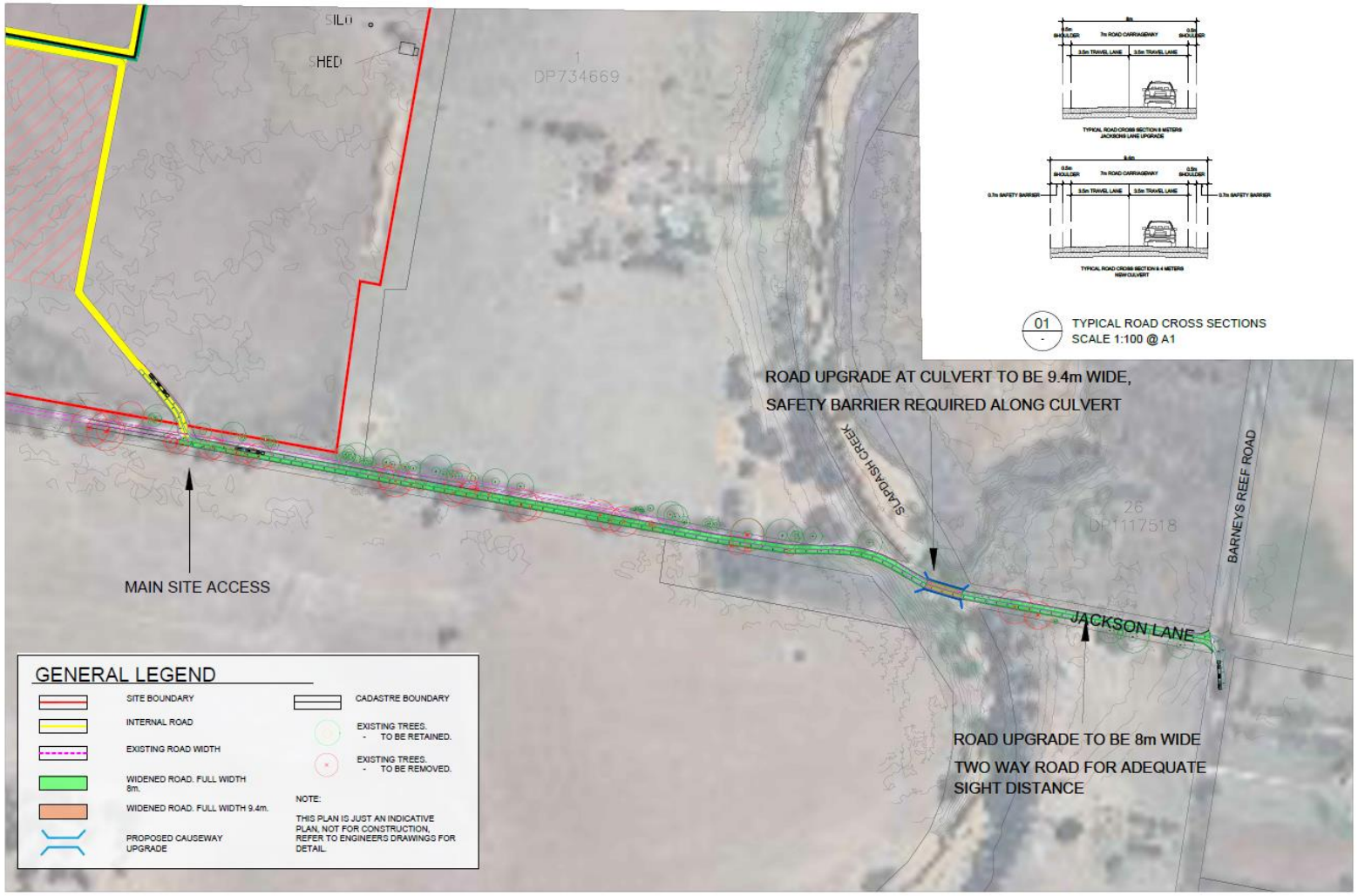
Figure 9 Project Layout



*The Site Boundary (shown in red) indicated on the Site Plan is aligned to the surveyed site boundary in Appendix X. As such, there is a minor misalignment with the cadastre line (light grey). All proposed development falls within the surveyed site boundary.

Source: Urbis, 2024

Figure 10 Project Layout – Jacksons Lane Detail



Source: Urbis, 2024

3.2.3. Power Conversion Units and Cabling

There will be eighteen PCUs arranged throughout the solar array to convert the direct DC electricity output from the panels to AC electricity and transform the voltage to the collection system voltage. Each PCU contains one inverter, one transformer and the associated control equipment. The size of each PCU is 6.058m long x 2.438m wide x 2.896m high, which will be mounted on a concrete slab or steel piles. Five of the proposed eighteen PCUs will include silencers to mitigate noise impacts. Refer to Section 6.1.6.4 in relation to proposed mitigation measures.

It will be necessary to utilise underground cabling to connect the PV arrays, PCUs and other infrastructure. While the layout of the electrical cabling will be subject to detailed design all underground cabling will be designed in accordance with the relevant Australian and international standards and the manufacturer's specifications. The cabling will be installed over a sand bed, covered with a layer of sand and then backfilled with fill obtained on-site, all-in trenches which are approximately 0.6 metres wide and 0.8 metres deep.

3.2.4. Battery Energy Storage System

The proposed BESS will be in the south-western corner of the Site. The Project includes a series of enclosed BESS in containers, which will be manufactured off-site before being installed on-site. The BESS will consist of up to 54 containers each with a capacity of 5.015MWh and standing at 6.058m long x 2.438m wide x 2.896m high. The final arrangement of the proposed BESS will be confirmed during the detailed design phase and submitted to the Planning Secretary prior to construction in accordance with conditions of consent.

Figure 11 Example of a BESS

Source: Hithium, 2024

3.2.5. Substation and Network Connection

The Project will be connected to the electrical grid via the existing 66kV transmission line which traverses the Site removing a need to construct new/additional infrastructure for electrical grid connection and avoiding potential environmental impacts.

As indicated in Figure 9 , a 33/66kV substation will be located along the western edge of the Site just north of the proposed BESS and adjacent to the point of connection to the existing 66kV transmission line. The substation will be in a compound approximately 0.30ha in size and feature a busbar, circuit breakers, current transformers, voltage transformers, switchgear/electrical protection, and a 33/66kV step up transformer. The substation will also be surrounded by security fencing to restrict access and vegetation will be planted in accordance with the landscaping plan to provide a visual screen.

3.2.6. Site Access/Jacksons Lane Upgrade

The upgrade of Jacksons Lane is required for construction and operation access (Figure 9). The proposed upgrading will comprise of:

- The widening and sealing of Jacksons Lane to 8m width (7m carriage), allowing for two-way access between Barneys Reef Road and the primary site access in the south-eastern corner of the Site (approximately 1km west of Barneys Reef Road).
- The upgrading of the existing causeway crossing of Slapdash Creek to a 9.4m wide culvert.
- The upgrade of Jacksons Lane will involve the removal of existing trees and earthworks. The final layout is subject to detailed design.

Jacksons Lane is a Council-owned road and Council's consent as landowner is enclosed as Appendix T.

3.2.7. Temporary Workforce Accommodation

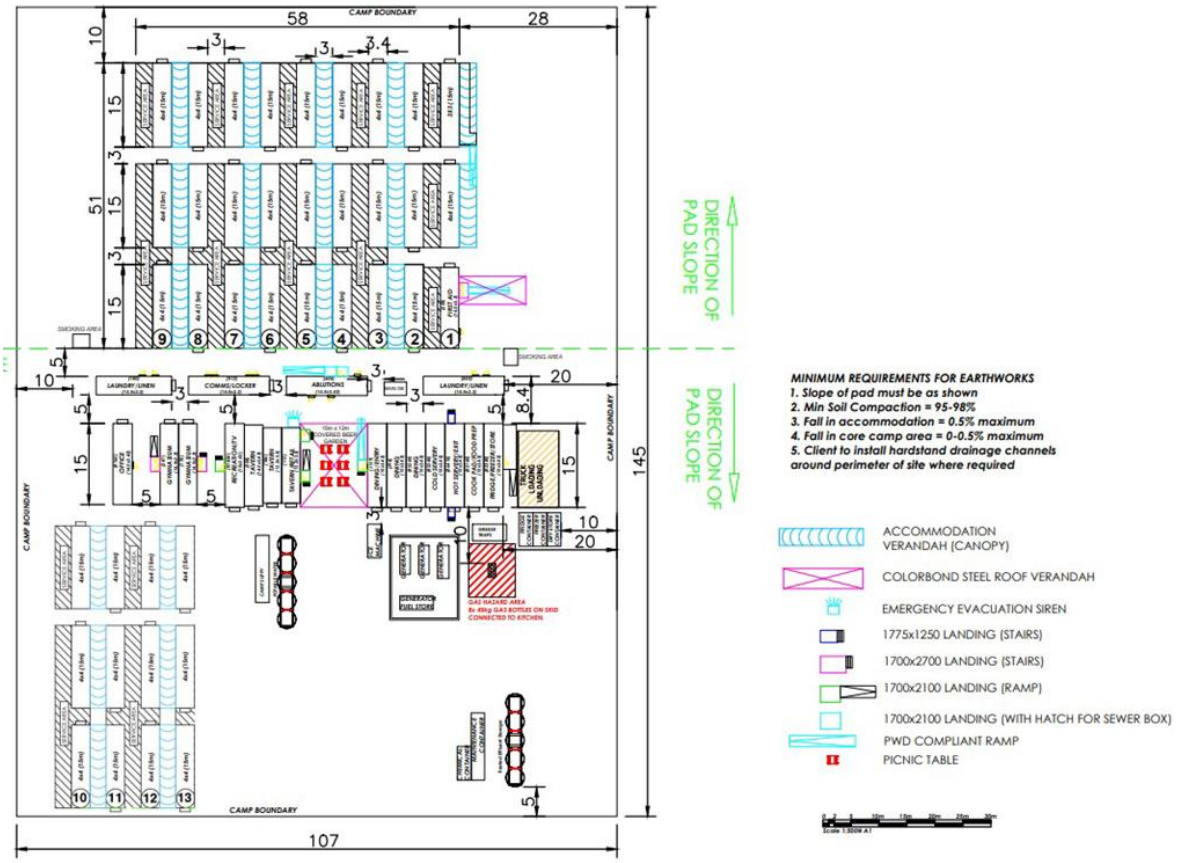
Following consultation with Council options for temporary workforce accommodation were explored. An on-site temporary workforce accommodation camp is proposed in the south-west portion of the Site. The temporary worker's camp will include:

- Demountable, single-storey, two or four person air-conditioned accommodation buildings.
- Various single-storey buildings for supporting facilities.
- Utilities (potable water, on-site wastewater treatment, electricity, gas, fuel storage, emergency generators, and waste disposal).
- Communications services including phone and internet.
- Car park.

The temporary workforce accommodation camp would be managed by an experienced operator engaged by the EPC contractor. Subject to various selection criteria including reliability, quality and financial competitiveness, local businesses could be engaged where possible to service the temporary workforce accommodation camp. This would typically include maintenance, laundry, cleaning, catering, waste management, transport, a medical practitioner, and security services. The indicative temporary workforce accommodation camp layout is shown in Figure 12. The EPC contractor would submit the final detailed design to the Planning Secretary prior to construction in accordance with a condition of consent.

The Applicant is aware that multiple renewable energy projects are anticipated to be constructed in the area in a similar timeframe. Should an opportunity arise to co-locate or utilise temporary accommodation off-site, the Applicant will explore the suitability of this option in the future. This will be addressed in consultation with all relevant stakeholders and address any potential environmental impacts and planning approvals that may be required at that time.

Figure 12 Indicative Temporary Workforce Accommodation Camp Layout



Source: Accent Environmental, 2024

3.2.8. Access and Internal Tracks

A series of wide internal access tracks will be constructed within the Site to allow for access throughout the construction and operational phases of the Project. The internal road will have a minimum of two entry points and will be 6 m wide to make up the overall width of the fire break, in line with NSW Rural Fire Service requirements. Internal access tracks will be constructed using crushed rock and will be designed to ensure that they are capable of accommodating construction vehicles and fully loaded firefighting vehicles and appliances.

3.2.9. Landscaping

The Project layout includes buffer zones and landscaping. These extents and densities are subject to LVIA and Glint and Glare assessment outcomes. Screening vegetation is contemplated around all perimeters. The low-profile form of most of the Project, primarily the solar array, which is approximately 3.2 m in height at full tilt, will ensure that planting will be able to provide screening within a five-year period (Figure 13).

The Landscaping Typologies will vary according to the sensitivity of the receiver areas. Higher sensitive areas are proposed to have denser planting typologies to enhance amelioration. The planting typologies will be 5 metres wide and only use native species (Appendix J). Further information is provided in **Section 6.1.12**.

Prior to commencing construction of the Project, the Applicant will prepare an Accommodation Camp Management Plan in consultation with Council. The plan will ensure utilities at the accommodation camp, including water, wastewater, waste and electricity, are designed and located in accordance with Council specifications and relevant standards; include measures for dust suppression within the accommodation camp; provide the Site layout including building locations, vehicle access and movement, servicing and utilities infrastructure; and include measures to support local suppliers in servicing the camp where possible.

Figure 13 Proposed Landscape Plan

Source: Urbis, 2024

3.2.10. Construction Compound

Ancillary facilities include:

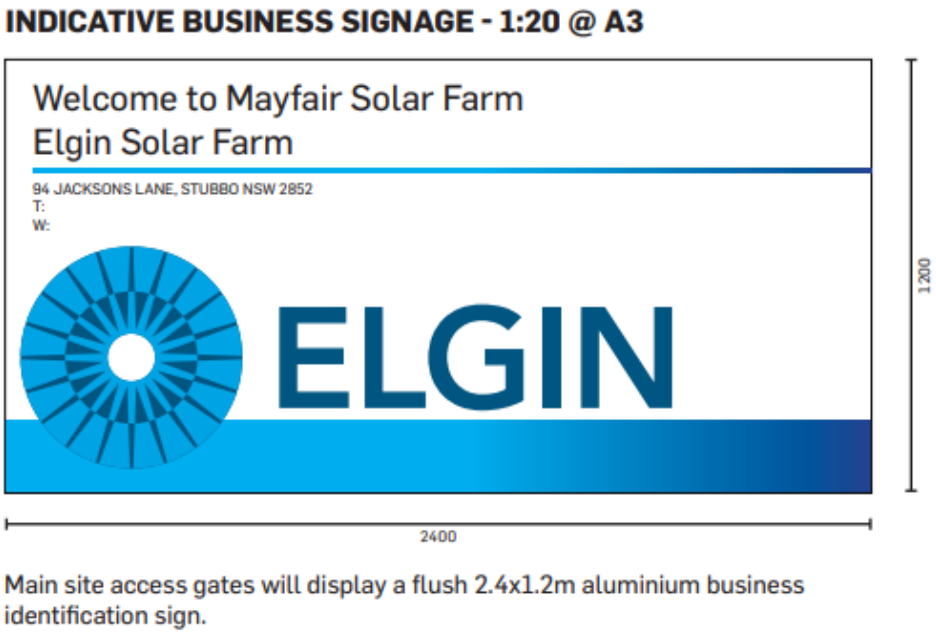
- Material laydown areas.
- Temporary construction site offices.
- Vehicle parking areas for construction workers' transportation, staff and visitors.

3.2.11. Security Fencing and Signage

The Site's perimeter will be fenced with chain link security fencing up to 3m high. Double gates are to be installed at the Site's access point along Jackson's Lane.

The Project also includes signage associated with the Site's identification. The proposed identification signage will be located adjacent to the primary site access on Jacksons Lane.

Figure 14 Proposed Signage



Source: Urbis, 2024

3.2.12. Uses and Activities

3.2.12.1. Solar Farm

The Project will operate 24-hours a day, seven days a week. This allows for the critical operations and generation and storage of electricity. The Project is anticipated to have an operational life of 40 years and create between up to three full-time equivalent employment opportunities. Operational activities will primarily comprise of routine operations and maintenance including:

- Routine visual inspections, general maintenance and cleaning operations of the solar arrays.
- Vegetation management growth beneath panels through maintaining sheep on-site.
- Site security.
- Replacement of equipment and infrastructure as required.
- It is likely that during operation, there will be no vehicles permanently present on the Site. Only occasional visits by standard light vehicles for maintenance will be required.
- Maintenance operations will be undertaken during the standard work hours listed below, unless emergency works are urgently required.

3.2.13. Construction

3.2.13.1. Earthworks

Some minor grading works will be required within the Site for installation of the solar panels and the associated infrastructure. The solar trackers can only tolerate gentle slopes and therefore some site preparation and earthworks are required. Ground disturbance would be minimal and limited to:

- Removal of topsoil across the Site.
- Sedimentation and erosion control.
- Grass slashing, and removal of rock and timber debris as required in preparation for construction.
- The installation of the piles supporting the solar panels, which would be driven or screwed into the ground to a depth of approximately 1.5m.
- Construction of internal access tracks.
- Concrete foundations for the inverter stations, BESS, substation etc.
- Trenches for the installation of cables.
- Minor benching for the temporary workers accommodation, staff amenities and offices during the construction phase (assumptions are approximately 0.1m uplift from existing levels, however this is subject to detailed design prior to construction, in accordance with a condition of consent).
- Construction laydown area.
- Construction of security fencing lining the perimeter.
- Upgrade of Jacksons Lane.

3.2.13.2. Stormwater Management

A Flood Risk and Impact Assessment has been prepared to inform this EIS. To avoid adverse impacts onto the local catchment area, the Project is proposing a swale to manage surface water runoff associated with the temporary workforce accommodation camp.

The swale is to be located along the southern boundary of the workforce accommodation camp, approximately 7.5m in width and 0.5m in depth. The detailed design of the swale will be resolved in association with the temporary workforce accommodation camp and submitted to the Planning Secretary prior to construction, in accordance with a condition of consent. Refer to Section 6.1.8 for further information.

3.2.13.3. Tree Removal and Retention

Installation of the solar arrays and associated infrastructure will result in the removal of some native vegetation as shown in Table 7 below.

Table 7 Vegetation Removal

Direct impact	Project phase/timing of impact	Extent (ha)
Removal of 0.90ha of PCT 201 – Moderate	Construction	0.90ha
Removal of 0.46ha PCT 201 – Severely Degraded	Construction	0.56ha
Removal of four (4) scattered trees.	Construction	4 trees (0.14ha)

Source: AEP, 2024

The Site Design Layout Plan (Appendix B) provides ecology exclusion areas to minimise removal of native vegetation. Conservation and revegetation works will deliver a nature-positive outcome from the Project as Biodiversity Management Plan (**BMP**) lands, also known as Vegetation Management Plan (**VMP**) lands (Figure 15).

3.2.13.4. Development Sequencing

This Project is the be constructed in a single construction phase. Subject to environmental approvals and licensing and finalisation of the Project design following determination of the SSDA, the construction program is anticipated to occur over an approximate twelve-month period, with peak construction occurring over four months.

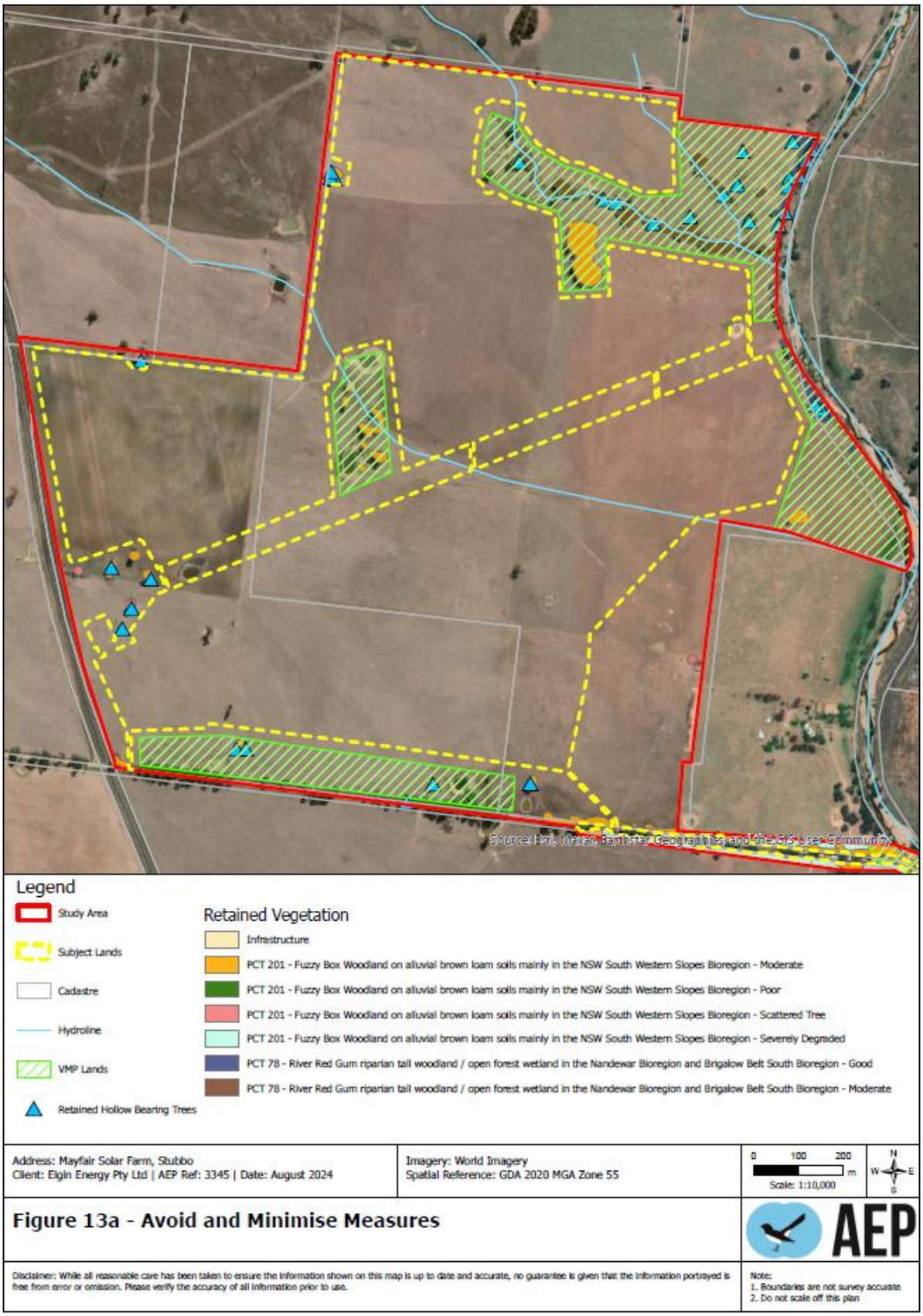
3.2.13.5. Construction Activities

The construction and commissioning phase will last approximately twelve months with the intention to commence construction in the second quarter of 2026 and have project energisation by the third quarter of 2027. A CEMP will detail the construction phasing across the Site.

The main activities of this phase include:

- The establishment of exclusion zones around ecologically sensitive land.
- Transportation of construction materials to the Site on a regular basis. Volumes are dependent on construction schedule.
- Establishing works including vegetation clearing, minor earthworks, construction of a temporary construction compound.
- Installation of steel post and rail foundation system for the solar panels.
- Installation of underground cabling (trenching) and installation of inverter stations.
- Construction of the substation, and switching station to facilitate interconnection with the 66kV transmission line which traverses the Site.
- Removal of temporary construction facilities and rehabilitation of disturbed areas.

Figure 15 Avoid and Minimise Measures – Areas Subject to Conservation Efforts.



Source: AEP, 2024

3.2.13.6. Water and Waste Water

Water utilised during construction will be limited to that required for dust mitigation and/or moisture conditioning of material in addition to potable supply for the construction personnel in the workforce accommodation camp. Water tanks will be installed to collect water for construction purposes only and this is to be incorporated into a Construction Stormwater Management Plan to be prepared post approval as a condition of consent.

Potable water will be trucked to the Project by a suitable contractor. The Applicant has identified an independent contractor in Dubbo to source potable water from the Cooreena Road Water filling station and deliver it to the Project to support the temporary workforce accommodation camp.

Given that the site is considered *Groundwater Vulnerable* under the MWR LEP, this was considered the preferred option, as it will avoid reliance on the groundwater system and groundwater-dependent ecosystem.

Water utilised during the operation of the Project will be limited to dust mitigation, maintenance and fire management. Storage tanks will be located on site for this purpose.

Sewage is proposed to be collected in portable toilets and small portable sewage treatment tanks. The sewage and other nightsoil will be collected by truck every week and treated offsite. The Applicant has contacted two independent contractors, who have identified there is capacity to collect the sewage quantities produced by the temporary workforce accommodation and dispose at the Dubbo Treatment Plant.

3.2.13.7. Hours of Construction

Works are to be undertaken during standard working hours:

- Monday to Friday: 7am – 6pm.
- Saturdays: 8am – 1pm.

Out of hours or night works are not anticipated; although this excludes emergency works. In the instance works need to be undertake outside of the above-described hours, the relevant authorities would be consulted, and neighbouring residents would be notified.

3.2.13.8. Personnel

It is estimated that up to 150 construction personnel would be required on-site during the peak construction period. As far as practicable, the construction workforce would be sourced from the local area. However, the Project proposes the provision of on-site temporary workers' camp to accommodate 150 workers from outside the local area as required. Council and local business owners will be consulted throughout the development and assessment of the Project regarding managing potential impacts and opportunities for the accommodation of the Project's construction workforce.

During the construction phase, to reduce vehicle congestion on public roads to and from the worksite, personnel will be accommodated in temporary construction workers accommodation. Workers staying in the workers accommodation will use the designated carpark located within the camp. It is anticipated that most of the workforce will utilise cars for weekend travel to and from the Site. Workers who commute from surrounding towns will be strongly encouraged to participate in carpooling arrangements.

Any potential cumulative impacts on accommodation, infrastructure, and services are considered as part of the social impact assessment in Section 6.

3.2.13.9. Materials and Equipment

The following materials will be transported to the Site (quantities are approximate only and subject to final design):

- 54 containerised BESS units.
- 36 power conversion units.

- 33/66kV substation.
- 113,640 PV panels.
- 2,088 single axis tracking systems.
- 46,500m^2 gravel for access tracks.
- 3,000m^3 of sand for inverter stations and burying of cables into trenches.
- 9,470 direct drive pile ramming for PV panels structures.
- 6,000 metres of underground cabling connecting each PCU to on-site substation.
- 10,500 metres of security fencing.
- Twenty trucks' worth of concrete for the inverters, substation, and maintenance building foundations.
- Drinking water stored using a suitable food grade water-tank.
- 8,000m^2 for upgrade and sealing of the existing vehicle pavement to Jacksons Lane.
- 640m^2 for upgrade to concrete causeway to Jacksons Lane.
- Equipment used during construction including earth-moving equipment for civil works, diesel generators, trucks, cranes and a pile driving machine.

3.2.13.10. Transportation of Materials and Equipment

Any traffic generated by the Project is anticipated to be concentrated in the construction phase, associated with material deliveries, trade persons and staff. Access to the Site is to be from the identified access point along Jacksons Lane.

Several construction vehicles will be required to transport bulkier items such as solar panels, battery systems and substation components. There are four categories of vehicles identified to be used for the construction of the Project:

- B-Doubles: These will transport large plant materials such as battery packs and transformers.
- Construction Vehicles: These will serve both to deliver materials and for general construction activities on-site. These will include HRVs and AVs.
- Medium and Heavy Rigid Trucks: These will be utilised for delivering raw materials and smaller plant materials, waste collection and foundation laying.
- Light Vehicles: This category includes cars and light commercial vehicles. These vehicles will be used for personnel movement, including construction personnel, subcontractors and escort vehicles.

The materials required would arrive at Port Botany (Sydney) or the Port of Newcastle. Some improvements to the local road network including Jacksons Lane and its culvert, will be needed to accommodate B-Double vehicles to access the Site. As such, two potential transport access routes are proposed; this is further discussed in Section 6 below. The nominated routes are compatible with B-Double vehicles and there will be adequate turning areas on-site for vehicle movement.

3.2.13.11. Vehicular Movements

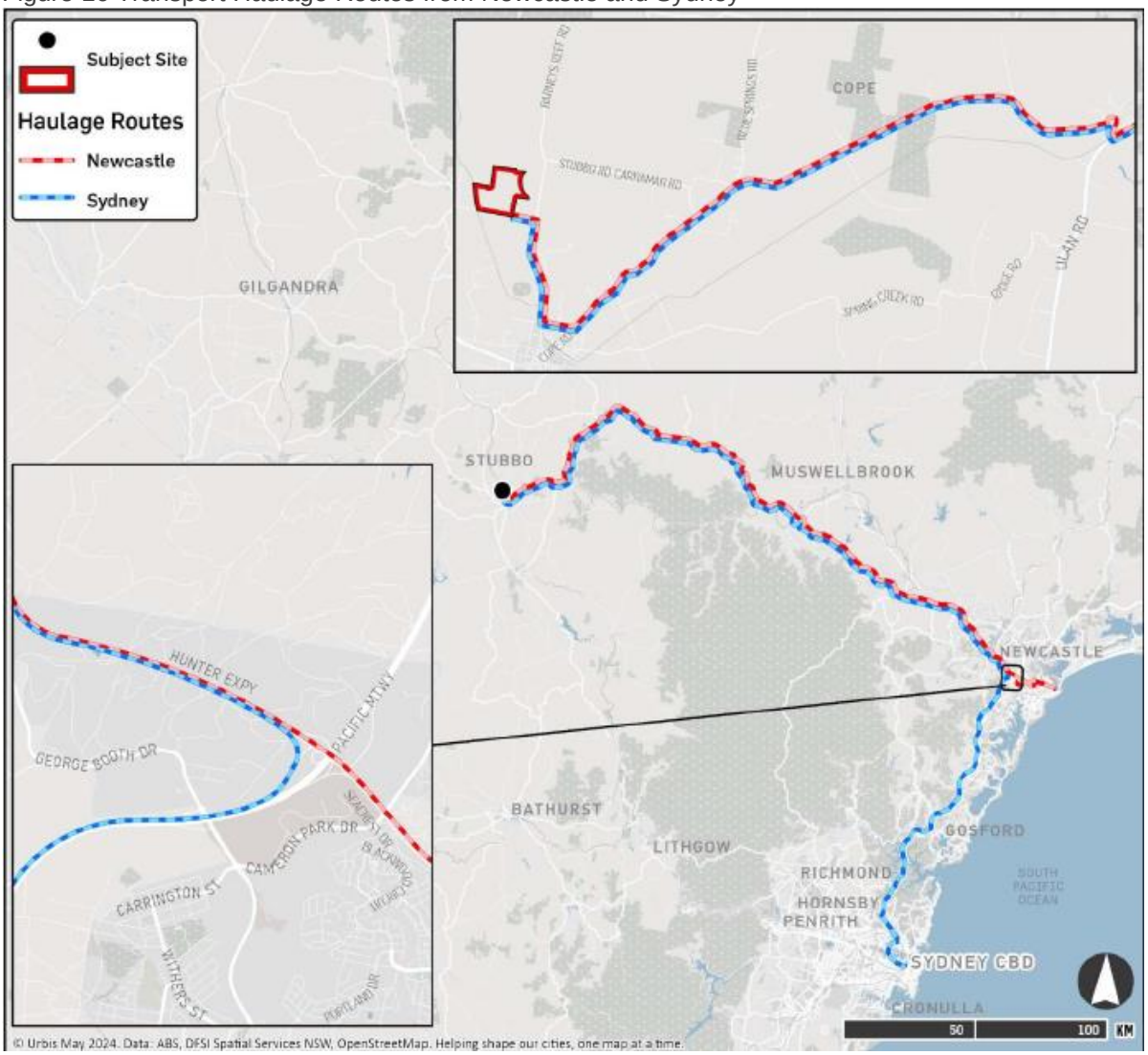
During the peak construction phase, the predicted construction vehicular movements generated by the Project are as follows:

- Daily traffic – Sixty construction vehicles per day.
- Peak hour traffic – Fifteen construction vehicles per hour.

The following in and out splits are adopted for the AM and PM peak hours:

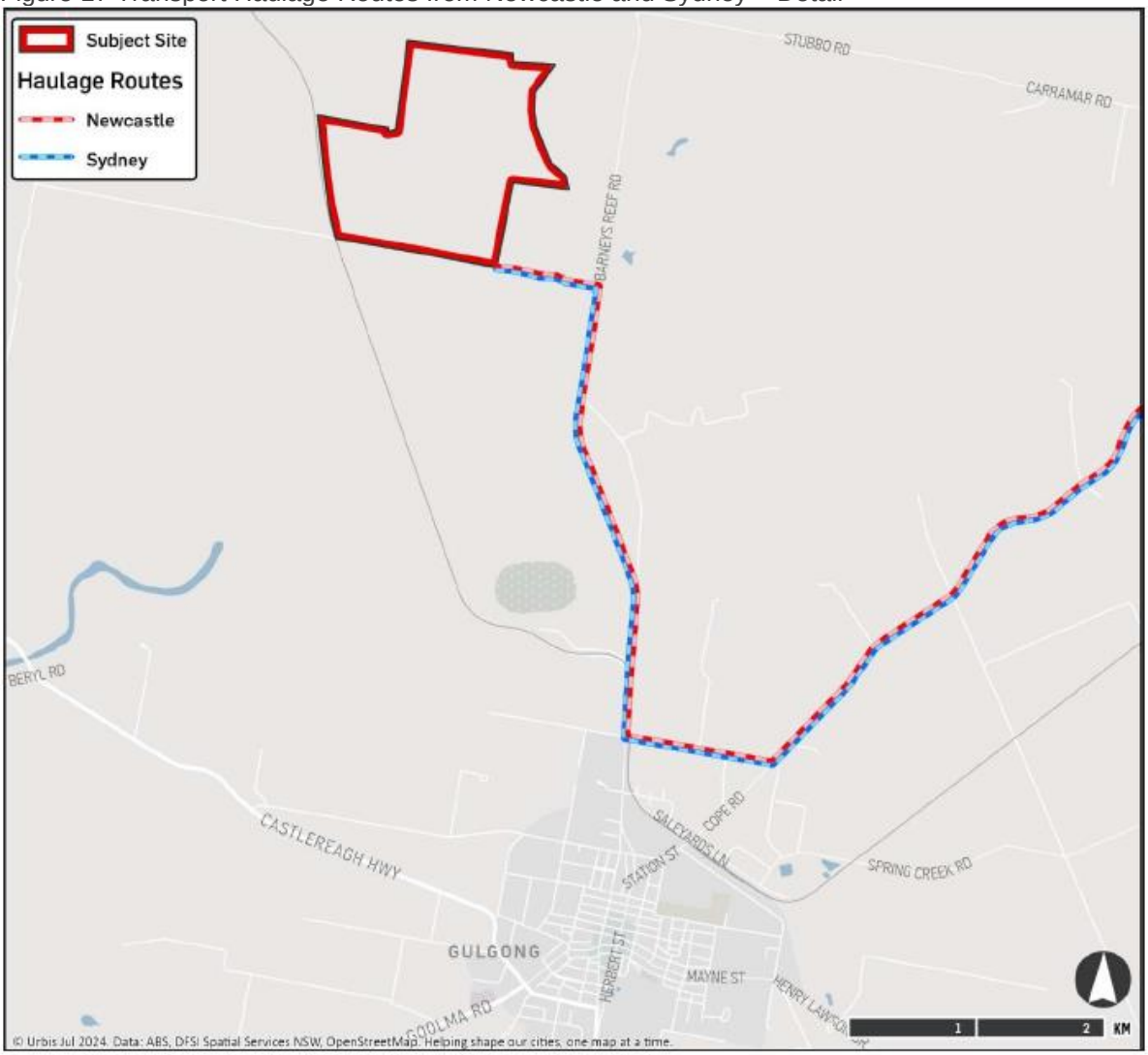
- AM – 80% In / 20% Out.
- PM – 20% In / 80% Out.

Figure 16 Transport Haulage Routes from Newcastle and Sydney



Source: Urbis, 2024

Figure 17 Transport Haulage Routes from Newcastle and Sydney – Detail



Source: Urbis, 2024

Table 8 Anticipated Construction Vehicle Volumes Throughout the Construction Stage

Vehicle type	**Average Vehicle movement**		**Peak vehicle times**	
	Daily (vpd)	Peak hour (vph)	Daily (vpd)	Peak hour (vph)
HRV / HRV	5	1	13	3
AV / B-Double	20	4	47	12
Total	25	5	60	15

Source: Urbis, 2024

For a conservative assessment, it is assumed that the staff travelling by car will arrive and depart from the Site during peak hours and will coincide with the construction vehicle traffic. Notably, the traffic generation is identical from Tuesday to Thursday. This is expected to be the typical traffic scenario for most work days.

These assumptions have helped create three scenarios of anticipated traffic generation during the peak construction stage. Out of the 150 staff, it is assumed that 10% will be local (i.e. within thirty minutes driving catchment). Therefore, it is assumed that fifteen construction staff will be travelling by

private vehicles to and from the Site during the peak periods. Some workers may stay over the weekend instead of going home and it is assumed that 5% of the non-local workers will do this.

These scenarios are summarised in Table 9 below.

Table 9 Typical Staff Traffic Volume During a Week (Peak Construction Period)

Scenario	**Sun**	**Mon**		**Tue**		**Wed**		**Thu**		**Fri**		**Sat**
	In	In	Out	In	Out	In	Out	In	Out	In	Out	Out
Worst case scenario	0	150	15	15	15	15	15	15	15	15	150	0
Probable scenario (excluding car occupancy)	**13**	**130**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**130**	**13**
Probable scenario (including car occupancy)	9	92	15	15	15	15	15	15	15	15	92	9

Source: Urbis, 2024

The probable scenario (excl. car occupancy) was used to undertake further traffic generation and total cumulative assessments in subsequent sections. This was selected to undertake a robust yet conservative traffic generation assessment. Based on this scenario, the anticipated peak traffic generation is 130 vehicles arriving in the AM peak (Monday) and 130 vehicles departing in the PM peak (Friday).

Table 10 Total Peak Traffic Generation for Monday and Friday

Component	**Number**	**Traffic Generation Rate**	**Daily Traffic (vpd)**	**Peak hour (vph)**
Staff	150	1 vehicle per staff	145 vehicle movements	130 vehicle movements per hour
Construction vehicles	60	-	60 vehicle movements	15 vehicle movements per hour
Total:			**205 vehicle movements**	**145 vehicle movements per hour**

Source: Urbis, 2024

A detailed assessment of the traffic generation, volumes on the nearby roads, impacts on nearby intersections and the recommended mitigation measures is provided in the Transport Impact Assessment (**Appendix M**). A summary of the impacts and mitigation measures contained in the Transport Impact Assessment is provided in **Section 6.1.7**.

3.2.13.12. Management Plans

Construction and Operational Environmental Management Plans (**CEMP** and **OEMP**) will be developed prior to construction and operation respectively.

The CEMP will document environmental procedures and controls that will be implemented during the construction phase, describing the role, responsibility, authority and accountability of all key personnel involved. Additionally, the CEMP will comprise various sub-plans detailing the specific mitigation

measures that would be implemented to avoid and manage potential environmental impacts during the construction phase.

The OEMP will include procedures, reporting, and the allocation of responsibilities which are designed to minimise environmental impact in order to operate the solar farm as a responsible rural land owner.

3.2.13.13. Monitoring and Ongoing Management

The operation and monitoring of the facility will be governed by an adopted operational environmental management and monitoring plan that will clearly identify any matters that may require ongoing attention during the facility's operation.

3.2.14. Decommissioning

After an anticipated forty years of operation, decommissioning and rehabilitation of the Site would be undertaken. In this process, all above ground infrastructure would be removed with the possible exception of the 66kV substation, as this would be at the discretion of the asset's owner, Essential Energy. Key elements of decommissioning include:

- Removal of solar arrays, including foundation posts.
- Removal of all on-site amenities and equipment including buildings, PCUs and all footings.
- Removal of all cabling, where practical.
- Some fencing would be removed. This would be coordinated with the landowner and their preference.
- Rehabilitation of disturbed surfaces in consultation with the landowner.
- Wherever possible, materials removed from the Site would either be re-used or recycled in accordance with the Waste Management Plan in Appendix S.

Traffic required for decommissioning would be similar in type but of shorter duration than that anticipated during the construction phase. A Decommissioning Management Plan, highlighting all environmental mitigation and avoidance measures during this phase, will be prepared and distributed to all relevant authorities at least three months before decommissioning works start.

3.2.15. Public Benefit Offer

In parallel to the SSDA, the Applicant is separately seeking to enter to into a Planning Agreement with Mid-Western Regional Council for the following:

- Contributions to a community benefit sharing scheme administered by Council.
- The Planning Agreement is being negotiated in accordance with the *NSW Draft Energy Policy Framework Benefit Sharing Guidelines*, with a proposed benefit sharing rate of $850 per megawatt per annum paid over the life of the Project.
- The Planning Agreement will exclude the application of section 7.11, section 7.12 and section 7.24 contributions.

A draft public benefit offer letter will be submitted to Council under separate cover. The draft letter is the initial step associated with a Planning Agreement under section 7.4 of the EP&A Act.

The VPA is to be finalised and executed prior to the determination of the SSDA.

4. STATUTORY CONTEXT

This section identifies the key statutory requirements relevant to the Site and the Project, which include:

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (**EPBC Act**).
- *NSW Biodiversity Act 2016* (**BC Act**).
- *Environmental Planning and Assessment Act 1979* (**EP&A Act**).
- *Environmental Planning Assessment Regulation 2021* (**the Regulations**).
- *State Environmental Planning Policy (Planning Systems) 2021* (**Planning Systems SEPP**).
- *State Environmental Planning Policy (Resilience and Hazards) 2021* (**R&H SEPP**).
- *State Environmental Planning Policy (Transport and Infrastructure) 2021* (**T&I SEPP**).
- *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (**B&C SEPP**).
- *State Environmental Planning Policy (Industry and Employment) 2021 (***I&E SEPP***).*
- *Mid-Western Regional Local Environmental Plan 2012* (**MWR LEP**).
- *Environmental Protection Licence under Part 3 of the NSW Protection of the Environment Operations Act 1993* **(POEO Act).**
- *Approval under Section 138 of the NSW Roads Act 1993.*
- *Dark Sky Planning Guidelines 2016.*
- *NSW Large-Scale Solar Energy Guidelines*

The following discussion identifies the key statutory matters which are addressed in detail within the EIS, including the power to grant consent, permissibility, other approvals, pre-conditions and mandatory considerations.

4.1. STATUTORY REQUIREMENTS

Table 11 categorises and summarises the relevant requirements in accordance with the DPE *State Significant Development Guidelines*. A detailed statutory compliance table for the Project is provided at **Appendix C**.

Table 11 Identification of Statutory Requirements for the Project

Statutory Relevance	**Action**
Power to grant land use classification and consent authority	Schedule 1, Section 20 of the Planning Systems SEPP, identifies that development for 'electricity generating works', are to be considered State significant if the Project: *(a) has an estimated development cost of more than $30 million, or* *(b) has an estimated development cost of more than $10 million and is located in an environmentally sensitive area.* The Project is development for the purpose of electricity generating works using solar power and has an estimated development cost of $207,635,086 and therefore exceeds the $30 million threshold. A QS report will be submitted under separate cover detailing the cost of the Project.

Statutory Relevance	Action
	The Project is State significant development under Part 4 Division 4.7 of the EP&A Act 1979. The consent authority is the NSW Minister for Planning or his delegate. In circumstances where more than 50 unique submissions are received in response to the public exhibition of the SSDA the NSW Independent Planning Commission (**IPC**) will be the consent authority.
Permissibility	The Site is zoned RU1 – Primary Production under the MWR LEP. Electricity generating works are permitted with consent in the RU1 – Primary Production zone under the MWR LEP. In addition, section 2.6(1)(a) of the Planning Systems SEPP identifies that electricity generating works are permitted with consent within any land in prescribed zones under the T&I SEPP, which states in Part 2.3 Development Controls, division 4, section 2.35 that: *Electricity generating works means a building or place used for the following purposes -* *(1) Making or generating electricity,* *(2) Electricity storage* The T&I SEPP, states in section 2.36: ▪ *Development for the purpose of electricity generating works may be carried out by any person with consent on the following land –* *(a) In the case of electricity generating works comprising a building or place used for the purpose of making or generating electricity using waves, tides, or aquatic thermal as the relevant fuel source-on any land,* *(b) In any other case – any land in a prescribed non-residential zone.* The RU1 Primary Production zone is a prescribed non-residential zone. The Project is therefore permissible with consent under section 2.36 (1) of the T&I SEPP.
Commonwealth Legislation	
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Under the EPBC Act any action (which includes a development, the Project or activity) that is considered likely to have a significant impact on Matters of National Environmental Significance (**MNES**) (including nationally threatened ecological communities and species and listed migratory species), must be referred to the Commonwealth Minister for the Environment. If an action is considered likely to have significant impact on any MNES, it is declared a "Controlled Action" for which formal Commonwealth approval is required. As outlined in the BDAR (Appendix F) several MNES were assessed. After careful assessment, no threatened flora or fauna species were identified as

Statutory Relevance	Action
	occurring on the Site; The BDAR concluded that the Project will not result in a significant impact to any threatened species. A protected matters search within 10km of the Site was undertaken to identify potential EPBC Act listed TECs that may occur on-site and wider area. The following TECs were identified for consideration: ▪ Endangered: Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions. ▪ Endangered: Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of south-eastern Australia. ▪ Endangered: Weeping Myall Woodlands. ▪ Critically Endangered: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland). PCT 201, which is the only PCT impacted by the Project, is not associated with any EPBC listed TECs, and there is no federal equivalent of Fuzzy Box Woodland TEC. During the determination of vegetation communities, one of the PCTs considered, PCT 277, is associated with the EPBC listing of Box Gum Woodland. As such, consideration is provided to the EPBC listing advice to determine if assessed vegetation meets the relevant criteria. As outlined in Appendix F, no assessed vegetation meets the key diagnostic characteristics required for the EPBC listing of Box Gum Woodland TEC No other EPBC-listed MNES were identified as potentially occurring on the Site. Accordingly, a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water is not required for the Project.
Native Title Act 1993 (Cth)	The Native Title Act 1993 recognises and protects native title rights to the Aboriginal and Torres Islander people of Australia. It allows a native title determination application to be made for land and/or waters where native title has not been previously and validly extinguished. A native title grants rights to certain uses and negotiations over the land. There are currently no native title determinations over the Site. A search of the National Native Title Tribunal (**NNTT**) registers and databases was undertaken on 10 November 2023. The search identified one undetermined Native Title claim within which the Site is located, being Warrabinga-Wiradjuri #7 (NC2018/002). The NNTT was also contacted by email on 10 November 2023 to request a formal search of the NNTT Register. A reply was received on 13 November 2023 indicating that the subject area is located within the Warrabinga-Wiradjuri #7 Native Title Claim (NC2018/002). A review of the application details was undertaken on 25

Statutory Relevance	Action
	June 2024, revealing that no determinations of Native Title have been made for this application.
Other Approvals – New South Wales	
Conveyancing Act 1919	The Project will require the execution of a lease by the owners of Lot 2 in DP 631312 and Lot 2 in DP 734669. A lease of the land for the Project is treated as a lease of premises, regardless of the duration of the lease.
Consistent Approvals	
Roads Act 1993	The Project will require consent from the Council as the local road authority under Section 138 for works undertaken Jacksons Lane including the new culvert. Section 4.42(1)(f) of the EP&A Act 1979, provides that a consent under section 138 cannot be refused if it is necessary for carrying out SSD that is authorised by a development consent under Division 4.7 and the road works are substantially consistent with the consent for the SSD.
Protection of the Environment Operations Act 1997 (POEO Act)	No activities identified in Schedule 1 of the POEO Act are proposed as part of this application. An Environment Protection Licence is not required.
Approvals not required as part of the SSD Application	
Water Management Act 2000	Pursuant Section 4.41 of the E&PA Act, the Project will not require a water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91.
Fisheries Management Act 1994	Pursuant Section 4.41 of the EP&A Act, the Project will not require a permit under section 201, 205 or 219 of the FM Act to block fish passage, dredge or carry out reclamation work on water land.
Heritage Act 1977	Pursuant Section 4.41 of the EP&A Act, the Project will not require an approval under Part 4, or an excavation permit under section 139.
National Parks and Wildlife Act 1974	Pursuant Section 4.41 of the EP&A Act, the Project will not require an Aboriginal heritage impact permit under section 90.
Rural Fires Act 1997	Pursuant Section 4.41 of the EP&A Act, the Project will not require a bush fire safety authority under section 100B.

4.2. PRE-CONDITIONS

Table 12 outlines the pre-conditions to exercising the power to grant approval which are relevant to the Project and the section where these matters are addressed within the EIS.

Table 12 Pre-Conditions

Statutory Reference	Pre-condition	Relevance	Section in EIS
Environmental Planning and Assessment Regulation 2021	An EIS must be prepared in accordance with the SEARs issued for the Project, and contain the relevant information identified in sections 190 and 192 of the EP&A Reg. 2021.	This EIS addresses the SEARs issued by the Secretary pursuant to section 175 and contains the detailed information identified in section 190 and section 192 of the EPA Regulation. Specifically, this includes a statement prepared by a Registered Environmental Assessment Practitioner. This SSDA will be placed on public exhibition on the NSW Major Projects Portal.	**Signed Declaration.** **SEARs Table at Appendix A.**
R&H SEPP - section 4.6(1)	A consent authority must be satisfied that the land is suitable in its contaminated state - or will be suitable, after remediation - for the purpose for which the development is proposed to be carried out.	The Project involves a change of use from agricultural activities to electricity generation works (renewable). No potentially contaminative locations or activities have been identified to date. An assessment of land use and soils has been conducted by Premise as part of the EIS – no historic potentially contaminating land uses or activities have been identified as part of this assessment.	**Section 6.1.3**
Mid-Western Regional LEP, Clause 6.3 (3) (Earthworks)	(3) Before granting development consent for earthworks, the consent authority must consider the following matters— (a) the likely disruption of, or any detrimental effect on, existing drainage patterns and soil stability in the locality of the development,	The Project includes minor earthworks for site preparation and the construction of stormwater infrastructure. The location and extent of the earthworks have been devised with consideration of the environment, managing stormwater and minimising	**Section 6.1.3 and 6.1.8**

Statutory Reference	Pre-condition	Relevance	Section in EIS
	(b) the effect of the development on the likely future use or redevelopment of the land, (c) the quality of the fill or the soil to be excavated, or both, (d) the effect of the development on the existing and likely amenity of adjoining properties, (e) the source of any fill material and the destination of any excavated material, (f) the likelihood of disturbing relics, (g) the proximity to, and potential for adverse impacts on, any waterway, drinking water catchment or environmentally sensitive area, (h) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	the likelihood of disturbing relics. Mitigation measures to avoid and minimise erosion are outlined in Appendix I and Appendix N.	
Mid-Western Regional LEP, Clause 6.4(4) (Groundwater Vulnerability)	(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that— (a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or (b) if that impact cannot be reasonably avoided—the development is designed,	The Site is identified as 'groundwater vulnerable' in the MWR LEP. However, groundwater is not anticipated to be impacted by the Project, nor groundwater abstraction will be required during its construction.	**Section 6.1.8, Appendix N**

Statutory Reference	Pre-condition	Relevance	Section in EIS
	sited and will be managed to minimise that impact, or (c) if that impact cannot be minimised—the development will be managed to mitigate that impact.		
Mid-Western Regional LEP, Clause 6.5(4) (Terrestrial Biodiversity)	(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that— (a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or (b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or (c) if that impact cannot be minimised—the development will be managed to mitigate that impact.	The Project footprint has been designed to avoid all areas of 'Moderate' and 'High' Biodiversity Sensitivity as identified in the MWR LEP.	**Section 0, Appendix F**
Mid-Western Regional LEP, Clause 6.9 (Essential services)	Development consent must not be granted to development unless the consent authority is satisfied that any of the following services that are essential for the proposed development are available or that adequate arrangements have been made to make them available when required—	The supply of electricity, stormwater drainage and suitable road access have been considered and are described within the Detailed Description of this EIS and relevant technical assessments. The supply of water and disposal and management of sewage are proposed to be arranged on a regular basis	**Section 3**

Statutory Reference	Pre-condition	Relevance	Section in EIS
	(a) the supply of water, (b) the supply of electricity, (c) the disposal and management of sewage, (d) stormwater drainage or on-site conservation, (e) suitable road access.	by independent contractors. Water is proposed to be trucked from an off-site source, while sewage will be collected on-site and treated off-site. The logistic details of these arrangements are subject to the detailed design phase and are proposed to be submitted as part of the Construction Environmental Management Plan prior to construction due to the high level of uncertainty regarding the extent of these services at this stage.	
Mid-Western Regional LEP, Clause 6.11(2) (Temporary workers' accommodation)	(2) Development consent must not be granted to development for the purposes of temporary workers' accommodation unless the consent authority is satisfied of the following— (a) the development is to be located— (i) if the development relates to a mine—within 5 kilometres of the relevant mining lease under the Mining Act 1992, or (ii) in any other case—within 5 kilometres of the large-scale infrastructure in which persons are to be employed, (b) there is a need to provide temporary workers' accommodation due either to the large-scale infrastructure or because of the remote or isolated location of the land on which	A Workforce Accommodation Plan has been prepared as part of this EIS. Relevant technical assessments have regarded consideration of the proposed workforce accommodation and have been evaluated against the cumulative impacts within the region.	**Section 6.1.12**

Statutory Reference	Pre-condition	Relevance	Section in EIS
	the large-scale infrastructure is being carried out, (c) the development will not prejudice the subsequent carrying out of development on the land in accordance with this Plan and any other applicable environmental planning instrument, (d) water reticulation systems and sewerage systems will be provided to adequately meet the requirements of the development, (e) when the development is no longer in use, the land will, as far as practicable, be restored to the condition in which it was before the commencement of the development. (3) In this clause— temporary workers' accommodation means any habitable buildings and associated amenities erected on a temporary basis for the purpose of providing a place of temporary accommodation for persons employed to carry out large-scale infrastructure, including development for the purposes of an extractive industry, mining, renewable energy or an electricity transmission or distribution network.		

4.3. MANDATORY CONSIDERATIONS

Table 13 outlines the relevant mandatory considerations to exercising the power to grant approval and the section where these matters are addressed within the EIS.

Table 13 Mandatory Consideration

Statutory Reference	Mandatory Consideration	Section in EIS
Consideration under the EP&A Act and EPA Regulations		
Section 1.3	Relevant objects of the EP&A Act *(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,* *(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),* *(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 7, Appendix C**
Section 4.15	Relevant environmental planning instruments ▪ Planning Systems SEPP. ▪ T&I SEPP. ▪ R&H SEPP. ▪ B&C SEPP. ▪ MWR LEP 2012. ▪ Relevant draft environmental planning instruments.	**Sections 6 and 7; Appendix C**
	Relevant planning agreement or draft planning agreement	**Section 2.5**

Statutory Reference	Mandatory Consideration	Section in EIS
	▪ Voluntary planning agreement for the Project entered into between the Applicant and Council.	
	Development control plans ▪ Mid-Western Regional DCP 2013.	**Section 6**
	The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.	**Section 6**
	The suitability of the Site for the development	**Sections 2.6 and 6**
	The public interest	**Section 7.7**
Environmental Planning and Assessment Regulation 2021	*(1) A development application must—* *(a) be in the approved form, and* *(b) contain all the information and documents required by—* *(i) the approved form, and* *(ii) the Act or this Regulation, and* *(c) be submitted on the NSW planning portal.*	**Signed Declaration**
Mandatory relevant considerations under EPIs		
R&H SEPP - clause 3.7	*In determining whether a development is—* *(a) a hazardous storage establishment, hazardous industry or other potentially hazardous industry, or* *(b) an offensive storage establishment, offensive industry or other potentially offensive industry,* *consideration must be given to current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development.*	**Section 6.1.9**
R&H SEPP - clause 4.6(1)	*(1) A consent authority must not consent to the carrying out of any development on land unless—* *(a) it has considered whether the land is contaminated, and* *(b) if the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and* *(c) if the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried*	**Section 6.1.3**

Statutory Reference	Mandatory Consideration	Section in EIS
	out, it is satisfied that the land will be remediated before the land is used for that purpose.	
T&I SEPP *clause 2.122 (4)*	*(4) Before determining a development application for development to which this section applies, the consent authority must—* *(a) give written notice of the application to TfNSW within 7 days after the application is made, and* *(b) take into consideration—* *(i) any submission that RMS provides in response to that notice within 21 days after the notice was given (unless, before the 21 days have passed, TfNSW advises that it will not be making a submission), and* *(ii) the accessibility of the Site concerned, including—* *(A) the efficiency of movement of people and freight to and from the Site and the extent of multi-purpose trips, and* *(B) the potential to minimise the need for travel by car and to maximise movement of freight in containers or bulk freight by rail, and* *(iii) any potential traffic safety, road congestion or parking implications of the development.*	**Section 6.1.7**
I&E SEPP – Chapter 3 Schedule 5	A consent authority must not grant development consent to an application to display signage unless the consent authority is satisfied that the signage is consistent with the objectives of this Chapter as set out in section 3.1(1)(a), and that the signage the subject of the application satisfies the assessment criteria specified in Schedule 5.	**Appendix C**
Mid-Western Regional LEP 2012	Objectives and land uses for RU1 – Primary Production Zone ▪ Part 4 – Principal development standards. ▪ Part 5 – Miscellaneous provisions. ▪ Part 6 – Additional local provisions.	**Appendix C**
Considerations under other legislation		
BC Act – section 7.14	*(1) This section applies to an application for development consent for State significant development under Part 4 of the Environmental Planning and Assessment Act 1979, or an application for approval for State significant infrastructure under Part 5.1 of the Environmental Planning and Assessment Act*	**Section 2**

Statutory Reference	Mandatory Consideration	Section in EIS
	1979, that is required under Division 2 to be accompanied by a biodiversity development assessment report. *(2) The Minister for Planning, when determining in accordance with the Environmental Planning and Assessment Act 1979 any such application, is to take into consideration under that Act the likely impact of the proposed development on biodiversity values as assessed in the biodiversity development assessment report. The Minister for Planning may (but is not required to) further consider under that Act the likely impact of the proposed development on biodiversity values.*	
Development Control Plans		
MWR DCP 2013	Clause 2.10 of the Planning Systems SEPP states that development control plans (whether made before or after the commencement of this Policy) do not apply to SSD. As such, there is no requirement for assessment of the Project against the MWR DCP 2013 for this SSDA. Notwithstanding this, best-practice consideration has been given to the DCP.	**Section 6**
Guideline		
Large-Scale Solar Energy Guideline	Planning framework	**Section 4**
	Community and stakeholder engagement	**Section 5**
	Landscape and visual impacts	**Section 6.1.4**
	Agricultural land use	**Section 6.1.3**
	Infrastructure contributions, benefit sharing and private agreements	**Section 6.2.3**
	Waste management and circular design	**Section 6.2.2**
	Decommissioning and rehabilitation	**Section 6.2.2**
	Glint and glare	**Section 6.1.5**
	Other assessments	**Section 6**

5. COMMUNITY ENGAGEMENT

The following sections of the report describe the engagement activities that have been undertaken during the preparation of the EIS and the community engagement which will be carried out if the Project is approved.

5.1. ENGAGEMENT APPROACH

Consultation occurred between December 2023 and June 2024 with different stakeholders and actions. This engagement methodology and its outcomes have been informed and are consistent with the NSW Department of Planning, Housing, and Infrastructure (**DPHI**) *Undertaking Engagement Guidelines for State Significant Projects*. The approach to consultation with community stakeholders was informed by the feedback from Council.

The engagement approach was adapted from the *International Association of Public Participation's (IAP2) Public Participation* spectrum. The spectrum (Figure 18) describes goals for public participation and the corresponding promise to the public.

The engagement objectives aligned with the goal of informing and consulting with stakeholders and the community.

Figure 18 IAP2 Public Participation Spectrum

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions	To obtain public feedback on analysis alternatives and/or decisions	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision- making in the hands of the public.
PROMISE	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

Source: IAP2, 2018

Community and stakeholder engagement has been undertaken by the Project Team in the preparation of the SSDA. As outlined in the *Undertaking Engagement Guidelines for State Significant Projects*, DPHI defines stakeholders as community, relevant agencies, landowners and land users and stakeholders involved in prospective resource developments.

- **Government Stakeholders**
  - Department of Planning, Housing and Infrastructure (**DPHI**).
  - Department of Climate Change, Energy, the Environment and Water.
  - Publicly elected officials.
  - Mid-Western Regional Council (Council Officers and Councillors).

- **Relevant Agencies**
  - Transport for NSW.
- **Aboriginal Stakeholder**s
  - Mudgee Local Aboriginal Land Council.
  - Registered Aboriginal Parties.
- **Community**
  - Adjacent neighbours.
  - Surrounding community.
  - Community groups: Watershed Landcare, Gulgong Chamber of Commerce, Gulgong Community Group and Gulgong Heritage Building Managers and Heritage Groups.
  - Community Facebook groups: Gulgong Community Group, Gulgong Show Society Inc and Gulgong Community Action Group.
  - Mining exploration licence holder.

In accordance with the Regulations, the EIS will be placed on formal public exhibition once DPHI has reviewed the EIS and deemed it 'adequate' for this purpose. Following this exhibition period, the applicant will respond to any matters raised by notified parties.

5.2. ENGAGEMENT ACTIVITIES

Engagement activities throughout the consultation process included the letterbox and email distribution of a community newsletter, targeted consultation with adjoining landowners, a project-specific website, developing a community webinar, hosting a community pop-up session, conducting stakeholder briefings and monitoring a contact email and phone line throughout the duration of the planning process.

As part of the Social Impact Assessment, an online survey was also distributed to stakeholders to understand the needs of the local area to identify potential positive or negative social impacts of the Project and recommend appropriate management measures.

These activities were undertaken in addition to the consultation to support the scoping report.

5.2.1. Community Newsletter

The newsletter introduced the Project, outlined the benefits, potential impacts and relevant technical assessments being undertaken and how to provide feedback or ask questions. This included details of the enquiry phone line, an email address and an invitation to the community pop-up. A copy of the Community Newsletter was attached to these emails.

A copy of this newsletter is found in Appendix K.

5.2.2. Direct Consultation with Adjoining Landowners

On 9 April 2024, Urbis Engagement made direct contact with five adjoining landowners through phone calls and emails with more information on the Project. This included making them aware of further briefings and let them know Urbis Engagement will be starting a broader conversation about the Project.

On 4 May 2024, the Applicant hosted a targeted coffee catch-up with adjoining landowners to provide information about the Project, answer any questions, and respond to any concerns about the Project.

The meeting was attended by all five adjoining landowners.

In October 2024, neighbours identified as sensitive receivers were contacted again, with the outcomes of follow-up consultation summarised as follows:

Engagement with sensitive receivers (neighbours)

- **Neighbour 1:** A one-on-one Teams call was conducted to discuss the project status in detail. During this call, the neighbour was directed to the relevant reports and ensured they understood the potential impacts and mitigation measures.
- **Neighbour 2:** After multiple attempts to contact this neighbour via phone and email, they expressed a preference to receive updates via email rather than meeting in person. Their preference was respected and a comprehensive email update provided.

Information provided to both neighbours

To ensure that all sensitive receivers are clearly aware of the potential impacts, the following information was included in the updates:

- Visual Impact Assessment: Detailed visual impact assessment and photomontages will be available during public exhibition.
- Traffic Impact Assessment: Information on the expected traffic levels during the construction period.
- Noise Impact Assessment: Details on the noise levels expected during both the construction phase and operational phase, including proposed mitigation measures.
- Construction: An overview of other potential impacts during construction, including proposed mitigation measures.

5.2.3. Project Website

Prior to the start of the scoping phase of engagement, the Applicant developed a project website that provided detailed information about the Project, an FAQ page, a link to the online survey and details of the available communication channels that stakeholders can use to ask questions or provide feedback. The website was updated to provide more detailed information and respond to community interest.

5.2.4. Recorded Webinar

The webinar included a ten-minute presentation about the Project and a facilitated question-and-answer session between the Applicant and Urbis.

5.2.5. Community Pop-up

The Applicant hosted a community pop-up outside the Gulgong IGA. The pop-up enabled community stakeholders to learn about the Project, ask questions and provide feedback. Eighteen community members engaged with the Project Team.

The session was supported by three A0-sized display boards that included project information, promoted the Project website and ways for the community to provide feedback or ask questions.

A copy of these display boards is included in Appendix K

5.2.6. Stakeholder Briefings – State Member

On 24 May 2024, the Applicant hosted a briefing with the State Member for Dubbo to discuss the opportunities the Project will create for the region, as well as community benefits and offer an opportunity for the Member for Dubbo to ask questions or provide feedback.

5.2.7. Enquiry Management

The community were invited to contact the Project team through an 1800 phone number and engagement email address. These contact details were managed and monitored by Urbis throughout the consultation process to enable the community to provide feedback and ask questions.

5.2.8. Online Survey

Throughout April and May 2024, an online survey was hosted on the Project website. The survey was undertaken as part of engagement for the Social Impact Assessment and sought to understand the needs of the local area to identify potential positive or negative social impacts of the Project and recommend appropriate management measures. A detailed summary of feedback received through the survey is included in Appendix Q.

5.3. COMMUNITY VIEWS

The key issues raised by the community and stakeholders are summarised in the section below. A detailed community engagement table is provided as **Appendix D** which details the way in which these issues have been addressed in the EIS.

Urbis Engagement has identified four key themes that emerged throughout the engagement process. These themes were consistent across all engagement channels. They are:

- Community impact and benefit sharing.
- Visual amenity impacts.
- Environmental impact.
- General support and future community participation.

The following table outlines the issues raised by all stakeholders including government authorities, relevant agencies and the community and the Project response.

Table 14 Detailed Feedback and Project Response

Stakeholder	How this group was consulted	Feedback received	Engagement response
Government authorities			
Mid-West Regional Council ▪ Council officers – Director Development, Alina Azar – Lisa Penson, Economic Development Coordinator.	Three meetings have taken place with Council. ▪ December 2023. ▪ 1 February 2024. ▪ 5 June 2024.	Consultation with Council has been fundamental to shaping the approach to community consultation. Feedback from Council included: ▪ The community is experiencing consultation fatigue. ▪ The engagement approach should 'think outside the box' and attract community attention. ▪ The community is not distinguishing between projects (as there is so many in the area) so it's important to stand out. ▪ **VPA/community benefit sharing** ▪ The VPA must be established in consultation with Council. ▪ A VPA would ensure contributions by Elgin to Council's community benefit fund.	In response to Council feedback, our engagement approach sought to 'go to the community' rather than expecting the community to come to us. Activities included: ▪ Online video recording. ▪ IGA pop-up. ▪ Coffee catch up with neighbours. Urbis socialised these activities with Council to seek further feedback ahead of going live to the community. Following the engagement approach, Council commended the Applicant and Urbis on its engagement for the Project, noting the activities were delivered in line with Council's feedback. **VPA/community benefit sharing** ▪ The Applicant and Urbis are in consultation with Council on the approach to the VPA.

Stakeholder	How this group was consulted	Feedback received	Engagement response
		▪ Council determines the priority areas that are funded by VPA contributions.	▪ The Applicant will highlight the issues raised by the Community during the Consultation process. ▪ Urbis will continue to negotiate with Council on the VPA as the SSDA moves through the planning process.
▪ Mayor and Councillors	On 22 April 2024, Urbis Engagement contacted the Mayor and councillors for Mid-West Regional Council via email to provide information about the Project, offer a project briefing and offer the opportunity for these stakeholders to ask questions or provide feedback. A copy of the Community Newsletter was attached to this email.	To date, no response has been received from the Council's Mayor and councillors.	The Applicant will continue to maintain project enquiry channels to enable Council's Mayor and councillors to access materials about the Project, ask questions and provide feedback.
Department of Planning, Housing and Infrastructure (DPHI)	The Applicant and Urbis met with DPHI via Teams on 12 June 2024.	DPHI acknowledged the status of the preparation of the EIS and provided further guidance on details required related to workforce accommodation.	The Applicant and Urbis will continue to consult with DPHI as plans progress, until the submission of the EIS.

Stakeholder	How this group was consulted	Feedback received	Engagement response
Department of Climate Change, Energy, the Environment and Water (the Biodiversity, Conservation and Science Group)	Between 23 April 2024 and 5 June 2024, the external consultancy AEP engaged in email correspondence with representatives of the Biodiversity, Conservation, and Science Group (BCSG), a division of DCCEEW. During this period, AEP submitted a draft Land Category Assessment along with relevant mapping files for review by the Department. Feedback on these submissions was provided on 5 June 2024	BCSG generally supported the methodology used but requested further justification and additional information in relation to the Local Land Service Land Category Assessment.	AEP have incorporated feedback from BCSG into the BDAR, (Appendix F) including an assessment on critically endangered plant species that could occur in Category 1 Land, a detailed decision pathway for the selection of PCTs and further justification on Category 1 Land designation.
Publicly elected officials ▪ Mr Dugald Saunders, Member for Dubbo (State) – The Nationals	On 24 May 2024, the Applicant and Urbis Engagement hosted a briefing with the State Member for Dubbo to discuss the opportunities the Project will create for the region, as well as community benefits and offer an opportunity for the Member for Dubbo to ask questions or provide feedback.	Feedback raised by the State Member included: ▪ Enquiry regarding the proposed size of Mayfair compared to others proposed nearby.	▪ The Project is much smaller in size in comparison to others proposed in the area. For example, Stubbo and Birriwa Solar Farms will be around 1,200ha in development footprint, while the Project will be closer to 120ha. ▪ While smaller, the Applicant acknowledges the cumulative impacts and understands that risks and impacts to the community need to be carefully managed (regardless of size).

Stakeholder	How this group was consulted	Feedback received	Engagement response
		▪ Enquiry regarding how much feedback the Applicant has received about fire risk. ▪ All community respondents were receptive to the Applicant's response to fire management and compliance requirements.	▪ Fire risk was raised as a question from some members of the community. The Project will be designed to the highest standards for fire safety, in line with Fire and Rescue NSW's design guidelines. A Preliminary Hazards Assessment and Bushfire Threat Assessment are included within this EIS (Appendix O; Appendix P) This includes creating cleared vegetation zones fire breaks between panels, strict land management (such as sheep grazing or mowing) and access to water supply on-site.
		▪ Question about how the decommissioning bond is being managed – private, state, or federal?	▪ If the Project is approved, the Applicant will appoint an independent third party (subject to the approval of the landowner) to manage and administer the decommissioning bond. At the end of the lease term, the bond will be available to the landowner if the Applicant fails to comply with legislative requirements around decommissioning.
		▪ Question about how the Applicant will manage insurance arrangements with its neighbours.	▪ The Applicant acknowledges concerns within the community regarding the perceived lack of insurance coverage for properties neighbouring a solar farm. To address this, the Applicant has consulted

Stakeholder	How this group was consulted	Feedback received	Engagement response
			with multiple insurance brokers, who have reassured the Applicant that there are no instances/examples where properties cannot be insured as a result of living next to a solar farm. ▪ If the Project is approved, the Applicant will also have a range of insurance policies in place to cover the Site in the event of damage or fire.
		▪ Urbis asked the MP how frequently they'd like to be updated. ▪ The MP confirmed for the Applicant/Urbis to provide an update to the MP if there are any changes/something that the MP should be aware of.	The Applicant will continue to consult with the MP at each project milestone. Consultation will take place in the form of email updates with the option for follow-up meetings if needed.
▪ Hon Andrew Gee MP, Member for Calare (Federal) – Independent	On 17 April 2024, Urbis Engagement contacted the Federal Member for Calare via email to provide information about the Project, offer a project briefing and provide the opportunity for these stakeholders to ask questions or provide feedback.	To date, no response has been received from the Member for Calare.	The Applicant will continue to maintain project enquiry channels to ensure the Federal Member for Calare can learn more about the Project ask questions and provide feedback or ask questions.

Stakeholder	How this group was consulted	Feedback received	Engagement response
	A copy of the Community Newsletter was attached to this email.		
▪ **Relevant agencies**			
▪ Transport for NSW (TfNSW)	On 11 July 2023, as part of the SEARs request, TfNSW was invited by the Department of Planning & Environment (DPE) to provide comments on the scoping report for the Project.	On 23 July 2023, TfNSW provided to DPE a letter with comments on the scoping report for the Project. This letter outlines tailored requirements to be included in the scope of the Traffic Impact Assessment (TIA).	Urbis Transport Advisory has addressed TfNSW's comments in the TIA. See Appendix M.
Aboriginal stakeholders			
▪ Local Aboriginal Land Council ▪ Registered Aboriginal Parties	As part of the Aboriginal Cultural Heritage Assessment Report (ACHAR), Urbis Heritage contacted the Local Aboriginal Land Council and other Registered Aboriginal Parties to determine the cultural significance of objects and/or places on and surrounding the Site.	Feedback from consultation with these groups is included in Section 2 of the ACHAR. An abridged version is at Appendix G and a full version will be submitted to DPHI with the SSDA.	The Applicant will continue to consult and provide project updates to the Local Aboriginal Land Council and Registered Aboriginal Parties offering the opportunity to comment/provide feedback should plans change.

Stakeholder	How this group was consulted	Feedback received	Engagement response
Community			
Site landowner	The Applicant and Urbis have been in ongoing conversations with the landowner throughout the EIS process. The site owner has provided advice on the following: ▪ Contact details for close neighbours. ▪ Insight/understanding into community sentiment/what needs to be addressed as part to respond to community feedback.	The Applicant has been in close contact with the Site owners throughout the process. The site owners have raised no feedback or concerns. They are supporting the Applicant throughout the process and have provided insight into community sentiment.	▪ As a key stakeholder, the Applicant will continue to consult with the Site owner as plans progress and the SSDA is assessed and will be kept involved/informed throughout the process.
Adjoining landowners Neighbours adjacent to the Project	▪ Urbis engaged with direct landowners on 9 May 2024 via phone and email. ▪ Following phone and email consultation, adjoining landowners were invited to a coffee catch-up (see Appendix K for a detailed description).	Feedback provided and questions asked included: **General:** ▪ Where energy from the solar farm would be distributed? **Visual impact:** ▪ What assessments are being undertaken for visual amenities?	The Applicant and Urbis Engagement provided the following responses: **General:** ▪ Renewable energy created by the Project will be connected to the grid where it can service both the local and wider community. **Visual impact:** ▪ A visual impact assessment has been prepared which assesses any potential

Stakeholder	How this group was consulted	Feedback received	Engagement response
		▪ No major objections were raised regarding the proposed screening and fencing. **Worker conduct** ▪ Concern over worker conduct and behaviour – particularly given the escalation of crime in the area. ▪ Comment regarding concerns about the worker accommodation as there has been an escalation of crime in the area recently. **Upgrade to Jackson's Lane:** ▪ No major objections were expressed about the proposed upgrades to Jackson's Lane. **Flooding of Slapdash Creek:** ▪ Concerns were raised about the impact of flooding on the solar farm. ▪ Neighbours have experienced floods in 2020, 2021, 2022 and 2023.	impacts on surrounding neighbours. It proposes mitigation measures such as landscaping or screening. The Applicant will continue to inform the community as plans progress (Appendix K). **Worker conduct:** ▪ The Applicant is preparing an on-site Worker Accommodation Plan (**WAP**) and a Worker's Code of Conduct (**WCC**) to ensure our team respectfully interacts with the Gulgong township and near neighbours. ▪ The Applicant will share this plan with its neighbours once finalised. ▪ The WCC will establish protocols for the management and occupation of the on-site workers' accommodation and protocols for workers going into Gulgong. Its objective is to establish protocols to protect the social infrastructure to ensure it's available and accessible to locals, as the workers needs will be generally accommodated on-site. **Upgrade to Jackson's Lane:** ▪ The Applicant will continue to consult with neighbours as plans for Jacksons Lane are finalised.

Stakeholder	How this group was consulted	Feedback received	Engagement response
		▪ The Project should take into consideration flooding around Slapdash Creek. **Community benefits and social impact:** ▪ Expressed interest in community benefits particularly the potential upgrades and maintenance of rural roads. ▪ Concern about the impact of outside workers on current health services. There is one medical centre with a long wait time. ▪ Suggest including healthy ageing programs as part of the community benefit scheme.	▪ A traffic management plan is also being prepared as part of the SSDA. This will assess whether existing proposed access roads can support the anticipated impact on traffic. If not, the Applicant will explore the upgrading and ongoing maintenance of access roads. **Flooding of Slapdash Creek:** ▪ A Flood Risk Assessment is being prepared as part of the SSDA which will determine the flood risk and provide appropriate mitigation measures. ▪ The Applicant has clarified a few points on the flood analysis with neighbours, to ensure the assessment reflects this lived experience of locals. **Community benefits and social impact:** ▪ The WAP and WCC are designed to minimise disruptions to the local community. The Applicant will consider the potential impacts on health services as part of this. ▪ Council determines the priority areas that are funded by VPA contributions. However, the Applicant will highlight the issues raised

Stakeholder	How this group was consulted	Feedback received	Engagement response
			by the community during the consultation process.
Broader community Residents and businesses within 8km of the site including Gulgong residents and businesses.	▪ Community pop-up (see Appendix K for a detailed description).	Feedback provided and questions asked included: **General support:** ▪ Visitors to Gulgong were generally supportive of the renewable energy transition. ▪ Some support for the increase in local jobs. ▪ Suggestion to arrange community education tours so the local community can learn more about renewable energy. **Worker impact:** ▪ Older residents expressed concern about the impact of workers on the city centre including parking on the main street - seniors and parents with children will have to park far away from services.	The Applicant and Urbis Engagement provided the following responses: **General support:** ▪ The Applicant notes the suggestion and will work with Council and the local community to determine whether tours are viable. **Worker impact:** ▪ The Applicant is preparing on-site WAP and a WCC to ensure our team respectfully interacts with the Gulgong township. ▪ The Applicant will share this plan with its neighbours and the community once finalised. ▪ The SSDA will also include an assessment that explores the impact on traffic and parking. This will outline mitigation measures to ensure the increase in construction workers will not negatively impact access to parking. **Cumulative impact of other solar farms:**

Stakeholder	How this group was consulted	Feedback received	Engagement response
		Cumulative impact of other solar farms: ▪ Concern over the loss of land value due to the surrounding solar farms. ▪ Concern over the lack of compensation from solar farms and suggestion to reduce power bills for surrounding residents. **Impact on tourism:** ▪ There's tourism in Gulgong which is causing tensions in the transition to renewable energy. ▪ Concern over impacts to visual amenities impacting the desire for tourists to visit Gulgong. **Impacts on sheep grazing:** ▪ Concern over how realistic to have solar farming and sheep farming on the Site e.g. rounding up sheep, ewes giving birth to lambs, sheep shearing and getting sheep to the paddock. **Bushfire risk concerns:**	▪ The Applicant had conversations with the Council about managing the cumulative impacts as a result of the Project. ▪ The Applicant is also working with Council on a VPA. ▪ The Applicant will highlight the issues raised by the community during the consultation process. ▪ The fund's purpose is to invest back into the community and benefit those who may be impacted by the accumulative implications. **Impact on tourism:** ▪ The Applicant respects Gulgong's proud history and wants to ensure there are no impacts on the tourism economy. ▪ A visual impact assessment is being prepared which will assess any potential impacts on surrounding neighbours. It will also propose mitigation measures such as landscaping or screening. The Applicant will continue to inform the community as plans progress. **Impacts on sheep grazing:**

Stakeholder	How this group was consulted	Feedback received	Engagement response
		▪ Concern over the risk of fires resulting from solar farm equipment.	▪ The Applicant will work closely with Council and the community to determine the best methods to ensure sheep grazing can co-exist with the solar farm. ▪ Once the solar farm is decommissioned, the land will be reinstated for continued agricultural use. **Bushfire risk concerns:** ▪ Mayfair Solar Farm will be designed to the highest standards for fire safety, in line with Fire and Rescue NSW's design guidelines. This includes creating cleared vegetation zones fire breaks between panels, strict land management (such as sheep grazing or mowing) and access to water.
	▪ Community newsletter letterbox distribution (see section 2.4 for a detailed description).	After receiving the community newsletter, Stralis Energy contacted Urbis Engagement on 18 April 2024 requesting to be kept informed on opportunities to tender for the electrical contractor services.	Urbis Engagement advised that the Applicant is still in the planning stages of the Project and will prioritise local employment during the tendering stages. The Applicant will keep Stralis Energy informed on opportunities to tender for the Project.
Community groups ▪ Watershed Landcare	▪ On 17 April 2024, Urbis Engagement contacted Watershed Landcare to	Between 17 April 2024 and 20 May 2024, the feedback provided and questions asked included:	▪ Urbis Engagement provided a site and surrounding context aerial map, a link to the

Stakeholder	How this group was consulted	Feedback received	Engagement response
	provide information on the Project and seek feedback. ▪ The community newsletter was attached to this email.	▪ Where exactly on Jacksons Lane is the Site proposed? ▪ What are the severe limitations for agricultural purposes. ▪ Will the Applicant be offering any community benefits with the Project? ▪ Will there be any visual screening requirements or biodiversity offsets required for the Project? ▪ Watershed Landcare has some community projects that its seeking funding for, would this be considered by the Applicant? ▪ Offering to support with visual screening through its local nursery in Mudgee.	project website and a link to the recorded webinar. ▪ Preliminary ecology assessments were conducted to support the Scoping Report for the Project. These assessments identified the Site as low-quality agricultural land mainly due to the quality of soil (i.e. it's highly erodible). Other limitations include shallow soils, stoniness, climatic limitations, acidification, potential for structure decline and salinity hazards. ▪ Additional assessments will be conducted for the SSDA to identify further site constraints. The assessments will outline methods to minimise environmental impacts. For example, this may include setting the panels away from elements with high ecological and heritage value. ▪ A community benefit fund will be established for the Project in consultation with the Council and the community. The Applicant has already started these discussions with the Council. Any feedback from the Landcare Group on how the fund should be allocated is welcome. This may include ideas such as grants, sponsorships,

Stakeholder	How this group was consulted	Feedback received	Engagement response
			and partnership programs, which I'll pass on to the Applicant for consideration. ▪ Visual screening will be part of the Project design. The Applicant is consulting with close neighbours to ensure screening addresses any visual impact on close properties. ▪ The Project team is working hard to avoid any tree/vegetation removal. If any tree removal is required, potential biodiversity offsets will be governed by the NSW Biodiversity Offsets Policy for Major Projects and will be considered as a requirement. ▪ The Applicant will keep Watershed Landcare of opportunities to be involved in this process.
▪ Gulgong Chamber of Commerce	▪ Urbis emailed the Gulgong Chamber of Commerce in May 2024. ▪ Feedback from Gulgong Chamber of Commerce has informed part of the SIA.	Feedback from the Chamber of Commerce: ▪ The biggest issue for Gulgong is that there is no GP in town so Western Area Health Service is servicing the area with locums which is costly.	▪ The Applicant acknowledges the concern about the lack of health services in town. ▪ The Applicant confirmed that it will use this information in the Social Impact Assessment. ▪ The Applicant explained this is similar feedback to what was shared by other community members.

Stakeholder	How this group was consulted	Feedback received	Engagement response
		▪ Local people who are not on the Mudgee GPs lists don't get served by them even if they have transport.	▪ On-site medical care is proposed as part of the Project, and it is expected that it will significantly decrease pressure onto the local healthcare services.

5.4. ENGAGEMENT TO BE CARRIED OUT

The Applicant continues to welcome feedback on the Project and will continue to be available to answer community questions as the Project processes. The Applicant will continue to keep stakeholders and the community informed of the Project approval process through the exhibition and determination phases by:

- Continuing to engage with the community about the Project, its impacts, and the approval process.
- Enabling the community to seek clarification about the Project through the two-way communication channels.

Should the Project be approved, the Applicant will continue to consult with the community and stakeholders as this approach is developed to ensure any community concerns/feedback in relation to workforce accommodation and travel is addressed as part of the Strategy development.

6. ASSESSMENT OF IMPACTS

This section presents a summary of the results of the social, environmental and economic impacts of the Project. This section is separated to present a detailed or standard assessment of relevant matters. The discussion included a summary of impacts of the Project, the key findings of the technical studies, and impact mitigation and management measures.

This section should be read in conjunction with the appended technical studies as well as:

- SEARs compliance table identifying where the SEARs are addressed in the EIS (**Appendix A**).
- Statutory compliance table identifying where the relevant statutory requirements have been addressed (**Appendix C**).
- Community engagement table identifying where the issues raised by the community during engagement have been addressed (**Appendix D**).
- Proposed mitigation measures for the Project which are additional to the measures incorporated into the physical layout and design of the Project (**Appendix E**).

The detailed technical reports and plans are individually referenced within the following sections.

6.1. DETAILED ASSESSMENT IMPACTS

This section of the EIS provides a detailed assessment of the key issues that could have a significant impact on the Site and locality This section provides a summary of the existing environment, findings, potential impact avoidance and mitigation measures for the Project.

6.1.1. Biodiversity

A Biodiversity Development Assessment Report (**BDAR**) has been undertaken by Anderson Environment & Planning (**AEP**). The BDAR has been prepared to meet the requirements of the Biodiversity Assessment Method (**BAM**) 2020 and signed by an accredited BAM Assessor.

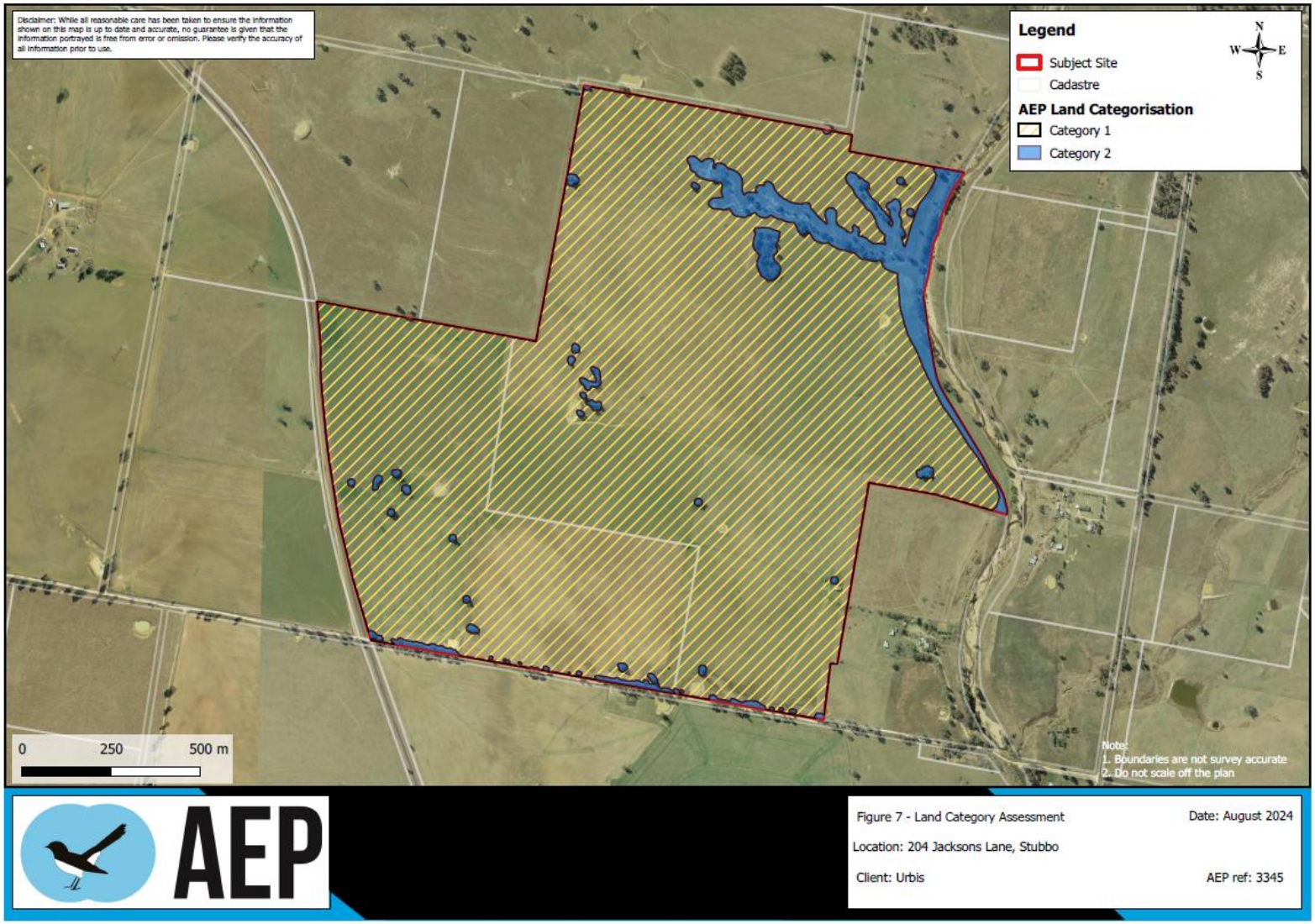
The BDAR has been prepared using the Streamlined Assessment Modules for 'scattered trees' and 'small area,' as outlined in Appendix B and Appendix C of the BAM According to Appendix B of the BAM, the scattered tree module can be used where vegetation has '*a percent foliage cover that is less than 25% of the benchmark for tree cover for the most likely plant community type and are on category 2-regulated land and surrounded by category 1-exempt land on the Native Vegetation Regulatory Map under the NSW Local Land Services Act 2013* (LLS Act). Paddock trees that meet these criteria within the Site have been assessed as scattered trees.

The small area module has been used because the Project does not exceed the area clearing threshold for small area developments as prescribed in the BAM, which, in the case of the Site with a minimum lot size of 100ha, is 3ha.

6.1.1.1. Existing Environment

The BDAR was undertaken following a desktop and site assessment. During the desktop assessment, several key items were identified, including the presence of mapped vegetation (DCCEEW 2023) and grazing native vegetation in areas not designated as Category 2 Land under the Transitional NVR Map (*Local Land Services Act 2013*). Based on this, it was determined that areas of the Site not mapped under the Transitional NVR Map would likely meet Category 2 Land designation (Figure 19).

Figure 19 LLS Land Categorisation



Source: AEP, 2024

In October 2023, December 2023 and March 2024 site assessments were conducted by AEP ecologists to identify biodiversity values within the Site. The vegetation was confirmed on-site using vegetation integrity plots.

The areas identified as exotic-dominant grassland were assessed using the transect methodology outlined in the '*Interim Grasslands and Other Groundcover Assessment Method*' (OEH 2017). A total of seven transects were conducted to ensure comprehensive coverage of the Site, with a transect undertaken at each exotic dominant grassland plot meeting the minimum requirements for number of plots per zone as per Table 2 of the above-mentioned methodology.

PCTs within the Site were determined according to BAM Section 4.2. The State Vegetation Type Map (SVTM) was interrogated to determine the likely ecological communities present within the Site. Ground-truthing of vegetation by AEP in 2023 and 2024 was the primary source of data for PCT determination in the present assessment (Figure 20). This included an assessment of dominant species, landscape position, geomorphology, and vegetation structure. All vegetation communities within the Site were identified and assessed against relevant threatened ecological communities (TECs).

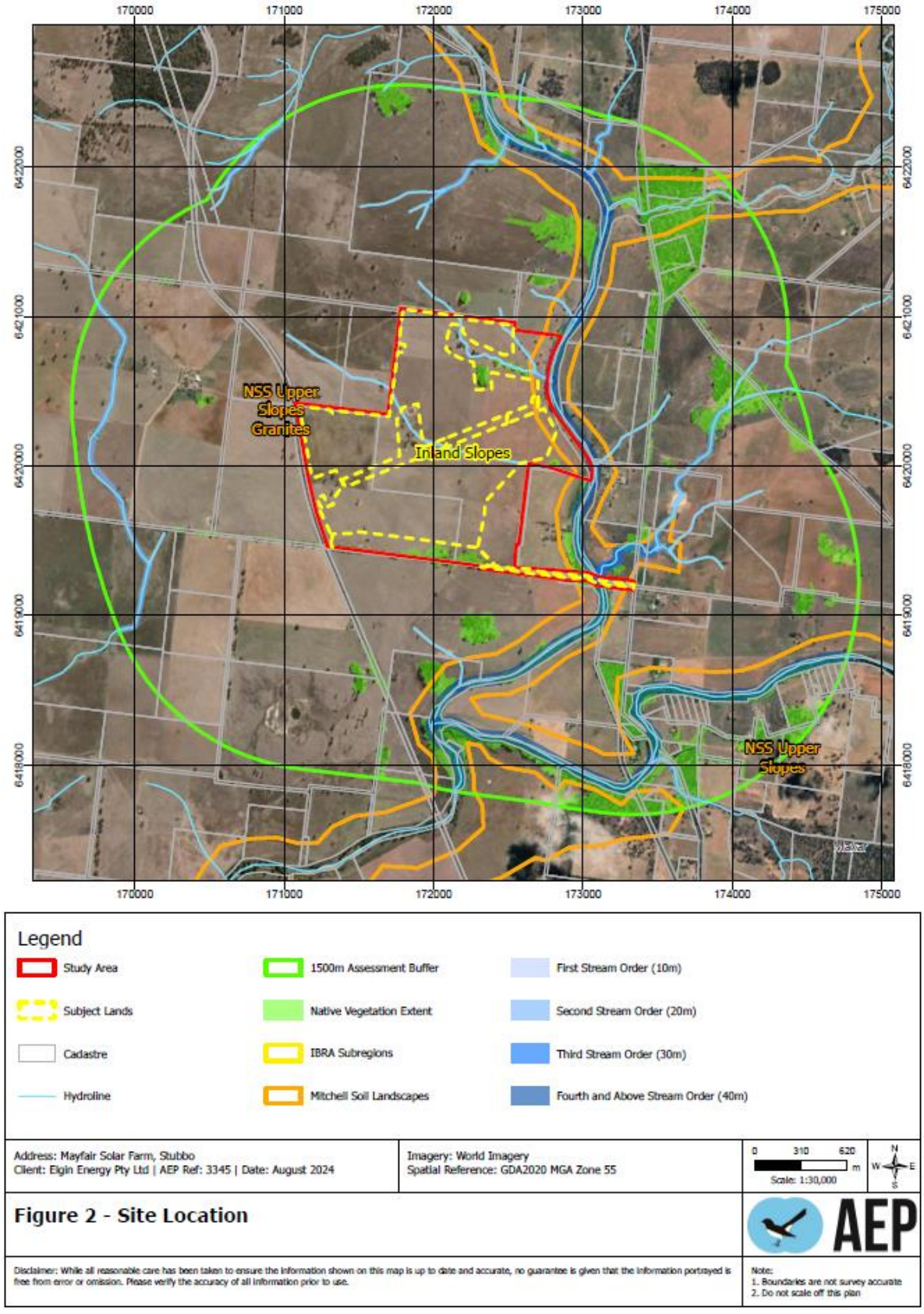
A review of literature and datasets was undertaken to develop a list of species to be targeted during the threatened flora species surveys including:

- NSW BioNet Atlas – searching within 100km^2 search area. Further consideration was given to species that have been recorded within the Mid-Western Regional Council LGA.
- Protected Matters Search Tool (PMST) (CthDCCCEW 2024) within a 10km buffer.
- NSW BioNet Threatened Biodiversity Data Collection (TBDC).
- The Biodiversity Assessment Method Calculator (BAM-C).

Flora species were assessed against the habitat features identified within Subject Lands to determine the suitability of the area to support these species. This involved cross-referencing species information in the TBDC and scientific literature with relevant information from the Site. The small area module only requires assessment of species listed as at risk of Serious and Irreversible Impacts (SAII). Non-SAII species were considered and manually added into the BAM-C.

No threatened fauna species were identified for inclusion as candidate species. Nevertheless, observations were undertaken including records of any fauna species observed during fieldwork were noted. This included opportunistic sightings of secondary indications (scratches, scats, diggings, tracks etc.) of any resident or migratory species. Searches were also conducted for whitewash, regurgitation pellets and prey remain from Owls, chewed Casuarina cones from Black-Cockatoos, chewed fruit remains from frugivorous birds etc. Stag-watching was undertaken on over three nights in October 2023 to identify potential use by Fauna. No threatened fauna was observed during assessment.

Figure 20 Site Location - Biodiversity



Source: AEP, 2024

A sixth order stream, Slapdash Creek, adjoins the north eastern boundary of the Site and a proposed causeway upgrade is planned along Jacksons Lane, crossing Slapdash Creek. Slapdash Creek is mapped as 'Key Fish Habitat' under the *Fisheries Management Act 1994,* and an Aquatic Ecology Report (**AER**) has been prepared to assess aquatic impacts. As detailed in the AER, the existing creek crossing is currently a barrier to fish passage, the creek is currently in a degraded condition with limited native aquatic flora and fauna, and aquatic pest fauna species were observed during assessment.

Ground-truthed native vegetation within the development footprint totals 1.49ha. State Vegetation Type Mapping (SVTM) identified the majority of the Site as 'not classified.' Smaller isolated pockets of vegetation and isolated trees were not mapped as native vegetation within the SVTM, and the broad-scale mapping included some areas of exotic vegetation along the southern portion of the buffer area. Ground-truthing provided a more granular representation of native vegetation (Figure 21).

Only PCT 201 – *Fuzzy Box Woodland on alluvial brown loam soils* was identified within the Site, conditions ranging from moderate to severely degraded (Appendix F). The vegetation is considered commensurate with the BC Act listed EEC *Fuzzy Box Woodland on the alluvial Soils of the South Western Slopes Darling Riverine Plains and Brigalow Belt South Bioregions*. PCT 201 is not associated with any EPBC listed TECs, and there is no federal equivalent of Fuzzy Box Woodland TEC. However, during the determination of vegetation communities, one of the PCTs considered, PCT 277, is associated with the EPBC listing of *Box Gum Woodland*. As such, consideration is provided to the EPBC listing advice (Cth DCCEEW 2023) to determine if the assessed vegetation meets the relevant criteria.

The listing advice prescribes the key diagnostic characteristics that must be met to qualify for EPBC listing including:

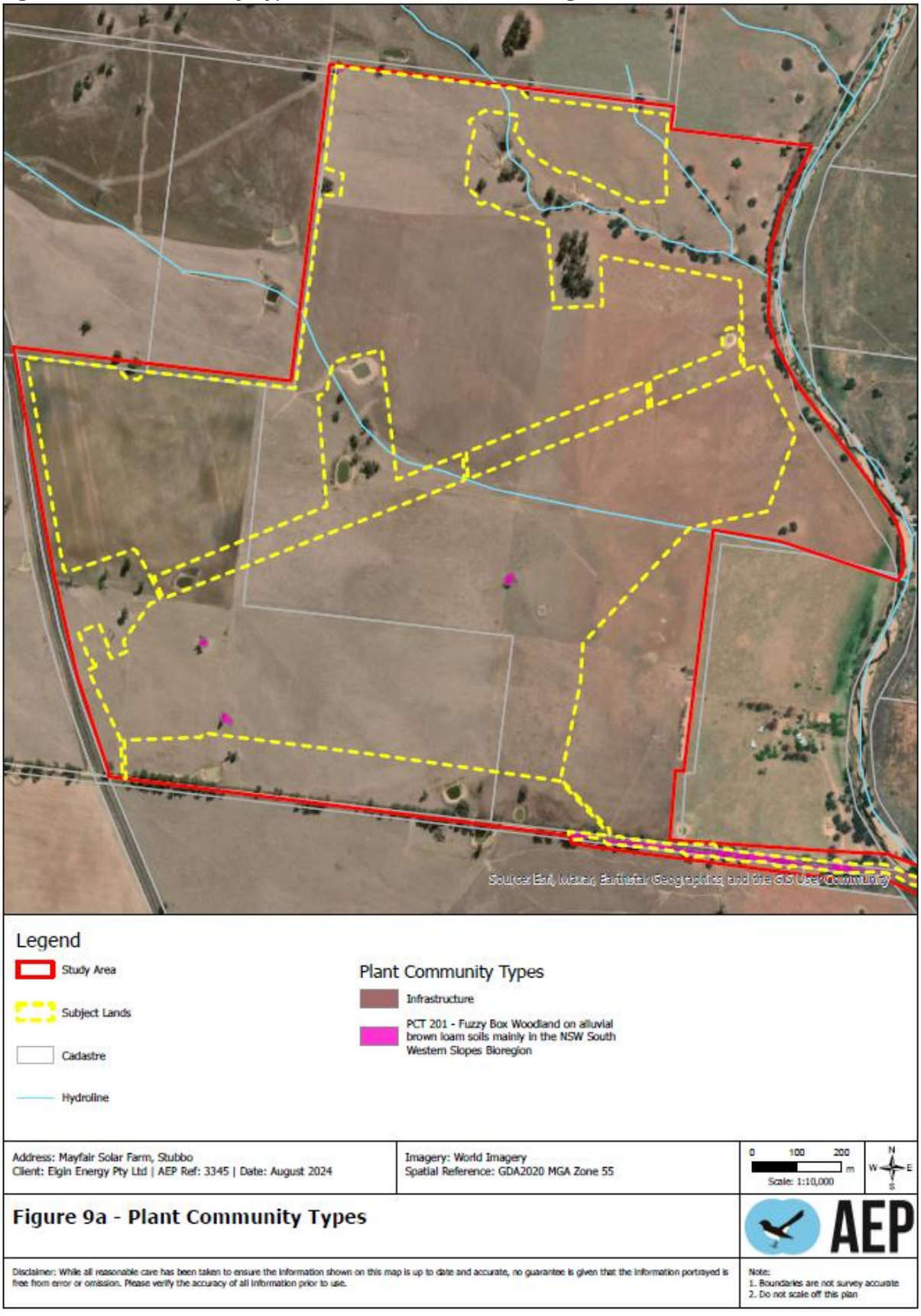
- Vegetation has an overstorey which consists of the following species which constitute at least 50% of the canopy cover or stem/trunk density: *Eucalyptus albens, Eucalyptus melliodora* and/or *Eucalyptus blakelyi*; or, it previously had an overstorey dominated or co-dominated by the aforementioned species, and there is no evidence that the area was previously dominated by other tree species.
- Vegetation has a predominantly native ground layer which is defined as '*at least 50% of the perennial vegetation cover in the ground layer is made up of native species'*.

After careful assessment, it was determined that the vegetation does not meet the key diagnostic characteristics required for the EPBC listing, as no plot surpassed the required thresholds

Both desktop and habitat assessments were undertaken to identify the potential use of the Site by threatened fauna. A total of 24 ecosystem or dual credit species were identified for further assessment. A total of two (2) flora species and three (3) fauna species were returned by the BAM-C for assessment. Consideration was given to the wider locality, and *Acacia ausfeldii* was manually entered into the BAM-C due to the presence of this species in surrounding landscapes, as advised by the. Additionally, *Dichanthium setosum* was manually added due to the presence of disturbed grasslands along the roadside reserve.

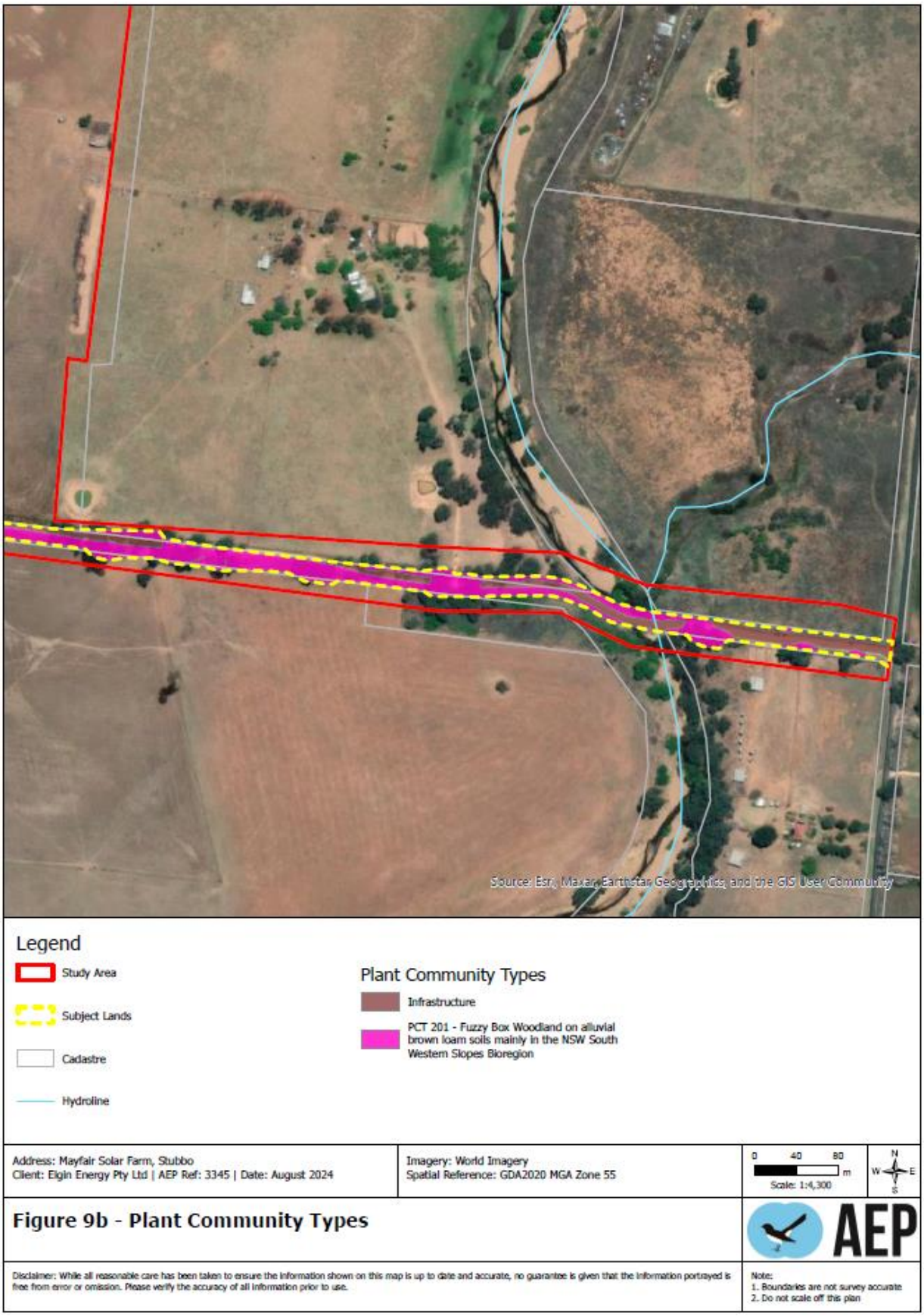
Of these species, only three flora species, *Acacia ausfeldii, Dichanthium setosum* and *Euphrasia arguta*, were retained for further assessment, as the rest were deemed unlikely to appear on the Site (Appendix F). Targeted surveys were undertaken for these species in October 2023, December 2023 and March 2024, which is appropriate months for their detection. No threatened species were found to be present within the Site.

Figure 21 Plant Community Types - Ground-Truthed Native Vegetation



Source: AEP, 2024

Figure 22 Plant Community Types - Ground-Truthed Native Vegetation



Source: AEP, 2024

6.1.1.2. Potential Impacts

Excluded impacts

The Site contains 'Category 1 – exempt land' (Category 1 Land) under the *NSW Local Land Services Act 2013* (LLS Act). A BDAR does not need to assess the impacts of any clearing of native vegetation and loss of habitat on land classified as Category 1 Land, other than prescribed impacts as defined in the *BC Regulation 2017* (Reg 6.1). The Native Vegetation Regulatory Map (NVR Map) is still in a draft stage, and there are currently two interim maps:

- In force: Transitional Native Vegetation Regulatory Map (DCCEEW 2024e).
- No legal effect: Draft Native Vegetation Regulatory Map (DCCEEW 2024f).

A self-assessment to evaluate how the site aligned with the NVR Map commenced in October 2023, it is noted at this time that the Draft NVR Map was not published and was subsequently released in March 2024. As such, self-assessment was informed by the Transitional NVR Map with due reference to the state guidelines: Determining native vegetation land categorisation for application in the Biodiversity Offset Scheme (DPE 2023). A map of the ground-truthed NVR is in Figure 19.

Direct impacts

Residual Direct impacts on native vegetation associated with the Project have been significantly reduced following avoidance measures incorporated into the Site layout. Threatened species impacts have been avoided through avoidance of suitable habitat identified in the wider Study Area. The Project would predominately impact Category 1 Land, with relatively small patches of remnant vegetation proposed to be removed. In total, the Project would remove 1.49ha of native vegetation. This area is listed as an *Endangered* TEC under the BC Act and a SAII entity. An assessment of SAII impacts arising from the Project has been incorporated into Appendix F.

Indirect impacts

Indirect impacts are considered likely during construction. This includes machinery access and laydown areas. To account for this, a 5m buffer has been provided for the proposed road upgrade and included within the Site during the evaluation.

The likelihood of indirect impacts to Slapdash Creek is considered likely due to the proposed upgrades to the creek crossing. These changes could potentially alter the hydrology of the creek, affecting water quality and aquatic habitats.

The vegetation on the Site is already impacted by weeds, and additional edge effects from the Project are not expected to be significant. While edge effects, such as changes in vegetation structure, increased exotic plant growth, and altered fauna behaviour, can result from construction activities, the Site and surrounding areas have already been extensively cleared for agriculture. Remnant vegetation patches may experience some additional edge effects, but these will be offset through active management under a Biodiversity Management Plan (BMP).

Construction activities can potentially introduce or spread pathogens like Phytophthora (*Phytophthora cinnamomi*), Myrtle Rust (*Austropuccinia psidii*), and Chytrid fungus (*Batrachochytrium dendrobatidis*) into native vegetation. Construction of the Project will introduce additional vehicles and machinery to the Site, leading to temporary increases in noise and vibration. However, given the temporary nature of these activities, the impact on resident fauna is expected to be minimal and unlikely to result in significant long-term effects.

The proposed causeway upgrade to Slapdash Creek has the potential to cause sedimentation and erosion on both the construction site and adjacent aquatic habitats due to soil disturbance during the upgrades to Jacksons Lane.

Prescribed Impacts

Development activities are primarily situated within Category 1 Land, which is dominated by non-native vegetation due to extensive historical agricultural use. This area offers highly limited habitat value and the impact on non-native vegetation is considered not consequential, as it avoids significant disturbance to higher quality habitat.

The existing habitat connectivity within the broader landscape is notably fragmented, predominantly due to extensive agricultural activities, with remaining connectivity largely restricted to riparian corridors like Slapdash Creek, which itself has experienced substantial clearing of riparian vegetation.

The Project involves upgrades to existing human-made structures, notably the upgrade of the current crossing over Slapdash Creek. These activities are confined to already disturbed areas and are designed to improve functionality while minimising environmental disturbance. The construction impacts will be localised and temporary, and are not anticipated to impact any threatened entities.

Detailed analysis of DPI Fisheries Threatened Species List and Spatial Data Portal were undertaken in April 2024. Species distribution data and habitat preferences indicates Southern Purple Spotted Gudgeon and Eel Catfish has the potential to occur within the Study Area. These species are considered unlikely to utilise the Subject Site, given the poor water quality and limited habitat, however, they were considered for further assessment (Appendix V). Following field surveys, no aquatic fauna native species were found at Slapdash Creek.

Impacts on aquatic native vegetation clearance have been considered as part of the BDAR and measures to minimise impacts to fish passage and rehabilitation efforts are formulated in accordance with the *Fisheries Management Act 1994*, including *DPI Guidelines for Controlled Activities on Waterfront Land 2018*, *DPI Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings 2003* and *DPE Policy & Guidelines for Fish Habitat Conservation and Management 2013*.

The proposed causeway upgrade at Slapdash Creek presents potential risks to local water quality and hydrological processes through possible sedimentation and erosion during construction activities. Recommendations are provided in the AER to mitigate impacts, and re-vegetation efforts are designed with the aim of improving hydrological processes in the long term. A total of three farm dams will be impacted by the Project, these are not anticipated to provide habitat for threatened species.

6.1.1.3. Mitigation Measures

The Project location and footprint are the result of a carefully considered and iterative design process that prioritised the avoidance of impacts on areas of high biodiversity value. Among these is the endangered Fuzzy Box Woodland, a community reduced to less than 5% (estimated) of its original extent and identified as at risk of SAII). Given the sensitivity of the PCT, the Project design was strategically developed to minimise impacts by situating development primarily in cleared areas and avoiding intact vegetation. This includes the preservation of intact vegetation in the northeastern portion of the site and clusters of trees where possible. An Arboricultural Impact Assessment (AEP, 2024) guided the retention of trees along Jacksons Lane to maximise the retention of vegetation.

Recognising the sensitivity of the Fuzzy Box Woodland, a BMP is proposed to manage retained lands with the objective of achieving a ‘Nature Positive’ outcome. A central aim of this BMP is to ensure a net increase in the extent of Fuzzy Box Woodland within the Site.

Additionally, the watercourses and riparian areas within the Site were identified and assessed and to avoid impacts, the development footprint was located outside vegetated riparian zones, with the exception of necessary upgrades to Jacksons Lane.

Although the risk of impact from pathogens is low due to the already disturbed nature of much of the Site, appropriate measures such as equipment and machine washdowns will be implemented as part of the CEMP.

The mitigation measures set out in Table 15 have been proposed to mitigate potential residual impacts on habitat (Table 15). In addition, the following recommended mitigation measures from the AER are provided in relation to facilitating improved environmental outcomes for aquatic flora and fauna habitat in Slapdash Creek:

- Prior to construction, a suitably experienced and qualified Project Ecologist will be appointed to oversee ecological works to mitigate construction impacts on native biota welfare.
- Prior to construction commencing, temporary construction fencing and signage will be installed to delineate construction zone from retained riparian vegetation.

- No machinery or material will be stored within retained vegetation or within the dripline of retained trees.
- Equipment should be cleaned thoroughly and disinfected before entering and exiting site to prevent weed and disease introduction such as *Phytophthora cinnamomi* (Root-rot fungus), *Puccinia psidii* (Myrtle Rust) and other pathogens.
- Final culvert design will be prepared in accordance with DPE guidelines: *Controlled activities – Guidelines for watercourse crossings on waterfront land*.
- The removal of in-stream woody debris should be minimised where possible during construction.
- Bank stabilisation measures will be implemented during construction and operation of the of the crossings to minimise erosion risk. This may include localised reshaping of the incised bank, installation of ground stabilising matting and/or terracing, and revegetation using suitably dense planting of groundcovers, trees, and shrubs. Final activities and monitoring will be undertaken in accordance with an approved Biodiversity Management Plan (**Appendix V**) to be included in the final CEMP.
- Aquatic floating screening should be utilised around the extent of the works area to ensure that mobilised sediment and debris are not distributed into the wider system.
- The SWMP will outline measures to prevent erosion and sediment flow on Slapdash Creek prior to the commencement of works.
- CEMP will include measures to avoid any indirect impact from waste disposal on Slapdash Creek.

After the implementation of these mitigation measures and in conjunction with appropriate offsets, it is considered that the Project can avoid significant biodiversity impacts and achieve a nature-positive outcome for the regional ecosystem.

It is considered unlikely that the Project is going to result into a significant cumulative impact of the biodiversity value in the region, having regard to the extent of the extent of avoidance incorporated into the Site layout and proposed mitigation measures.

Table 15 Mitigation Measures for Residual Impacts on Habitat.

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES
Implementation of recommendations detailed in the AER for the Slapdash Creek upgrade	Established pre-clearance protocols	Pre-construction / clearing	Implemented during construction	Construction contractor/Project Manager	High (Low risk of failure)	N/A
Environmental induction for all workers covering ecological values and protection measures	Training and induction sessions	Pre-construction / clearing	Continuous during construction	Construction contractor	High (Low risk of failure)	N/A
Regular inspection and maintenance of erosion and sediment control measures	Inspections and routine maintenance	Pre-construction / clearing	Regular intervals during work	Construction contractor	High (Low risk of failure)	N/A
Fence off or mark trees and areas of native vegetation to be retained	Erect physical barriers and markers	Pre-construction / clearing	Once before clearing	Construction contractor / Arborist	High (Low risk of failure)	N/A
Establishment of appropriate buffers around retained trees, in accordance with AS4970-2009	Avoidance of Structural Root Zones	Pre-construction / clearing	Once before clearing; maintained during works	Construction contractor / Site ecologist	High (Low risk of failure)	N/A
Restriction of stockpiles to existing cleared areas	Stockpile management in designated areas	Construction / clearing	Continuous during construction; maintained during works	Construction contractor	High (Low risk of failure)	N/A
Application of water to soil stockpile areas during windy conditions	Dust suppression by watering	Construction / clearing	As needed during windy conditions	Construction contractor	High (Low risk of failure)	N/A
Construction traffic restricted to existing roads, tracks and the Site.	Traffic management and routing	Construction / clearing	Continuous during construction	Construction contractor	High (Low risk of failure)	N/A

Source: AEP, 2024

6.1.1.4. Offsets

The following impacts will require an offset as a result of the direct clearance from the Project (Table 16). These will be in the form of ecosystem credits, associated with PCT 201. Offsets will be provided in accordance with the *Biodiversity Offset Scheme* (BOS).

Table 16 Impacts that require an offset - ecosystem credits

Vegetation zone	PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
Moderate	PCT 201	Fuzzy Box Woodland	0.9	26
Scattered Trees	PCT 201	Fuzzy Box Woodland	0.13ha (4 trees)	4

Source: AEP, 2024

6.1.2. Aboriginal Cultural Heritage/Archaeology

This section provides a summary of the assessment, findings, potential impacts and mitigation measures for the provision of the Project whilst observing the Aboriginal cultural heritage historic significance of the subject area. This section addresses the specific SEARs as relating to Aboriginal cultural heritage for the Project and the Aboriginal Cultural Heritage Assessment (**ACHA**) prepared by Urbis in Appendix G.

6.1.2.1. Existing Environment

The environment context of the subject area encompasses the characteristics of the natural landscape and the impacts of historical human activity. These aspects are important to predicting the potential for unknown Aboriginal objects occurring within the subject area.

The subject area is relatively flat, gently sloping towards Slapdash Creek in the south-east. The highest elevation of the subject area is approximately 440m above sea level near the Wallerawang Gwabegar Railway. The lowest elevation of the subject area is approximately 420m adjacent to Slapdash Creek. The bioregion characteristics are described as 'a large area of foothills and ranges comprising the western fall of the Great Dividing Range and comprised of a wide variety of rock and soil types across the region'.

Disturbance to the natural landscape, either through human activity or natural processes, reduces the likelihood of deposited Aboriginal objects being retained, either through destruction of the Aboriginal objects or their removal. Ground disturbance may affect the natural topsoil (A-horizon), within which subsurface Aboriginal archaeological remains are typically found. For the present assessment, historical ground disturbance is rated according to the following criteria:

- **High**: all or most topsoil has been removed, with at most only a small part of the lower portion of topsoil possibly remaining intact.
- **Moderate**: the upper part of the topsoil has been substantially disturbed or removed, but a substantial amount remains intact.
- **Low**: little or no disturbance or removal of topsoil, with all or most topsoil remaining intact.

The degree of disturbance is relative to the depth of the natural topsoil. The Subject area has been utilised since the mid to late 19th Century for agricultural and pastoral use. Located within the Parish of Puggoon, County of Bligh, the Subject area had been subdivided into multiple allotments by 1870. The land within the subject area had been granted to the following people comprising of S. Bennet (Section 186), James Grimshaw (Section 187), Thomas Butler (Section 73 and 215), and Matthew Homer (Section 221). Historical ground disturbance during the early phase of the Subject area's history is likely to have included the clearing of native vegetation, various agricultural activities and construction of fences and temporary structures. No buildings are evident within the early parish maps of this phase.

From the early 20th Century, the subject area remained largely vacant and undeveloped. The aerial photograph from 1964 shows the subject area with no structures present. There are small dams and

irrigation channels present across the subject area. Historical ground disturbing activities during this phase included grazing, ploughing and crop production and construction of additional fence lines. The aerial photograph from 1994 shows little change since 1964, indicating the same pattern of use.

Ground disturbing activities that have been undertaken at the subject area comprise of clearing of native vegetation, construction of fences, grazing, ploughing and crop production. These activities might have caused moderate level of ground disturbance within the subject area, with localised high disturbance around dams and unformed vehicle tracks. Erosion might have caused surface soil loss and impact to the A horizon around the intensely ploughed areas and creek and gully banks.

6.1.2.2. Assessment Methodology

The ACHA was prepared in accordance with the requirements of sections 60 and 61 of the NSW *National Parks and Wildlife Regulation 2019* (**NPW Reg**) and the following guidelines:

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

The aim of the ACHA is to investigate whether development of the Subject area is likely to impact any Aboriginal objects and/or Aboriginal places that may exist within the subject area and to formulate measures for avoiding or minimising any such impacts.

The ACHA was prepared using the following methodology.

Aboriginal Consultation

Consultation with the Aboriginal community is required under section 60 of the NPW Reg and the Consultation Requirements. The purpose of consultation with Aboriginal people is to understand their views and concerns about the Project and to understand the cultural values present in the area that may be harmed. Consultation ensures that Aboriginal people have the opportunity to improve assessment outcomes by providing relevant cultural information, influencing assessment methodology, contributing to the development of cultural heritage management options and reviewing and commenting the draft assessment report.

To identify Aboriginal people who may be interested in registering as Aboriginal parties for the Project, the organisations stipulated in Section 4.1.2 of the Consultation Guidelines were contacted. A total of 104 Aboriginal parties with a potential interest in the Subject area were identified during this stage and letters were sent to the 104 identified Aboriginal parties by either email or mail to notify them of the Project. An advertisement was placed in a local newspaper, the Mudgee Guardian.

Twenty-four Aboriginal parties registered interest in the Project. A list of the Registered Aboriginal Parties (**RAPs**) was provided to Heritage NSW and Mudgee Local Aboriginal Land Council. Information packs were sent to RAPs.

The draft ACHA was sent to the 24 RAPs and providing 28 days for response and five responses were received. Full details of the RAPs and their responses are included in the ACHA.

Desktop Assessment

The protection and management of Aboriginal cultural heritage items, places and archaeological sites within New South Wales is governed by the relevant Commonwealth, state or local government legislation. Assessment of the Project under the relevant legislation and controls including:

- *Environment Protection and Biodiversity Conservation Act 1999.*
- *National Parks and Wildlife Act 1974* (**NPW Act**).
- *Environmental Planning and Assessment Act 1979.*
- Mid-Western Regional Local Environmental Plan 2012.

The aim of the desktop assessment is to understand the archaeological and environmental context of the subject area, and to determine whether any known Aboriginal objects are located within the subject area and whether there is a potential for the presence of any unknown Aboriginal objects. The findings of the desktop assessment will inform the predictive model for the archaeological survey of the subject area.

A search of the Aboriginal Heritage Information Management System (**AHIMS**) was carried out on 1st February 2024 (AHIMS Client Service IDs: 860319 and 860320) for an area of approximately 3km x 3km centred on the subject area. While a total of 98 Aboriginal sites are registered in the search area, the extensive search did not identify any Aboriginal objects or Aboriginal Places within the curtilage of the Subject area.

The closest site is 'Slapdash Creek 1' (AHIMS ID# 36-3-0048) recorded in 1981, an artefact site which is located 50m from the south-eastern corner of the subject area according to the converted spatial data in the AHIMS register.

Previous Aboriginal archaeological investigations undertaken within or near to the subject area may provide information about known Aboriginal sites that have not previously registered on the AHIMS database. Additionally, Aboriginal archaeological investigations undertaken in the broader region may provide information on the types of archaeological site features that are likely to occur within the subject area. However, no previous archaeological investigations of the subject area have been carried out.

Physical Assessment – Archaeological Survey and Meeting

An archaeological survey of the subject area was undertaken on 26 and 27 March 2024. The survey was carried out with the intent to entirely cover the Subject area and the survey achieved close to 80% of this goal, with only two paddocks excluded due to dense crops that restricted visibility to almost 0%.

The survey inspected the Subject area on foot in linear transects utilising GPS navigation, with reference to aerial photographs and property boundaries. The subject area was divided into five survey units (**SUs**) (Figure 23), the approximate area and landforms encompassed by each survey unit is described under the relevant section below. Visible exposures and remnant mature trees were further inspected for cultural material or markings.

The ACHA survey identified six Aboriginal archaeological sites, including three isolated finds and three artefact scatters (Figure 24). The details of which are as follows:

- One Aboriginal object found in the northern section of SU1. 'Mayfair IF1' (AHIMS registration of the Site is pending) is a chert, multidirectional retouched core, with at least six flake scars. No areas of landscape features were identified as potential archaeological deposits (PADs).
- There were no Aboriginal objects found in SU2, nor were any areas identified as a PAD.
- There were two Aboriginal objects found in within the boundaries of SU3. 'Mayfair IF2' is a quartz, distal flake, and 'Mayfair IF3' is a quartz, complete flake. AHIMS registration of the Sites is under way. There were no areas identified as PAD within SU3.
- There was one Aboriginal site found in the eastern section of SU4, on a sandy-loamy rise just above the western bank of the creek. 'Mayfair AS1' is a well-defined, intensive artefact scatter, covering a relatively small area, on the eroded knoll above the creek. There were 50-60 artefacts visible on the surface, covering an area of approximately 50m (N-S) by 40m (E-W). No PAD is associated with the Subject area due to the heavy erosion caused by the historical land use and amplified by constant soil loss due to water run-offs from the gullies. For Survey Unit 5 (SU5), two Aboriginal sites were found on localised, knolls along the creek line. 'Mayfair AS2' is a large artefact scatter, comprising more than 100 artefacts. The Subject area is located on the eastern side of a small knoll, approximately 200m from the creek and covering an area of 100m(N-S) by 70m(E-W). Artefacts have been moved around by post-depositional impacts, such as ploughing, erosion and surface water wash.
- 'Mayfair AS3' is a large artefacts scatter, comprising at least 100 artefacts, located on a flat rise, and its eastern sloping/eroding side, just south west of the confluence of Slapdash Creek and the large eastern tributary/gully. During the survey of this area, the survey team first identified small concentration of exposed artefacts along the survey transects, and after criss-crossing the area, decision was made to record it as one, large continuous site. This was justified by being located

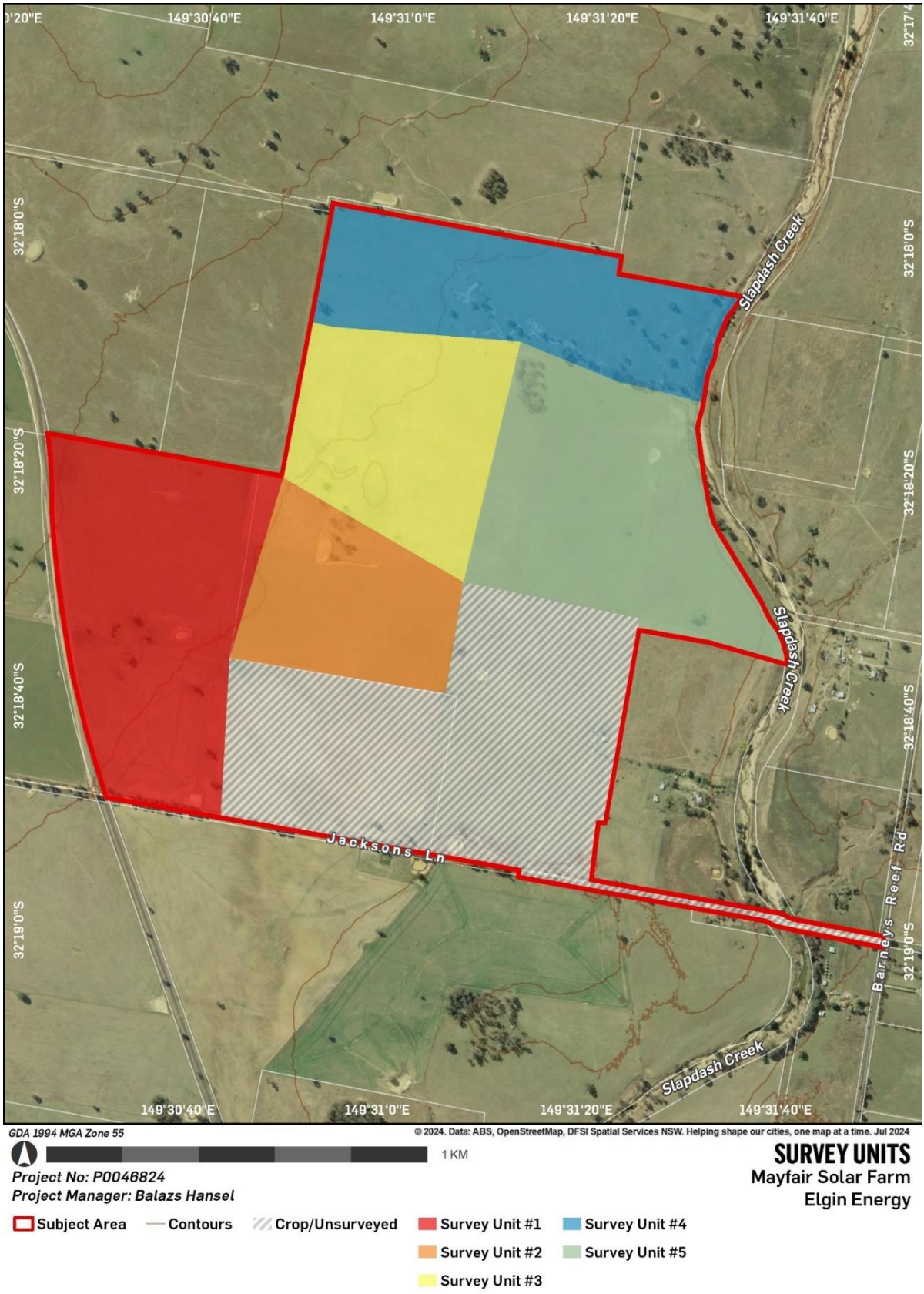
on the same landform and well defined by the creek and gully, in similar settings as the other two artefact scatters.

The outcomes of the subject area survey are summarised as follows:

- The survey confirmed the results of the desktop assessment, including the level of disturbance and impact of historical land use.
- The survey confirmed the results of the predictive model and results of other archaeological survey carried out in the vicinity and wider region.
- Six Aboriginal archaeological sites were identified during the survey. Three isolated finds and three Artefact scatters.
- Test excavation may be required to identify the extent of Mayfair AS3 in context with the final impact footprint and design.
- As addressed in Section 4.1.4 of the ACHAR (Appendix G), the extent of the survey was deemed to be effective, given that 76% of the area was covered, average visibility and exposure was around 48% and effective survey coverage in areas of the most potential was around 81%. Further, visibility was around 90% on the majority of the landforms with the most potential, including vicinity of Slapdash Creek and its right-bank gully and associated creek flat (located in Survey Unit #5)
- Limitations to the survey area are deemed acceptable, as the cropped area was inspected by the RAPs and deemed unsuitable for survey due to almost zero visibility. The extent of Jacksons Lane was also deemed highly disturbed and unsuitable for survey. Both of these unsurveyed areas are located in areas considered to have low archaeology potential.

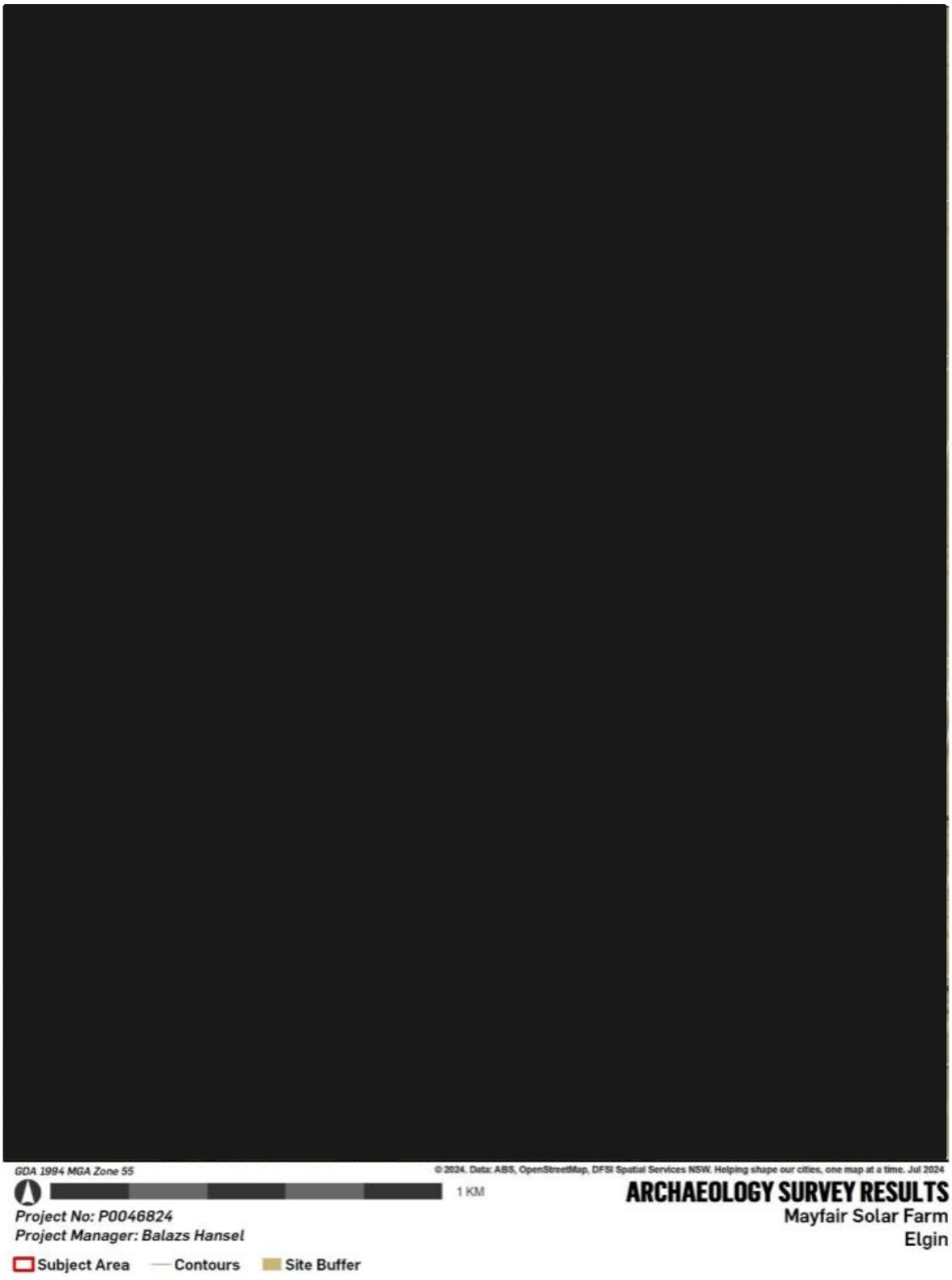
The outcomes of the survey and assessment have been discussed with the RAPs. RAPs were supportive during discussions throughout the ACHA process and have agreed with all aspects of the ACHA, including methodology and the extent of the survey area. RAPs have also supported the conclusions and recommendations that additional site survey and the proposed testing for Site AS3 is to be carried out post-approval, subject to a condition of consent.

Figure 23 Survey Units



Source: Urbis, 2024

Figure 24 Archaeology Survey Results



This Figure is to be redacted for public exhibition due to its cultural sensitivity. An unredacted version has been provided to DPHI for its assessment.

Source: Urbis, 2024

6.1.2.3. Potential Impacts

The Aboriginal archaeological potential of an area is the likelihood that it retains material evidence of past Aboriginal land use. The purpose of undertaking an assessment of Aboriginal archaeological potential and predictive model is to inform the strategy for the subsequent archaeological survey, including to decide if a full coverage survey or a sampling strategy is more applicable to the subject area.

Significance Assessment

The appropriate management of cultural heritage items is usually determined based on their assessed significance, as well as the likely impacts of any proposed developments. In consultation with the RAPs, Urbis undertook a significance assessment to characterise the social or cultural, archaeological or scientific, aesthetic and/or historic values of the identified sites.

The assessment follows principles and procedures outlined in the Burra Charter the Assessment Guidelines. The overall cultural heritage values of a site, place or area are resolved through the combination of these elements.

Table 17 provides a summary of the scientific (archaeological) significance assessment of the Aboriginal cultural heritage sites recorded during the field survey.

Table 17 Scientific (archaeological) significance Assessment

Site ID	Rarity	Representativeness	Research	Educational	Overall
Mayfair IF1	Low	Low	Low	Low	Low
Mayfair IF2	Low	Low	Low	Low	Low
Mayfair IF3	Low	Low	Low	Low	Low
Mayfair AS1	Low	Low	Moderate	Moderate	Moderate
Mayfair AS2	Low	Low	Moderate	Moderate	Moderate
Mayfair AS3	Low	Low	Moderate	Moderate	Moderate

Source: Urbis, 2024

Impact Assessment

The assessment of potential harm considers harm that may occur to known Aboriginal objects within the subject area. Table 18 provides details of site-specific harm.

Table 18 Site Specific Assessment of Potential Harm

Site ID	Direct Harm	Indirect Harm
Mayfair IF1	Yes	N/A
Mayfair IF2	Yes	N/A
Mayfair IF3	Yes	N/A
Mayfair AS1	No	No
Mayfair AS2	No	No
Mayfair AS3	Yes	Yes

Source: Urbis, 2024

The ACHA concludes the following:

- The three isolated finds, Mayfair IF1, IF2 and IF3 will be directly impacted by the Project.
- Two artefact scatters, Mayfair AS1 and AS2 are outside of the development footprint, will be avoided by the Project and long term conservation is proposed.
- The artefact scatter Mayfair AS3 will be partially impacted, and the scope of the impact and consequent conservation will be investigated by test excavation programme.
- No previously identified Aboriginal objects or places were recorded for the subject area on AHIMS.
- The archaeological field survey undertaken as part of this ACHA has identified six Aboriginal archaeological sites, including three isolated finds and three artefact scatters.
- The Site has generally undergone a low to high level of ground disturbance. Historical activities undertaken at the subject area includes clearing of native vegetation, intensive, long history of ploughing and cropping, construction of dams, fence lines and temporary farm infrastructure.
- Disturbance has been further amplified by erosion and surface wash, especially within the flood zone of Slapdash Creek.
- The predictive model and preliminary archaeological potential highlighted the importance of Slapdash Creek and its flood plain.
- This was tested by the archaeological field survey and confirmed the potential as 99% of Aboriginal objects, including the three artefact scatters were found within 300m of the creek.
- The rest of the subject area has low potential.
- The social and cultural significance of the identified Aboriginal sites and in general the Site has been raised by those RAPs that responded during consultation and identified various elements of significance, including the connection to country, the intergenerational connection and significance.
- The scientific/research potential of the three artefact scatters is **moderate**, while the isolated finds are of low potential.
- Various aspects of historical significance of the identified Aboriginal sites and in general the subject area has been raised by the RAPs.
- The Aesthetic significance of the identified Aboriginal sites and in general the subject area has been discussed by the RAPs in their responses to the ACHA during Stage 4 of the assessment.

6.1.2.4. Mitigation Measures

During the preparation of the ACHA, there were six Aboriginal archaeological sites identified and three isolated finds will be impacted and acceptable for removal. The conservation and mitigation measures detailed in

Table 19 and Table 20 are proposed to minimise impacts on three areas of scattered artefacts.

Table 19 Proposed Conservation Measures

Site ID	Proposed Conservation Measures	Outcome
Mayfair AS1	Outside of proposed impact footprint, complete avoidance, application of an ACHMP.	Conservation of entire site.
Mayfair AS2	Outside of proposed impact footprint, complete avoidance, application of an ACHMP.	Conservation of entire site.

Site ID	Proposed Conservation Measures	Outcome
Mayfair AS3	Partially impacted by the Project. Further testing and potential salvage, combined with avoidance and application of ACHMP.	Partial conservation.

Source: Urbis, 2024

If harm to Aboriginal objects and/or Aboriginal places is unavoidable, management strategies must be considered to minimise the harm. The type of management strategies proposed must be appropriate to the significance of Aboriginal heritage values of the relevant Aboriginal objects and/or Aboriginal places. Harm avoidance and minimisation measures must be feasible and within the financial viability of the proposed activity.

Table 20 Management and Minimisation of Harm

Site ID	Proposed Mitigation Measures	Outcome
Mayfair IF1	Salvage through community collection, application of ACHMP.	Direct harm managed through mitigation.
Mayfair IF2	Salvage through community collection, application of ACHMP.	Direct harm managed through mitigation.
Mayfair IF3	Salvage through community collection, application of ACHMP.	Direct harm managed through mitigation.
Mayfair AS3	Partially impacted by the Project. Further testing and potential salvage, combined with avoidance and application of ACHMP.	Partial harm and managed through mitigation.

Source: Urbis, 2024

The above conservation and mitigation measures will be supported by the following actions.

Continued Consultation Until Finalisation

Consultation with RAPs should continue until the finalisation of the construction of the Project to ensure the opportunity for Aboriginal community input and involvement in managing cultural heritage matters.

Further Investigation – Archaeological Survey

In areas that were previously unsurveyed, including the cropped area and extent of Jacksons Lane proposed for upgrade, an archaeological survey must be undertaken within proposed development foot print areas. The survey is proposed to be undertaken post-approval under conditions of consent prior to works commencing on that part of the Site, in accordance with the survey methodology utilised for the ACHA. Any mitigation measures required will be in line with those proposed for identified sites in the recommended Aboriginal Cultural Heritage Management Plan (**ACHMP**).

Further Investigation - Archaeological Test Excavation of Mayfair AS3

An archaeological test excavation program should be undertaken under the condition of consent to clarify the proposed impact to Mayfair AS3 and inform the proposed management decision. The archaeological test excavation will be carried out in accordance with the methodology to be set out in the ACHMP and with reference to the Code of Practice to determine the nature, spatial and vertical extent, and integrity of Mayfair AS3. The subsurface archaeological investigation program should be undertaken by appropriately qualified archaeologists with the participation of Aboriginal RAPs.

An Archaeological Technical Report (**ATR**) will be prepared following completion of the test archaeological excavation program, with further recommendations based on the findings of the

investigation. The ATR will be submitted to the RAPs for comments for at least 28 days, and their comments will be considered for the management decision in relation to Mayfair AS3.

Aboriginal Cultural Heritage Management Plan

An ACHMP will be prepared in consultation with the RAPs to implement appropriate strategies for the archaeological management of identified Aboriginal objects within the subject area. The ACHMP will include:

- Plan of ongoing consultation with the RAPs during the implementation of the ACHMP.
- Methodology for completion of additional survey within previously cropped areas, and along the portion of Jacksons Lane requiring upgrade, including the creek crossing.
- Description of the measures that would be implemented for the conservation and avoidance of Mayfair AS1, Mayfair AS2.
- Methodology for the community collection of Mayfair IF1, Mayfair IF2 and Mayfair IF3.
- Description of updated proposed methodology for test excavation and salvage (if required) for Mayfair AS3 in consultation with the RAPs and notification for HNSW.
- The details of the proposed management of unexpected finds and for human skeletal remains, in accordance with the relevant HNSW guidelines.
- Proposed Aboriginal cultural heritage inductions for all contractors involved with the Project. This induction will be provided in digital form and be part of the construction induction protocol.
- Long-term management of any Aboriginal objects or material, should any be recovered during test and/or salvage excavation. Preferred option will be re-burial on country, within the Site boundaries.
- Methodology for undertaking further Aboriginal heritage assessment for any areas of the Project footprint that have changed following completion of the ACHAR and/or during the final design and construction phases of the Project.

6.1.3. Land

An Agricultural Impact Assessment (**AIA**) has been prepared by Premise to satisfy the SEARs in accordance with the *Large-Scale Solar Energy Guideline.* The assessment also includes a soil survey to determine the soil characteristics and consider the potential for salinity, acid sulfate soils, and erosion to occur. The key objectives of the AIA are to:

- Identify the soil and land characteristics of the Site using a combination of desktop research and site inspection.
- Assess potential impacts of the Project related to soil, erosion, and agricultural production.
- Address the SEARs in relation to potential agricultural land and soil impacts.
- Highlight or recommend strategies to help mitigate potential for impacts to land and soil occurring during the construction, operation and decommissioning of the Project.

Refer to the following in relation to addressing other ‘Land’ matters required under the SEARs:

- Suitability of the site – **Section 7.6**
- Permissibility – **Section 4.1**
- Strategic context – **Section 2**
- Existing land uses, including Flood prone land, Crown lands, etc – **Section 2.3**
- Cumulative impact assessment – **Section 6.3**

6.1.3.1. Existing Environment

Underlying geology influences agricultural productivity as parent rock contributes to soil fertility, minerology, and hydrogeological activity. The majority of the Site is mapped as Carboniferous Intrusions of Gulgong granite with sections of Cainozoic Units of alluvial silt, sand and clay along Slapdash Creek. Acid sulfate soils are not mapped within the Site or locality. The likelihood of acid sulfate soils occurring within the Site is considered very low due to its position away from the coast.

Soil information was assessed with a combination of desktop research and a site inspection. Information was assessed online from:

- Australian Soil Classification system soil type mapping of NSW (DPE, 2024).
- Land and Soil Capability Assessment Scheme (OEH 2012).
- Estimated Inherent Soil Fertility of NSW mapping (DPIE, 2021).
- The Central Resource for Sharing and Enabling Environmental Data in NSW (SEED Mapping, 2020).
- NSW Soil and Land Information (eSpade Mapping, 2020).
- NSW Planning Portal Spatial Viewer (NSW ePlanning Spatial Viewer, 2024).
- The Soil Landscapes of Central and Eastern NSW mapping (DPIE 2020).

A site inspection was conducted on 8 May 2024, including visual survey of the full extent of the 127-hectare area of the proposed activity and analysis of four soil profile cores located to best represent all soil types present within the survey area. Sample locations were determined using soil and geology mapping, landform features, vegetation changes and other biophysical markers in the landscape.

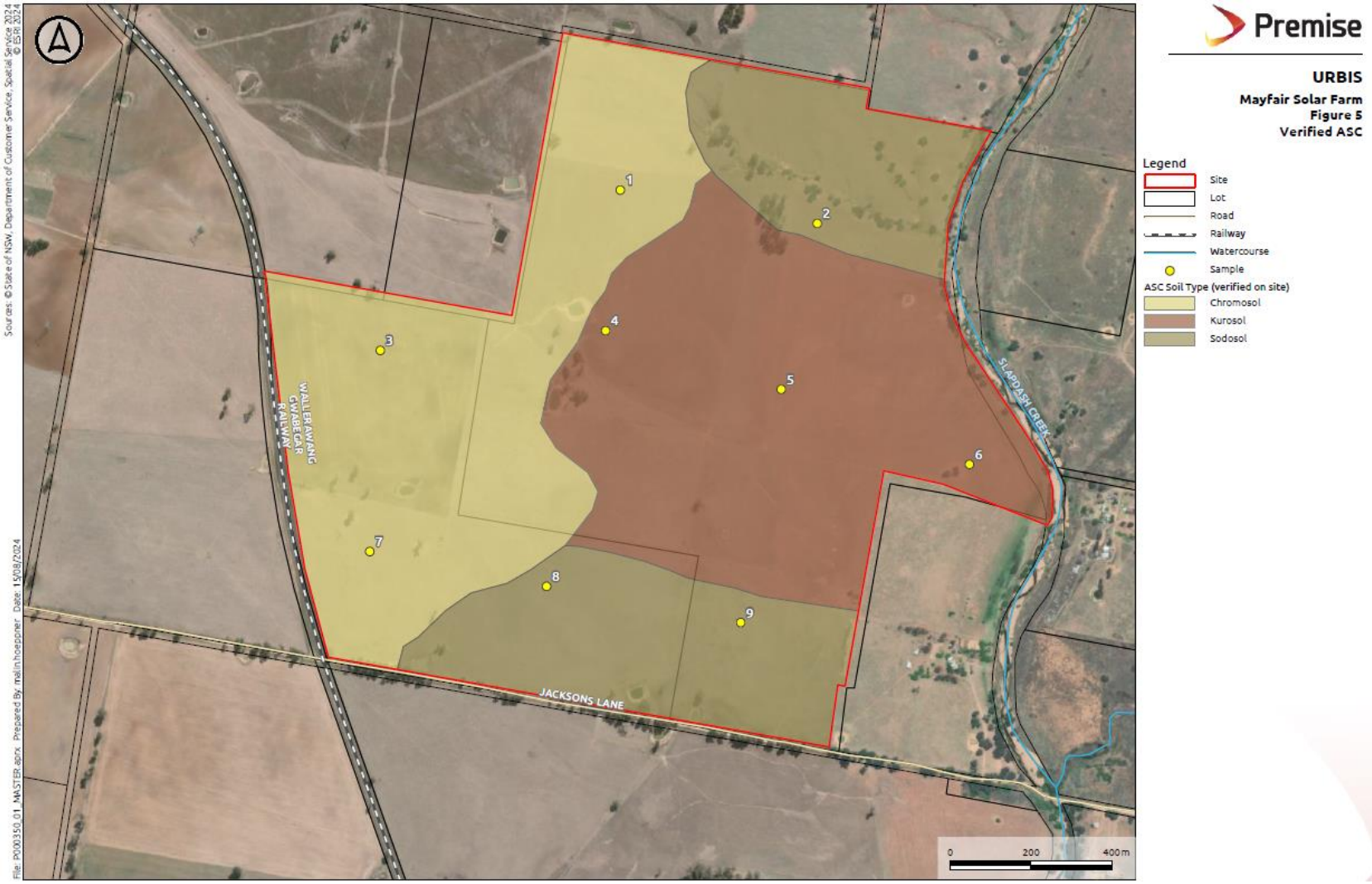
Australian Soil Classification system soil type mapping of NSW (DPIE 2021) maps the soils across the Site as Sodosols. The Site inspection identified Sodosols, Chromosols and Kurosols, as described in Table 21. Mapping of the soil types is included in Figure 25.

Table 21 Soil Units Within the Site

ASC soil type	ASC description	Detailed sites	Constraints	Total area mapped within Site
Chromosol	Soils with a strong texture contrast between the A and B horizons, where the B horizon is not strongly acidic or sodic.	M1, M3, M7	Moderate to strongly alkaline subsoils. Low chemical fertility.	76.07 ha
Sodosol	Soils with a clear or abrupt textural B horizon and in which a major part of the upper 0.2 m of the B2t horizon is sodic and not strongly acid.	M2, M8, M9	Moderate to strongly sodic subsoils. Risk of erosion. Prone to waterlogging and ponding. Low chemical fertility. Acidic topsoils, moderately alkaline subsoils.	61.16 ha
Kurosol	Soils with strong texture contrast between A horizons and strongly acid B horizons.	M4, M5, M6	Moderate to strongly acidic topsoils and subsoils. High aluminium levels and risk of toxicity. Low chemical fertility.	80.33 ha

Source: Premise, 2024

Figure 25 Australian Soil Classification (ASC)



Source: Premise, 2024

The *Land and Soil Capability Assessment Scheme* (OEH, 2012) (LSC Scheme) ranks the capacity of land to sustain a range of land uses without causing degradation of the land and soil at the Site and off-site environment. The LSC Scheme considers the biophysical features of the land and soil including landform position, slope gradient, drainage, climate, soil type and soil characteristics. The final LSC class of the land is based on the most limiting factor.

The LSC maps the soil of the Site as Class 5 as described in Table 22 and mapped in Figure 26. The Site visit confirmed that the soil is considered Class 5: Moderate–low capability land due to the chemical limitations across the Site including strongly sodic and strongly acidic subsoils and general low chemical fertility.

Table 22 LSC Definitions

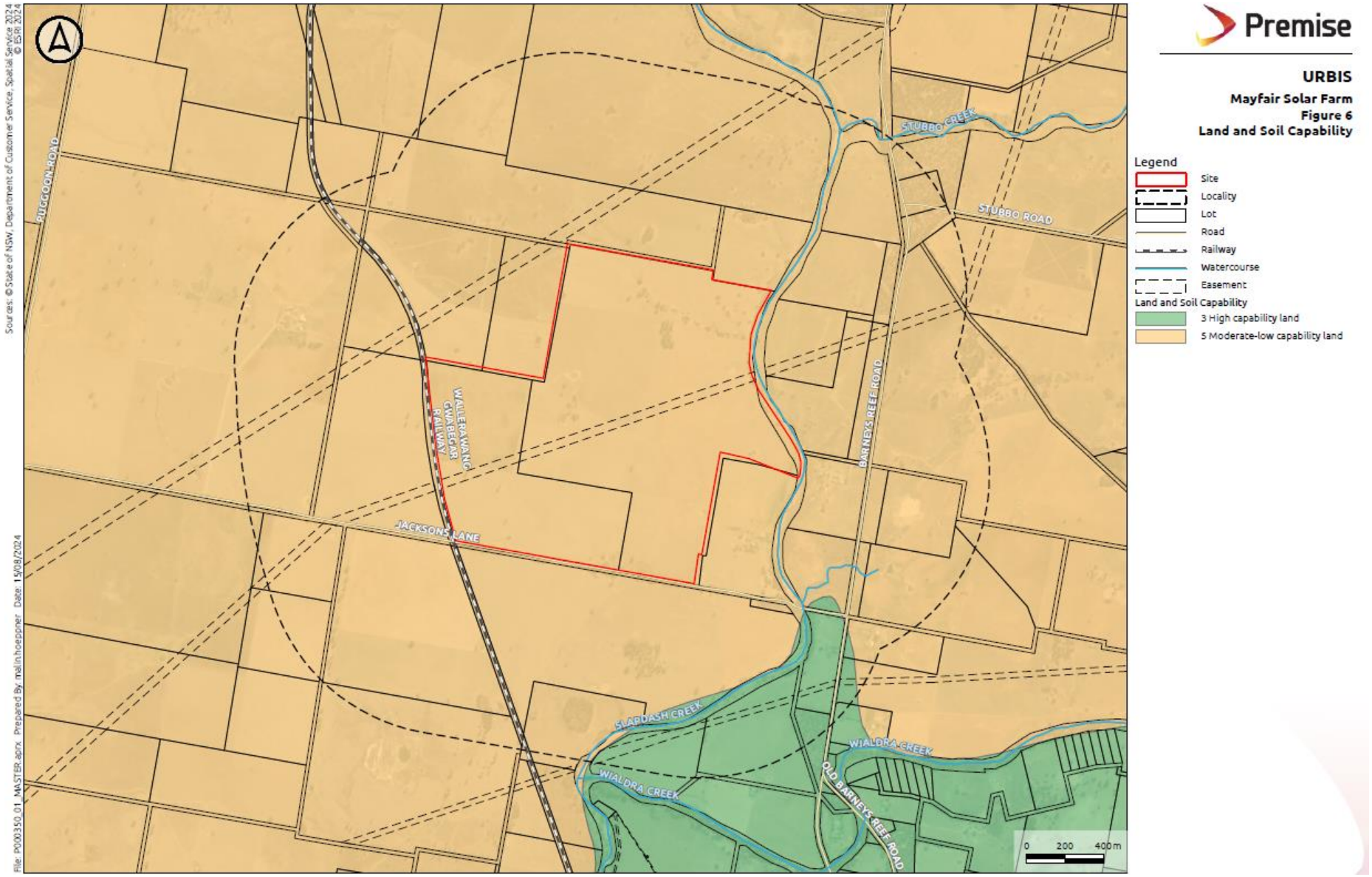
Class	General definition
Land capable of a variety of land uses (cropping with restricted cultivation, pasture cropping, grazing, some horticulture, forestry, nature conservation)	
5	**Moderate–low capability land:** Land has high limitations for high-impact land uses. Will largely restrict land use to grazing, some horticulture (orchards), forestry and nature conservation. The limitations need to be carefully managed to prevent long-term degradation.

Source: OEH, 2012

A review of the NSW ePlanning Spatial Viewer (2024) and the SEED portal (2020) mapping did not identify any known geological hazards within the Site or locality, including:

- Acid sulfate soils are not mapped within the Site or locality (SEED portal, 2020).
- No mine subsidence districts, or underground coal mining is mapped at or within 1 km of the Site (NSW ePlanning Spatial Viewer, 2024).
- No landslide risk land is mapped within the Site or locality (NSW ePlanning Spatial Viewer, 2024).
- No naturally occurring asbestos (NOA) at or within 1km of the Site (SEED Portal, 2020).
- Biophysical Strategic Agricultural Land (BSAL) is land with high quality soil and water resources capable of sustaining high levels of productivity. A review of relevant mapping indicates that no BSAL is located within the Site.

Figure 26 Land and Soil Capability



Source: Premise, 2024

Land Use and Agricultural Production

The NSW Landuse 2017 mapping (DPIE, 2020) maps the Site primarily as cropping with a small section of grazing native vegetation and grazing modified pastures in the northern portion of the Site. However, consultation with the current landowner on 26 June 2024 confirmed that the land is primarily used for dryland grazing of fodder crops with a small amount of wheat cropping.

The surrounding area primarily consists of land used for modified pastures and cropping. Other notable land uses throughout the locality include transport and communication along the Wallerawang Gwabegar Railway, mining in a disused quarry to the south and various residential and farm infrastructures.

Review of land uses within the locality indicate that land use is predominately grazing, with cropping as the next largest land use.

Based on the 2020-21 Australian Agricultural Census (ABARES, 2021), the most important agricultural commodities with the highest gross value for the Mid-Western Regional LGA were meat cattle, sheep and lambs, and wheat. These three commodities represent about 90% of the total agricultural revenue of the Mid-Western Regional LGA.

The primary income generation on the study area is sheep grazing, supplemented by cattle and occasional wheat cropping. The indicative value of these commodities is calculated in Table 23.

Table 23 Commodity Production Value for the Mid-Western Regional Council 2020-21

Commodity	Production Value ($m)	No. Units	Av. Value Per Unit
Sheep and lambs	$34 million	424,933 animals	$80.01
Meat cattle	$39 million	62,235 animals	$626.66
Wheat	$5 million	15,712 tonnes	$318.23

Source: ABARES, 2021

The land on which the study area is located was purchased by the current owner approximately fifteen years ago. It has been used for primarily dryland grazing of improved pastures with occasional cropping for the past forty years. Gulgong experienced a boom in the wheat industry in the 1960's and it is speculated that the area was used for wheat production during this time. Intensive wheat production across the property during this period is speculated to have caused to erosion on the Site. Most of the land is no longer suitable for growing grain due to issues with soil salinity and acidity, aside from the western most paddock near the railway line which produces an occasional crop of wheat.

Current land management practices are primarily for rotational grazing of meat sheep and cattle, including pasture, grazing forage and occasional cropping. The northern paddocks of the Site were cultivated by disc harrow and planted with forage oats approximately two weeks prior to the Site visit (this is in the area where soil samples M1, M2, M3, M5, M6, M7, and M4 were taken as shown on Figure 27). The southern paddocks had been cultivated and planted with forage oats approximately six weeks prior to the Site visit which were approximately 60cm high (soil samples M8 and M9).

The Site was dominated by plantings of forage oats at the time of the Site visit (9 May 2024). Previous use of improved pastures was evident with volunteer populations of white clover and ryegrass throughout the Site. Discussions with the property manager indicated that the northern and western paddocks along the trainline are occasionally used for cropping wheat for grain and lucerne for hay. The rest of the Site is too acidic to produce these crops and is usually only planted with forage oats or other pastures.

The property manager applied lime approximately 7-8 years ago on to the southern paddock that fronts onto Jacksons Lane (M8). No other applications of lime are known to have occurred on the Site. Single superphosphate (**SSP**) was applied during planting of the forage oats across the Site. This is reflected in the soil chemical results that show high available phosphate in areas where oats were recently planted.

Assessment of income generated from the Site has considered an area of 127 ha, inclusive of the entire area of the proposed solar farm and BESS development. The property manager intends to continue using the Site for sheep grazing in between panels (agrivoltaics) after the solar farm is constructed.

The following information was determined in consultation with the property manager and landowner.

Table 24 Average Estimated Annual Farm Income

Commodity	Av. annual production units	Av. Value Per Unit	Production value
Sheep and lambs	70 sheep	$80.01	$5,600.70
Cattle	8 steers	$626.66	$5,013.28
Wheat	29.3 tonnes	$318.23	$9,333.68
		Total	**$19,947.66**

Source: Premise, 2024

It should be noted that average annual farm income does not represent farm profits as it does not include capital costs (machinery, land, structures) or fixed or variable costs (insurance, rates, taxes, labour, fertiliser, farm chemicals). It also does not account for other variable factors that influence farm productivity year on year (weather, climate, commodity prices, pests and disease).

Soil Survey

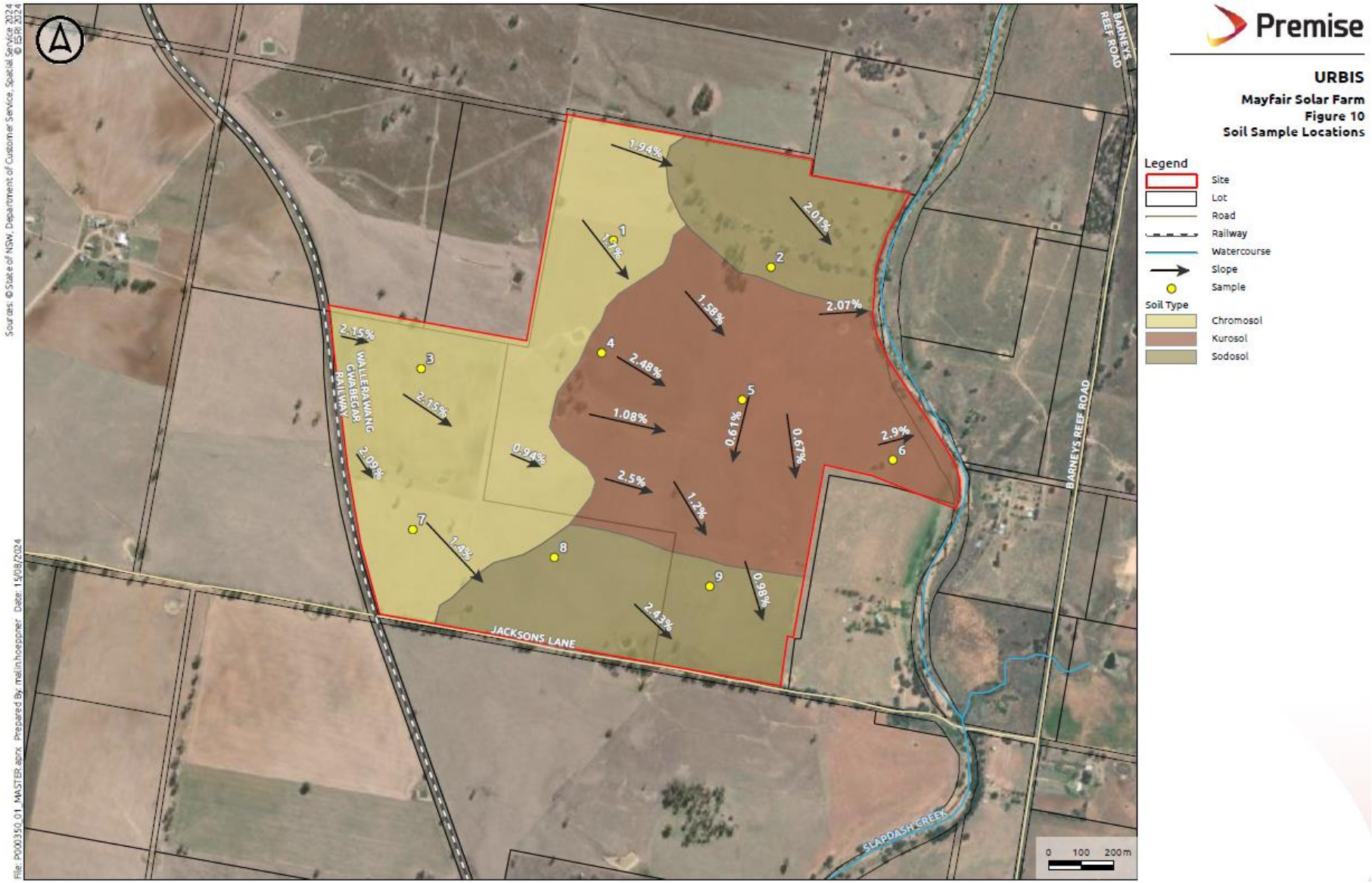
The soil survey was conducted on 9 May 2024 by Premise. Conditions were dry and sunny. Soil samples taken across the Site exhibited variable characteristics due to slope, cultivation, and current/past land use:

- Sites M1, M3 and M7 had similar field characteristics across the western portion of the Site. Topsoil pH (tested in field with a Manutec soil pH test kit) was pH 5.5-6.5 (moderately acid) across the three sites, with alkalinity increasing through the subsoil up to pH 8-8.5 (strongly alkaline). Soil texture across these sites was dominated by fine sandy loam topsoil, gradually changing from light to medium clay subsoils. Soil colour was yellowish brown, around 10YR 5/6 (Munsell Soil Colour Book, 2012). These soils are classified under the Australian Soil Classification (Isbell, 2002) as Chromosols. These soils were considered the most productive soil type across the Site as they did not appear to be sodic or strongly acidic.
- Sites M2, M8 and M9 had similar field characteristics as they were slightly down slope or located in a slight depression. They had been previously planted with a crop of forage oats. Soil characteristics indicated the soil was prone to waterlogging including soil gleying (grey layers of soil which are associated with low oxygen conditions) and topsoil compaction. Topsoil pH (tested in field with a Manutec soil pH test kit) was 5.5-6.5 (moderately acid) across these sites with alkalinity increasing through the subsoil up to pH 8-8.5 (strongly alkaline). Calcium carbonate concretions were observed at depth which may trigger soil alkalinity at depth. Soil texture across these sites was dominated by fine sandy loam topsoil, gradually changing to sandy, dispersive clay subsoils. The subsoils were dispersive and suspected to be sodic. Soil colour was yellowish brown, around 10YR 5/6, with light brownish grey subsoils and mottles at depth (2.5Y 6/2) (Munsell Soil Colour Book, 2012). These soils are classified under the Australian Soil Classification (Isbell, 2002) as Sodosols due to their strong sodicity at depth.
- Sites M4, M5, and M6 had similar field characteristics as they were located on a slight rise that ran through the centre of the property. They had been heavily grazed, showed indications of acidity and were relatively stony and well drained. Topsoil pH (tested in field with a Manutec soil pH test kit) was 5.5-6 (strongly acid) with acidity continuing throughout the subsoils (pH 5-6). Soil texture across these sites was dominated by sandy loams, gradually changing to sandy clay subsoils. Soil colour was reddish brown (5YR 3/3) (Munsell Soil Colour Book, 2012). These soils are classified under the Australian Soil Classification (Isbell, 2002) as Kurosols due to the strong acidity at depth.
- The samples sent for laboratory analysis were samples M1, M2, M5, M7, M8 and M9 as they were considered to best represent the dominant soil type across the Site. A National Association of Testing Authorities (NATA) accredited laboratory, SGS Australia, was used to analyse the samples.

The samples were split into four standard depths of 0-15, 15-30, 30-60, and 60-90cm. Each layer was sent for basic analysis and the topsoil (0-15cm) was sent for additional laboratory analysis.

Full analysis results are outlined in Appendix I.

Figure 27 Soil Sample Locations



Source: Premise, 2024

Erosion Assessment

RUSLE is specified in the IECA '*Best Practice Erosion and Sediment Control Guidelines*' (2008) ('IECA Manual') to predict the long-term, average, annual soil loss from rill and sheet erosion. The RUSLE equation provides an estimate of the annual soil loss and does not consider individual storm events. The annual soil loss due to erosion is used to determine the erosion risk rating, stabilisation requirements and the level of sediment control required for the Site.

To calculate the soil erosion hazard and the soil erosion risk, the Revised Universal Soil Loss Equation (RUSLE) from the IECA Manual was used using the following formula:

$$A = K \times R \times LS \times P \times C \qquad \text{(IECA, 2008)}$$

Where:

A: is the predicted soil loss per hectare per year

K: is the soil erodibility factor

R: is the rainfall erosivity factor

LS: is the slope length/gradient factor (varies for each catchment)

P: is the erosion control practice factor

C: is the ground cover and management factor

Considering all relevant factors, the RUSLE formula was resolved in accordance with the IECA Manual to determine existing soil erosion on the Site (Table 25). It should be noted that the soil loss estimate is not considered representative of actual annual soil loss for the Site and should be used rather as an indicator of potential erosion risk and a link between risk and controls. If at any time circumstances affecting the above factors should change, a reassessment should be conducted immediately.

Table 25 Calculated Soil Loss

Factor	Units	Study Area Value
Catchment size	Hectares	140ha
Soil erodibility (K Factor)	t ha h $ha^{-1}MJ^{-1}mm$	0.03
Rainfall erosivity (R Factor)	MJ.mm/ha.t.yr	1,849
Cover (C Factor)	Factor (Landcom 2004)	1.0
Conservation practice (P Factor)	Factor (Landcom 2004)	1.3
Length/slope (LS Factor)	Factor (Landcom 2004)	0.91
Average soil loss	t/ha/yr	**65.62**
Erosion Risk Rating	Rating (Landcom 2004)	**Very Low**

Source: Premise, 2024

Based on the above analyses the Site has been assessed as a **very low** erosion risk site by the RUSLE guideline from the *Managing Urban Stormwater: Soils and construction – Volume 1* (Landcom, 2004).

6.1.3.2. Potential Impacts

The total annual agricultural productivity loss for a change of land use will be approximately $14,346.96. Wheat cropping and cattle grazing will no longer occur on the Site whilst the solar farm is operational and the total production value for these commodities will be discontinued for the period of operation. The Site for the proposed BESS will be fenced off and unavailable for agriculture. Sheep are expected to be stocked at approximately 80% current capacity under the solar panels.

While the Project represents a reduction in annual agricultural farm productivity, it is expected that this will be offset by the value of the solar energy production. The reduction in agricultural productivity is expected to be relatively small for the region and is considered unlikely to significantly negatively impact local agricultural communities (saleyards, abattoirs, agricultural suppliers, grain traders).

Engagement with the Gulgong community and neighbouring landholders on immediately adjacent land was conducted as part of the Engagement Outcomes Report. Consultation did not identify any specific agricultural impacts to neighbouring land or the surrounding agricultural community. A copy of the Engagement Outcomes Report is included in Appendix K.

Developing a solar farm on a rural property will support a diversified income portfolio for the region, allowing financial flexibility in a changing and unpredictable climate. Additionally, the Project is expected to have minimal impacts on long term agricultural productivity of the Site. Once the Project is decommissioned, land on the Site will be rehabilitated and returned to its pre-existing land use or another permitted land use as agreed between the landholder and the Project owner. The substation will be retained and dedicated to Essential Energy, and therefore will not be rehabilitated with the rest of the Site.

Potential impacts to soil associated with the construction of the Project are detailed in Table 26 below. Impacts were determined by identifying unmitigated risks associated with construction activities and potential impacts to the receiving land.

Table 26 Potential Construction Impacts

Activity	**Impact**	**Likelihood**	**Significance of impact**
Vegetation clearing	Vegetation removal has the potential to increase the risk of erosion and sedimentation by exposing soils to weathering processes and reducing soil stability.	Moderate	Moderate
Earthworks and excavation (including trenching)	Increased the risk of erosion through soil disturbance if unmitigated.	Moderate	Moderate
	Exposing subsoils which may be saline or sodic and dispersive may increase the risk of erosion and reduce overall soil fertility.	Moderate	Moderate
	Excavation of buried soil contaminants (heavy metals, pesticides, hydrocarbons) may occur. If unmitigated this may cause impacts to human health and environmental safety.	Low	High
Stockpiling and removal of excavated material	Mixing of soil horizons may occur if soil is incorrectly removed or stockpiled during construction. Mixing topsoil and subsoil may impact long term soil quality and erosion hazard.	Moderate	Moderate
Operating heavy machinery	Soil compaction may occur during the operation of heavy machinery on-site if unmitigated. Soil compaction has impacts to erosion risk and long-term impacts to land and soil capability.	Moderate	Moderate
Waste and spills	Waste accumulated during construction activities, including litter and putrescible waste, has the potential to pollute soil and groundwater resources if appropriate measures are not implemented.	Low	Moderate
	The release of potentially harmful chemicals, substances or contaminated stormwater may occur accidentally during construction and has the potential to contaminate soil (i.e., leakage or spill of petroleum, oils or other toxicants from construction machinery and plant equipment resulting from inappropriate storage of contaminated materials, refuelling and/or	Low	High

Activity	Impact	Likelihood	Significance of impact
	maintenance activities, leakage from sewer infrastructure).		

Source: Premise, 2024

Potential impacts to soil associated with the operation of the Project are detailed in **Table** 27 below. Impacts were determined by identifying unmitigated risks associated with construction activities and potential impacts on the receiving land.

Table 27 Potential Operation Impacts

Activity	Impact	Likelihood	Significance of impact
Operating heavy machinery	Soil compaction may occur during the operation of heavy machinery on-site if risks are unmitigated. Soil compaction has impacts to erosion risk and long-term impacts to land and soil capability.	Moderate	Moderate
Solar panel operation	Reduced soil permeability and localised erosion may occur under the solar panels from water run-off during rainfall or cleaning. This is likely if groundcover is not promptly established under the solar panels.	Moderate	Low
	Erosion, soil loss and sedimentation may continue to occur during operation if risks are unmitigated during construction.	Low	Moderate
	Downstream salinity impacts may occur if water infiltration to saline subsoils increases when pasture is not utilised (i.e. by grazing or slashing).	Low	Moderate
	Impacts to metal or concrete structures may occur if they come into contact with acidic or sodic soils.	Moderate	Low
Grazing	Nitrification or acidification of surface soils may occur if grazing is not appropriately rotated and managed.	Low	Moderate
	Excessive removal of pasture and vegetation may result in soil exposure and erosion if grazing is not appropriately rotated and managed.	Low	Moderate
	Surface soil compaction from foot traffic of sheep may occur if sheep are not appropriately rotated and managed.	Low	Moderate
BESS operation	Erosion, soil loss and sedimentation may continue to occur during operation if risks are unmitigated during construction.	Low	Moderate
	Soil compaction may occur if traffic around the BESS is not appropriately managed and controlled.	Low	Moderate
Waste and spill	The release of potentially harmful chemicals, substances or contaminated stormwater may occur accidentally during operation and has the potential to contaminate soil (i.e., leakage or spill	Low	High

Activity	Impact	Likelihood	Significance of impact
	of petroleum, oils or other toxicants from construction machinery and plant equipment resulting from inappropriate storage of contaminated materials, refuelling and/or maintenance activities, leakage from sewer infrastructure, or heavy metal or microplastic contaminants from structures).		

Source: Premise, 2024

Potential impacts to soil during decommissioning are anticipated to be similar to construction impacts. Longer term impacts of decommissioning may include:

- Failure to return the Site to the existing or improved land and soil capability.
- Failure to return the Site to a safe, stable and non-polluting landform.

6.1.3.3. Mitigation Measures

The following mitigation measures are recommended to minimise impacts to land and soil, and ensure that agricultural production remains stable throughout the lifespan of the Project up until after decommissioning and rehabilitation. It is expected that these mitigation measures will be detailed within an Environmental Management Plan (**EMP**) and responsibilities and timing detailed in it.

Erosion and Sedimentation

A Soil and Water Management Plan (SWMP) is to be prepared in accordance with Managing Urban Stormwater – Soils and Construction Volume 1 (Landcom, 2004).

The SWMP will be prepared as part of a Construction Environmental Management Plan (**CEMP**) to manage potential risks to soils, surface and ground water. Recommended measures for the construction SWMP include but are not limited to:

- Measures to minimise and manage the potential for erosion and sediment transport within and from the Site.
- Measures to minimise slope length across the Site to a maximum of 80m.
- Measures to manage accidental spills and waste storage.
- Measures to manage stormwater and the potential for contaminated runoff from the Site.
- Measures to ensure that excavation activities and any stockpiling are managed to minimise the potential for downstream contamination.
- Measures to ensure that areas of exposed soil and the time in which they are exposed are minimised as far as practical.
- Measures to ensure that areas of exposed soil and the time in which they are exposed are minimised as far as practical.

The SWMP will reflect measures according to the moderate-low likelihood of impacts and calculated ‘very low’ erosion risk according to its RUSLE measure.

Soil Disturbance and Sedimentation

The construction of the Project shall be managed in compliance with measures specified within the construction SWMP to ensure impacts to water quality are appropriately managed. Measures shall be implemented to ensure that areas of exposed soil and the time in which they are exposed are minimised as far as practical during construction.

Wastes, Spill and Emergency Management

The construction SWMP shall include procedures to reduce and manage the risk of emergency events and the potential for wastes and spills to contaminate soils. Recommended measures to manage the potential for contaminated discharge include:

- The storage of all fuel chemicals and liquids in sealed bunded areas on level ground away from stormwater drainage lines and waterways.
- Ensuring refuelling and maintenance activities are restricted to designated areas with appropriate bunding and spill capture controls where relevant.
- Implementing controls as part of the construction SWMP that provide procedures to respond to emergencies and spills.

During operation procedures shall be developed to reduce the potential contamination of soils, surface and ground water, resulting from wastes, spills and/or emergency incidents. Suggested measures to control the potential for contamination during operation include:

- The appropriate storage of equipment and hazardous substances during operation.
- Ensuring that plant and stormwater control measures are maintained to prevent contamination of soil.
- Preparation of appropriate procedures to response to emergency incidents, spills and leaks from the Site, including operational equipment and maintenance activities.

A decommissioning plan shall be developed which minimises the contamination of soils, surface and ground water, resulting from wastes, spills and/or emergency incidents. Suggested measures to control the potential for contamination during decommissioning including:

- A soil sampling plan to be undertaken prior to decommissioning to assess any risk of contamination.
- Preparation of procedures to minimise risk of contamination.

Soil Mixing and Topsoil Loss

As part of the CEMP for the Project, soil management measures should include:

- Assessment of topsoil depth prior to stripping to minimise mixing of topsoil and subsoil.
- Topsoil and subsoil should be stripped and stockpiled separately for rehabilitation works following excavation.
- Avoid stripping and stockpiling soil following heavy rain periods.
- Avoid compaction of topsoil during stripping and stockpiling operations.
- If required, amelioration of topsoil and/or subsoil during soil stripping in accordance with a soil scientist's recommendations.
- Prevent erosion of stockpiles using soil stabilising biopolymers, cover crops or other forms of stabilisation.
- Test stockpiled soils to determine amelioration requirements prior to reinstatement.

Soil Compaction

As part of the CEMP for the Project, soil compaction management measures should include:

- Development of controlled traffic practices for plant machinery movements.
- Avoid excavation and plant machinery movements on wet soils following heavy rain periods.
- Prevent long term storage of plant machinery on clay or wet soils.
- Avoid long term exposure of subsoils which are more susceptible to compaction.
- Progressively stabilise and rehabilitate soil as soon as practically possible after excavation.
- Ensure soil is replaced in correct subsoil/topsoil orders.

- Ensure vegetative cover is re-established after soil rehabilitation.

Grazing Impacts

A grazing management plan should be implemented as part of the operational management plan. The grazing plan should prevent negative impacts from grazing and include:

- Plans that take into account the forecasted climate conditions and feed demand calculations for the year.
- Measures to avoid over grazing and soil exposure during operation (time-based rotation, destocking during periods of drought).
- Measures to prevent and rectify nitrification and acidification of soils (time-based rotation, destocking, soil amendment).
- Measures to prevent surface soil compaction from stock (time-based rotation, moving stock off wet paddocks).

Based on the assessment of potential impacts and proposed mitigation measures, it is considered that the Project can achieve adequate compatibility with the land and its impacts minimised and rehabilitated to return the land to full production, including cropping, once decommissioned.

6.1.4. Landscape and Visual

This section provides a summary of the assessment of the visual change caused by the Project in relation to the local and wider visual context. A Landscape and Visual Impact Assessment (**LVIA**) has been prepared by Urbis and is found in Appendix J.

This section and the LVIA addresses the specific SEARs in relation to landscape and visual, including:

- *A landscape and visual impact assessment, prepared in accordance with the Solar Guideline and the Technical Supplement – Landscape and Visual Impact Assessment.*

The LVIA also contains a reflectivity (glint) and glare assessment and considers potential glint and glare impacts and provides recommendations and assessment of visual mitigation measures.

6.1.4.1. Methodology

The LVIA includes a methodology statement regarding the preparation method and accuracy of photomontages. The photomontages have informed the analysis of visual effects and impacts.

The LVIA follows the guidance and methodology as set out in:

- Technical Supplement – Landscape and Visual Impact Assessment, Large-Scale Solar Energy Guideline, August 2022, Department of Planning & Environment NSW (‘the technical supplement’).
- Guidance for Landscape and Visual Impact Assessment (LVIA), Third Edition, Landscape Institute of Environmental Management & Assessment (2013).
- Guidance Note for Landscape and Visual Assessment, Australian Institute of Landscape Architect (AILA), (2018).

Urbis undertook a Preliminary Visual Assessment based on viewshed mapping and application of the Preliminary Assessment Tool (**PAT**), which predicts potential visibility based in the vertical and horizontal field of view (**FOV**) that the Project is likely to occupy when viewed from each viewpoint. Potential visibility is influenced by the distance, height, change in elevation and width of a project. A copy of the PAT is available in Table 5 of the LVIA.

The methodology used to assess the Project is further enhanced with the application of an Urbis methodology that is based on a combination of widely accepted concepts and terms used in LVIA and VIA in NSW. The method considers additional relevant factors such as visual compatibility with both the existing and wider visual context and the strategic planning context for the Site. The Urbis method also distinguishes and places ‘weight’ on key factors such as view place and viewer sensitivity, physical absorption capacity and considers impacts on unique settings near the Site that could be potentially affected, for example heritage items, conservation areas, landscape character areas, views to icons and areas of high scenic quality.

The measurement of visual impact determined for the Project is based on a combination of viewer sensitivity relative to the proposed visual change or magnitude of the Project against a particular composition or visual setting.

An assessment of lightning impacts on the Siding Spring Observatory has been conducted in accordance with the *Dark Sky Planning Guideline 2016*.

6.1.4.2. Existing Environment

The Site forms part of the rural landscape north of the town of Gulgong. The existing surrounding visual context is predominantly naturalistic, characterised by open pastures, undulating topography, ephemeral creek lines, rivers and intermittent stands and linear boundary vegetation.

The Site is close to Castlereagh Highway (west) and Barney's Reef Road (east) which leads into the main town centre of Gulgong to the south. The Site is accessible via Jackson's Lane which is an unsealed road along located the southern boundary of the Site. The western boundary of the Site sits near the slightly elevated Gwabegar railway line. Castlereagh Highway is a major roadway that links several road corridors and towns throughout the central west including major tourist destination Mudgee, approximately 33km south of Gulgong and regional centre Dubbo 100km west of Gulgong.

Slapdash Creek, along the eastern boundary of the Site, is a tributary to the larger, and more heavily vegetated Wialdra Creek, which is located approximately 1.5km south of the Site.

Gulgong is an historic gold mining town containing multiple heritage items and is a significant place of both European and Aboriginal cultural heritage. The township is well maintained and visually appealing, known as a tourist attraction, holding significance as part of the UNESCO Australian Memory of the World Register.

Gulgong is characterised by underlying gentle north-facing slopes and localised undulating topography. The town is characterised by a grid-like settlement pattern where the horizontal west-east roads are slightly 'tilted' to broadly align in a north-west to south-east axis. In this regard the west-east aligned roads including Bayly, Queen and Mayne streets are crossed by northerly roads Medley, Hervert and White streets etc where none are aligned to allow for road corridor views in the direction of the Site. North-north-easterly views via intermittent, elevated locations for example at the intersection of Herbert Street and Mayne Street, to the lower lying rural areas north of town, are available but would not include the Site.

Gulgong town's highest point and public look out at Flirtation Hill, offers panoramic, expansive views in all directions and potentially to the Site to the north-west, if able to be discerned between vegetation. From Gulgong, travelling north, the Site is accessible via Barney's Reef Road which adjoins the main street of Gulgong, Medley Street. From low lying areas on the northern outskirts of Gulgong moving north towards the Site there are open, intermittent distant views to the slightly elevated undulating hills to the north, however visibility to the Site is limited due to the riparian vegetation of Wialdra Creek.

Notable public places include Gulgong Racecourse and Gulgong Park, both located north of Gulgong, and approximately mid-way between town and from the southern site boundary. Both are located on low-lying relatively flat land characterised by surrounding riparian and other vegetation.

6.1.4.3. Landscape Character

Landscape character is defined as 'the interplay of geology, topography, vegetation, water bodies and other natural features, combined with the effects of land use and built development, which makes one landscape different from another.

The below characterisation of the Site and surrounding area has been informed by detailed site observations and fieldwork analysis, supplemented by the recommended sources outlined in Section 2.2 of the technical supplement.

Key Landscape Features

- Flat to undulating agricultural land (grazing, modified pastures and dryland cropping).
- Multiple creek lines.
- Sparse settlements.
- Elevated, vegetated slopes including surrounding State Forests, conservation areas and unique landforms (Barney's Reef).

- Exotic and native shelterbelts along property boundaries and paddock lines.

Key Characteristics and Scenic Quality

The predominant visual character of the wider visual context is formed by a combination of the following, predominantly naturalistic, characteristics.

(a) Landform

- Flat to gently undulating open pastures, rising from 420 – 480m in elevation.
- Slopes are gently inclined (4-8%) ranging from 2000 – 6000m in length.
- Local relief varies from 30 – 60m.
- Visually characterised by distant elevated ridgelines and sloping hills including heavily forested landforms for example Barney's Reef (maximum elevation 600m) and Gulgong town (Flirtation hill, 500m).

(b) Water bodies

- Ephemeral creek lines and rivers including Slapdash Creek (sparsely vegetated) and Wialdra Creek (dense riparian corridor).
- Heavily modified agricultural land includes multiple dams.

(c) Vegetation

- Open, grassed agricultural land, mostly devoid of trees.
- Scattered and intermittent stands of native vegetation.
- Linear boundary and roadside vegetation.
- Distant, densely vegetated slopes and ridgelines.
- Communities of grey gum, narrow-leaved red ironbark woodland.
- Riverine community of river she-oak and rough-barked apple common along perennial streams and main drainage lines.

(d) Geology

- Geological zone – Siliceous Granites.
- Parent Rocks – Gulgong and Rouse Granite.

(e) Soil

- Fragile, light textured surface soils with low water holding capacity.
- Shallow, sandy subsoils with restricted root growth in some areas.

Private Views

Dwellings within 5km from the Site boundaries have been visually inspected from public roads, where the orientation, presentation of windows and extent of existing vegetative screening has been considered.

There are few close private domain locations, likely to have any potential views towards and across the Site, or likely to be exposed to a medium or large extent of the Site.

Residential dwellings south of the Site, are intermittent and isolated restricted to large lot, rural dwellings and farm residences, generally across areas of low relative elevation, except for two areas where dwellings are more clustered including along a local spur marked by Black Lead Lane and others near Old Mill Lane.

No dwellings located north of Jacksons Lane either along Castlereagh to the west or Barneys Reef Road to the east, will have any significant potential visibility to any part of the Site, due to presence of multiple intervening, localised undulations (spurs and knolls) to the north-west, north and north-east of the Site and intervening vegetation which will block virtually all direct views towards the Project.

6.1.4.4. Potential Impacts

Summary of Viewshed Analysis

As shown in Figure 28, visibility to the Site is limited and will not extend beyond areas indicated in yellow or orange. The viewshed indicates potential visibility to the Project within 4km as follows:

- Visibility to the site from the north-west, west and south-west is limited to less than 1km (this is reduced if considering existing vegetation).
- Visibility to the site from the north-east, east and south-east beyond 1km is reduced by riparian vegetation which filters views.
- Visibility to the site from the east is intermittent. High visibility zones are limited to within 3km of the site boundary.
- Visibility to the site from the northern outskirts of Gulgong are blocked or constrained by undulating terrain.
- Close public domain locations within a red zone include short, isolated sections of Barneys Reef Road (approximately 300m east of the site), Jacksons Lane which adjoins the site's southern boundary and Stubbo Road (approximately 1km northeast of the site).
- There is limited potential visibility from Castlereagh Highway, due to relative heights and intervening topography and vegetation (4km south-west of the site).

Residential Locations and Potential Visibility

All viewpoints shown in Figure 29 were inspected by Urbis. These locations were informed by:

- Scoping Report PAT results (Envisage)
- PAT interrogation and testing (Urbis)
- Desktop viewshed analysis (Urbis)
- Review of vegetation via aerial imagery (Urbis)

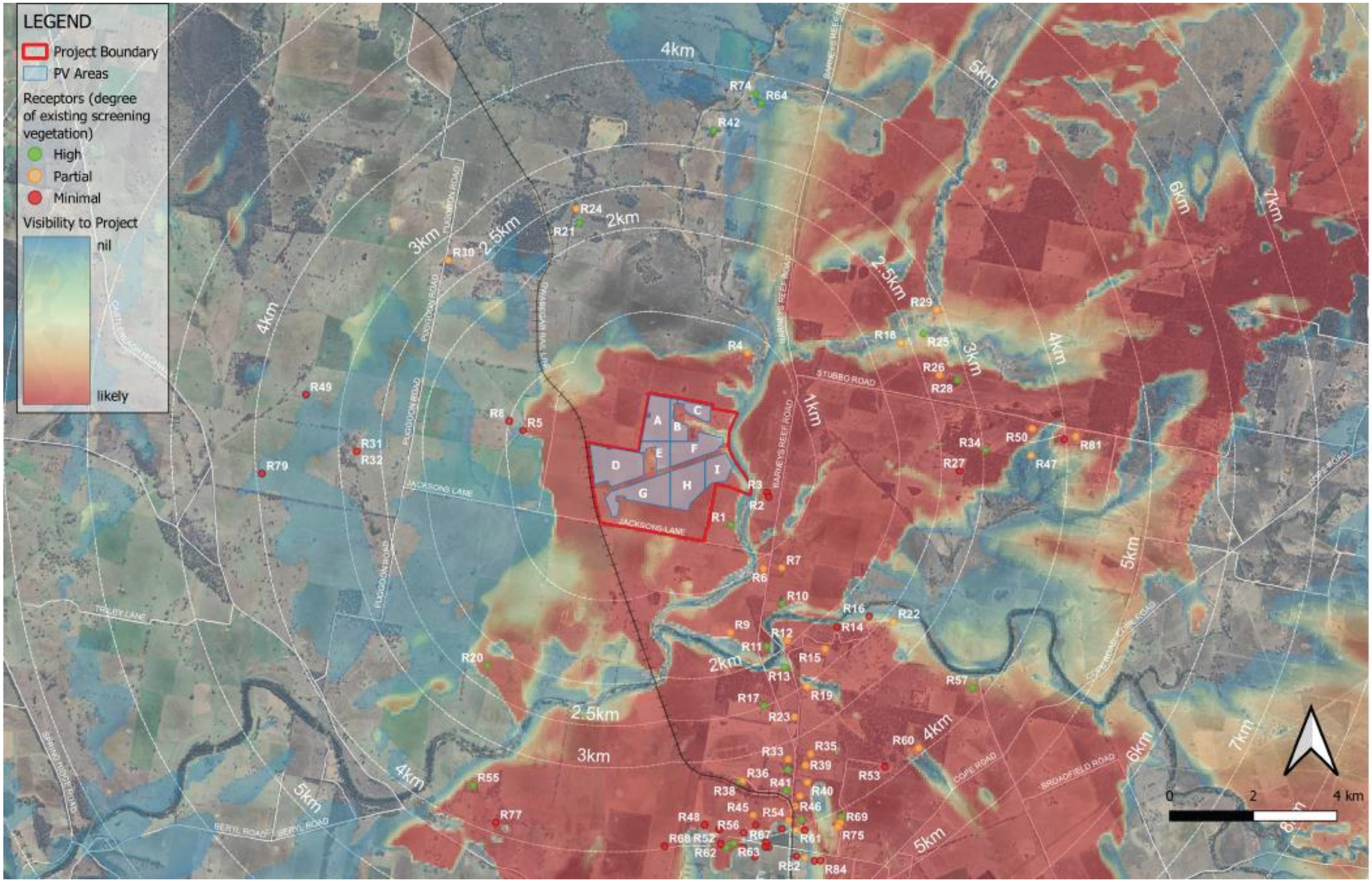
The presence of vegetation and likely screening effects was interpreted from aerial imagery where receivers were assigned red, orange or green colour to indicate the level of potential screening.

Fieldwork inspections were informed by the baseline data listed above. Locations inspected and documented are mapped in Figure 29. The following additional observations were recorded:

1. Visibility to the site from the north-east, beyond the junction of Carramar Road and Eloura Road, is blocked by stands of vegetation and boundary planting in long sections.
2. Visibility to the site from the south (south of Wialdra Creek) in the vicinity of Sandgrove Road, Barneys Reef Road and Gulgong Turf Club is heavily filtered by riparian vegetation.
3. Potential visibility to the site from the northern outskirts of Gulgong (approximately 3.5km from site and within a red zone shown in Figure 28) is constrained to a group of dwellings in Black Lead Lane. From these dwellings, the Project would be difficult to perceive due to distance, intervening vegetation and the height and form of the Project within its landscape context.
4. Visibility to the site from elevated slopes within Gulgong, more than 5km from the Site's southern boundary will not be significantly affected, as the Project will either be difficult to perceive in the landscape, for example from Flirtation Hill, or not visible at all.
5. Visibility to the site from the west and south, from isolated, short sections of Castlereagh Highway and Old Mills Road is limited for reasons outlined in point 3.
6. Direct visibility to the site is limited to immediately surrounding dwellings and roads as identified in both sets of PAT results.

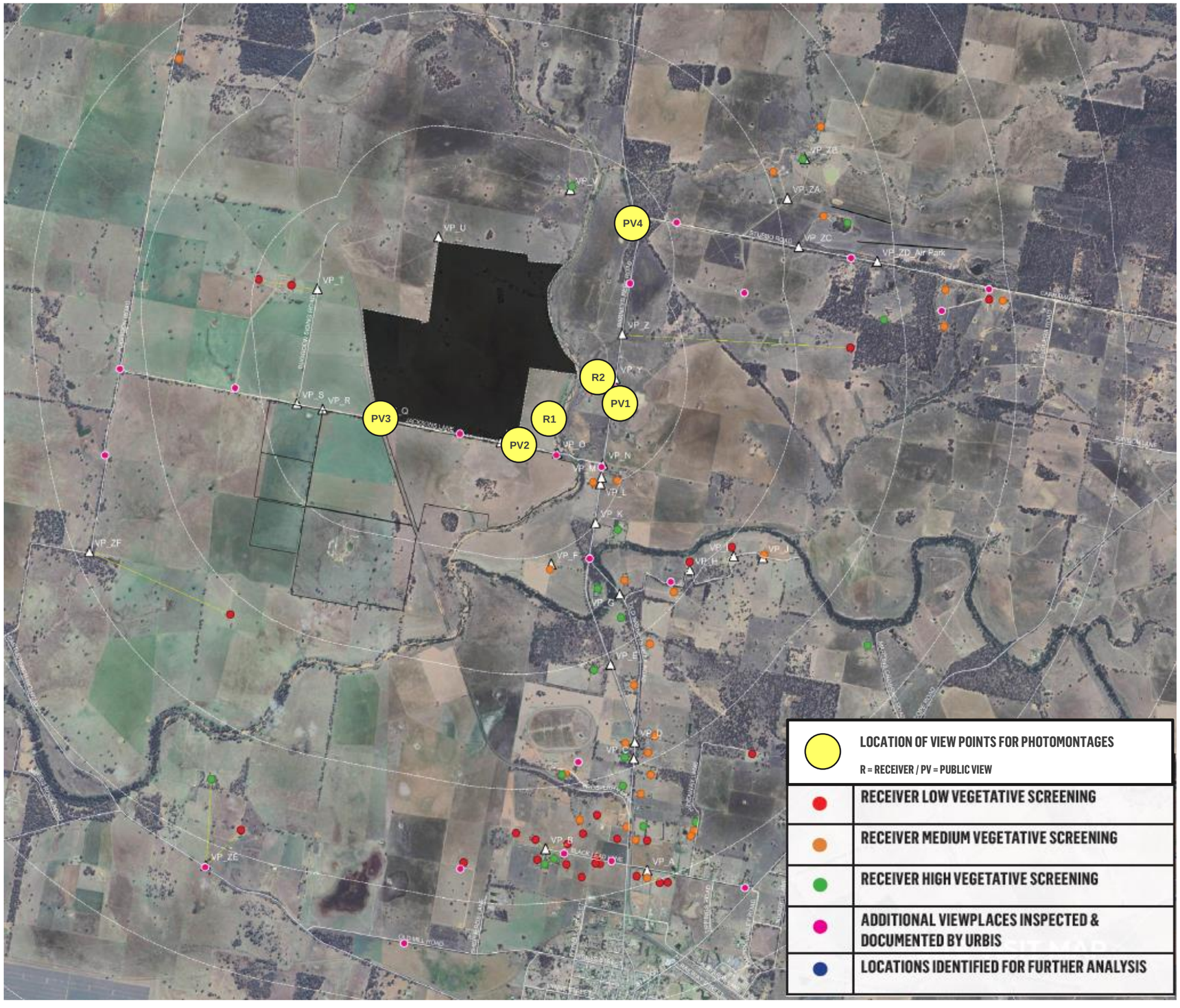
Urbis has used the PAT, viewshed and on-site ground truth analysis to confirm the viewpoints which require further assessment. The following Table 28 summarises the views selected for further assessment and rationale.

Figure 28 Viewshed Mapping



Source: Urbis, 2024

Figure 29 View Places Inspected and Documented by Urbis.



Source: Urbis. 2024

Table 28 Views Selected for Assessment

PRIVATE RECEIVERS - DWELLINGS						
RECEIVER POINT	**TYPE**	**IDENTIFIED IN SCOPING REPORT BY ENVISAGE (YES/NO)**	**IDENTIFIED IN BY URBIS USING NSW PAT**	**ADDRESS/DESCRIPTION**	**SELECTED FOR FURTHER ANALYSIS BY URBIS (YES/NO)**	**RATIONALE**
R1	Residential	yes	yes	38 Jacksons Lane, Stubbo	yes - refer to Photomontage R1.	• Identified for further analysis in EIS stage by Urbis using NSW PAT. • Located within high visibility zone less than 1km from site (Urbis Viewshed Figure 8).
R2	Residential	no	yes	491 Barneys Reef Road, Stubbo	yes - refer to Photomontage R2 & R3. • The above photomontage has been prepared as a representative view to satisfy potential visual effects for R2 and R3 using photographs from R2 (worst-case scenario and highest cell count).	• Identified for further analysis in EIS stage by Urbis using NSW PAT. • Located within high visibility zone less than 1km from site (Urbis Viewshed Figure 8).
R3	Residential	yes	yes	489 Barneys Reef Road, Stubbo	yes - refer to photomontage R2 & R3. • The above photomontage has been prepared as a representative view to satisfy potential visual effects for R2 and R3 using photographs from R2 (worst-case scenario and highest cell count).	• Identified for further analysis in EIS stage by Urbis using NSW PAT. • Located within high visibility zone less than 1km from site (Urbis Viewshed Figure 8).
R4	Residential (non-habitable structure)	no	yes	681 Barneys Reef Road, Stubbo	no	• Analysis of aerial photography and on-site observations confirm receiver point R4 to be an uninhabited building.
R5	Residential (shed/ outbuilding associated with R8).	no	yes	340 Jacksons Lane, Beryl	no	• Analysis of aerial photography and on-site observations confirm receiver point R5 to be a shed/outbuilding associated with R8
PUBLIC VIEW PLACES						
LOCATION	**TYPE**	**IDENTIFIED IN SCOPING REPORT BY ENVISAGE (YES/NO)**		**ADDRESS/DESCRIPTION**	**SELECTED FOR FURTHER ANALYSIS BY URBIS (YES/NO)**	**RATIONALE**
BARNEYS REEF ROAD	Transport/ Infrastructure	yes		Viewpoints along Barneys Reef Road within 2.5 km of the project.	yes -refer to Photomontage Public View 1.	• Located within high visibility zone less than 1km from site (Urbis Viewshed Figure 8). • Shows a representative worst-case scenario view from closest and potentially most affected public domain location (local main road).
JACKSONS LANE	Transport/ Infrastructure	yes		Viewpoints along minor roads (Jacksons Lane) within 2.5 km of the project.	yes - refer to Photomontage Public View 2.	• Shows within high visibility zone less than 1km from site (Urbis Viewshed Figure 8). • Shows a representative worst-case scenario view from closest and potentially most affected public domain location (local unsealed access road).
INTERSECTION OF JACKONS LANE & RAIL CORRIDOR	Transport/ Infrastructure	no		The intersection of Jacksons Lane and rail corridor, at south-western corner of site boundary.	yes - refer to Photomontage Public View 3.	• Located within high visibility zone less than 1km from site (Urbis Viewshed Figure 8). • Shows a representative worst-case scenario view from closest and potentially most affected public domain location (intersection of rail corridor and local unsealed access road).
STUBBO LANE	Transport/ Infrastructure	yes		Viewpoints along minor roads (Stubbo Lane) within 2.5 km of the project.	yes -refer to Photomontage Public View 4 .	• Located within high visibility zone within 2km of the site (Urbis Viewshed Figure 8). • Shows a representative worst-case scenario view from closest and potentially most affected public domain location (local main road).
OLD BARNEYS REEF ROAD	Transport/ Infrastructure	yes		Viewpoints along minor roads (Old Barneys Reef Road) within 2.5 km of the project.	no	• On-site observations confirm visibility to the site from this location is limited or nil due to the presence of riparian vegetation associated with Wialdra and Slapdash Creeks.
PUGGOON SIDING ROAD	Transport/ Infrastructure	yes		Viewpoints along minor roads (Puggoon Siding Road) within 2.5 km of the project.	no	• On-site observations confirm visibility to the site from this location is limited or nil due to the presence of linear roadside vegetation, boundary plantings and intervening topography.

Visual Effects Analysis

Urbis has prepared six panoramic photomontages in accordance with the requirements of the technical supplement, including the preparation of panoramic photomontages which equate to 180° horizontal field-of-view and with a 40° vertical field-of-view (the 40° VFOV is implied in the technical supplement with directions to take photos using a 50mm focal length taken in portrait orientation). Photos have been taken at standing eye height of 1.65m.

View Place Sensitivity

View place sensitivity is considered low for all views modelled and assessed. Close views to the Site are predominantly from the immediately surrounding street network which includes unsealed, local predominantly access roads for farm activities that attract low user numbers and a lower sensitivity rating. Visibility to the Site from these locations is experienced for short durations of time and form moving, viewing situations.

Physical Absorption Capacity

The existing visual environment and landscape setting generally has a high capacity to physically and visually absorb the Project due to the low and linear nature of the Project across a low, low landscape form. Opportunities to overlook the Project are limited to isolated undulations, where views from close or adjacent areas, would take in immediate foreground forms rather than any extended expanse proposed.

Viewing opportunities from more elevated locations for example from Flirtation Hill are distant, where the form, line or extent of the Project would be difficult to discern or identify in the context of midground and distant undulating topography and dark tones of vegetation that characterise the compositions.

The Project is physically absorbed by the existing visual environment to an extent that the fundamental landscape character of the wider visual context, and sub-regional visual character area will remain unchanged and unaffected by the Project.

The location and extent of the Project is not visible in any views from Castlereagh Highway which include other similar facilities due to distinct visual catchments created by intervening landforms.

Visual Compatibility

The low height of the Project, and its location within a predominantly flat area means that in most potential views from surrounding public roads or isolated elevated locations, its form, linear nature and scale is compatible with the form and vast horizontal scale of the open landscape. The proposed perimeter planting is visually consistent with the roadside and boundary plantings which characterise the Site and surrounding land character zones (**LCZs**).

The mapped LCZs are shown in Figure 30. The Project is compatible with existing and anticipated future development within the CWOREZ. Beryl Solar Farm (approximately 6km south-west of the Project) includes infrastructure that is of a compatible scale, height and form and in views inspected from roads surrounding this facility is visually similar to the Project.

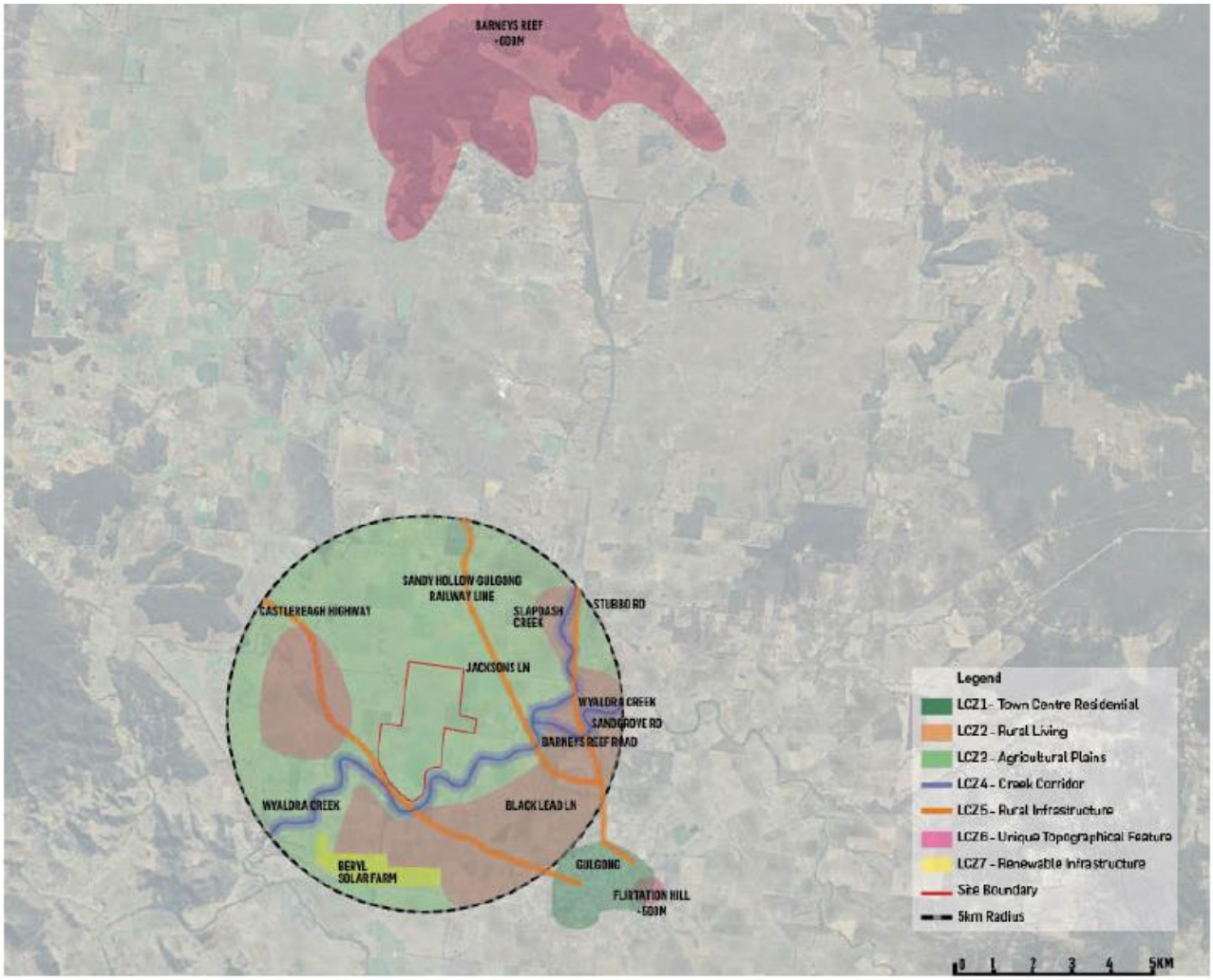
Landscape Character Impacts

Landscape character impacts were found to be low or low-medium for all LCZs. Those closest and potentially most affected LCZs are not visually unique, are highly modified and can tolerate the level of visual change and type of development envisaged by the Project. The level of change proposed is minor relative to the extent of surrounding LCZs. The Project would not adversely affect any key landscape features of surrounding LCZs.

Residual Visual Impacts

Residual impacts are low and acceptable given the PAC of the surrounding landscape character, the visual compatibility of proposed mitigative screening with existing vegetation patterns, and the compatibility of the Project with anticipated future development of energy infrastructure within the CWOREZ. The Project does not create any significant adverse effects on the wider landscape character of this part of Central-western NSW.

Figure 30 Mapped Landscape Character Zones



Source: Urbis, 2024

Summary of Impact Statement

The level of visual impact (Very Low, Low, Moderate or High) has been assessed against the Visual Performance Objectives outlined in Section 3 of the technical supplement, which determine the need, level and type of visual mitigation. The potential visual impacts of the Project will be constrained to a reasonably small area and combined with the ability of the landscape to visually absorb the physical appearance of the Project results in the rating of its impact as low to moderate.

The impact rating and required mitigation measures are outlined in Table 29 below.

Table 29 Required Mitigation Measures per Visual Performance Objectives

Receiver	Receiver type	Impact Rating	Mitigation Required	Photomontage
R1	Private	Low	No mitigation required	Figure 31
R2 & R3	Private	Low	No mitigation required	Figure 32
Public View 01	Public	Very Low	No mitigation required	Figure 33
Public View 02	Public	Very Low	No mitigation required	Figure 34
Public View 03	Public	Low	No mitigation required	Figure 35
Public View 04	Public	Very Low	No mitigation required	Figure 36

Source: Urbis

Dark Sky Planning Guideline – Lighting Impacts

The Site is located within the Mid-Western Regional LGA, which is within the mapped Dark Sky Region under the Dark Sky Planning Guideline.

Proposed lighting associated with the Project is restricted to temporary night works during construction phases or for emergency use only. Proposed lighting is to be installed within close proximity to the substation, BESS and operation and management facilities.

The Project does not require ongoing operational lighting and any lighting impacts during the construction phase of the Project are temporary. The level and duration of required lighting combined with physical distance between Siding Spring Observatory and the Project is unlikely to generate any significant adverse lighting effects or impacts. Notwithstanding the above, a detailed lighting plan for the Site may be required in the future. Any such report would be undertaken by a suitably qualified professional an in accordance with the relevant AS-NZ standard.

6.1.4.5. Mitigation Measures

The visual impact ratings for Public Views 1, 2, 3 and 4 were found to be low or very low, where mitigative planting is not required but is highly recommended to assist in retaining the predominant landscape character.

The recommended overall planting strategy is shown in Figure 43 and a cross-section of the screen planting is shown in Figure 44.

It is recommended the southern and eastern edges of the Project are screened to ameliorate views towards the proposal from Gulgong (south) and receivers assessed along Barneys Reef Road (east). Areas immediately west and north of the Project are considered less sensitive and do not require mitigative screening. Photomontages have been prepared from Public View 1, 2 and 3 which are the closest and potentially most sensitive public domain locations.

The Project involves a 2.3 m high security fence installed around the solar panel areas. A 5m wide landscape buffer has been allowed to provide screening to the Project.

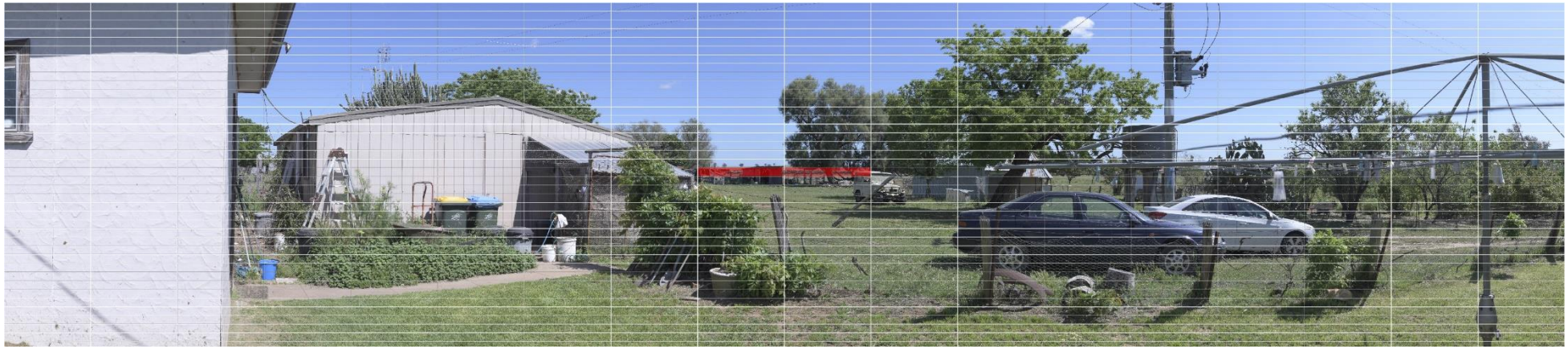
The landscaping is to be planted with a “Landscape Buffer Type 1”, high density shrub planting typology and “Landscape Buffer Type 2”, low density trees and shrub planting that aims to ameliorate views from along Barneys Reef Road and Jacksons Lane.

The low-profile form of the majority of the Project, primarily the solar array, which is approximately 3.2m in height at full tilt, will ensure that planting will be able to provide screening within a 5-year period of time.

The following panoramic photomontages include the proposed planting mitigation strategy and aim to evidence the screening performance of this strategy at a five-year development age.

The following panoramic photomontages, a single frame view has been extracted, represent the ‘worst-case’ view with the highest cell count available to a viewer from the view place.

Figure 31 R1 – Panoramic photomontage



Source: Urbis, 2024

Figure 32 R2 & R3 – Panoramic photomontage

Source: Urbis, 2024

Figure 33 Public View 1 – Panoramic photomontage

Source: Urbis, 2024

Figure 34 Public View 2 – Panoramic photomontage

Source: Urbis, 2024

Figure 35 Public View 3 – Panoramic photomontage

Source: Urbis, 2024

Figure 36 Public View 4 – Panoramic photomontage

Source: Urbis, 2024

The following panoramic photomontages include one photomontage showing the existing conditions and one photomontage showing the Project and landscape planting mitigation at a five-year development age.

Figure 37 Public View 1 – Existing View from Barneys Reef Road

Source: Urbis, 2024

Figure 38 Public View 1 – Showing the Project and Landscaping After Five Years

Source: Urbis, 2024

Figure 39 Public View 2 – Existing View from Jacksons Lane

Source: Urbis, 2024

Figure 40 Public View 2 – Showing the Project and Landscaping After Five Years from Jacksons Lane

Source: Urbis, 2024

Figure 41 Public View 3 – Existing View from Intersection of Jacksons Lane and Gwabegar Railway Line

Source: Urbis, 2024

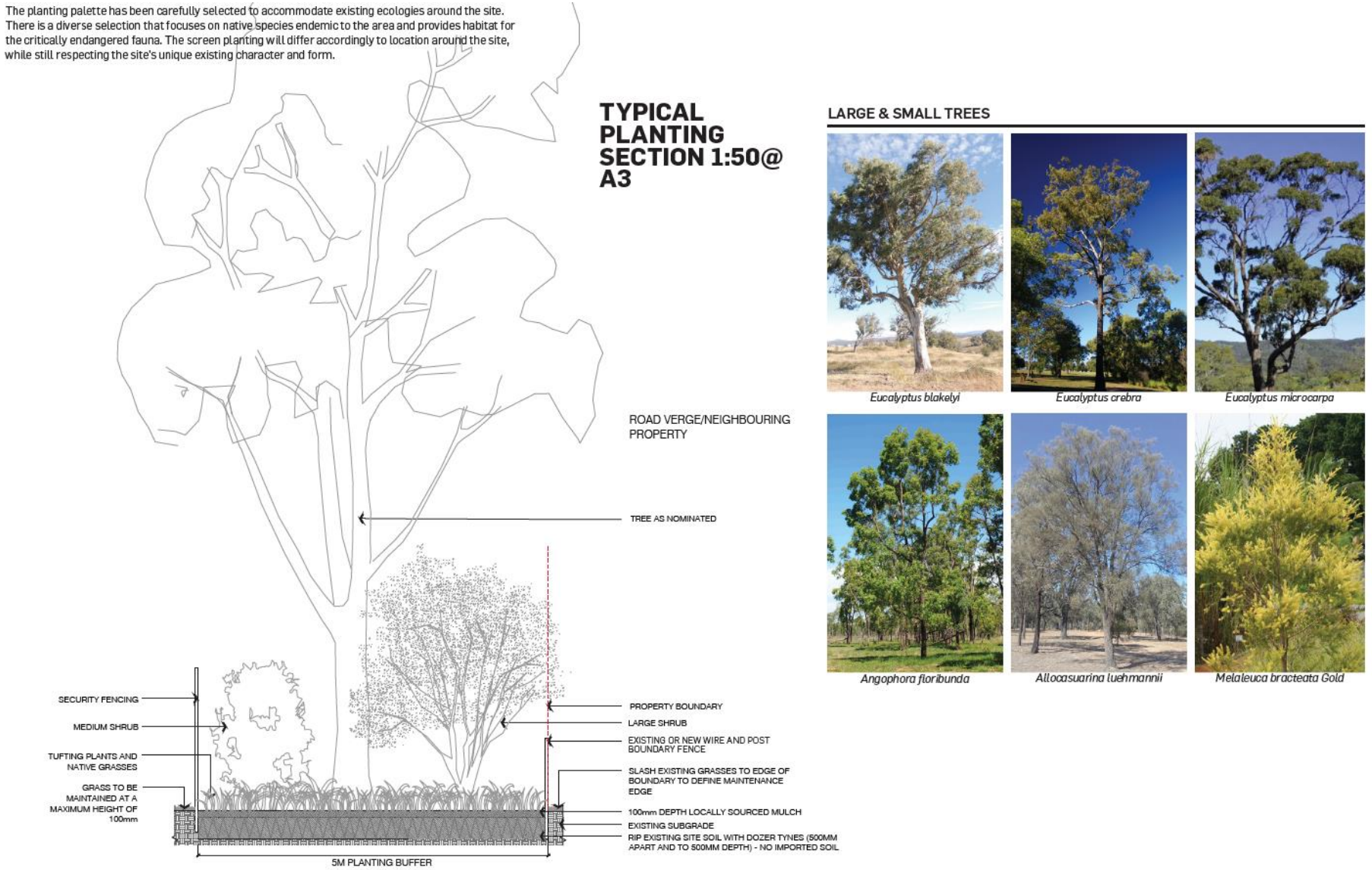
Figure 42 Public View 3 – Showing the Project and Landscaping After Five Years from the Intersection of Jacksons Lane and the Gwabegar Railway Line

Source: Urbis, 2024

Figure 43 Overall Planting Strategy

Source: Urbis, 2024

Figure 44 Screen Planting Cross-section



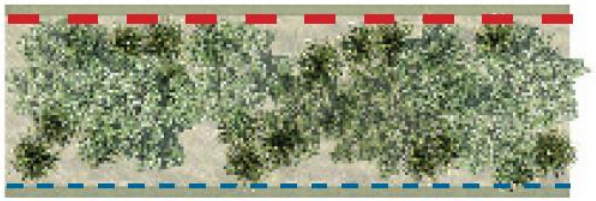
Source: Urbis, 2024

Figure 45 Planting Typologies Type 1 and Type 2

PLANTING TYPOLOGIES

BUFFER PLANTING TYPE 1

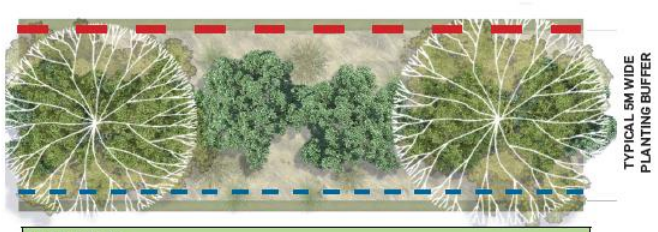
HIGH DENSITY SHRUB PLANTING



LARGE SHRUBS			
COMMON NAME	SCIENTIFIC NAME	MATURE SIZE (H X W)	POT SIZE
Western Silver Wattle	*Acacia decora*	3-10m x 2-8m	Tubestock
Prickly Wattle	*Acacia paradoxa*	2-4m x 4-10m	Tubestock
Sweet Bursaria	*Bursaria spinosa*	2-4m x 2-4m	Tubestock
Wedge Leaf Hop Bush	*Dodonaea viscosa Cuneata*	2-4m x1-2m	Tubestock
Native Wisteria	*Hardenbergia violacea*	2-4m x1-2m	Tubestock
MEDIUM SHRUBS			
COMMON NAME	SCIENTIFIC NAME	MATURE SIZE (H X W)	POT SIZE
Pale Vanilla Lily	*Arthropodium milleflorum*	60cm-1m x 60cm-1m	Tubestock
Rock Correa	*Correa glabra*	1-2m x 1-2m	Tubestock
Blue Flax Lily	*Dianella longifolia*	30-60m x 30-60m	Tubestock
Hopbush	*Dodonaea boroniifolia*	1-2m x 60cm-1m	Tubestock
Hoary Guinea Flower	*Hibbertia obtusifolia*	60cm-1m x 60cm-1m	Tubestock
Australian Indigo	*Indigofera australis*	1-2m x 1-2m	Tubestock
Kangaroo Grass	*Themeda australis*	15cm x 30cm	Tubestock

BUFFER PLANTING TYPE 2

LOW DENSITY TREE & SHRUB PLANTING



LARGE TREES			
COMMON NAME	SCIENTIFIC NAME	MATURE SIZE (H X W)	POT SIZE
Blakely's Redgum	*Eucalyptus blakelyi*	15m x 30m	Tubestock
Western Grey Box	*Eucalyptus crebra*	25m x 15m	Tubestock
Narrow Leaved Ironbark	*Eucalyptus microcarpa*	25m x 15m	Tubestock
Yellow Box Gum	*Eucalyptus melliodora*	10-25m x 4-10m	Tubestock
LARGE SHRUBS			
COMMON NAME	SCIENTIFIC NAME	MATURE SIZE (H X W)	POT SIZE
Western Silver Wattle	*Acacia decora*	3-10m x 2-8m	Tubestock
Prickly Wattle	*Acacia paradoxa*	2-4m x 4-10m	Tubestock
Sweet Bursaria	*Bursaria spinosa*	2-4m x 2-4m	Tubestock
Wedge Leaf Hop Bush	*Dodonaea viscosa Cuneata*	2-4m x1-2m	Tubestock
Native Wisteria	*Hardenbergia violacea*	2-4m x1-2m	Tubestock
MEDIUM SHRUBS			
COMMON NAME	SCIENTIFIC NAME	MATURE SIZE (H X W)	POT SIZE
Pale Vanilla Lily	*Arthropodium milleflorum*	60cm-1m x 60cm-1m	Tubestock
Rock Correa	*Correa glabra*	1-2m x 1-2m	Tubestock
Blue Flax Lily	*Dianella longifolia*	30-60m x 30-60m	Tubestock
Hopbush	*Dodonaea boroniifolia*	1-2m x 60cm-1m	Tubestock
Hoary Guinea Flower	*Hibbertia obtusifolia*	60cm-1m x 60cm-1m	Tubestock
Australian Indigo	*Indigofera australis*	1-2m x 1-2m	Tubestock
Kangaroo Grass	*Themeda australis*	15cm x 30cm	Tubestock

LEGEND

- Trees*
- Shrub \ Screen Planting*
- Tufting Planting*
- Existing Grass
- Security Mesh Fence
- Property Boundary Line

*Plants to be selected from Proposed Planting List

Source: Urbis, 2024

6.1.5. Glint and Glare Assessment

This glare assessment has referred to NSW Government DPE's 'Large-Scale Solar Energy Guideline (August 2022) which provides assessment parameters in the form of Glint and Glare requirements and Impact ratings.

6.1.5.1. Potential Impacts

A total of six scenarios based on resting angle were simulated covering the full range of motion from 0° to +/-60° to understand the effect of altering the resting angle parameter on predicted glare. Under the worst-case scenario, where the resting angle is configured at 0°, glare is predicted from seventeen of the 47 assessed receptors.

However, it was found that the amount of glare predicted decreases as the resting angle is increased. For the Project, the modelling shows that scenarios ranging from a resting angle from 5°-60°, inclusive, resulted in no predicted glare from the Project to any identified receptors.

6.1.5.2. Mitigation Measures

It is recommended that the resting angle for the Project is configured to between 5° and 60° (inclusive) to eliminate all potential glare towards assessed receptors. This range falls within the typical resting angle range for solar farms of around 45-60 degrees.

Based on the proposed layout there are no glare impacts expected for the Project for all assessed receptors based on the DPE guidelines, which includes assessed roads, railway line, dwellings and aerodromes. As a result, there would also be no interference expected for viewpoints located at greater distances from the Site.

As there is no glare predicted when the proposed solar panels for the Project are configured within the recommended and typical resting angle ranges, additional glare mitigation measures are not required.

6.1.6. Noise

This section provides a summary of the assessment, findings, the existing environment and identifies potential noise and vibration impacts in the area as well as any required mitigation measures for the Project.

This section addresses the specific SEARs as relating to Noise for the Project and a noise impact assessment (**NIA**) prepared by WSP in Appendix L.

6.1.6.1. Existing Environment

The existing noise environment in the Site is primarily rural and is dominated by agricultural and rural residential land uses. The Site is approximately 4.5km north of the township of Gulgong and is in the vicinity of the following noise sources:

- Road traffic on the Castlereagh Highway and Barneys Reef Road.
- Infrequent local road traffic on Jacksons Lane and Puggon Road.
- Gwabegar railway line.
- Various local roads.

Other noise sources in the locality would include natural noises (cicadas, insects, fauna) and agricultural activities.

Potential Sensitive Receivers

Noise sensitive receivers typically include land uses potentially affected by noise such as residential, educational, medical and/or outdoor recreational areas. Receivers with the potential to be impacted by noise during operation and construction of the Project were identified through preliminary calculations, which indicates receivers within an approximate buffer distance of 3km from the Site at noise risk.

Review of recent aerial imagery identified 81 receivers within the buffer distance and 10 representative receivers have been identified to represent the worst impacted receivers to simplify the discussion of results. The 81 receivers are shown in below and 10 representative receivers are shown in Table 30 below.

Table 30 Representative Receivers

Receivers ID	Receiver Type	Address
1	Residential	38 Jacksons Lane, Stubbo
2	Residential	491 Barneys Reef Road, Stubbo
3	Residential	489 Barneys Reef Road, Stubbo
5	Residential	340 Jacksons Lane, Beryl
6	Residential	401 Barneys Reef Road, Stubbo
9	Recreational	366 Barneys Reef Road, Stubbo
18	Residential	66 Old Barneys Reef Road, Gulgong
31	Residential	343 Puggoon Road, Beryl
44	Residential	41 Prosperity Lane, Gulgong
46	Residential	112 Barneys Reef Road, Gulgong

Due to the highly rural nature of the study area, noise monitoring to determine existing levels of background noise is not justified. Instead, the minimum assumed rating background noise levels (**RBLs**) of the Noise Policy for Industry (NPfI), have been assumed. These levels represent the minimum possible RBLs for a given land use type and as such constitute a conservative approach to the assessment. The minimum RBLs

in Table 31 have been selected in reference to the description of existing noise environment outlined of the NPfI.

Table 31 Minimum Assumed RBLs

Time of Day	Minimum Assumed Rbl La90 dBA
Day	35
Evening	30
Night	30

Source: WSP, 2024

6.1.6.2. Methodology

The purpose of this NIA is to assess the potential noise impacts from construction and operation of the Project. The NIA was prepared in accordance with the following policies and guidelines:

- *Interim Construction Noise Guideline* (**ICNG**) (DECCW, 2009).
- *Noise Policy for Industry* (**NPfI**) (EPA 2017).
- *ISO 8297 – Determination of Sound Power Levels of Multisource Industrial Plants for Evaluation of Sound Pressure Levels in the Environment* (Engineering Method).

6.1.6.3. Potential Impacts

Construction Noise Impact Assessment

Construction is expected to be carried out during standard hours where it is feasible and reasonable to do. However, some works may still be required during out of hours (works) (**OOHW**). This assessment has assumed that all work activities may be undertaken during out of hours at some time.

A summary of the predicted construction noise levels at representative receivers during each work stage has been conducted by WSP. Results from each work stage are tabulated in Table 32.

Construction Road Traffic Noise

During the construction phase of the Project, heavy vehicles would be required for the delivery of materials and equipment and light vehicles would transport workers to and from the Site. This additional road traffic will increase existing levels of road traffic noise along the Castlereagh Highway, which is a major arterial road and classified as designated heavy vehicle routes by TfNSW.

A doubling of road traffic numbers would result in a 3dB increase in road noise and a 60% increase in traffic is required to increase traffic noise levels by 2dB.

Given the preliminary nature of this assessment, precise traffic numbers during construction are unknown. However, in consideration of existing road traffic on these routes, it is considered highly unlikely that the Project would generate increases in road traffic numbers of more than 60% along the Castlereagh Highway and as such would comply with the RNP guidelines along this route.

Given existing traffic numbers on Barneys Creek Road and Jacksons Lane, it is expected that during peak construction traffic flows, road traffic noise criteria may be exceeded along these routes.

Construction Noise Summary

The assessment of construction noise indicates that:

- Construction noise levels are predicted exceed the Project NMLs at some properties at all stages except Stage 6.
- The loudest work stage is predicted to be stage SC2 (earthworks).
- The receivers most affected by construction noise are predicted to be:
  - (R1) 38 Jacksons Lane, Stubbo
  - (R2) 491 Barneys Reef Road, Stubbo
  - (R3) 489 Barneys Reef Road, Stubbo
  - (R4) 681 Barneys Reef Road, Stubbo
  - (R6) 401 Barneys Reef Road, Stubbo
  - (R7) 412 Barneys Reef Road, Stubbo
  - (R8) 340 Jacksons Lane Beryl, Stubbo

It is noted that the predicted noise levels are based on work being undertaken at the nearest point to each receiver. Given the large size of the Site, these exceedances will not occur continuously, and noise levels will generally be well below the predicted levels.

Table 32 Construction Noise Level and Assessment – Unmitigated Levels

ID	ADDRESS	COMPLIANCE (CONSTRUCTION NML)	COMPLIANCE (CONSTRUCTION SLEEP AWAKENING)	EXCEEDANCE DESCRIPTION (CONSTRUCTION NML)	EXCEEDANCE DESCRIPTION (CONSTRUCTION SLEEP AWAKENING)
1	38 Jacksons Lane, Stubbo	Exceedances in all stages	Exceedances in all stages	Up to 17 dBA in SH, Up to 22 dBA in OOH1, Up to 27 dBA in OOH2 Up to 12 months of exceedances	Up to 17dBA Up to 12 months of exceedances
2	491 Barneys Reef Road, Stubbo	Exceedances in all stages	Exceedances in all stages	Up to 18 dBA in SH, Up to 23 dBA in OOH1, Up to 28 dBA in OOH2 Up to 12 months of exceedances	Up to 18dBA Up to 12 months of exceedances
3	489 Barneys Reef Road, Stubbo	Exceedances in all stages	Exceedances in all stages	Up to 20 dBA in SH, Up to 25 dBA in OOH1, Up to 30 dBA in OOH2 Up to 12 months of exceedances	Up to 20dBA Up to 12 months of exceedances
4	681 Barneys Reef Road, Stubbo	Exceedances in all stages	Exceedances in all stages	Up to 6 dBA in SH, Up to 11 dBA in OOH1, Up to 16 dBA in OOH2 Up to 12 months of exceedances	Up to 6dBA Up to 12 months of exceedances
5	340 Jacksons Lane, Beryl	Exceedances in all stages	Exceedances in WS 1, 2, 3	Up to 3 dBA in SH, Up to 8 dBA in OOH1, Up to 13 dBA in OOH2 Up to 12 months of exceedances	Up to 3dBA Up to 8 months of exceedances
6	401 Barneys Reef Road, Stubbo	Exceedances in all stages	Exceedances in WS 1, 2, 3, 4	Up to 5 dBA in SH, Up to 10 dBA in OOH1, Up to 15 dBA in OOH2 Up to 12 months of exceedances	Up to 5dBA Up to 11 months of exceedances

ID	ADDRESS	COMPLIANCE (CONSTRUCTION NML)	COMPLIANCE (CONSTRUCTION SLEEP AWAKENING)	EXCEEDANCE DESCRIPTION (CONSTRUCTION NML)	EXCEEDANCE DESCRIPTION (CONSTRUCTION SLEEP AWAKENING)
7	412 Barneys Reef Road, Stubbo	Exceedances in all stages	Exceedances in WS 1, 2, 3	Up to 3 dBA in SH, Up to 8 dBA in OOH1, Up to 13 dBA in OOH2 Up to 12 months of exceedances	Up to 3dBA Up to 8 months of exceedances
8	325 Barneys Reef Road, Stubbo	Exceedances in all stages	Exceedances in WS 1, 2, 3, 4	Up to 5 dBA in SH, Up to 10 dBA in OOH1, Up to 15 dBA in OOH2 Up to 12 months of exceedances	Up to 5dBA Up to 11 months of exceedances
9	366 Barneys Reef Road, Stubbo	Exceedances in all stages	Exceedance in WS 2	Up to 1 dBA in SH, Up to 6 dBA in OOH1, Up to 11 dBA in OOH2 Up to 12 months of exceedances	Up to 1dBA Up to 2 months of exceedances
10	358 Barneys Reef Road, Stubbo	Exceedances in all stages	Exceedance in WS 2	Up to 0 dBA in SH, Up to 5 dBA in OOH1, Up to 10 dBA in OOH2 Up to 12 months of exceedances	Up to 1dBA Up to 2 months of exceedances
11	124 Old Barneys Reef Road, Gulgong	Exceedances in all stages	Compliance in all stages	Up to 3dBA in OOH1, up to 8dBA in OOH2 Up to 12 months of exceedances	N/A
12	71 Old Barneys Reef Road, Gulgong	Exceedances in all stages	Compliance in all stages	Up to 2dBA in OOH1, up to 7dBA in OOH2 Up to 12 months of exceedances	N/A

ID	ADDRESS	COMPLIANCE (CONSTRUCTION NML)	COMPLIANCE (CONSTRUCTION SLEEP AWAKENING)	EXCEEDANCE DESCRIPTION (CONSTRUCTION NML)	EXCEEDANCE DESCRIPTION (CONSTRUCTION SLEEP AWAKENING)
13	87-89 Sandgrove Lane, Gulgong	Exceedances in all stages	Compliance in all stages	Up to 5dBA in OOH2 Up to 12 months of exceedances	N/A
14	62 Sandgrove Lane, Gulgong	Exceedances in Stage 1-4 Evening/Night	Compliance in all stages	Up to 5dBA in OOH2 Up to 12 months of exceedances	N/A
15	155 Sandgrove Lane, Gulgong	Compliance in all stages	Compliance in all stages		
16	37 Racecourse Road, Gulgong	Exceedances in Stage 1-3 Evening/Night	Compliance in all stages	Up to 5dBA in OOH2 Up to 7 months of exceedances	N/A
17	97 Stubbo Road, Stubbo	Compliance in all stages	Compliance in all stages		
18	66 Old Barneys Reef Road, Gulgong	Exceedances in Stage 1-3 Evening/Night	Compliance in all stages	Up to 5dBA in OOH2 Up to 7 months of exceedances	N/A
19	146 Puggoon Road, Beryl	Exceedances in Stage 1-3 Evening/Night	Compliance in all stages	Up to 5dBA in OOH2 Up to 7 months of exceedances	N/A
20	588 Puggoon Road, Stubbo	Exceedances in Stage 1-3 Evening/Night	Compliance in all stages	Up to 5dBA in OOH2 Up to 7 months of exceedances	N/A
21	179 Sandgrove Lane, Gulgong	Compliance in all stages	Compliance in all stages		
22	35 Old Barneys Reef Road, Gulgong	Exceedances in Stage 1-3 Evening/Night	Compliance in all stages	Up to 2dBA in OOH2 Up to 7 months of exceedances	N/A

ID	ADDRESS	COMPLIANCE (CONSTRUCTION NML)	COMPLIANCE (CONSTRUCTION SLEEP AWAKENING)	EXCEEDANCE DESCRIPTION (CONSTRUCTION NML)	EXCEEDANCE DESCRIPTION (CONSTRUCTION SLEEP AWAKENING)
23	99 Stubbo Road, Stubbo	Exceedances in Stage 2-3 Evening/Night	Compliance in all stages	Up to 2dBA in OOH2 Up to 5 months of exceedances	N/A
24	151 Stubbo Road, Stubbo	Exceedances in Stage 2-3 Evening/Night	Compliance in all stages	Up to 2dBA in OOH2 Up to 5 months of exceedances	N/A
25	108 Stubbo Road, Stubbo	Exceedances in Stage 2-3 Evening/Night	Compliance in all stages	Up to 2dBA in OOH2 Up to 5 months of exceedances	N/A
26	343 Puggoon Road, Beryl	Exceedances in Stage 2-3 Evening/Night	Compliance in all stages	Up to 2dBA in OOH2 Up to 5 months of exceedances	N/A
27	167 Barneys Reef Road, Gulgong	Exceedances in Stage 2-3 Evening/Night	Compliance in all stages	Up to 1dBA in OOH2 Up to 5 months of exceedances	N/A
28	423 Carramar Road, Stubbo	Exceedance in Stage 2, Evening/Night	Compliance in all stages		
29	172 Barneys Reef Road, Gulgong	Exceedance in Stage 2, Evening/Night	Compliance in all stages		
30	588 Puggoon Road, Stubbo	Exceedances in Stage 1-3 Evening/Night	Compliance in all stages	Up to 3dBA in OOH2 Up to 5 months of exceedances	N/A
31	343 Puggoon Road, Beryl	Compliance in all stages			
32	343 Puggoon Road, Beryl				

ID	ADDRESS	COMPLIANCE (CONSTRUCTION NML)	COMPLIANCE (CONSTRUCTION SLEEP AWAKENING)	EXCEEDANCE DESCRIPTION (CONSTRUCTION NML)	EXCEEDANCE DESCRIPTION (CONSTRUCTION SLEEP AWAKENING)
33	167 Barneys Reef Road, Gulgong	Compliance in all stages			
34	423 Carramar Road, Stubbo				
35	172 Barneys Reef Road, Gulgong				
36	37 Racecourse Road, Gulgong				
37	153 Barneys Reef Road, Gulgong				
38	37 Racecourse Road, Gulgong	Exceedances in Stage 1-3 Evening/Night	Compliance in all stages	Up to 5months of exceedances	N/A
39	168 Barneys Reef Road, Gulgong	Compliance in all stages			
40	148 Barneys Reef Road, Gulgong				
41	8 Racecourse Road, Gulgong				
42	913 Barneys Reef Road, Stubbo				
43	122 Barneys Reef Road, Gulgong				
44	41 Prosperity Lane, Gulgong				
45	57 Prosperity Lane, Gulgong				
46	112 Barneys Reef Road, Gulgong				
47	45 Carawatha Road, Stubbo				
48	220 Black Lead Lane, Gulgong				

ID	ADDRESS	COMPLIANCE (CONSTRUCTION NML)	COMPLIANCE (CONSTRUCTION SLEEP AWAKENING)	EXCEEDANCE DESCRIPTION (CONSTRUCTION NML)	EXCEEDANCE DESCRIPTION (CONSTRUCTION SLEEP AWAKENING)
49	900 Castlereagh Highway, Beryl	Compliance in all stages			
50	421 Carramar Road, Stubbo				
51	75 Barneys Reef Road, Gulgong				
52	202 Black Lead Lane, Gulgong				
53	9 Mineshaft Lane, Gulgong				
54	93 Barneys Reef Road, Gulgong				
55	314 Castlereagh Highway, Gulgong				
56	176 Black Lead Lane, Gulgong				
57	85 Martins Crossing Road, Gulgong				
58	102 Barneys Reef Road, Gulgong				
59	69 Barneys Reef Road, Gulgong				
60	62-64 Mineshaft Lane, Gulgong				
61	80 Barneys Reef Road, Gulgong				
62	199 Black Lead Lane, Gulgong				
63	183 Black Lead Lane, Gulgong				
64	955 Barneys Reef Road, Stubbo				
65	80 Barneys Reef Road, Gulgong				

ID	ADDRESS	COMPLIANCE (CONSTRUCTION NML)	COMPLIANCE (CONSTRUCTION SLEEP AWAKENING)	EXCEEDANCE DESCRIPTION (CONSTRUCTION NML)	EXCEEDANCE DESCRIPTION (CONSTRUCTION SLEEP AWAKENING)
66	183 Black Lead Lane, Gulgong	Compliance in all stages			
67	132 Black Lead Lane, Gulgong				
68	21 Shepherds Lane, Gulgong				
69	49 Hideaway Lane, Gulgong				
70	171 Black Lead Lane, Gulgong				
71	143 Black Lead Lane, Gulgong				
72	143 Black Lead Lane, Gulgong				
73	41 Hideaway Lane, Gulgong				
74	955 Barneys Reef Road, Stubbo				
75	41 Hideaway Lane, Gulgong				
76	359 Carramar Road, Stubbo				
77	312 Castlereagh Highway, Gulgong				
78	155 Black Lead Lane, Gulgong				
79	900 Castlereagh Highway, Beryl				
80	101 Black Lead Lane, Gulgong				
81	359 Carramar Road, Stubbo				
82	97 Black Lead Lane, Gulgong				

ID	ADDRESS	COMPLIANCE (CONSTRUCTION NML)	COMPLIANCE (CONSTRUCTION SLEEP AWAKENING)	EXCEEDANCE DESCRIPTION (CONSTRUCTION NML)	EXCEEDANCE DESCRIPTION (CONSTRUCTION SLEEP AWAKENING)
83	85 Black Lead Lane, Gulgong	Compliance in all stages			
84	77 Black Lead Lane, Gulgong				

Operational Noise Impact Assessment

The predicted unmitigated operational noise levels from the Project to the representative receivers for adverse and neutral meteorological along with the nighttime limits is in Table 33. Where applicable, the predicted operational noise levels include additional considerations for low frequency and tonal noise characteristics. Table 33 identifies the predicted operational noise levels without mitigation controls in place indicate levels comply with NPfI and sleep disturbance criteria.

Table 33 Predicted Operational Noise Level and Assessment – Unmitigated Levels

ID	Address	PTNL, Night Time LAEQ,15MIN	Predicted Steady Noise Level LAEQ,15MIN DB		Sleep Disturbance Trigger LFMAX	Predicted Noise Level LFMAX	
			Adverse	Neutral		Adverse	Neutral
1	38 Jacksons Lane	35	32	28	52	41	34
2	491 Barneys Reef Road		35	25		37	31
3	489 Barneys Reef Road		35	25		38	31
5	340 Jacksons Lane		27	23		40	35
6	401 Barneys Reef Road		26	20		35	28
9	366 Barneys Reef Road		18	17		29	27
18	66 Old Barneys Reef Road		17	11		25	19
31	343 Puggon Road		17	11		30	23
44	41 Prosperity Lane		16	10		24	17
46	112 Barneys Reef Road		18	12		29	22

Source: WSP, 2024

Existing or proposed developments located within 2km of the Project have the potential to generate cumulative noise impacts during construction and operation. Cumulative vibration impacts may occur where vibration intensive work is undertaken within approximately 100m of the Project and a vibration sensitive receiver.

In consideration of these buffer distances, no relevant developments have been identified and cumulative noise or vibration impacts are not predicted to arise because of the Project. Where future developments are proposed within these distances, it is recommended that the outcomes within this report are considered for the consideration of potential cumulative noise impacts.

6.1.6.4. Mitigation Measures

Construction Noise Mitigation Measures

Due to the predicted exceedance of the NMLs, reasonable and feasible mitigation and/or management measures will be required to minimise construction noise impacts. As part of the Project detailed design and prior to commencement of works, a project specific CEMP will be prepared and implemented. This will include measures for the mitigation and management of noise in accordance with the requirements of the ICNG. It is proposed that works are carried out only during Standard Hours.

Further reasonable and feasible noise mitigation measures would include:

- Ensuring deliveries are made during Standard Hours.

- The selection and duration of use for equipment which is generating noise.
- Switching off any equipment not in use for extended periods.
- Keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the Site.
- Using the most suitable equipment necessary for the works at any one time.
- Regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc.
- Use of quieter methods where feasible and reasonable.
- Use of temporary noise screens around noisy construction plant. Screens will be positioned to interrupt a direct line of sight between the major noise source and potentially affected receivers.

Table 34 below provides the estimated reduction in noise for standard mitigation measures.

Table 34 Estimated Noise Reduction for Standard Mitigation Measures

Measure	Estimated Noise Reduction, Db
Avoiding using noisy plant simultaneously and/or close together, adjacent to sensitive receivers.	2 to 5
Orienting equipment away from sensitive receivers.	3 to 5
Carrying out loading and unloading away from sensitive receivers.	3 to 5
Using noise source controls, such as the use of residential class mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks.	5 to 10
Selecting site access points and roads as far as possible away from sensitive receivers.	3 to 6

Source: WSP, 2024

Operational Noise Mitigation Measures

For the operational noise, the biggest potential for source control for the Project has been identified to be the five solar panel inverters and BESS inverters. Noise control at the source has been identified as a potential mitigation option. Noise control at the source is considered the most effective in improving the overall acoustic outcome at sensitive receivers.

A key adopted mitigation measure adopted is the implementation of silencer kits for five solar inverters and BESS inverters, which can effectively reduce the solar inverter SWLs by 6 dB. Therefore, the recommended locations for silencer kits are SI_9, SI_10, SI_11, SI_12, SI_14. The location of these inverters is shown in

Figure 46. The predicted operational noise levels from the Project with the proposed mitigation treatment under adverse meteorological conditions is provided in Table 35 below.

Table 35 Predicted mitigated operational noise levels and assessment under adverse meteorological conditions

ID	Address	PTNL, Night Time LAEQ,15min DB	Predicted Noise Level LEQ,15MIN dB
			Adverse @ 20 degrees C
2	491 Barneys Reef Road	35	33
3	489 Barneys Reef Road		33
5	340 Jacksons Lane		31
6	401 Barneys reef Road		24
9	366 Barneys Reef Road		22
18	66 Old Barneys Reef Road		15

ID	Address	PTNL, Night Time LAEQ,15min DB	Predicted Noise Level LEQ,15MIN dB
			Adverse @ 20 degrees C
31	343 Puggon Road		16
31	343 Puggon Road		35
44	41 Prosperity Lane		14
46	112 Barneys Reef Road		16

Figure 46 Location of Inverters

Source: WSP, 2024

The results indicate that with the inclusion of silencer kits on the identified inverter units, operational noise levels from the Project would be compliant at the nearest receivers under adverse meteorological conditions, with a reasonable margin of safety. It is noted that the proposed mitigation adequately allows for potential tonal penalties for the inverter units, further reducing potential risk associated with any adverse meteorological conditions.

The project equipment may be subject to minor design changes. Where equipment changes result in noise levels that are equal to or lower than the modelled values, compliance is still expected. Compliance will be confirmed in a Construction Environmental Management Plan prior to construction.

6.1.7. Transport

This section addresses the specific SEARs as relating to transport impacts for the Project and the Transport Impact Assessment (**TIA**) prepared by Urbis is in Appendix M.

6.1.7.1. Existing Environment

Public Transport

There is no public transport infrastructure or services that connect directly to the Site. The closest public transport infrastructure is in the town of Gulgong. Gulgong Station is located 7km south of the Site and is served by the following train lines

- Gwabegar Line.
- Mary Vale Line Sandy.
- Gulgong Line.

The train lines are currently used to transport coal, with a small section of the Gwabegar line running the occasional heritage passenger train services.

Walking and Cycling Network

There is limited active transport infrastructure surrounding the Site, with no footpaths on the roads immediately surrounding the Site to enable walking. Cycling is permitted on the shoulders of the roads, although the nature of these roads (often being unsealed or having an unsealed shoulder) makes cycling on these roads challenging, even for experienced riders.

Road Network

Vehicle access to the Site will be provided via two site access points on Jacksons Lane. The primary site access in the south-eastern corner of the Site will be supported by the proposed upgrade of Jacksons Lane. The other access point to the south-western corner is designated as emergency site access only during construction and for operational purposes.

At its eastern end, Jacksons Lane intersects with Barneys Reef Road and it is proposed to upgrade and seal Jacksons Lane from Barneys Reef Road to the eastern most Site access (approximately 1km), including replacement of the existing vehicle crossing over Slapdash Creek to accommodate traffic related to the operation and maintenance of the Project as well as construction heavy vehicle movements.

The chrematistics of the existing road network is described in Table 36 below.

Table 36 Characteristics of Surrounding Roads

Road	**Castlereagh Highway**	**Golden Highway**	**Barneys Reef Road**	**Ulan Road**	**Cope Road**	**Black Lead Lane**	**Jacksons Lane**
Classification/Function	Arterial	Arterial	Local	Local	Local	Local	Local
Sealed (yes/no)	Yes	Yes	Yes	Yes	Yes	Yes	No
Movement lanes	One lane in each direction	One lane in each direction	Bidirectional single lane	One lane in each direction	One lane in each direction	One lane in each direction	Bidirectional single lane
Parking lanes	No	No	No	No	No	No	No

Road	Castlereagh Highway	Golden Highway	Barneys Reef Road	Ulan Road	Cope Road	Black Lead Lane	Jacksons Lane
Carriageway width (approx.) (metres)	9 metres	9 metres	6.5 metres	7 metres	7 metres	5.5 metres	6.5 metres
Signposted speed (km/h)	100	100	100	100	100	80	60
Line marking/divided lanes	Yes	Yes	Some portions	Yes	Yes	No	No
Pedestrian pathways	No	No	No	No	No	No	No
Rail/Level Crossing	No	No	Yes	No	Yes	Yes	Yes
Bus stops	No	No	No	No	No	No	No
B-Double accessibility	Yes	Yes	Yes	Yes	Yes	Yes	No

Source: Urbis, 2024

Traffic Volumes

Traffic volumes for Castlereagh Highway and Golden Highway are provided in the NSW Traffic Volume Viewer, which provides bi-directional AADT for 2009. The AADT for Castlereagh Highway near the Old Mill Road intersection and Golden Highway near the Merotherie Road intersection is as follows:

- 619 vehicles per day (vpd) in the southbound direction, with 10% of AADT being heavy vehicles.
- 613vpd in the northbound direction, with 1% of AADT being heavy vehicles.
- 304vpd in the eastbound direction, with 1% of AADT being heavy vehicles.
- 317vpd in the westbound direction, with 1% of AADT being heavy vehicles.

The TfNSW data for various data stations in the regional areas have considered a growth of 1.9% per annum (compounded) and is considered acceptable. Therefore, the 2009 traffic volumes have been extrapolated by 28.5% for a fifteen-year period between 2009 and 2024.

Extrapolated traffic volumes in vpd and vehicles per hour (vph) for 2024 year along Castlereagh Highway is provided in Table 37 below and it has been assumed that 10% of the daily traffic is peak hour traffic.

Table 37 Traffic Volumes

Road - Direction	2009 Data		Growth factor per annum	2024 Data (estimated)		Level of Service (LoS) – vpd
	Daily Traffic	Peak Hour		Daily Traffic	Peak Hour	
Castlereagh Highway – north	613vpd	61vph	1.9%	813vpd	81vph	A
Castlereagh Highway – south	619vpd	62vph		821vpd	82vph	A
Golden Highway – east	304vpd	30vph		403vpd	40vph	A
Golden Highway - west	317vpd	31vph		420vpd	42vph	A

Source: Urbis, 2024

Crash History

Crash statistics from the TfNSW allows users to analyse crash data based on time, location, conditions, crash type, road user type, object hit etc. This data was analysed for the surrounding road network for the past five years from 2018 to 2022.

The crash history identifies four crashes that have occurred along Caldonian Street to Barneys Reef Road and ten crashes occurred along Cope Road to Ulan Road. Of these crashes, one was a fatal injury on Cope Road, four resulted in serious injury, two moderately injured, two resulted in minor/other injury and five were non-casualty.

The vehicles are expected to use Jacksons Lane via the Barneys Reef Road to access the solar farm. There have been no reported truck related crashes at the Barneys Reef Road – Jacksons Lane intersection and given the types of vehicle crashes recorded along the proposed construction routes there is no evidence to suggest any significant systemic road safety issues at this intersection.

6.1.7.2. Traffic Impact Assessment

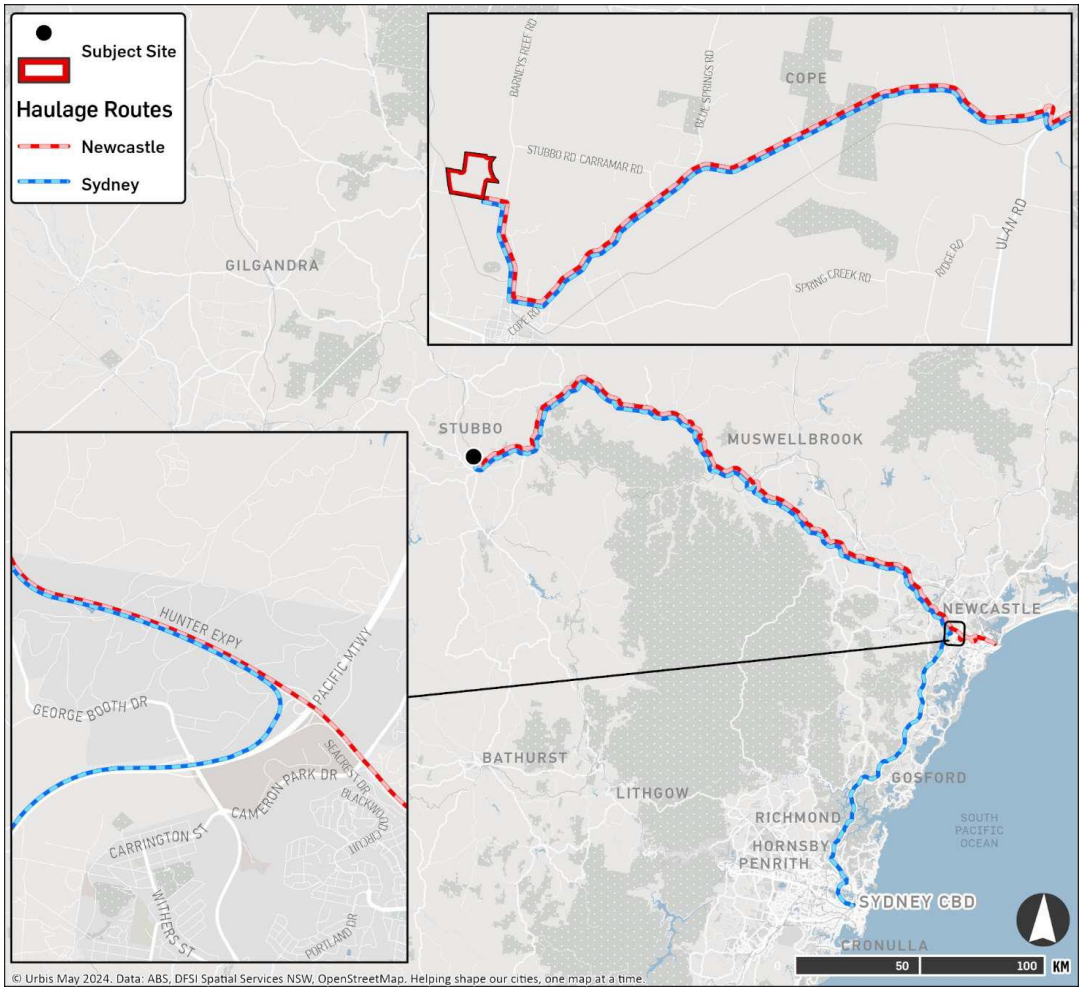
The TIA included a review of the local road network with regard to road safety, junction controls, access constraints, access to the state and regional road network, sight distances, turn warrant assessment and intersection assessment, construction vehicles routes, construction worker management, construction laydown area and parking.

Construction Vehicles Routes

Traffic that will be generated during the construction of the Project will largely be associated with the transportation of materials/equipment. It is expected that construction material delivery vehicles will access the Site from either/both Newcastle and Sydney and these routes are shown in Figure 43 below. The vehicle haulage routes within the local context are shown in Table 36 above.

Except for local, Council-controlled roads, all other roads on the above routes are classified (state or regional) and governed by TfNSW. It is noted that all these roads are pre-approved for 26 metre long B-Doubles, which are expected to be the largest vehicles to access the Site. If any oversized vehicle is expected to access the Site, then a permit for transporting all OSOM vehicles will be applied through the National Heavy Vehicle Regulator (NHVR) and a traffic management (including support vehicles) is required to be prepared to the satisfaction of the relevant authority.

Figure 47 Haulage Routes from Newcastle and Sydney for B-Doubles.



Source: Urbis, 2024

Accessibility Assessment of Haulage Routes

The haulage routes have been assessed for accessibility by the largest anticipated vehicle. The biggest truck to access the Site during the construction phase is expected to be a B-Double. Relevant roads and the conditions applied on B-Double trucks are summarised in Table 38 below.

Table 38 Largest Truck Accessible Routes and Conditions

Road Name	26 Metres B-Double Accessible	Condition	To/From Condition Applied
Castlereagh Highway	Yes	None	Great Western Highway – Golden Highway
Ulan Road	Yes	None	Ulan Road – Golden Highway
Barneys Reef Road	Yes	80km/h B-Double speed limit and outside school bus operation times	Scott Street – Merotherie Road
Caledonian Street	Yes	None	Castlereagh Highway – Ulan Road

Road Name	26 Metres B-Double Accessible	Condition	To/From Condition Applied
Rouse Street	Yes	80km/h B-Double speed limit and outside school bus operation times	Scott Street – Merotherie Road
Cope Road	Yes	None	Castlereagh Highway – Ulan Road
Golden Highway	Yes	None	New England Highway – Upper Hunter Warrmbungle Shire Boundary
Jacksons Lane	No	-	-

Source: Urbis, 2024

It is considered that the anticipated largest vehicle can be accommodated along all roads which are identified as accessible by a 26 metre long B-Double as per TfNSW's Restricted Vehicle Access Map. There are rail level crossings on Barneys Reef Road and Cope Road, both of which permit B-Double haulage routes under the conditions in Table 38 above.

Jacksons Lane is not categorised as a B-Double accessible lane on the restricted vehicle access map. However, as part of the Project, upgrade works will be undertaken to cater for B-Doubles to access the Site.

Road Safety Assessment of Intersections along Haulage Routes

Swept path assessments were undertaken at key intersections between the Site and the Golden Highway to identify the potentially necessary road works required to accommodate B-Doubles. The intersections that were assessed are as follows:

- Rouse Street – Medley Street: the swept path assessment indicates the existing traffic separation island and the give-way sign is required to be temporarily removed to accommodate the B-Double.
- Station Street – Rouse Street: the swept path assessment indicates the existing road configuration at the Station Street – Rouse Street intersection can accommodate the 26-metre B-Double movement).
- Cope Road – Main Street: a B-Double can manoeuvre within the extent of the intersection.
- Ulan Road – Main Street: a B-Double can manoeuvre within the extent of the intersection.

Construction Worker Management

To reduce vehicle congestion on public roads to and from the Site, personnel will be accommodated in temporary construction workers accommodation. All subcontractors working on the Project will be required to actively support and comply with this initiative unless they live locally.

Workers staying in the on-site accommodation will use the designated carpark located within the camp. It is anticipated that most of the workforce will utilise cars for weekend travel to and from the Site. Workers who commute from surrounding towns will be strongly encouraged to participate in carpooling arrangements. Detailed workforce numbers (both local and non-local workers) during the construction stage are shown in Table 39 below.

Table 39 Summary of Indicative Workforce

Month	Construction peak	Local workers	Non-local workers	Total workers
Month 1	No	1	15	16
Month 2	No	3	35	38
Month 3	No	4	40	44
Month 4	No	5	50	55
Month 5	No	6	62	68
Month 6	No	6	62	68
Month 7	Yes	10	110	120
Month 8	Yes	13	137	150
Month 9	Yes	13	137	150
Month 10	Yes	11	110	121
Month 11	No	5	50	55
Month 12	No	2	20	22

Source: Urbis, 2024

To cater for the above workforce, a total of 150 on-site car parking spaces will be provided. These parking spaces will be regularly monitored on a day-to-day basis. To reduce the use of private vehicles and incentivise carpooling, the following strategies have been identified:

- Vehicle Control: The Applicant should control the number of vehicles provided for self-performed works and any hired vehicles. This control will help regulate and limit the number of vehicles on the Site, encouraging carpooling among personnel.
- Work Subcontract conditions: Accommodation in workers camp will be included as one of the conditions in the work subcontracts with subcontractors engaged by the Applicant. This inclusion will reduce daily subcontractor trips, reducing the overall impact on nearby rural roads.

These measures aim to incentivise workers and reduce the number of private vehicles travelling to the Site. Environmental impact and traffic congestion associated with individual vehicle trips can be minimised by promoting carpooling and monitoring parking usage.

Construction Traffic Generation

The construction period for the Project will be approximately 12 months with a peak period of four months. Project information indicates an estimated 150 workers and 60 construction vehicles per day are expected during the peak construction period. Based on this information, staff and construction traffic have been assessed.

Regarding project staff, during the construction stage, as part of the contract, all construction staff are expected to stay at the Site. Temporary accommodation (for 150 workers) and other facilities will be provided within the Site to cater for the staff demand. However, out of the 150 staff, it is assumed that 10% will be local (i.e. within 30-minute driving catchment). Therefore, it is assumed that 15 construction staff will be travelling by private vehicles to and from the Site during the peak periods. This is expected to be the typical traffic scenario for most work days.

The assumptions made to determine the appropriate staff traffic generations are as follows

- Worst case scenario:

  - This considers all workers arriving at the same time on Monday morning and departing on Friday afternoon. This is deemed to be highly unlikely.

- Probable scenario (excl. car occupancy):
  - Some workers may arrive on Sundays prior to work on Monday and leave on Saturdays rather than Fridays. For this report, it is assumed that 10% of the non-local workers will do this.
  - Some workers may stay over the weekend instead of going home. For the purpose of this report, it is assumed that 5% of the non-local workers will do this.
  - This scenario adopts the assumption that all workers arrive in separate vehicles, which is deemed unlikely.
- Probable scenario (including car occupancy):
  - The scenario is the same as the previous scenario, but instead adopts a car occupancy of 1.5 workers per vehicle. This car occupancy considers that coworkers may carpool to travel to the Site and considers workers that are flying in and may be transported on buses to the Site.

Based on the above assumptions, the anticipated traffic generation during the peak construction stage is summarised in Table 40 Notably, the traffic generation is identical from Tuesday to Thursday.

Table 40 Typical Traffic Volume During a Week (Peak Construction Period)

Scenario	**Sun**	**Mon**		**Tue**		**Wed**		**Thu**		**Fri**		**Sat**
	In	In	Out	In	Out	In	Out	In	Out	In	Out	Out
Worst case scenario	0	150	15	15	15	15	15	15	15	15	150	0
Probable scenario (excluding car occupancy)	13	130	15	15	15	15	15	15	15	15	130	13
Probable scenario (including car occupancy)	9	92	15	15	15	15	15	15	15	15	92	9

Source: Urbis, 2024

The probable scenario (excl. car occupancy) was used to undertake further traffic generation and total cumulative assessments in subsequent sections. This was selected to undertake a robust yet conservative traffic generation assessment. Based on the scenario, the anticipated peak traffic generation is 130 vehicles arriving in the AM peak (Monday) and 130 vehicles departing in the PM peak (Friday).

Regarding construction vehicles, there will be up to sixty vehicles accessing the Site during the peak construction phase. This will result in the traffic generation set out in Table 41 below.

Table 41 Anticipated Vehicle Volumes Throughout the Construction Stage

Vehicle Type	**Average vehicle movement**		**Peak vehicle movements**	
	Daily (vpd)	Peak hour (vph)	Daily (vpd)	Peak hour (vph)
MRV/HRV	5	1	13	3
AV/B-Double	20	4	47	12
Total	25	5	60	15

Source: Urbis, 2024

In terms of total traffic generation, for a conservative assessment, it is assumed that the staff travelling by car will be arriving and departing to and from the Site during the peak hours. It is also assumed, that the staff

traffic will coincide with the construction vehicle traffic. The total traffic expected to be generated by the Project is summarised in Table 42 below.

Table 42 Total Peak Traffic Generation

Component	Number	Traffic Generation Rate	Daily Traffic (vpd)	Peak hour (vph)
Staff	150	1 vehicle per staff	145 vehicles movements	130 vehicle movements per hour
Construction vehicles	60	-	60 vehicles movements	15 vehicle movements per hour
Total			205 vehicles movements	145 vehicle movements per hour

Source: Urbis, 2024

6.1.7.3. Sight Distance

The safe intersection sight distance (**SISD**) is defined in Section 3.2.2 of the Austroads Guide to Road Design, Part 4A, Signalised and Un-signalised intersections, as the minimum standard to be provided at an intersection with a major road. SISD assessment was undertaken at the intersection of the Jacksons Lane access with Barneys Reef Road.

The SISD is assessed based on the following parameters:

- An observation time of three seconds.
- A reaction time of 2.5 seconds.
- Deceleration coefficients for the purpose of SISD calculations are 0.46 for light vehicles and 0.24 for heavy vehicles.
- Driver eye height is 2.4m for trucks and 1.1m for cars.
- Speed zone of 100km/h on Princes Highway along the subject section being assessed.

The results of the SISD assessment are summarised in Table 43 below.

Table 43 Safe Intersection Sight Distance Requirements

Location	Vehicle Type	Design Speed	Decision time	Grade	Required SISD
Jacksons Lane – Barneys Reef Road intersection	Truck	100km/h	3.0 + 2.5 s	0 %	316 m
	Car	100km/h	3.0 + 2.5 s	0 %	238 m

Source: Urbis, 2024

At the junction of Jackson Lane, Barneys Reef Road is a straight road with a sight distance of more than 350 metres in the northbound and southbound directions. This length satisfies the SISD requirements. Accordingly, the available sight distance from Jacksons Lane can be considered adequate for the proposed site access.

6.1.7.4. Potential Impacts

The expected LoS during construction is shown in Table 44 below. The road network has ample capacity to operate with an overall LoS of A. This suggests that the Project is expected to have a marginal impact on the performance of the surrounding road network. Again, this is a conservative assessment assuming all staff will be arriving and departing the Site in the peak hour, and the Site will not be served by any shuttle buses to transport the staff.

Table 44 Expected Daily Traffic During Construction

Intersection	Base daily traffic volume vpd (vph)	Construction daily traffic volume vpd (vph)	Base and construction traffic volume combined vpd (vph)	LoS vpd
Castlereagh Highway – north	813vpd (81 ph)	103vpd (73vph)	916vpd (154vph)	A
Castlereagh Highway – south	821 pd (82 ph)	103vpd (73vph)	924vpd (155vph)	A
Golden Highway – east	403vpd (40vph)	103vpd (73vph)	506vpd (113vph)	A
Golden Highway - west	420vpd (42vph)	103vpd (73vph)	523vpd (115vph)	A

Source: Urbis, 2024

During operation, the Site will operate with up to one to three staff personnel (including contractors) and generate two to six regular daily traffic movements. Additional deliveries to the Site may be up to 20 per year, ranging from regular utility vehicles to medium-sized trucks. If there is a major failure at the plant, which would generally occur only one or two times over a 20-year period there may be the need for a large crane and low loader to attend the Site.

Outside of the construction and decommissioning periods the Project is anticipated to have a negligible impact on traffic on the local road network.

6.1.7.5. Cumulative Impact

The SEARs for the Project require the undertaking of a cumulative assessment having regarded other renewable energy projects that may overlap with the Project. Therefore, all renewable projects within a 10km radius have been considered. The cumulative assessment of the 10km radius incorporates developments that are likely to utilise the proposed access/haulage routes in the surrounding road context and have overlapping construction traffic.

It has been conservatively assumed that the developments will have some overlap during the construction phase. However, it is unlikely that the proposed renewable energy projects will occur concurrently. The approved and proposed renewable energy projects that have been considered as part of this cumulative assessment are shown in Table 45 below.

Table 45 Relevant Renewable Projects - Construction

Project	**Status**	**Cumulative Impact**	**Daily Traffic (vpd)**	**Peak Hour (vph)**
Mavis Solar Farm	In planning	Mavis Solar Farm is currently awaiting SEARs and is in the application process. It is anticipated to obtain project determination approval by the first quarter of 2025 and construction is expected to start late 2025. Mavis Solar Farm is anticipated to access their site via Castlereagh Highway.	1386 vpd	353 vph
Tallawang Solar Farm	In planning	Tallawang Solar Farm is currently preparing report amendments and is	1716 vpd	543 vph

Project	Status	Cumulative Impact	Daily Traffic (vpd)	Peak Hour (vph)
		expected to overlap with the Project construction. Tallawang Solar Farm is expected to utilise Castlereagh Highway and Golden Highway. The anticipated traffic to be generated by the Tallawang Solar Farm during the construction phase was obtained from SAMSA Consulting TIA prepared in July 2022.		
Beryl Solar Farm	Operational	The operational traffic generated by Beryl Solar Farm is already accounted for in the background growth of the current traffic along Castlereagh Highway. Therefore, there is minimal cumulative impact.	-	-
Barney's Reef Wind Farm	In planning	Barney's Reef Wind Farm is currently under application process and is expected to overlap with the Project construction. Barney's Reef Wind Farm is expected to utilise Castlereagh Highway and Golden Highway. The anticipated construction traffic generated for the proposed was not publicly accessible. Therefore, the traffic numbers were extracted from Tallawang Solar Farm TIA.	796 vpd	376 vph
Stubbo Solar Farm	In construction	The EIS for Stubbo Solar Farm states that the solar farm is currently under construction. If the solar farm is consistent with the proposed timetable, then the development will be at the operational stage by 2025 and will have minimal impact on the cumulative impact assessment.	-	-
Beryl Battery Energy Storage System	In planning	Beryl Battery Energy Storage System is currently in the planning stage with documents being prepared for EIS. The Project is anticipated to begin construction by 2025. As such there will be an overlap of construction traffic with the Project.	1386 vpd	354 vph

Project	Status	Cumulative Impact	Daily Traffic (vpd)	Peak Hour (vph)
Bellambi Heights Battery Energy Storage System	In planning	Bellambi Heights is currently at a prospective stage and is expected to complete construction in 2026. It is anticipated to have some overlap of construction traffic with the Project. TIA prepared by Vena Energy Australia dated 27th July 2023 outlines the anticipated traffic per day and traffic per hour during the peak construction period.	80 vpd	44 vph
Total			5364 vpd	1670 vph

Source: Urbis, 2024

Several other projects are proposed within the Gulgong area, including a proposed education facility (49 White Street Gulgong), a proposed clubhouse (37 Racecourse Road, Gulgong), and several other residential projects. As part of the cumulative impact assessment, these volumes have been incorporated along Castlereagh Highway and Golden Highway base traffic volumes.

The Project-generated traffic during the construction phase along the Castlereagh Highway and Golden Highway is shown in Table 46 below.

Table 46 The Project Traffic Volumes During the Construction Phase

Road	Current Traffic - vpd (vph)	The Project – vpd (vph)	Total Traffic - vpd (vph)
Castlereagh Highway – north	813 vpd (81 vph)	103 vpd (73 vph)	916 vpd (154 vph)
Castlereagh Highway – south	821 vpd (82 vph)	103 vpd (73 vph)	924 vpd (155 vph)
Golden Highway – east	403 vpd (40 vph)	103 vpd (73 vph)	506 vpd (113 vph)
Golden Highway - west	420 vpd (42 vph)	103 vpd (73 vph)	523 vpd (115 vph)

Source: Urbis, 2024

The possible cumulative daily traffic along Castlereagh Highway and Golden Highway generated by the proposed and approved developments is shown in Table 47 below.

Table 47 Potential Cumulative Traffic During the Construction Phase

Road	Current Traffic + the Project - vpd (vph)	Tallawang Solar Farm - vpd (vph)	Mavis Solar Farm - vpd (vph)	Beryl BESS - vpd (vph)	Barneys Reef Wind Farm - vpd (vph)	Bellambi Heights BESS - vpd (vph)	Total Traffic - vpd (vph) & LoS
Castlereagh Highway – north	916 vpd (154 vph)	572 vpd (181 vph)	462 vpd (118 vph)	462 vpd (118 vph)	0 vpd (0 vph)	27 vpd (7 vph)	2439 vpd (578 vph) LoS B
Castlereagh Highway - south	924 vpd (155 vph)	572 vpd (181 vph)	462 vpd (118 vph)	462 vpd (118 vph)	0 vpd (0 vph)	27 vpd (7vph)	2447 vpd (579 vph) LoS B
Golden Highway - east	506 vpd 113 vph)	0 vpd (0 vph)	462 vpd (117 vph)	462 vpd (117 vph)	0 vpd (0 vph)	27 vpd 7vph)	1457 vpd (354 vph) LoS A
Golden Highway - west	523 vpd (115 vph)	572 vpd (181 vph)	0 vpd (0 vph)	0 vpd (0 vph)	506 vpd (231 vph)	0 vpd (0 vph)	1601 vpd (527 vph) LoS A

Source: Urbis, 2024

The total cumulative traffic flow indicates that the rural roads will be operating at LoS A/B even with the added cumulative traffic generation from the above approved and proposed developments. Again, this is seen as a conservative assessment because the chances of all approved projects overlapping during the construction phase is considered unlikely.

Similar to the Project during the operational period, the surrounding renewable projects are anticipated to generate an operational/maintenance staff. Based on other renewable projects, the estimated maximum traffic generated per renewable site will be limited to 20 vehicle movements per day in the 10-year horizon. Given the existing capacity of the road network, the anticipated traffic generated by the surrounding developments including the Project can be absorbed into the spare capacity of the road network.

6.1.7.6. Mitigation Measures

Dilapidation Survey

Before starting the construction, the contractor will conduct a dilapidation survey of the nearby roads within a 2km radius of the Site. This survey will involve creating a written report and taking photos of any existing damage to public infrastructure. The report will cover the condition of table drains, gravel road surfaces, seals, signs, and other public infrastructure in front of the property, neighbouring properties, and along the designated haulage route.

During and after construction, the Site management team and an independent appointed party shall monitor the road conditions utilised by construction vehicles. If any significant damage is caused by the Applicant or its subcontractors, the Site manager shall engage a contractor to repair the roads.

The log of photographic evidence shall be used as a reference in determining the extent of road dilapidation. Unless identified in the written report, any damage to infrastructure identified post-construction will be attributed to the Project. A copy of the road dilapidation report shall be submitted to the Council prior to the commencement of works and once construction works are completed.

Road Hazards

A construction traffic management plan (**CTMP**) should be prepared to identify road hazards in the area and include but is not limited to the following:

- Impacts of fog, frost, wet weather, heat.
- Impacts on wildlife.
- Impacts on school and local bus routes.
- Coordinate with other development construction activity (e.g. Tallawang Solar Farm). To mitigate the risk of overlapping of projects, the contractor/the client will be required to liaise with the surrounding approved and proposed developments to understand their construction schedule. They will be required to collaborate on a timetable to evade any cumulative construction vehicle impacts. This will minimise any additional traffic impact on the surrounding road network. It is also recommended to share the road infrastructure upgrade works with the surrounding projects.

Construction Vehicle Movements

During construction, all vehicles and machinery associated with the construction of the Site will be contained within the Site. All vehicles associated with construction works, including the delivery and removal of materials and debris, will use the haulage route identified in Figure 43 above.

Appropriate traffic control measures will be taken to notify other road users of large vehicles entering and exiting the Site. All appropriate mitigation measures will be taken to support the use of B-Doubles. During the delivery of some materials, short-duration traffic control and temporarily blocking access to specific sections of Jacksons Lane may be required.

To minimise disruptions and congestion, the Project will schedule the movement of the largest trucks outside peak traffic periods (including school peak periods), plan routes that avoid built-up areas during daytime peak traffic and ensure convoy length or platoons are effectively minimised.

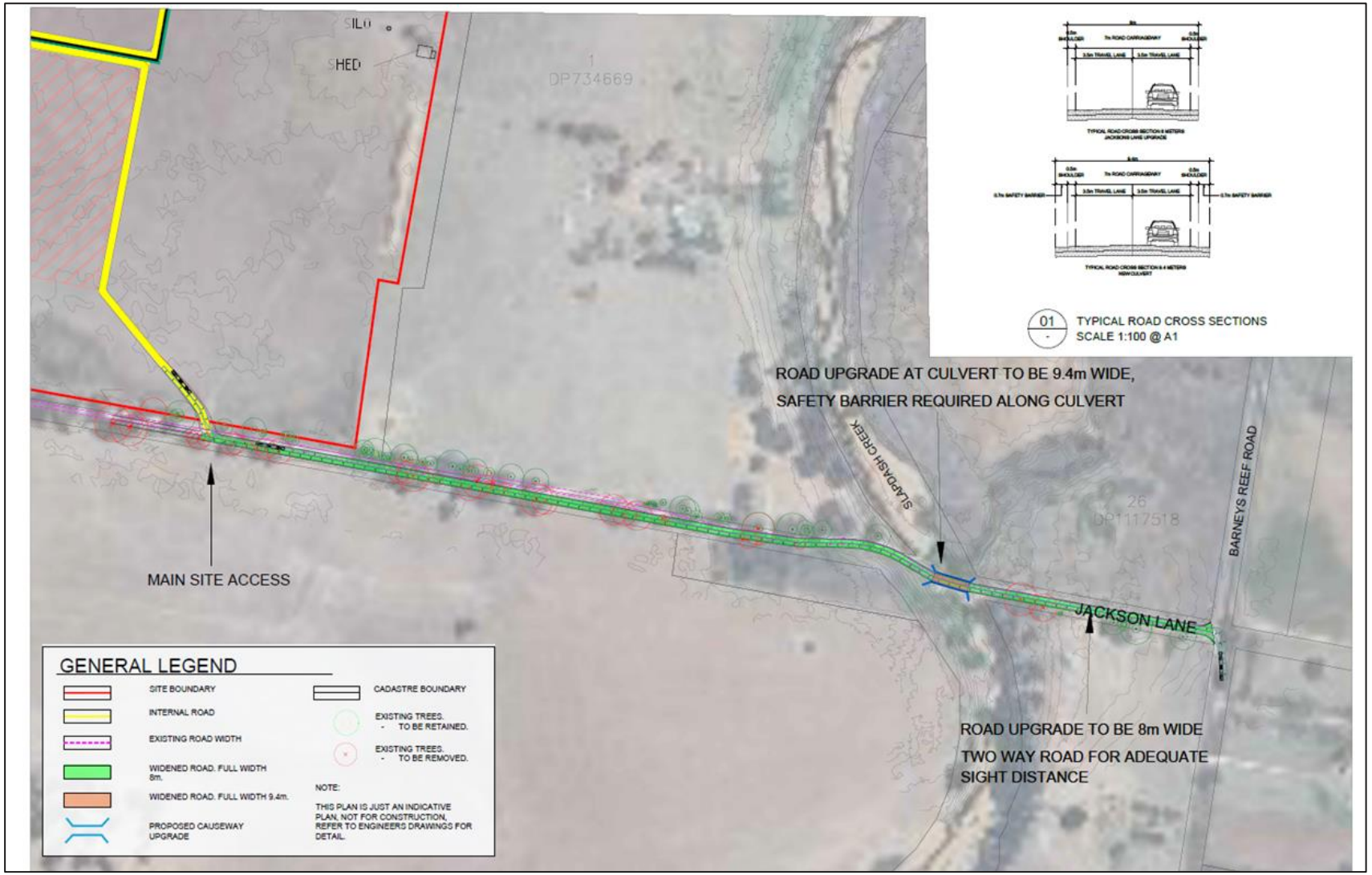
Jacksons Lane Upgrade

It is proposed to upgrade Jacksons Lane, to accommodate construction traffic. Key features of this upgrade include the following:

- Widening of Jacksons Lane and Barneys Reed Road intersection.
- Provision of 8m carriageway from Barneys Reef Road to the easternmost access point of Jacksons Lane, characterised by the cross-section in Figure 48 below.
- Provision of a 9.4 m carriageway at the culvert over Slapdash Creek, characterised by the cross-section in Figure 48 below.
- Straightening of Jacksons Lane alignment for improved sight distance and driveability.

The strategic design for the Jacksons Lane upgrade is shown in Figure 48 below.

Figure 48 Strategic Design of Jacksons Lane Road Upgrade



Source: Urbis, 2024

Nature of Loads and Monitoring

Traffic monitoring during the construction phase will include daily pre-start visual inspections of vehicles to ensure that the vehicles are in good working order and follow manufacturer specifications. Noise controls (efficient silencers, low-noise mufflers, etc.) must be installed and maintained (where reasonable and practicable).

Deliveries to the Site will be tracked in a register to ensure that allowable limits outlined in the conditions are maintained. Civil works vehicles shall cover their loads, including standard construction materials, concrete, prefabricated components, and steel reinforcement.

Street sweeping shall be undertaken following sediment tracking from the Site if required. Soil is loaded onto trucks using diggers, loaders and excavators. All trucks transporting contaminated soil are licenced by the Environment Protection Authority (EPA). All trucks removing soil and material from the Site are covered to prevent dirt and dust from escaping. The Project also aims to minimise the time that spoil is stockpiled on-site.

No building materials, waste, machinery, or related matter shall be stored on the road. All loading and unloading of vehicles shall occur within the boundaries of the Site. Truck tyres must be washed before entering the public roadway from the Site.

The construction contractor will be obligated to manage any debris or damage to roads on which vehicles associated with construction travel. Mitigation measures such as sediment tracking, dust suppression and wheel cleaning will be implemented to ensure debris from the Site is managed. The proponent will undertake remediation to public roads if required due to damage caused by vehicles associated with the Site.

School Bus Interaction

The school bus services (Eastend bus services at Gulgong) operate between Tuckland and Gulgong along Castlereagh Highway. The proposed haulage route is through the northern end of the urban area, as such, the interaction between school bus and construction trucks are minimal.

To minimise the impact on the functionality and safety of the local school bus operation, it is recommended that vehicle deliveries associated with construction do not take place between 8:00 AM – 8:30 AM and 3:30 PM – 4:00 PM on days when the school bus is operational. This exclusionary period of deliveries should form part of the CTMP.

Dangerous Goods

Any controls for the transport of dangerous goods are to be provided before construction as part of the TMP in the event they are identified by the appointed contractor. At this stage, no dangerous goods have been identified.

Community Consultation

The Project Manager will consult with and notify the surrounding property owners and any affected businesses of the proposed works and the proposed traffic management strategy.

A project-specific communication strategy will be prepared to determine the most effective way of notifying all affected parties. Consultation will also be undertaken with the responsible road authority to determine suitable communication methods.

Possible communication methods that could be utilised are as follows

- Mail drop to local residents.
- Email lists.
- Variable Message Signage.
- Noticeboard/Poster signage.
- Media advertisement (radio/newspaper).
- Website.

6.1.8. Water

This section addresses the specific SEARs as relating to water and flood modelling for the Project and the Flood Risk and Impact Assessment report prepared by Water Technology in Appendix N. The assessment addresses likely impacts of the development including flooding, groundwater resources, surface water movements and measures to mitigate the impacts, including flood management of Slapdash Creek.

Refer to **Section 6.1.1** for any matters related to key fish habitat and impacts on aquatic native vegetation clearance in accordance with the *Fisheries Management Act 1994*, including *DPI Guidelines for Controlled Activities on Waterfront Land 2018*, *DPI Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings 2003* and *DPE Policy & Guidelines for Fish Habitat Conservation and Management 2013*.

6.1.8.1. Existing Environment

The Site is in the Macquarie-Bogan catchment in New South Wales, within rural land near Stubbo. The Site is bounded by the adjacent Stubbo Railway to the west and Jacksons Lane to the south. Slapdash Creek, that passes along the eastern boundary of the Site boundary, is a tributary of Wialdra Creek and the larger Cudgegong River.

The surface water point of discharge for the Site is at the intersection of the Jacksons Lane and Slapdash Creek. There are several farm dams and areas which pool water for extended periods within the Site.

In addition, the Site is located within the Mid-Westen Regional Council on land classified as *Groundwater vulnerable* according to DPIEs Groundwater Vulnerability mapping.

Mean annual rainfall at the Bureau of Meteorology's (BoM) Gulgong Post Office station (station number 62013) is 654 mm, with mean monthly rainfall ranging from approximately 44mm in April and May to approximately 71mm in January. Mean monthly rainfall, although highly variable, is generally higher from late spring through summer to early autumn compared to the mean monthly rainfall from late autumn, through winter and into early spring.

Hydrogeological information, including lithology, water level, yield, and salinity were collated from bores located within a 2km buffer of the Site (Appendix N). The Groundwater Dependent Ecosystems (GDE) atlas was queried to locate terrestrial, aquatic, and subterranean GDEs near the Site. According to the GDE atlas, no subterranean GDEs are located near the Site and thus, not considered further. The GDE atlas identified several terrestrial and aquatic GDEs located within 2km of the Site.

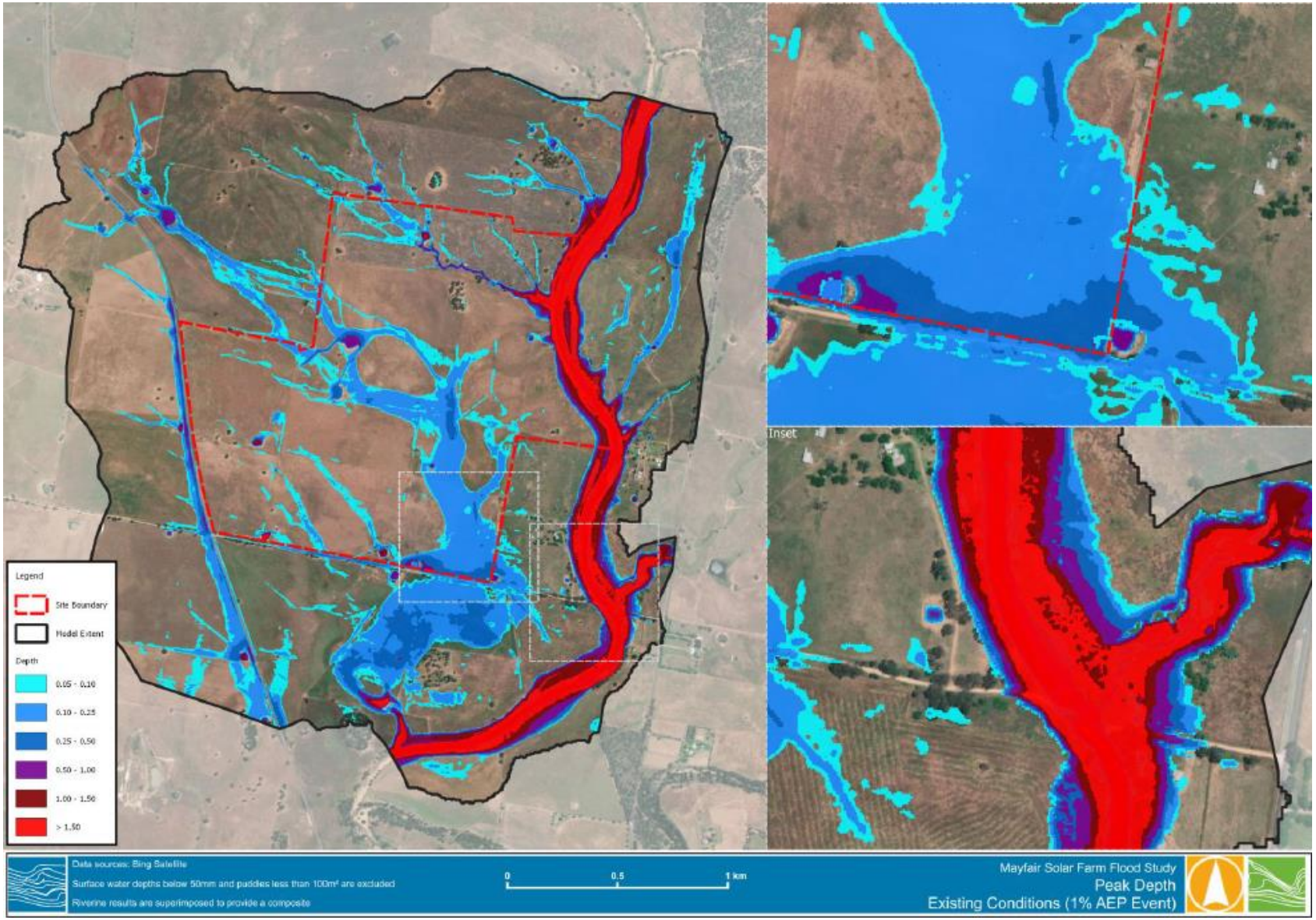
No records of water quality monitoring in Slapdash Creek or Wialdra Creek were available for the Hydrology Assessment.

Hydrology for the Slapdash Creek catchment was modelled using rainfall runoff software (RORB), which produced design flow hydrographs in the catchment in line with Australian Rainfall and Runoff 2019 (ARR2019) guidelines. An inflow hydrograph from the Slapdash Creek catchment within the RORB model was placed into a hydraulic model (TUFLOW) where the flows were routed past the topography of the Site and surrounding area to determine the maximum extent and depth of the 1% AEP storm events. Hydrology for the local catchment was modelled using the Direct Rainfall or Rain on Grid (RoG) approach, which introduces rainfall directly on the model extent for the selected AEP events.

TUFLOW HPC was selected as the numerical solver for the development of the surface water and riverine 2D hydraulic model.

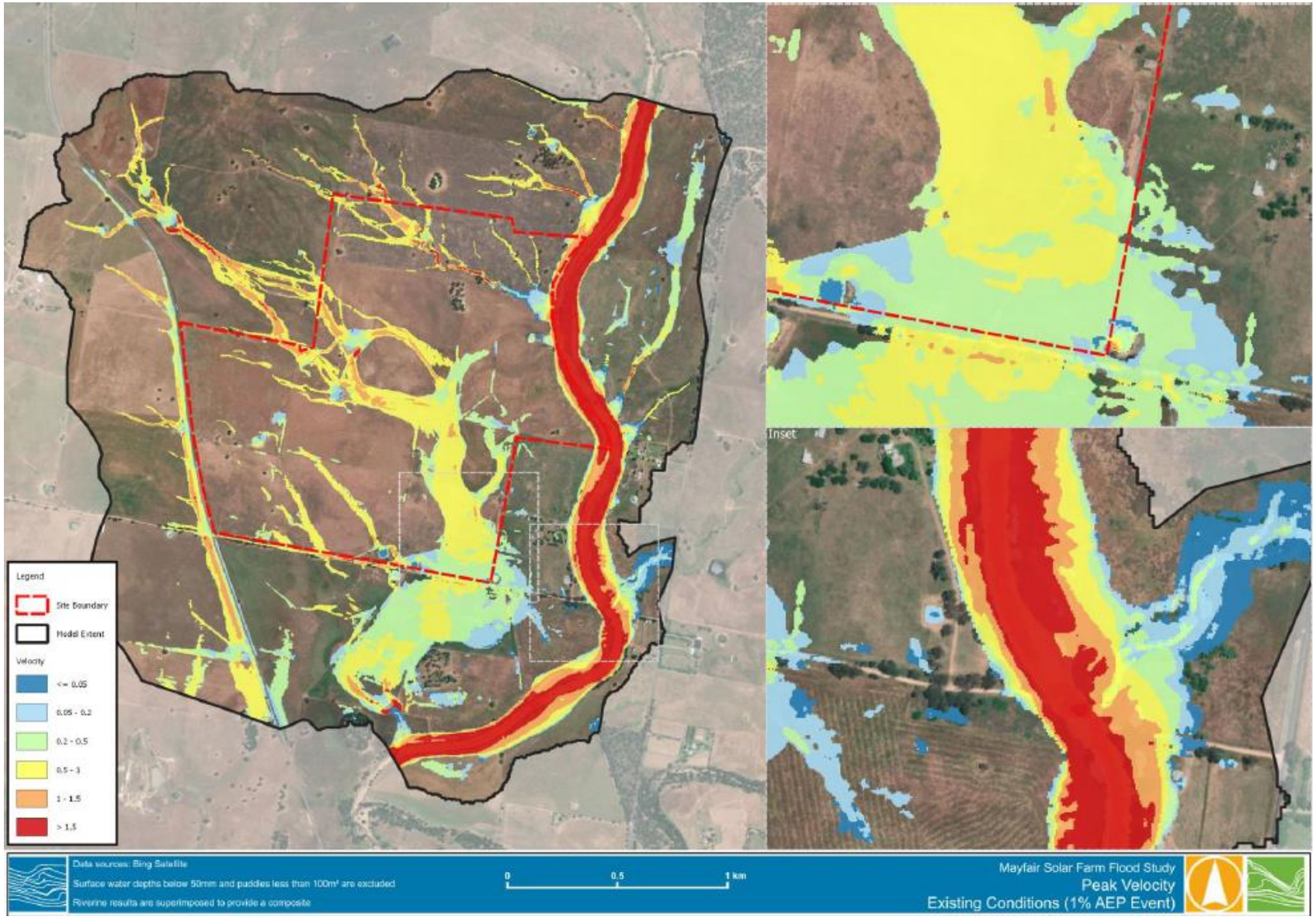
The Site has been observed as subject of minor flooding in recent years, particularly around Slapdash Creek. The 1% AEP hydraulic model results indicate that the 1% AEP event produces a significant external catchment flow path through the Site (Figure 49; Figure 50; Figure 51). The general topography shows eroded low points through the Site area that convey runoff over Jacksons Lane and further downstream to Slapdash Creek.

Figure 49 Existing Conditions - 1% AEP Flood Depth



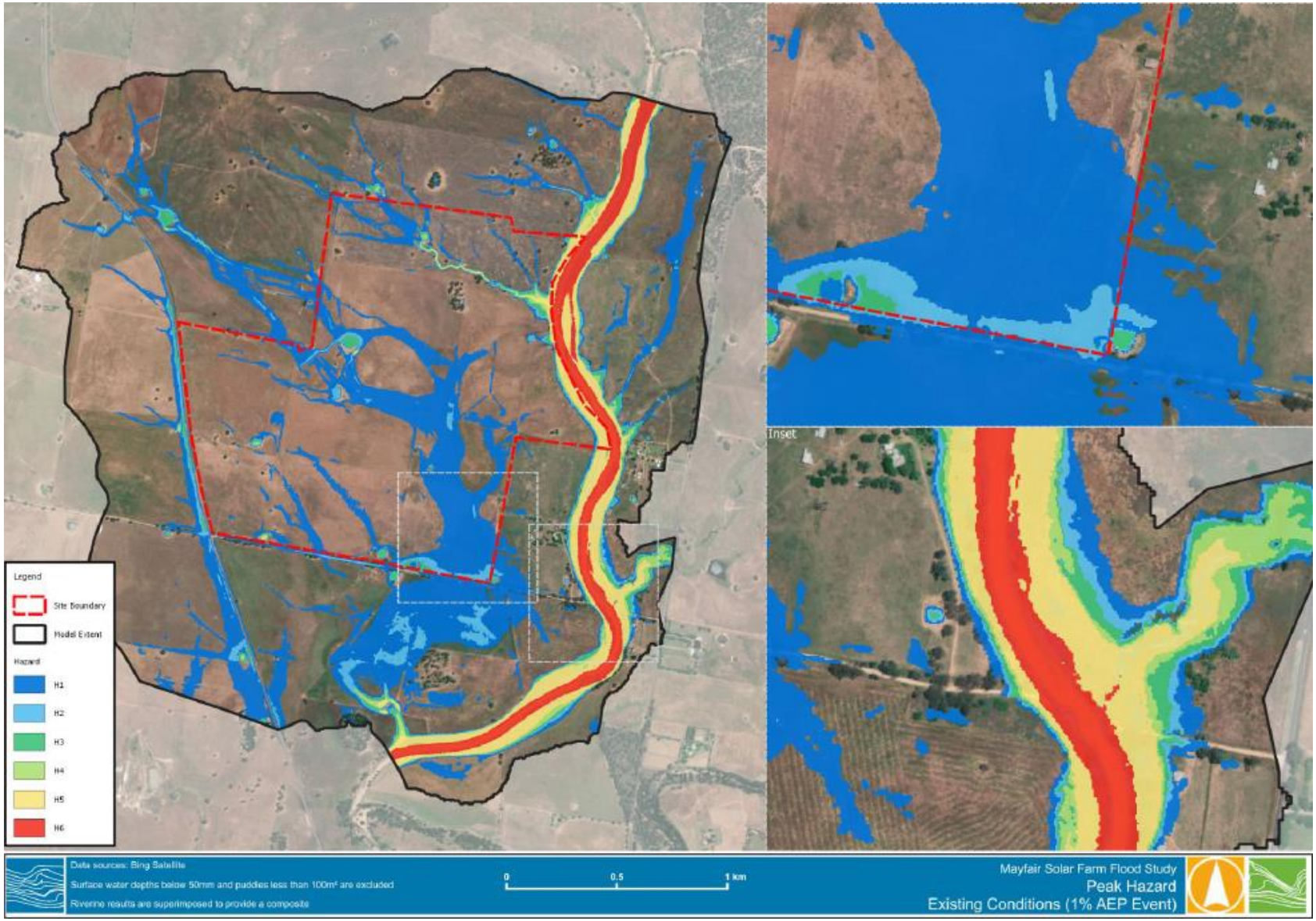
Source: Water Technology, 2024

Figure 50 Existing Conditions - 1% AEP Flood Velocity



Source: Water Technology, 2024

Figure 51 Existing Conditions - 1% AEP Flood Hazard



Source: Water Technology, 2024.

6.1.8.2. Potential Impacts

The impact of the Project on the flood behaviour of the overall Site is likely to be very low as no major changes to the land topography (cut/fill) are proposed.

However, hydraulic modelling has considered the potential impacts from raised areas for internal access roads, the temporary workforce accommodation area and laydown area, project infrastructure and the Jacksons Lane upgrade (including upgraded causeway crossing of Slapdash Creek). The assessment prepared by Water Technology considers two primary features of potential hydrology changes:

- **Jacksons Lane crossing of Slapdash Creek:** The proposed changes as a result of the Project is reflected in the attenuation behind the Jacksons Lane culvert. The uplifting of the causeway produces a small increase on the northern face of Jackson Lane which extends for approximately 950m upstream. There is no change in the expected flooding as a result of the causeway upgrade. However, water levels within Slapdash Creek adjacent to each of the nearby properties (R1, R2 and R3) are modelled to increase by 0.02 – 0.09m. The upgraded culvert is predicted to not convey all the riverine inflow and therefore results in overtopping of the causeway. The existing scenario produced peak depths over the existing causeway ranging from 3.3m in the 20% AEP to 4.5m in the 1% AEP. In comparison, the upgraded causeway with an increased road surface elevation and additional culverts results in peak depths ranging from 1.2m to 2.3m. In each scenario, traversing the causeway is dangerous to both vehicles and people. However, the proposed upgraded causeway will provide an improved outcome over the existing.
- **On site runoff:** The developed conditions on the Site produce slightly more runoff than was predicted in the existing scenario. The differences are more pronounced amongst the solar panels along the main overland flow path through the Site and the temporary accommodation area (associated with the assumed 0.1m uplift from existing levels). As shown in Figure 52, the uplifted temporary accommodation area will redirect runoff, producing increased water levels and new areas of inundation on site compared to the existing scenario. However, this also reduces water levels extending to Jacksons Lane and downstream. Additional areas of impact are identified in the south eastern corner of the site, Jacksons Lane and potentially the adjacent property. However, this is only prevalent in larger magnitude events and only in the range of 10-20mm. On review of the peak results, the developed conditions generally predicted lower velocities and hazards where increased water levels are observed. Considering the magnitude of the PMF, the probability of risk is further reduced as a result of the infrastructure lifetime on Site.

Local water quality is expected to vary due to various factors, including the type of land the waters are draining (e.g. soils, slope), or rainfall and runoff patterns (e.g. ephemeral or permanent streams). Differences in land use and land management practices may also affect water quality. Since this may involve cumulative impacts on nutrients and sediments, the best approach may be to develop load targets for the catchment.

The Project is not expected to have any adverse impacts on GDEs. Mapped GDEs associated with Slapdash Creek are located along the eastern boundary of the Site; however, as these have been mapped in a development exclusion zone, it is unlikely that GDEs will be directly damaged during construction.

The Project is not expected to require groundwater abstraction during construction or ongoing operations and, therefore, is not expected to impact the volume or quantity of water in the local groundwater system.

6.1.8.3. Mitigation Measures

The following mitigation measures are proposed to avoid and mitigate impacts regarding:

Groundwater systems

- Self-bunded battery storage units.
- Self-bunded fuel storage areas.
- Regular maintenance and inspection of fuel bund, oil bund and battery storage units.
- Development of site management plans to respond to leaks, such as spill kits, removal, testing, and disposal of impacted soils, and options for installing groundwater monitoring bores in the case of a significant fire or unexpected leak.
- Drilling of at least three bores to verify lithology and map depth to water table at the Site. If drilling verified potential impact or interference of the Project on the groundwater system, an assessment of

construction dewatering against the AIP (2012) may be required. Each bore should be dipped routinely to confirm seasonal groundwater level fluctuation. Noting that the bores recommended may also be used for ongoing monitoring purposes (Appendix N).

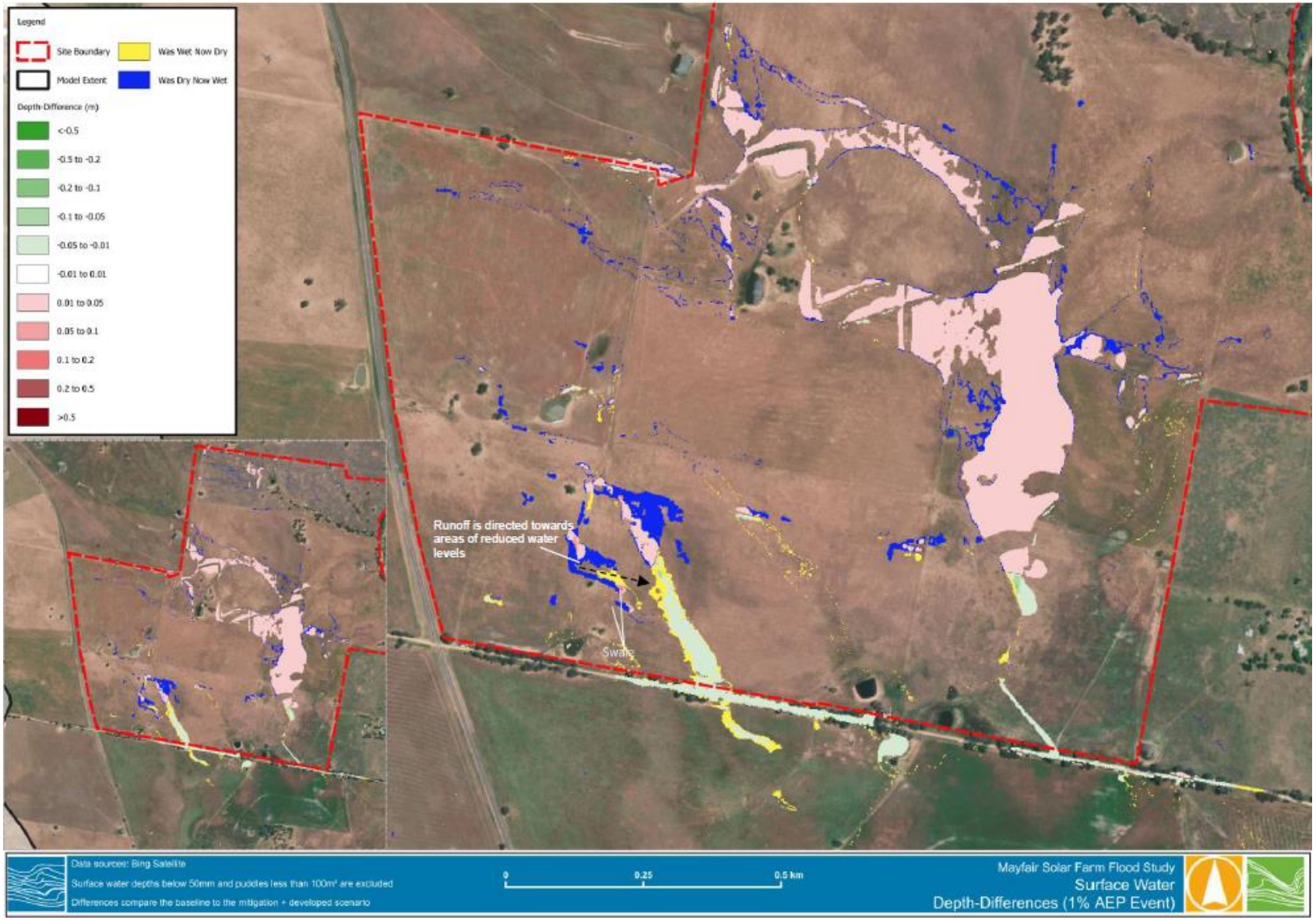
Surface Water Quality

- It is recommended that an appropriate water quality monitoring program be incorporated to establish a baseline prior to the commencement of construction works on-site. The water quality sample sites should be specific to the Site within a relevant management plan, to include water quality management strategies in accordance with the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality Guidelines* (ANZG, 2018).
- Proposed sampling locations and sampling parameters are highlighted in Appendix N.
- Duplicate or triplicate samples should be collected from each site for at least three reasonable magnitude run-off events (of the order of '0.25 year Average Recurrence Interval (ARI)') before any works commence in regard to the Project.
- Water quality monitoring should be continued during the construction phase of the Project. Operational phase water quality monitoring is unlikely to be required on a regular basis. This will be confirmed during later stages of the Project development.

Flooding Mitigation Measures

- Any sensitive infrastructure such as inverters and battery storage etc, to be located on raised fill pads with 300mm freeboard above the maximum of the 1% AEP flood level. It is common for this type of infrastructure to be housed within shipping containers or small sheds with relatively small footprints. Given the shallow depths across the Site, raising these small fill pads is highly unlikely to result in any adverse impacts off-site.
- The footings will be designed to withstand the flood velocities described in Appendix N, which are mostly low (<1m/s) in the Site.
- Swale/cut-off drains are to be installed to prevent off-site detriment. Specifically, proposed open drains/swale of approximately 7.5m in width and 0.5m in depth along the southern edge of the temporary accommodation will capture sheet flow before channelising the excess runoff more to the east as shown in Figure 53. The design of the swale will be considered during detailed design of the temporary workforce accommodation camp, in accordance with a Construction Stormwater Management Plan, required as a condition of consent.
- It is recommended that the best practice principles to stormwater and sediment control be incorporated into the design, construction and operation phases of the Site.
- It is anticipated that vehicles can safely access and egress from the Site under normal conditions. However, consideration should be given to not restrict the movement of emergency vehicles on Barneys Reef Road with any scheduled roadworks. Nevertheless, during a storm event access and egress will likely be curtailed. A Flood Emergency Plan will be prepared for construction and operational measures. Temporary workers and other staff on the Site will be made aware of the dangers in attempting to cross Jacksons Lane causeway as part of the Flood Emergency Plan.

Figure 52 Modelled Depth-differences Post-development and Mitigation (1% AEP)



Source: Water Technology, 2024

6.1.9. Hazards

A Preliminary Hazard Analysis (**PHA**) has been prepared by Riskcon in accordance with the *Hazardous Industry Planning Advisory Paper No 6 – Guideline for Hazard Analysis (DoP, 2011)* (**HIPAP No. 6**)*, Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Planning (DoP, 2011)* (**HIPAP No. 4**) and *Multi-Level Risk Assessment (DoP, 2011).* This included an assessment of potential hazards that electromagnetic fields could have against the *International Commission on Non-Ionizing Radiation Protection (**ICNIRP**) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields.*

The PHA also included a *preliminary risk screening completed in accordance with the State Environmental Planning Policy (Resilience and Hazards)* and *Applying SEPP 33 (DoP, 2011)*, which outlines the components and quantities that would be considered as 'Dangerous Goods'.

The methodology used for the PHA is as follows:

- **Hazard Analysis** – A detailed hazard identification was conducted for the Site facilities and operations. Where an incident was identified to have a potential off-site impact, it was included in the recorded hazard identification word diagram (Appendix O). The hazard identification word diagram lists incident type, causes, consequences, and safeguards. This was performed using the word diagram format recommended in HIPAP No. 6.
- **Consequence Analysis –** For those incidents qualitatively identified in the hazard analysis to have a potential off-site impact, a detailed consequence analysis was conducted. The analysis modelled the various postulated hazardous incidents and determined impact distances from the incident source. The results were compared to the consequence criteria listed in HIPAP No. 4.
- **Frequency Analysis** – In the event a simple solution for managing consequence impacts was not evident, each incident identified to have potential off-site impact was subjected to a frequency analysis. The analysis considered the initiating event and probability of failure of the safeguards (both hardware and software). The results of the frequency analysis were then carried forward to the risk assessment and reduction stage for combination with the consequence analysis results.
- **Risk Assessment and Reduction** – Where incidents were identified to impact off-site and where a consequence and frequency analysis was conducted, the consequence and frequency analysis for each incident were combined to determine the risk and then compared to the risk criteria published in HIPAP No. 4. Where the criteria were exceeded, a review of the major risk contributors was performed, and the risks reassessed incorporating the recommended risk reduction measures. Recommendations were then made regarding risk reduction measures.

6.1.9.1. Existing Environment

The closest sensitive receptor in the surrounding area is approximately 500m away from the solar farm and 1,400m away from the BESS. There is a rail corridor to the immediate West of the Site.

6.1.9.2. Potential Impacts

The Project features 54 containerised battery storage units. Each unit has an energy capacity of 5,015MWh resulting in a gross capacity for the BESS of approximately up to 240MWh. Each unit employs lithium iron phosphate (**LFP**) battery modules and is equipped with a liquid cooling mechanism and a Battery Management System for operational control.

Each container measures approximately 6.0m by 2.4m by 2.9 m, with a total weight under 45,000 kilograms and an IP55 rating. The Project includes one transformer with a capacity of 70 megavolt-amperes (**MVA**) for voltage transformation from 33 kVto 66kV.

The containers conform to IEC 62619, IEC 62477, IEC 63056, IEC 61000, UL 1973, UL 9540A, NFPA 855, and UN 38.3 standards which govern the safety and performance of the included batteries. This includes the installation of a multistage active fire protection system within each container.

The classes and quantities of Dangerous Goods (**DGs**) and their class according to the NSW Environmental Protection Agency (EPA) are provided in

Table 48. The type of transformer oil will be subject to detailed design, so a conservative assumption is applied as a C1 combustible liquid for the purposes of this PHA.

Table 48 Maximum Quantities of Dangerous Goods Stored

Area	Class	Description	Quantity
Workers Camp Kitchen	2.1	LPG Bottles	8 x 45kg
BESS	9	Lithium Batteries	1,530t
Transformer oil	C1	Combustible liquid	40kL

Source: Riskcon, 2024

Based on the hazard identification and properties of Dangerous Goods as set in **Appendix O**, the following hazardous scenarios have been assessed:

LPG release, ignition and fire

Minor quantities of LPG are to be stored at the workers camp kitchen area in 8 x 45kg bottles. These bottles are regularly tested and designed to withstand impacts associated with regular transport, filling and handling, hence a release is unlikely. However, there is still a low-probability potential for a flammable atmosphere to develop which upon exposure to an ignition source may result in a fire.

Due to the small quantities involved, a fire is expected to be handled by personnel using first attack firefighting equipment (fire blanket/extinguisher). In the unlikely event that the fire is not controlled and propagates to involve all gas bottles, due to the small quantities present and location of the camp, the resulting fire would not pose an off-site impact.

Li-ion battery fault, thermal runaway and fire

Despite the improvement in battery technology, there are several degradation mechanisms that are still present within the battery which can result in thermal runaway. These include:

- Chemical reduction of the electrolyte at the anode.
- Thermal decomposition of the electrolyte.
- Chemical reduction of the electrolyte at the cathode.
- Thermal decomposition of the cathode and the anode.
- Internal short circuit by charge effects.

These effects arise primarily as a result of high discharge, overcharging, or water ingress into the battery which results in a host of biproducts being formed within the battery during charge and discharge cycles.

As a result, Li-ion batteries are equipped with several safety features to prevent the batteries from charging or discharging at voltages which result in battery degradation, leading to shorting of the battery and thermal runaway. Safety features generally include:

- Shut-down separator (for overheating).
- Tear-away tab (for internal pressure relief).
- Vent (pressure relief in case of severe outgassing).
- Thermal interrupt (overcurrent/overcharging/environmental exposure).

In terms of physical damage, the batteries are contained within in modules which are located within a fenced area. Therefore, there is a low potential for damage to occur to the batteries which may initiate an incident. The battery chemistry is anticipated to be lithium iron phosphate (LiFePO4, or simply **LFP**) which are considered to be one of the safest battery chemistries within the industry.

LFP technology does not cause fire during thermal runaway. Should fire be developed within one BESS container it would not transfer to nearby containers due to the fire safety design features.

Victorian Big Battery Fire Review

According to the independent investigation report on its fire incidence, the main reason for fire propagation was strong wind blowing flames from one Megapack into the unprotected vent atop an adjacent Megapack which resulted in the ignition of the plastic fan which was able to impact the battery modules directly beneath the fan.

Lessons learnt from the VBB incident resulted in fire safety precautions on the design of the proposed associated BESS.

Li-ion battery fire and toxic gas dispersion.

If a BESS failure occurs resulting in a fire, toxic by-products of combustion may form. These by-products include:

- Carbon dioxide.
- Carbon monoxide.
- Fluorine gases.

Both oxide carbons are considered unlikely to be formed at concentrations that would result in a substantial downwind impact in the event of ignition. Hydrogen fluoride, on the other hand, could case danger to life in concentrations above 30 ppm and the 10-minute lethal concentration is 170 ppm. Nevertheless, provided all security systems recommended are in place, the potential for the initiating event is considered unlikely.

Electrical equipment failure and fire

The type of equipment used for the Project is standard across industry segments and is therefore not a unique fire scenario. Based upon fire development within switch rooms the fire would be considered to be relatively slow in growth and would be unlikely to result in substantial impacts in terms of off-site impact or incident propagation.

Transformer internal arcing, oil spill, ignition and bund fire

Transformers contain oil which is used for insulation during operation. If arcing occurs within the transformer (e.g. due to a low oil level), the high energy passing through the coolant vaporises the oil into light hydrocarbons (methane, ethane, acetylene, etc.) resulting in rapid pressurisation within the reservoir. It is anticipated that non-mineral oil is to be used, which has a high flashpoint (KNAN ester-based oil), thus providing an increased safety margin, however, arcing may still provide sufficient energy to vaporise this oil.

Notwithstanding, considering the low potential for failure and the separation distance given to the Site boundary and other adjacent components of the Project, it is considered unlikely that they would result in incident propagation and off-site impacts.

Transformer electrical surge protection failure and explosion

If the transformer gets an extreme surge of energy, such as that which could occur due to a lightning strike, and the electrical surge protection measures fail, the mineral oil may start to decompose and vaporise, resulting in gas bubbles of hydrogen and methane as temperatures above the auto-ignition of the gases. This could lead to an event chain in which concentration of flammable gases increase towards their explosive limits.

To protect against overheating and explosions, transformers generally have surge protection devices that shunt electrical surges safely to the ground. Although these measures are not universal, as previously mentioned, these units have a low potential for failure and are considered safe during these events.

Electromagnetic field impacts.

Electric and Magnetic fields (EMFs) can appear naturally or man-made wherever there may be electricity sources. BESS create EMFs from operational electrical equipment and has the potential to produced extremely low frequency (ELF) EMFs in the range of 30 to 300 Hz.

The *International Commission on Non-Ionizing Radiation Protection (ICNIRP)* has provided some guidelines around exposure limits for prolonged exposure which limits the exposure to 2,000 milligauss (mG) for members of the public in 24 hours.

Based upon the typical levels which may be generated by transmission equipment the cumulative effect would not exceed the 2,000 mG limit for prolonged exposure. In addition, the closest residence is over 1,400 m away from the EMF generating sources at the Site; hence, the potential for the EMF to exceed the accepted levels is considered negligible.

6.1.9.3. Mitigation Measures

Based on the assessment conducted by Riskcon, it is concluded that the risks at the Site boundary are not considered to exceed the acceptable risk criteria; hence, the Project would only be classified as potentially hazardous and would be permitted within the current land zoning for the Site.

The following recommendations have been made as a result of the assessment to mitigate any potential hazards that could result during the construction and operation of the Project:

- BESS will be tested in accordance with UL9540A.
- Testing to demonstrate clearances required to prevent the propagation of fires between separated units.
- BESS is to be installed in accordance with the manufacturer and UL9540A report recommended clearances based on testing.
- BESS to be installed with fire protection systems specified by the manufacturer and UL9540A report.
- Before construction, a detailed design to validate the system can be installed in the Project area whilst meeting the recommended clearances.
- UL testing information shall be made available to the certifying authority. It is noted that a confidentiality agreement may be required.
- The vent covers of the BESS shall be constructed of non-combustible material.
- The vents shall not be located above battery packs within the BESS containers.

6.1.10. Bushfire

A Bushfire Threat Assessment has been prepared by AEP. The report presents the bushfire protection measures required by the NSW RFS *Planning for Bushfire Protection 2019* (**PBP**) and the construction requirements for the Project in accordance with the provisions of the *Building Code of Australia – Volume 1&2, Edition 2022* and *Australian Standard 3959-2018 (AS 3959) – Construction of buildings in bushfire-prone areas*.

6.1.10.1. Existing Environment

Examination of the Bushfire Prone Land (**BPL**) Mapping (2024) revealed that the Site is not located on Bushfire Prone Land. The Site and surrounds are within the Mid-Western Region, with existing vegetation assessed with a Fire Danger Index (**FDI**) of 80, as defined in NSW Rural Fire Service (2017) NSW Local Government Areas FDI and an associated Grass Fire Danger Index (**GFDI**) of 110.

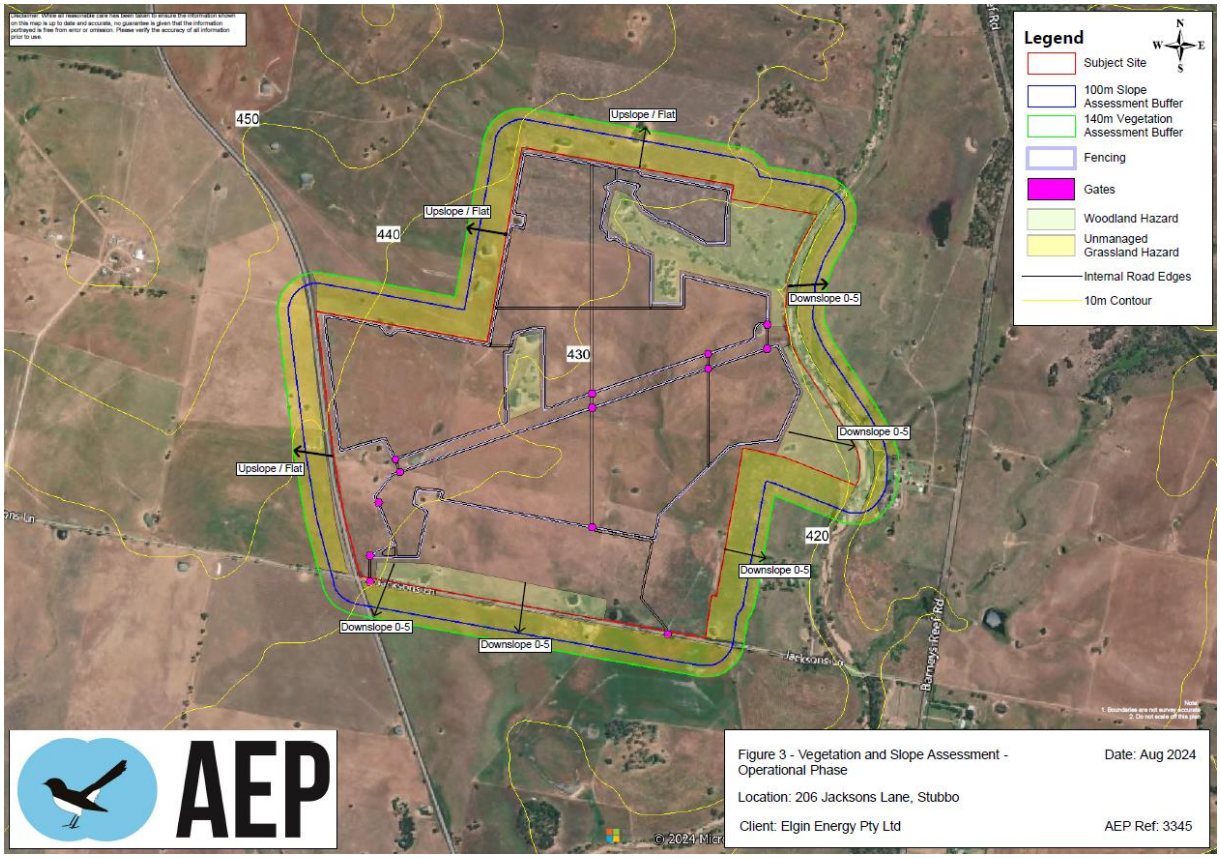
A 100m slope assessment area has also been included to show the underlying slope of the Site and the surrounding areas. Where slope is mentioned in the context of vegetation it is to be considered the effective slope as defined in PBP 2019 (Appendix P). Future Vegetation Hazards are shown in Potential Impacts

The Project is surrounded by unmanaged grassland areas that could pose a threat in the event of a bushfire. In addition, once rehabilitation of the VMP lands is complete these areas will also have the potential to pose a threat to the Project. Both current and future vegetation has been considered as part of this assessment.

6.1.10.2. Potential Impacts

The Project is surrounded by unmanaged grassland areas that could pose a threat in the event of a bushfire. In addition, once rehabilitation of the VMP lands is complete these areas will also have the potential to pose a threat to the Project. Both current and future vegetation has been considered as part of this assessment.

Figure 53 Vegetation and Slope Assessment – Operational Phase



Source: AEP, 2024

The temporary workforce accommodation has been assessed separately against the residential criteria. (Appendix P). The most likely bushfire event that will affect these structures will be a grass fire.

6.1.10.3. Mitigation Measures

A PBP Performance Criteria Assessment was undertaken in accordance with the PBP – Other Development for the solar arrays, BESS and other ancillary infrastructure (Appendix P) to identify the required mitigation measures. The Project will adhere to and comply with the all the criteria outlined in the guidelines for water supply, gas services, landscaping, Asset Protection Zones (APZs) and any other consideration.

Table 49 and Table 50 show the assessment for the following performance criteria mitigation measures in accordance with the PBP 2019 guidelines.

Table 49 Performance Criteria Mitigation Measures for Wind and Solar Farms

Performance Criteria/ Mitigation Measures	**Comment**
Afford buildings and their occupants protection from exposure to a bush fire.	All structures within the Project are afforded at least 10m of defendable space, noting that a specific assessment is provided in Table 50 for the temporary worker accommodation located in the south of the Site.
Provide for a defendable space to be located around building.	Suitable defendable space of 10m is currently present between every part of the Project and hazard vegetation. Proposed solar arrays have a 6m internal road around the perimeter with a minimum additional 4m of cleared, managed land. Biodiversity management lands have also been designed in such a way as to provide additional space on top of the required 10m where possible.
Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent the likely fire spread to buildings.	The current design provides adequate separation between the proposed building and the hazard vegetation surrounding the Project. Where areas of hazard vegetation are present these are separated from the Project by roads or managed lands out to a minimum 10m, generally with an additional buffer of managed land between the Project and hazard vegetation.
Ensure that appropriate operational access and egress for emergency service personnel and occupants is available.	Proposed access is adequate from the public road, Jacksons Lane, which will be upgraded as part of the Project. There are two access points, one at the south-eastern end of the Site and one at the south-western end. This should allow for adequate evacuation in the event of an emergency and the distance between the two roads and the connecting roads running north south should ensure that the Project is not isolated. With the entire Project enclosed with security fencing and the two entry points being controlled by gates emergency services (including the RFS) are to be provided with keys or another suitable method to independently access the site in the case of an emergency.
Provide for ongoing management and maintenance of BPMs.	Defendable space will be provided in the form of a road and additional managed grass areas between the hazard vegetation and structures. The

Performance Criteria/ Mitigation Measures	Comment
	grassland areas are to be subject to management plan that will involve keeping the grass mown to an acceptable level for defendable space.
Ensure that utility services are adequate to meet the needs of firefighters.	Two 45,000L water tanks are to be installed as part of the Project. These tanks are to be fitted with 65mm Storz outlet with ball valve are to be fitted to each. The ball valve and any piping is to be adequate for water flow and are to be made of metal. Supply pipes from the tank to the ball valve are to have the same bore size to ensure flow volume.
Fire hydrant spacing, sizing and pressures comply with AS 2419.1 – 2021.	Hydrants are not proposed as static water is to be provided as described above.
Location and distance to nearest Fire Station	Gulgong Fire Station is located approx. 6km to the south-west, seven minutes drive from the Site. This is considered appropriate for the Project.
The provisions of public roads in section 8.3.1 in relation to parking are met	There is a small carpark proposed within the workers accommodation area. This would be outside of road carriageways and would be dedicated parking. Otherwise, no parking is proposed on internal roads.

Source: AEP, 2024

Table 50 Performance Criteria Measures for Temporary Worker Accommodation.

Performance Criteria/ Mitigation Measures	Acceptable Solutions	Comment
Assets Protection Zones		
Potential building footprints must not be exposed to radiant heat levels exceeding 29 kW/m² on each proposed lot.	APZs are provided in accordance with Tables A1.12.2 and A1.12.3 based on the FFDI.	An 11m APZ will be provided. This will ensure that all accommodation structures are able to be provided in an area of at least BAL 29 or lower.
APZs are managed and maintained to prevent the spread of a fire towards the building	APZs are managed in accordance with the requirements of Appendix 4.	The grassland, which will make up the majority of the APZ, is to be kept at or below 100mm sward height, in line with Appendix 4 of PBP 2019.

Performance Criteria/ Mitigation Measures	Acceptable Solutions	Comment
The APZs is provided in perpetuity.	APZs are wholly within the boundaries of the Site.	APZs are located wholly within the Site.
APZ maintenance is practical, soil stability is not compromised and the potential for crown fires is minimised.	APZs are located on lands with a slope less than 18 degrees.	The land within the site is very gently sloping, less than 5 degrees. All APZs can meet this requirement.
Landscape		
Landscaping is designed and managed to minimise flame contact and radiant heat to buildings, and the potential for wind-driven embers to cause ignitions.	Landscaping is in accordance with Appendix 4 of PBP 2019.	Landscaping management is to be in line with Appendix 4 of PBP 2019 and addressed in a separate landscape management plan.
	Fencing is constructed in accordance with section 7.6.	Fencing proposed is metal security fencing.
Access (General Requirements)		
Firefighting vehicles are provided with safe, all-weather access to structures.	Property access roads are two-wheel drive, all-weather roads.	Property access roads are two-wheel drive, all-weather roads.
	All roads are proposed to be all-weather and two-wheel drive accessible.	All roads are proposed to be all-weather and two-wheel drive accessible.
	Perimeter roads are provided for residential subdivisions of three or more allotments.	Perimeter roads are provided for residential subdivisions of three or more allotments.
	A perimeter road is provided around the entire Site and Jacksons Lane can be used to provide an additional road that could be used to fight a fire coming from the south.	A perimeter road is provided around the entire Site and Jacksons Lane can be used to provide an additional road that could be used to fight a fire coming from the south.
	Subdivisions of three or more allotments have more than one access in and out of the Site.	Subdivisions of three or more allotments have more than one access in and out of the Site.

Performance Criteria/ Mitigation Measures	Acceptable Solutions	Comment
	N/A – not a subdivision. However, there are two access paths into and out of the residential accommodation and the Site.	N/A – not a subdivision. However, there are two access paths into and out of the residential accommodation and the Site.
	Traffic management devices are constructed to not prohibit access by emergency services vehicles.	Traffic management devices are constructed to not prohibit access by emergency services vehicles.
	While there are gates and fences present, the RFS will be given the ability to access these in the case of an emergency and will be supplied with keys or will have a specific padlock included in the daisy chain. Otherwise, no traffic management devices are proposed.	While there are gates and fences present, the RFS will be given the ability to access these in the case of an emergency and will be supplied with keys or will have a specific padlock included in the daisy chain. Otherwise, no traffic management devices are proposed.
	Where access/egress can only be achieved through forest, woodland and heath vegetation, secondary access shall be provided to an alternate point on the existing public road system.	N/A – access is through grassland
	One way only public access roads are no less than 3.5 metres wide and have designated parking bays with hydrants located outside of these areas to ensure accessibility to reticulated water for fire suppression.	N/A – no one way public access roads proposed.
The capacity of access roads is adequate for firefighting vehicles.	The capacity of perimeter and non-perimeter road surfaces and any bridges/causeways is sufficient to carry fully loaded firefighting vehicles (up to 23 tonnes); bridges/ causeways are to clearly indicate load rating.	The culvert on Jackson's Lane is being upgraded as part of the Project to be able to carry a fully loaded fire fighting vehicle (up to 23 tonne). The culvert is to clearly indicate load rating.

Performance Criteria/ Mitigation Measures	Acceptable Solutions	Comment
There is appropriate access to water supply.	Hydrants are located outside of parking reserves and road carriageways to ensure accessibility to reticulated water for fire suppression.	No hydrants are proposed. The Project will be serviced by a static water system.
	Hydrants are provided in accordance with the relevant clauses of AS 2419.1:2021 - Fire hydrant installations System design, installation and commissioning.	No hydrants are proposed. The Project will be serviced by a static water system.
	There is suitable access for a Category 1 fire appliance to within 4m of the static water supply where no reticulated supply is available.	The exact location of the water tanks is still to be determined, however given the infrastructure present within the site it is envisaged that the tanks would be located within 4m of an accessible road for RFS emergency vehicles.
Non-Perimeter Roads		
Access roads are designed to allow safe access and egress for firefighting vehicles while residents are evacuating.	Minimum 5.5m carriageway width kerb to kerb.	The internal roads next to the proposed worker accommodation are 6m wide.
	Parking is provided outside of the carriageway width.	Parking is specifically provided outside of these roads and there is a carpark and construction lay down area.
	Hydrants are located clear of parking areas.	No hydrants are proposed. The Project will be serviced by a static water system.
	Roads are through roads, and these are linked to the internal road system at an interval of no greater than 500m.	All roads within the Site are through roads.
	Curves of roads have a minimum inner radius of 6m.	Roads within the Site all have a minimum inner radius of 6m.

Performance Criteria/ Mitigation Measures	Acceptable Solutions	Comment
	The road crossfall does not exceed 3 degrees.	Given the gradient of the site it is not expected that road crossfall would exceed three degrees.
	A minimum vertical clearance of 4m to any overhanging obstructions, including tree branches, is provided.	Vertical clearance of 4m is to be provided at all times.
Water Services		
Adequate water supplies is provided for firefighting purposes	Reticulated water is to be provided to the Project where available.	The Project is to be serviced by a static water supply.
	A static water and hydrant supply is provided for non-reticulated developments or where reticulated water supply cannot be guaranteed.	Two 45,000L tanks will be provided for the Project. The tanks will be placed in the south-western corner of the site close to the BESS location.
	Static water supplies shall comply with Table 5.3d.	While this is not a rural subdivision to ensure adequate water supply for this large lot two 45,000L water tanks are being installed to provide a static water supply for the Project.
Water supplies are located at regular intervals; and the water supply is accessible and reliable for firefighting operations.	Fire hydrant, spacing, design and sizing complies with the relevant clauses of Australian Standard AS 2419.1:2021.	No fire hydrants are proposed.
	Hydrants are not located within any road carriageway.	No fire hydrants are proposed.
	Reticulated water supply to urban subdivisions uses a ring main system for areas with perimeter roads.	The Project is to be serviced by a static water supply.
Flows and pressure are appropriate.	Fire hydrant flows and pressures comply with the relevant clauses of AS 2419.1:2021.	No fire hydrants are proposed.

Performance Criteria/ Mitigation Measures	Acceptable Solutions	Comment
The integrity of the water supply is maintained.	All above-ground water service pipes are metal, including and up to any taps.	All above ground water service pipes are to be made of metal, up to and including taps.
	Above-ground water storage tanks shall be of concrete or metal.	The two 45,000L water tanks will be concrete or metal.
Electricity Services		
Location of electricity services limits the possibility of ignition of surrounding bush land or the fabric of buildings.	Where practicable, electrical transmission lines are underground.	The cabling for the solar arrays will be underground, however the point of interconnection, the substation and the BESS cabling will all be above ground.
	Where overhead, electrical transmission lines are proposed as follows: lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines.	Where overhead, electrical transmission lines are proposed as follows: lines are installed with short pole spacing of 30m, unless crossing gullies, gorges or riparian areas; and no part of a tree is closer to a power line than the distance set out in ISSC3 Guideline for Managing Vegetation Near Power Lines.
Gas Services		
Location and design of gas services will not lead to ignition of surrounding bushland or the fabric of buildings.	Reticulated or bottled gas is installed and maintained in accordance with AS/NZS 1596:2014 - The storage and handling of LP Gas, the requirements of relevant authorities, and metal piping is used.	Eight (8) 45kg gas bottles will be supplied in the workforce accommodation area. Installation, storage and maintenance of these bottles is to be in accordance with AS/NZS 1596:2014.
	All fixed gas cylinders are kept clear of all flammable materials to a distance of 10m and shielded on the hazard side.	No fixed gas cylinders are proposed. Bottled gas only is supplied. Bottled gas cylinders are to be kept clear or flammable materials.

Performance Criteria/ Mitigation Measures	Acceptable Solutions	Comment
	Connections to and from gas cylinders are metal.	No fixed gas cylinders are proposed. Bottled gas only is supplied.
	Polymer-sheathed flexible gas supply lines are not used.	No fixed gas cylinders are proposed. Bottled gas only is supplied.
	Above-ground gas service pipes are metal, including and up to any outlets.	No fixed gas cylinders are proposed. Bottled gas only is supplied.
Water Tanks		
Large rural/lifestyle lots (>10,000m2)	20,000L/lot	Two 45,000L water tanks are to be supplied as part of the Project. An additional tank is to be provided adjacent to the worker's accommodation that will have at least 20,000L dedicated to firefighting purposes for the life of the worker's accommodation area.

Source: AEP, 2024

A minimum of 10m of defendable space is provided between areas of hazard vegetation solar arrays and other structures. 6m wide roads are provided between the arrays and any hazard vegetation, with the additional 4m being managed grassland.

Residential APZs and BALs have been applied to the temporary worker accommodation being provided during the construction phase of the Project. The temporary workers accommodation will be built to a minimum BAL 12.5 standard.

In addition, the following Fire Risk Considerations will be implemented:

- Any works within the solar farm that have the ability to start a fire, hot works etc, should not be undertaken on days of extreme or catastrophic fire danger. These works also need to ensure that they are not carried out on days where there is a Total Fire Ban in effect.
- The BESS will be surrounded by a 10m non-vegetated area of gravel or hardstand to provide additional protection in the case of a bushfire emergency and to provide some level of protection from a thermal battery runaway.
- A Bushfire Emergency Management Plan will be created to detail the steps that are to be taken in the case of a bushfire. This is to include emergency evacuation points, triggers for evacuation, sheltering protocols, shut down procedures in the event of an emergency and details of personnel and staff that will be responsible for enacting the Bushfire Emergency Management Plan in the case of a bushfire event.

6.1.11. Social and Economic Impacts

This section provides a summary of the Social and Economic Impact Assessment (**SEIA**) in Appendix Q that identifies and analyses the potential positive and negative social and economic impacts associated with the development and operation of the Project. The two components of the SEIA are a Social Impact Assessment (**SIA**) and an Economic Impact Assessment (**EIA**) each of which addresses the specific SEARs for the Project.

6.1.11.1. Assessment Methodology

The scope of the SIA has been developed in accordance with the:

- SEARs for the Project.
- SIA Guideline (DPHI 2023).
- The social characteristics and community values of the local area and Mid-Western Regional Council.

The methodology was informed by the guidance contained within the SIA Guideline and Technical Supplement (DPHI 2023).

6.1.11.2. Existing Environment

Social Locality

The social localities identified for the Project include:

- **Immediate social locality**: this area includes the residents and landowners within a 2km radius of the Site, covering the main roads of Barneys Reef Road, Jackson's Lane and Puggoon Siding Road. There is a potential for these groups to experience localised impacts from the Project, such as noise, changes to traffic, access to facilities, and visual amenity.
- **Surrounding social locality**: this area includes residents, workers and businesses within a 10km radius of the Site. It includes Gulgong Town Centre, which is approximately 5km south of the Site. These groups are likely to be impacted by the workers residing at the temporary workers' accommodation camp at the Site and their interaction in the locality. These groups are also likely to experience long-term benefits delivered as part of the contributions to the Council's community benefits scheme.
- **Broader regional locality:** this area includes the broader regional LGAs and populations (50km radius) who will contribute and/or benefit from the localised impacts of the Site. The Site is located within Mid-Western Regional LGA and is within the boundaries of the Central-West Orana REZ. It is surrounded by Dubbo Regional, Warrumbungle Shire and Upper Hunter Shire LGAs, where a local workforce could be sourced (sixty-minutes commute by vehicle). The origin of solar farm construction materials is likely to be from ports in Sydney or Newcastle.

Population and Demography

A demographic profile has been developed for Gulgong, Stubbo and Beryl Suburbs and Localities (SAL) based on demographic data from the Australian Bureau of Statistics (2021) Census of Population and Housing and DPHI Population Projections (2019). These three suburbs comprise the 'Study Area' identified as relevant to the SIA. The demographic characteristics of Mid-Western Regional LGA and Rest of NSW have been used, where relevant, to provide a comparison.

In 2021, there were 2,950 people living in the Study Area, representing 11.5% of the residents in Mid-Western Regional LGA. The average household size of the Study Area is 2.4 people per household. There is high proportion of people aged over 65 (21.8%), though similar compared to Rest of NSW (22.2%) but lower compared to the Mid-Western Regional LGA (27.4%). There is also a higher proportion of children aged 0-14 (20.4%) compared to Mid-Western Regional LGA and Rest of NSW (19.8% and 17.9% respectively). The medium age of the Study Area is 41 years, slightly lower though comparable to Mid-Western Regional LGA (42.0) and rest of NSW (42.1).

Culture and Diversity

The Study Area has a higher proportion of Aboriginal and/or Torres Strait Islander people (7.3%) compared to Mid-Western Regional LGA (6.8%) and Rest of NSW (6.1%). The Study Area has lower rates of cultural and linguistic diversity compared to the Mid-Western Regional LGA and Rest of NSW. For example, 7.6% of the Study Area were born overseas compared to 16.1% in Mid-Western Regional LGA and 11.4% in Rest of NSW.

Health and Wellbeing

There is a comparable rate of people in the Study Area with long-term health condition (31.9%) to compared Mid-Western Regional LGA (31%) and Rest of NSW (33.3%). The rate of arthritis in the Study Area (11.8%) is higher compared to Mid-Western Regional LGA (10.3%), though comparable compared to Rest of NSW (11.6%). Across the remainder of long-term health conditions including (asthma, cancer, dementia, diabetes, heart disease, kidney disease, lung donation, mental health condition and stroke) are comparable to both Mid-Western Regional LGA and Rest of NSW rates.

Housing and Income

The average annual income for working aged people in the Study Area is $55,500, slightly lower compared to rest of NSW ($56,800). The Study Area has lower average weekly rent repayments ($310) compared to Mid-Western Regional LGA ($330) but higher compared to Rest of NSW ($270). The Study Area also has lower average mortgage repayments ($1,650) compared to Mid-Western Regional LGA ($1,733) and Rest of NSW ($1,910).

The Study Area has a higher rate of separate houses (85.7%) compared to Rest of NSW (73.3%), though lower compared to Mid-Western Regional LGA (91.4%). There are slightly higher rates of home ownership in the Study Area with 41.5% of households in the Study Area owned their homes outright and 35% who owned homes with a mortgage compared to Mid-Western Regional LGA (38.6% and 32.2% respectively) and Rest of NSW (39.6% and 32.5% respectively). Correspondingly, the Study area has a lower proportion of renters (23.5%) compared to Mid-Western Regional LGA (24.4%) and Rest of NSW (27.9%) There is a high though comparable rate of family households in the Study Area (67.8%) compared Mid-Western Regional LGA (68.9%) and Rest of NSW (68.8%).

Workforce and Employment

The most common occupation in the Study Area is technicians and trades workers (20%), which is higher compared to 17.5% in Mid-Western Regional LGA and 14.8% in Rest of NSW. There is also a higher proportion of machinery operators and drivers (17.9%) compared to Mid-Western Regional LGA (7.0%) and Rest of NSW (12.9%). The Study Area has a comparable rate of labour force participation (60%) compared to the Mid-Western Regional LGA (57.8%) and Rest of NSW (60.4%). The Study Area also a comparable rate of unemployment (4.1%) compared to Mid-Western Regional LGA and Rest of NSW (4% and 4.6% respectively). The top industry of employment of the Study Area is Mining (20.5%), followed by health care and social assistance (11.1%), and retail trade (10.1%).

The Study Area has higher rates of people employed in mining (20.5%), and agriculture, forestry and fishing (6.4%) compared to the Mid-Western Regional LGA (2.5% and 4.3%) and Rest of NSW (5.1%), reflecting the Study Area's strong mining and agriculture industries.

Community Facilities and Services

Data available from MWR Council provides an overview of the current facilities available in Mudgee, Gulgong and other surrounding town centres within the LGA. As outlined in Table 51 Summary of Facilities Available in Town Centres of MWR LGA, when compared to Mudgee, Gulgong has a lower number of facilities, including SES, doctors' surgeries, dental services and childcare services.

Table 51 Summary of Facilities Available in Town Centres of MWR LGA

FACILITY	MWR COUNCIL LGA			
	MUDGEE	GULGONG	KANDOS	RYLSTONE
Council Offices	1	1	0	1
Post Office	1	1	1	1
Police Station	1	1	1	1
Fire Services	2	2	1	1
SES	1	0	0	1
Ambulance Station	1	1	0	1
Hospital	1	0	0	0
Multi-purpose Services	0	1	0	1
Doctors' Surgery	2	1	2	0
Dental Services	3	1	0	0
Airport/ Aeropark	1	0	0	1
Railway - Operating	-	-	1	1
Pharmacy	4	1	1	0
Banks/Credit Unions	5	1	1	0
Supermarkets	4	1	1	1
Library	1	1	1	1
Places Of Worship	10	3	3	3
Swimming Pool (Seasonal)	1	1	1	0
Petrol Station	6	2	2	2
Mechanic (Approx. Count)	18	4	2	0
Cinema	0	0	0	0
Childcare Centre	7	1	0	0
Pre-School	1	1	1	0
School – Up to Year 6	3	2	1	1
School – Years 7 to 12	2	1	1	0
Tafe/College	1	0	0	0
Real-Estate Agents	10	3	1	2

Source: Urbis, 2024

Vulnerable Groups

According to the 2021 Socio-Economic Indexes for Areas (**SEIFA**), there is some variation regarding relative socio-economic advantage and disadvantage between communities within the local area and regional area. Stubbo ranked in the bottom 40% of NSW suburbs, Gulgong ranked in the bottom 15% of NSW suburbs and Beryl ranked in the bottom 50% of NSW suburbs regarding relative socio-economic advantage and disadvantage. The Mid-Western Regional LGA ranked in the bottom 45% of LGAs in NSW.

Findings suggest Mid-Western Regional LGA on a regional level, and Stubbo and Beryl on a suburb level, have comparatively average levels of socio-economic advantage and disadvantage. Comparatively, Gulgong has lower levels of socio-economic advantage and higher disadvantage.

Seven percent of the Study Area's population require assistance due to disability, old age, and long-term health condition. These are similar to both Mid-Western Regional LGA (6.8%) and Rest of NSW (7%). In the Study Area, there are 1,911 people (10% of the total population) who provided unpaid assistance to someone with an identified need for assistance. This is similar to Mid-Western Regional LGA (10%) and rest of NSW (11%).

Data on the estimated levels of homelessness according to the ABS 2021 Estimating Homelessness Census is only available at a regional level and has been gathered for Mid-Western Regional LGA. In 2021, there were no recorded people in Mid-Western Regional LGA living in improvised dwellings, tents, or sleeping out.

There were no recorded people residing in supported accommodation for the homeless, and 10 people temporarily residing in another household. Further, there were 22 people living in crowded dwellings, and 25 people living in 'severely' crowded dwellings.

Community and Council Feedback on the Project

As specified in the DPHI Guideline, SIAs require community and stakeholder engagement to be undertaken to develop an understanding of impacts on communities and people as a result of a project.

A SIA community survey, coffee catch-up session with neighbours, a community pop-up at the supermarket in Gulgong, and an in-depth interview with a Mid-Western Regional Council representative were used to engage and consult the community and key stakeholders in relation to social impacts. Additional communication and engagement activities were also undertaken by representatives from the Urbis Engagement Team with nearby landholders, key community stakeholders, and other agencies.

The methods of engagement and consultation with community and key stakeholders and details of participation are provided in Appendix K.

In general, feedback from the community and key stakeholders raised some concerns on potential impacts on local residents and the locality aligned with the findings in **Section 5**.

6.1.11.3. Potential Social Impacts

The following table summarises the assessed potential impacts from the Project (Table 52).

Table 52 Potential Impacts from the Project

Theme	Matter	Unmitigated/Unenhanced	Mitigated/Enhanced	Proposed mitigation, enhancement and management	Responsibility	Potential partners
Way of life	Demand on local housing and accommodation	High negative during construction Low negative to negligible during operation	Low negative to negligible (both construction and operation)	An WAP has been prepared. This includes the construction of a temporary workers' accommodation camp with the capacity for 150 personnel at the Site.	The Project	Workforce and Accommodation Plan consultants
Community	None identified.					
Accessibility	Pressure on the local road and parking network	Medium negative during construction Low negative during operation	Low negative during construction Negligible during operation	A TIA has been prepared. The recommendations include encouraging workers who commute to the Site from surrounding towns to carpool. The TIA also outlines an intention to upgrade Jacksons Lane to accommodate the Project. A CEMP will prepared under the terms of a future consent to mitigate construction traffic impacts.	The Project Construction Contractor	Traffic Impact Assessment consultants
Culture	Potential disruption to sites of Aboriginal significance	High negative	Medium positive	An ACHA has been prepared, and outlines several recommendations including: Continued consultation with RAPs until the finalisation of the Project to ensure the opportunity for Aboriginal community input and	The Project Construction Contractor	Registered Aboriginal Parties Heritage consultants

Theme	Matter	Unmitigated/Unenhanced	Mitigated/Enhanced	Proposed mitigation, enhancement and management	Responsibility	Potential partners
				involvement in the management of cultural heritage matters. Further archaeological surveys to be undertaken under the terms of a future consent to clarify the proposed impact to Mayfair AS3 and inform the final constructed layout. Recommendation for an ATR to be prepared following the completion of the program. The development of an ACHMP in consultation with RAPs, to implement appropriate strategies for the archaeological management of identified Aboriginal objects within the subject area.		
Health and wellbeing	Concerns for safety in the event of a hazard	Low negative	Low negative	A Flood Risk and Impact Assessment Report has been prepared and includes several recommendations to minimise the potential for any contribution to flood impacts on-site or in the surrounding locality. The BTA recommends that a Bushfire Emergency Management	The Project	Flood risk consultant Bushfire threat consultant Hazard engineering consultant

Theme	Matter	Unmitigated/Unenhanced	Mitigated/Enhanced	Proposed mitigation, enhancement and management	Responsibility	Potential partners
				Plan be created to detail the actions to be undertaken in the event of a bushfire. The PHA outlines several mitigations to reduce the risk of bushfire or other hazards from occurring and/or impacting nearby residents and businesses.		
Health and wellbeing	Pressure on local services and facilities	High negative	High positive	The interim WAP includes the provision of a gymnasium, recreational/TV area, laundry and dining/catered areas, to encourage workers to remain largely on-site. Measures suggested to mitigate potential strain on the local healthcare system include: ▪ Induction training for workers on the limited local health services and the use of telehealth and online prescription services. ▪ Adopt and encourage good health and safety practices as part of the Project's work culture. ▪ Temporary employment of a fully qualified medical	The Project	Local public hospital and medical services

Theme	Matter	Unmitigated/Unenhanced	Mitigated/Enhanced	Proposed mitigation, enhancement and management	Responsibility	Potential partners
				professional, such as a paramedic, on an as-needed basis for the construction phase of the Project. ▪ Inclusion of a fully equipped and stocked first aid room at the Site, including a defibrillator. ▪ Trained first aiders to manage any minor medical issues on-site as required under *First aid in the workplace* (SafeWork NSW 2020) and *Code of Practice- Managing the work environment and facilities* (SafeWork NSW 2019). The public hospital system will be used to ensure compliance with the *Work Health and Safety Act 2011* on occasions when a worker requires a higher level of medical assistance than can be provided by first aiders.		
Surroundings	Potential change to sense of place and local character in	Medium negative	Low negative to negligible	The prepared LVIA notes that on-site mitigation measures to ameliorate view from high sensitivity viewpoints is to establish screen planting around the perimeter of the	The Project	Not identified.

Theme	Matter	Unmitigated/Unenhanced	Mitigated/Enhanced	Proposed mitigation, enhancement and management	Responsibility	Potential partners
	agricultural and natural areas			Project boundary where there is a lack of existing vegetation.		
Livelihoods	Increased local employment opportunities	Medium positive	High positive	The WAP (Appendix R) outlines several strategies to maximise local employment opportunities. These include: ▪ Prioritising local employment and service provision opportunities. ▪ Engaging with local business stakeholders. ▪ Advertising expressions of interest for employment and other services locally. ▪ The use of weighted criteria in tender evaluations to encourage subcontractors to hire and procure locally. ▪ Looking for opportunities to supervise, mentor and up skill local-businesses and employees for specialist works.	The Project	Local businesses

Theme	Matter	Unmitigated/Unenhanced	Mitigated/Enhanced	Proposed mitigation, enhancement and management	Responsibility	Potential partners
Livelihoods	Contributing to the renewable energy transition	High positive	High positive	There are no further enhancement measures recommended for this impact.	The Project	Not identified.
Decision-making systems	Ability for people to make informed contributions to decision making processes that impact them	Medium negative	High positive	The Engagement Outcomes Report states that the Applicant continues to welcome feedback on the Project and will continue to be available to answer community questions as the Project progresses. The Applicant will continue to keep stakeholders and the community informed about the Project approval process through exhibition and determination phases. Should the Project be approved, the Applicant will continue to consult with the community and stakeholders following approval and through the construction phase.	The Project	Engagement consultant
Cumulative impacts	The Project is anticipated to contribute to potential positive cumulative social impacts related to employment and training opportunities, and contribution to the renewable energy transition. No further enhancements are proposed at this time. The Project may contribute to potential negative cumulative social impacts related to demand on local housing and accommodation, loss of productive agricultural land, and cumulative amenity impacts. The Project will incorporate several mitigation measures relating to these matters as detailed throughout the EIS (for example, on-site workers accommodation, landscaping, CEMP) and the SIA makes the following recommendations:					

Theme	Matter	Unmitigated/Unenhanced	Mitigated/Enhanced	Proposed mitigation, enhancement and management	Responsibility	Potential partners
	▪ Prepare and implement a Decommissioning Management Plan, highlighting all environmental mitigation and avoidance measures during this phase. The Plan will be prepared and distributed to all relevant authorities at least three months before decommissioning works start. ▪ Develop a Construction Management Plan and/or Plan of Management which considers concurrent renewable and major projects, particularly in relation to traffic, noise and dust, and aligning any workforce accommodation plans or employment strategies. ▪ Ensure the establishment of construction and operation complaints handling procedures to enhance ongoing engagement activities with the local community.					

Source: Urbis, 2024

6.1.11.4. Potential Economic Impacts

Project Expenditure – Construction

Total expenditure estimates for the Project have been provided by the Applicant. The total estimated capital investment value of the Project is $207,635,086 (excluding GST). For the purposes of assessing economic impacts, however, GST must be included. As such, the Project is estimated to generate approximately $162 million of direct expenditure (Economic Output) GST for the local region and State. The Project has an estimated construction period of 9-12 months. For the purposes of modelling the construction phase economic benefit, Urbis has adopted a period of 12-months.

Employment Benefits – Construction

New jobs will be supported during a 12-month development phase by the direct expenditure on the Project. The direct (mostly on-site construction jobs) and indirect employment benefits according to our REMPLAN analysis are shown below:

- Direct Jobs = 169 jobs over a year.
- Indirect Jobs = 426 over a year.
- Total Jobs = 595 over a year.

Employment Benefits – Operation

The operation of the Project will require up to three FTE employees on-site. The Project operations could support thirteen additional jobs supplying industries throughout the MWR LGA and the wider region. Total employment generated from the operational phase could, therefore, be in the order of 16 jobs ongoing throughout the operation.

- Direct Jobs = 3.
- Indirect Jobs = 13.
- Total Jobs = 16.

Value-Added Benefits – Operation

The direct ongoing employment of three jobs has the potential to support direct gross value added (**GVA**) benefit of up to $1.4 million in each year of operation.

This direct employment and economic benefit, in turn, can support up to $3.9 million in supply chain GVA across NSW each year. Supply chain GVA reflects increased economic activity in supporting and supplying businesses because of jobs and output from the facility.

Therefore, the total economic benefit from the operational phase could be on the order of $5.3 million in GVA in each year of operation.

Table 53 Ongoing Gross Value Added Benefit

	Operational Phase
Direct Jobs	Three Jobs
Direct GVA per Year	$1.4 million
Indirect Jobs	Thirteen Jobs
Supply Chain GVA per Year	$3.9 million
Total GVA per Year	**$5.3 million**

Source: Urbis, 2024

6.1.11.5. Mitigation Measures

Workforce and Accommodation

- Revise and refine the interim Workforce and Accommodation Plan (WAP) post-planning approval, in consultation with relevant stakeholders to reflect any additional requirements, closer to the start of the construction phase. The WAP should be adopted and adapted as necessary through the Project construction phase.
- With consideration to the Worker Code of Conduct being developed, encourage workers to carpool into the town centre if visitation during the week or weekend is required.
- In line with the interim WAP, implement measures to prioritise local employment and procurement (including for marginalised community groups), establish ongoing partnerships with local training and education institutions to connect local apprentices, trainees and workers with placement during construction and operation, and upskilling pathways for employees.
- Explore programming constructions works to align with reductions in workforce requirements for concurrent projects to enhance potential availability of local workers which can support the construction phase of the Project.

Local service provision

- Advocate to Mid-Western Regional Council to consider directing VPA contributions to improving local service and facility provision (particularly health and medical services).

Environmental management

- Ensure that all ACHA recommendations are implemented, including the preparation of an Aboriginal Cultural Heritage Management Plan (**ACHMP**).
- Prepare and implement a Decommissioning Management Plan, highlighting all environmental mitigation and avoidance measures during this phase. The Plan will be prepared and distributed to all relevant authorities at least three months before decommissioning works start.

Construction management

- Develop a Construction Environmental Management Plan and/or Plan of Management which considers concurrent renewable and major projects, particularly in relation to traffic, noise and dust, and aligning any workforce accommodation plans or employment strategies.

Communication

- Provide nearby neighbours with specific details regarding hazard risk and mitigation as part of future communication, or if requested.
- Identify opportunities to educate the community on the Applicant's contribution of renewable energy generally and on a site-specific level.
- In addition to existing community/engagement channels, consider a range of educational activities with the local community to reduce any anxiety or confusion about the Project (e.g. site tours for local community members and/or local students).
- Ensure the establishment of post-lodgement complaints handling procedures to enhance ongoing engagement activities with the local community.

6.1.12. Workforce Accommodation Plan

A Workforce and Accommodation Plan (**WAP**) has been prepared by Accent Environmental Pty Ltd (**Accent**) for the Project to address the SEARs. The purpose of this WAP is to provide an overarching plan to enable the Applicant to meet management obligations in relation to social impacts and opportunities specifically regarding accommodation and employment. It sets out the framework for managing the social impacts and opportunities associated with the Project procurement process, and construction workforce sourcing and accommodation needs.

Its principal, regional focus is the indicative 60-minutes commute radius (by vehicle) to the Site, approximately 11,695km^2, as this is where the local labour force and short to long-term accommodation will

be sourced. A maximum commute time of 60-minutes is selected to align with the NSW government's 'Fatigue Management: Guidance for the NSW mining, petroleum and extractives industries' (NSW Resources Regulator 2019), and is shown in Figure, which incorporates:

- 5,283km^2 (or 60%) of the MWR LGA, together with the towns of Gulgong and Mudgee.
- 3,316km^2 of the Warrumbungle Shire (**WS**) LGA, together with the towns of Dunedoo and Coolah.
- 2,424km^2 of the Dubbo Regional (**DR**) LGA, together with the town of Wellington.
- 672km^2 of the Upper Hunter Shire (**UHS**) LGA, together with the town of Cassilis.

The regional study area, which sets the regional socio-economic baseline for the WAP in coordination with the SEIA, is the indicative ninety-minute commute to the Site (by motor vehicle) radius and incorporates the city of Dubbo and towns including Merriwa, Kandos, Rylstone, Mendooran, Geurie and Mumbil.

6.1.12.1. Existing Environment

In the MWR LGA, approximately 38.9% of the population owned their homes and a further 32.2% owned mortgaged properties. Approximately 24.4% of the population rent their dwellings (ABS 2021a). EnergyCo has undertaken various investigations and stakeholder consultation regarding potential cumulative impacts and their mitigation.

EnergyCo's report identifies significant housing and accommodation constraints in the REZ, with limited supply of short-term and long-term housing further confounded by the risk of demand for short-term accommodation exceeding the available supply. Population forecasts in the MWR and DR LGAs indicate the need for more permanent housing. In the meantime, like many other locations in NSW, the area is experiencing a decrease in mortgage and rental affordability due to increasing house prices and weekly rents relative to household incomes (DPIE 2021).

Short-term accommodation located in the townships within a sixty-minute commute of the Site, service several different industry sectors, including tourism, business, and agriculture. A desktop survey of short-term accommodation options was completed for the WAP in November 2023. Data sources included the Visit NSW webpage and Google searches. The search outcomes are summarised in Table 54.

Table 54 Short-term Accommodation Summary

Location	**Hotel**		**Motel**		**Holiday parks**		**B&B and other****		**Airbnb -House /apartment**		**Estimated no. rooms**
	No.	**Rooms**	**No.**	**Rooms**	**No**	**Cabins**	**No**	**Rooms**	**No.**	**Rooms**	
Mudgee	Excluded*		Excluded*		3	86	6	55	62	148	289
Gulgong	Excluded*		Excluded*		1	19	24	24	9	23	66
Dunedoo	2	20	1	9	2	16	1	2	2	9	56
Dubbo~	55 venues, 1,526 rooms with capacity of up to 5,684 occupants (Delos Delta 2023)										1,526
Welling-ton											
Other locations	1	8	2	13	2	25	3	15	-	-	1,937

*Excluded to preserve MWR LGA's short-term accommodation supply to service tourist demand, noting there will be some use of these facilities by people visiting the Site for up to a week (e.g., auditors, specialist consultants, company executives).
~Only to be used if accommodation within the 60-minute commute radius is unavailable.

Source: Accent Environmental, 2024

The survey identified 1,937 short-term accommodation rooms in the MWR, WS, UHS and DR LGAs. This is an underestimate as the search was not exhaustive, all hotel and motel rooms in the MWR LGA are excluded and some accommodation providers did not respond to contact efforts.

The long-term accommodation was partly induced by the 2021 Census data for the MWR LGA, which showed there were 9,638 occupied private dwellings (85% of total dwellings), and 1,704 unoccupied dwellings (15% of the total) (ABS 2021a). Vacancy rates indicate the rental market in all study area localities in the last six months are lower than the 3% benchmark, indicating a sustained high demand and a persistent undersupply of rental properties. On average, 2-3% of rental properties have a change in tenants (ABS 2023). It is likely that a small number of personnel would require long-term accommodation (e.g., site management personnel who are likely to have contracts for the full duration of the construction phase).

A summary of some of the available facilities and services in various localities in the Mid-Western Regional Council (**MWR**), Dubbo Regional Council (DR), Upper Hunter Shire Council (**UHS**) and Warrumbungle Shire Council (**WS**) LGAs are shown in Table 55.

Table 55 Summary of Facilities Available in Local LGAs (as of June 2024)

Facility	**MWR LGA**				**DR LGA**		**WS LGA**			**UHS LGA**	
	Mudgee	Gulgong	Kandos	Rylstone	Dubbo	Wellington	Dunedoo	Coolah	Mendooran	Cassilis	Merriwa
Council offices	1	1	0	1	1	0	0	1	0	0	1
Post office	1	1	1	1	4	1	1	1	1	1	1
Police station	1	1#	1#	1#	1	1	1	1	1	1	1
Fire Services	2	2	1	1	3	2	1	1	0	1	1
SES	1	0	0	1	1	0	1	1	1	1	1
Ambulance station	1	1	0	1	1	1	1	1	1	0	1
Hospital	1	0	0	0	2	1	1	1	0	0	0
Multi-purpose services	0	1	0	1	0	0	1	0	0	0	1
Doctors' surgery	2	1	2	0	9	3	3	2	1	0	3
Dental services	3	1	0	0	8	1	2	1	0	0	0
Airport/aeropark	1	0	0	1	1	1	0	1	0	0	0
Railway - operating	-	-	1	1	1	1	-	-	-	0	-
Pharmacy	4	1	1	0	10	3	1	1	0	0	1
Banks/credit unions	5	1	1	0	15	2	0	0	0	0	1
Supermarkets	4	1	1	1	10	2	1	1	0	0	1
Library	1	1	1	1	1	1	1	1	1	1	1
Places of worship	10	3	3	3	22	8	2	4	3	1	2
Swimming pool (seasonal)	1	1	1	0	1	1	1	1	1	0	1
Petrol station	6	2	2	2	20	6	2	3	1	0	2
Mechanic (approx. count)	18	4	2	0	20	11	3	3	1	0	3
Cinema	0*	0	0	0	1	0	0	0	0	0	0
Childcare centre	7	1	0	0	14	3	2	1	1	1	2
Pre-school	1	1	1	0	15	2	1	1	0	0	1

Facility	MWR LGA				DR LGA		WS LGA			UHS LGA	
	Mudgee	Gulgong	Kandos	Rylstone	Dubbo	Wellington	Dunedoo	Coolah	Mendooran	Cassilis	Merriwa
School – up to year 6	3	2	1	1	10	1	2	2	1	1	2
School – years 7 to 12	2	1	1	0	9	1	1	1	1	0	1
TAFE/college	1	0	0	0	8	1	1	0	0	0	0
Real-estate agents	10	3	1	2	17	2	2	2	0	0	3

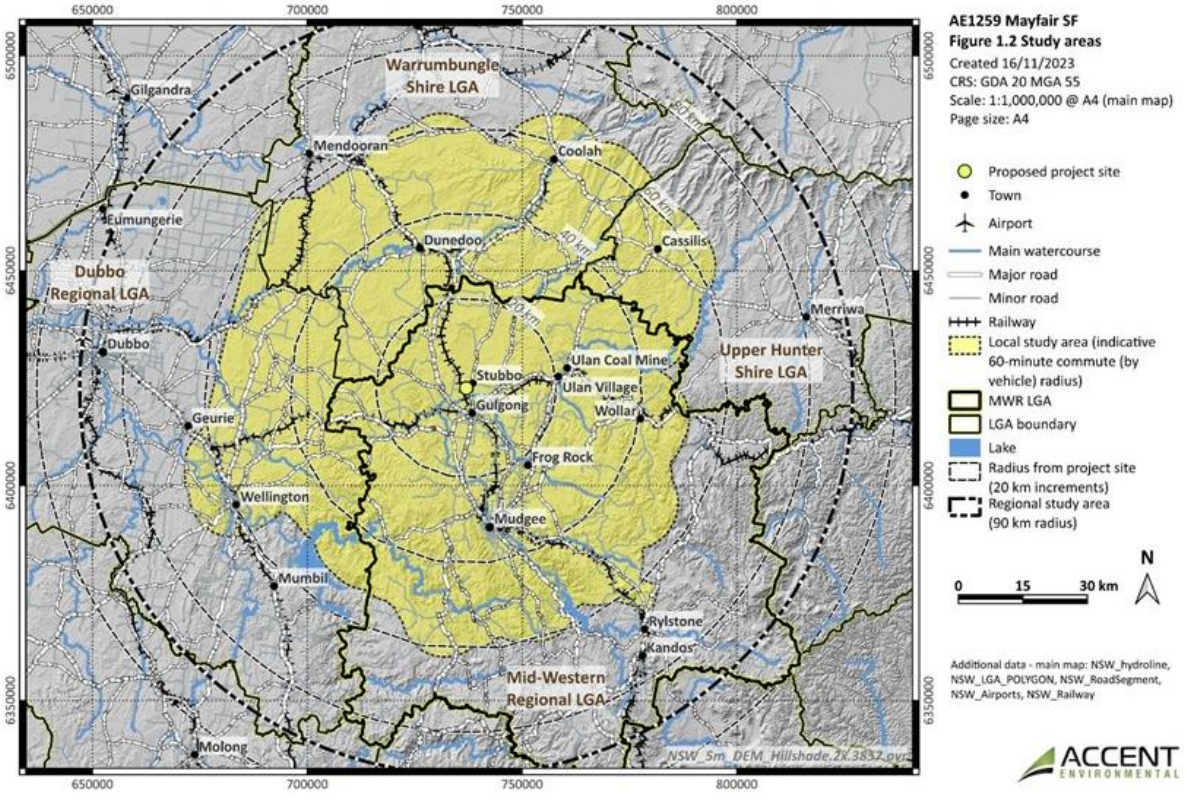
*1 screening per month in the Town Hall # open part-time

Source: Accent Environmental, 2024

6.1.12.2. Projected Workforce Breakdown

Construction personnel will be sought in the local and regional study areas wherever practicable (Figure 54). It is likely that project personnel will be sourced from beyond these areas if these positions cannot be filled locally. The Applicant proposes to accommodate up to 150 non-local workers in a temporary workers' accommodation camp to be constructed on-site.

Figure 54 Local and Regional Study Areas



Source: Accent Environmental, 2024

A summary of likely key construction activities is provided in Table 56. Construction is expected to last for 12 months and will require up to 150 personnel during a peak period of four months. The 12-month project construction period includes the pre-construction and commissioning phases; there may be some overlap between phases. Approximately 1-3 full-time equivalent (FTE) personnel will be required during the proposed 40-year operational life.

Table 56 Indicative Construction Activities and Schedule

Activity	Approximate Duration
Public roads upgrade – design, approval and construction	One month
Civil works (laydown yards, site roads, grading, fencing etc.)	One month
Drilling/pile installation	Two months
Racking installation and module installation	Three months
Electrical trenching, MV foundations	Two months
Array electrical and MV installation	Three months
Substation	Ten months
Testing and commissioning, R2 testing and reporting	Two months
PAC testing and substantial completion	One month
Punch list and final completion	One month

Source: Accent Environmental, 2024

The Project workforce is expected to comprise:

- local workers: workers already resident in the region within commuting distance; up to 10% of the total workforce.
- non-local workers: workers not resident in the region who will temporarily relocate to the region and reside within it to fulfil work requirements; approximately 90% of the total workforce.

At the peak of construction, approximately 150 personnel (including project personnel and contractors) will be on the Site. Peak construction is expected to generate up to 13 light vehicle and 47 heavy vehicle (including oversize and over-mass (OSOM) vehicle) movements per day. Operational personnel light vehicle movements will be minimal, with approximately three movements per day with no site-related heavy vehicle movements except where maintenance activities require.

The estimated number of workers required for the construction phase of the Project is provided in Table 57 and is shown in Figure 55. The Project peak workforce (i.e. when the workforce exceeds 50% of its predicted total) is anticipated to occur for a four-month period, six months after construction starts. The maximum project workforce is expected to be 150 personnel. Based on similar projects within the area and scale of the Project, it is considered that the construction phase workforce may be comprised of around 10% of local workers. At the peak of construction, it is anticipated that the workforce may contain up to 15 local workers.

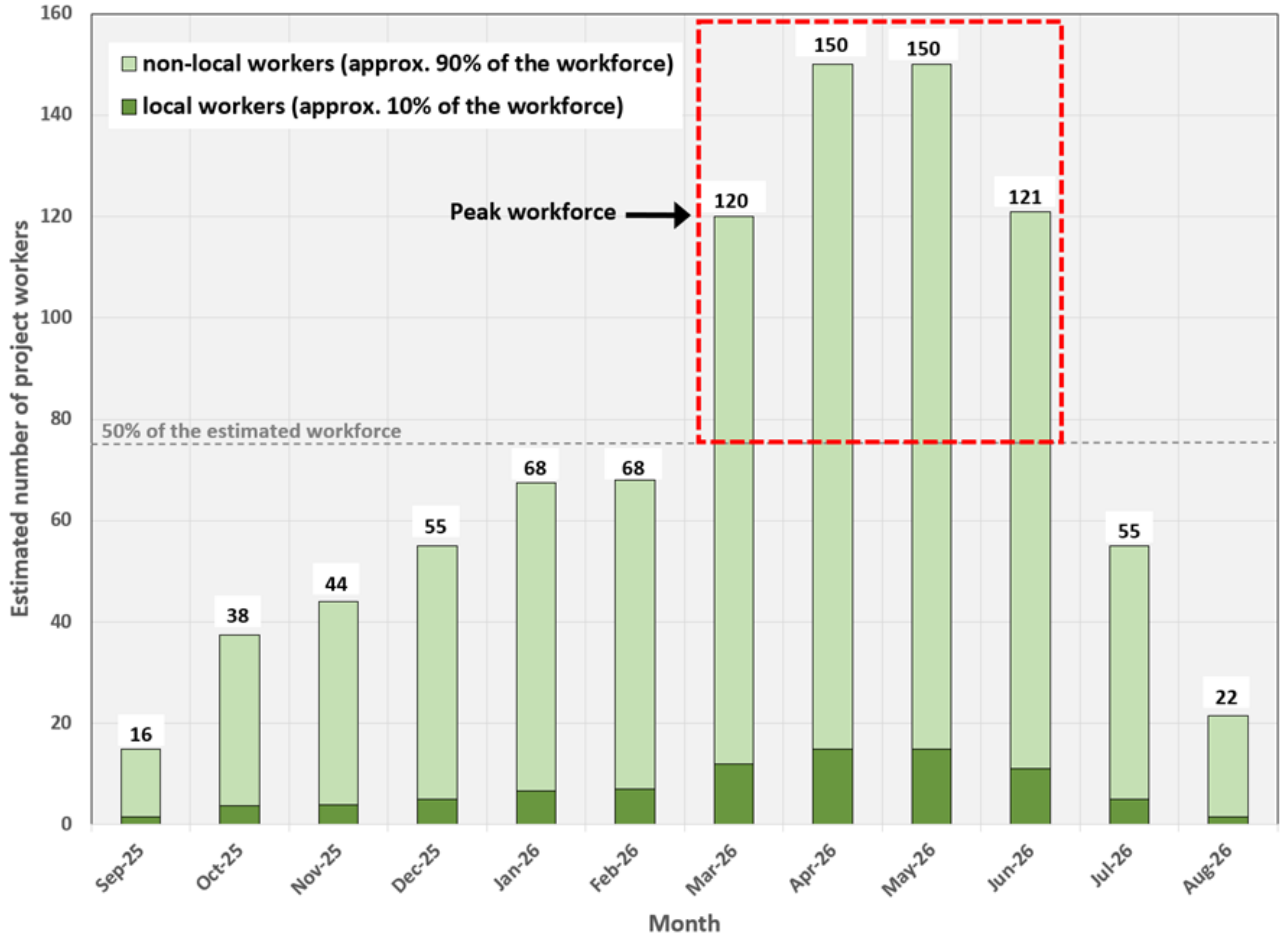
Table 57 Summary of Indicative Construction Workforce

Month / estimated date	Construction peak?	Local workers	Non-local workers	Total workers
Month 1 / Sep-25	no	1	15	16
Month 2 / Oct-25	no	3	35	38
Month 3 / Nov-25	no	4	40	44
Month 4 / Dec-25	no	5	50	55
Month 5 / Jan-26	no	6	62	68
Month 6 / Feb-26	no	6	62	68
Month 7 / Mar-26	yes	10	110	120
Month 8 / Apr-26	yes	13	137	150

Month / estimated date	Construction peak?	Local workers	Non-local workers	Total workers
Month 9 / May-26	yes	13	137	150
Month 10 / Jun-26	yes	11	110	121
Month 11 / Jul-26	no	5	50	55
Month 12 / Aug-26	no	2	20	22

Source: Accent Environmental, 2024

Figure 55 Indicative Construction Workforce



Source: Accent Environmental, 2024

During operation, it is expected that there will be up to three full-time personnel based at the Project to manage site activities and to support routine plant operation and maintenance. The operational staff will be sought from within the MWR LGA or surrounding region. If the operation positions cannot be filled locally, personnel will be recruited from further afield and will likely relocate locally.

Clause 6.11 of the Mid-Western Local Environmental Plan 2012 relates to temporary worker's accommodation and was amended to enable the establishment of temporary workers' accommodation on suitable and appropriate sites rather than be subject to distance restrictions.

6.1.12.3. Potential Impacts

The rising cost and lack of availability of affordable accommodation in MWR, and particularly in Mudgee, has been recently documented in the *Draft Mudgee and Gulgong Urban Release Strategy 2023 Update* (HillPDA 2023). The existing short-term accommodation capacity in MWR LGA is limited and is to be preserved to service the growing local tourist industry. Increased construction activity by transmission infrastructure and renewable energy projects within the Central-West Orana Renewable Energy Zone (CWOREZ) will increase ongoing regional accommodation demands (HillPDA 2023).

While there may be some limited supply available of suitable accommodation, there is unlikely to be adequate accommodation for the entire CWOREZ workforce during peak construction, including the Project workforce. EnergyCo is currently considering the potential temporary workforce accommodation demand, temporary camp design requirements, siting options, and planning approval pathway for a combined construction workforce accommodation facility for the CWOREZ that could accommodate the workforce associated with the transmission line upgrades and a number of other proposed renewable projects in the vicinity (EMM 2023).

Property vacancy rates for November 2023 were 3.1% for Gulgong; Cassilis had the lowest rental vacancy rate in November (0.70%) (SQM 2023). Rental vacancy rates in the study area have generally been below 3% (except for Mudgee during July (5.7%), August (4.5%) and September (3.2%)).

Real estate agents in the general locality suggest various factors are influencing the Mudgee, Gulgong and possibly Dunedoo housing market as follows (EMM 2022a):

- reduction in available rental stock as properties are purchased as holiday homes or transferred into the short-term stay market (i.e., Airbnb, Stayz etc.).
- demand generated by major projects occurring in or near the study area (i.e., the construction of renewable energy projects, and other projects such as the new Dubbo Bridge (Newell Highway upgrade project) and various Inland Rail projects).
- increased in-migration due to the COVID-19 pandemic and the corresponding increase in the attractiveness of regional NSW communities as permanent resident locations.

A Gulgong real estate agent recently indicated during the Bellambi BESS Heights SIA that the private rental market in the area is relatively tight and would be unable to cater for the influx of non-local construction workers (Vena Energy 2023). In the same consultation process, Business Mudgee also expressed concerns that the use of private rentals by non-local workers would have negative flow-on impacts for residents and local vulnerable individuals and families. Council have provided instances or where this scenario has occurred in the last 12 months (pers. comm.).

It is therefore possible that renewable energy project construction workers may compete with the tourism, agribusiness and mining sectors for the limited supply of local short-term accommodation. Council has stated that short-term accommodation in the LGA must be preserved for the growing tourism sector.

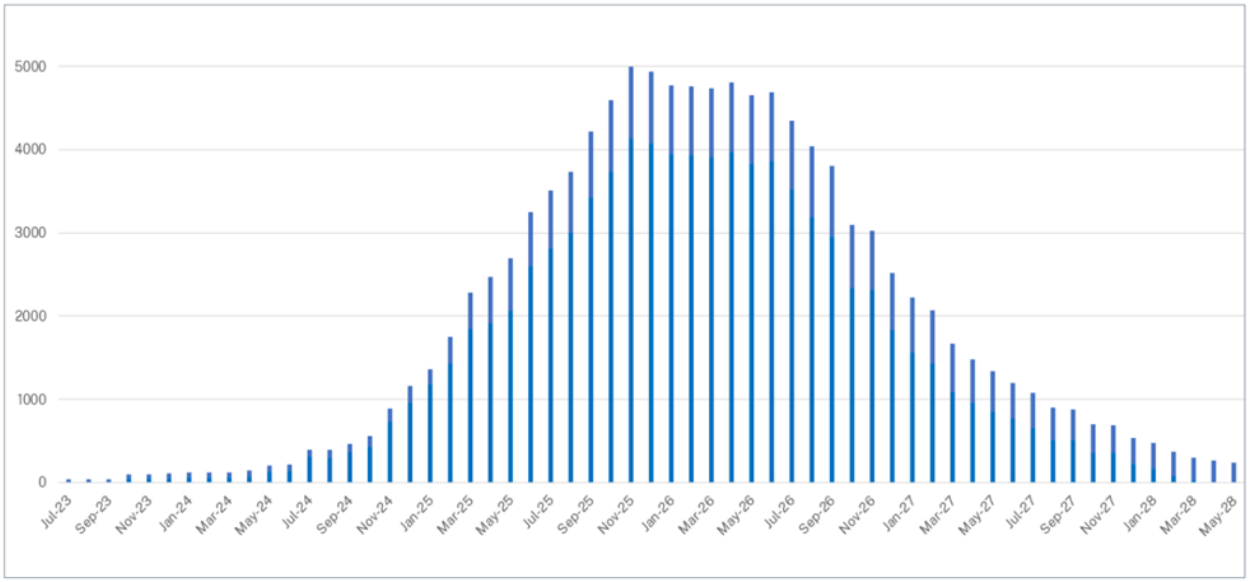
Council will not support projects that propose to use local short-term accommodation to meet non-local project worker housing requirements. Council is also concerned that the influx of non-local workers may cause housing stress in the LGA. Housing stress describes a situation where the cost of housing is high relative to household income. It occurs when households in the lower 40% of income distribution spend more than 30% of their income on rent payments or mortgage repayments. People in such situations are vulnerable to increases in housing costs which can be triggered by increased demand.

Therefore, project proponents must consider alternative accommodation to preserve the short-term accommodation stock for use by other sectors, and care would need to be taken to ensure any prevailing housing stress is not further exacerbated.

The Applicant understands the concerns related to workforce recruitment and accommodation in the CWOREZ. The cumulative workforce from up to 30 other nearby SSD projects either within the planning approval or early construction phases, could have significant impacts on accommodation availability, social infrastructure/social cohesion, noise, and/or visual impacts if not adaptively and effectively mitigated and managed.

EnergyCo estimates indicative workforce numbers over the next 5 years for construction of the CWOREZ transmission project (4.5 GW transmission capacity to be delivered by 2030) together with eleven renewable projects, could peak at around 5,000 in late 2025, as shown in Figure 56, which shows a construction start date of July 2023.The CWO REZ Transmission Project received approval on the 26th of June 2024, with several months of delay with respect of the originally projected timeframe. This illustrates the difficulty in assessing the timing of individual projects and the potential cumulative impacts of multiple projects.

Figure 56 Indicative Workforce Projection for the CWO-REZ and 11 Associated Renewable Energy Projects



Source: EnergyCo, 2023

6.1.12.4. Mitigation Measures

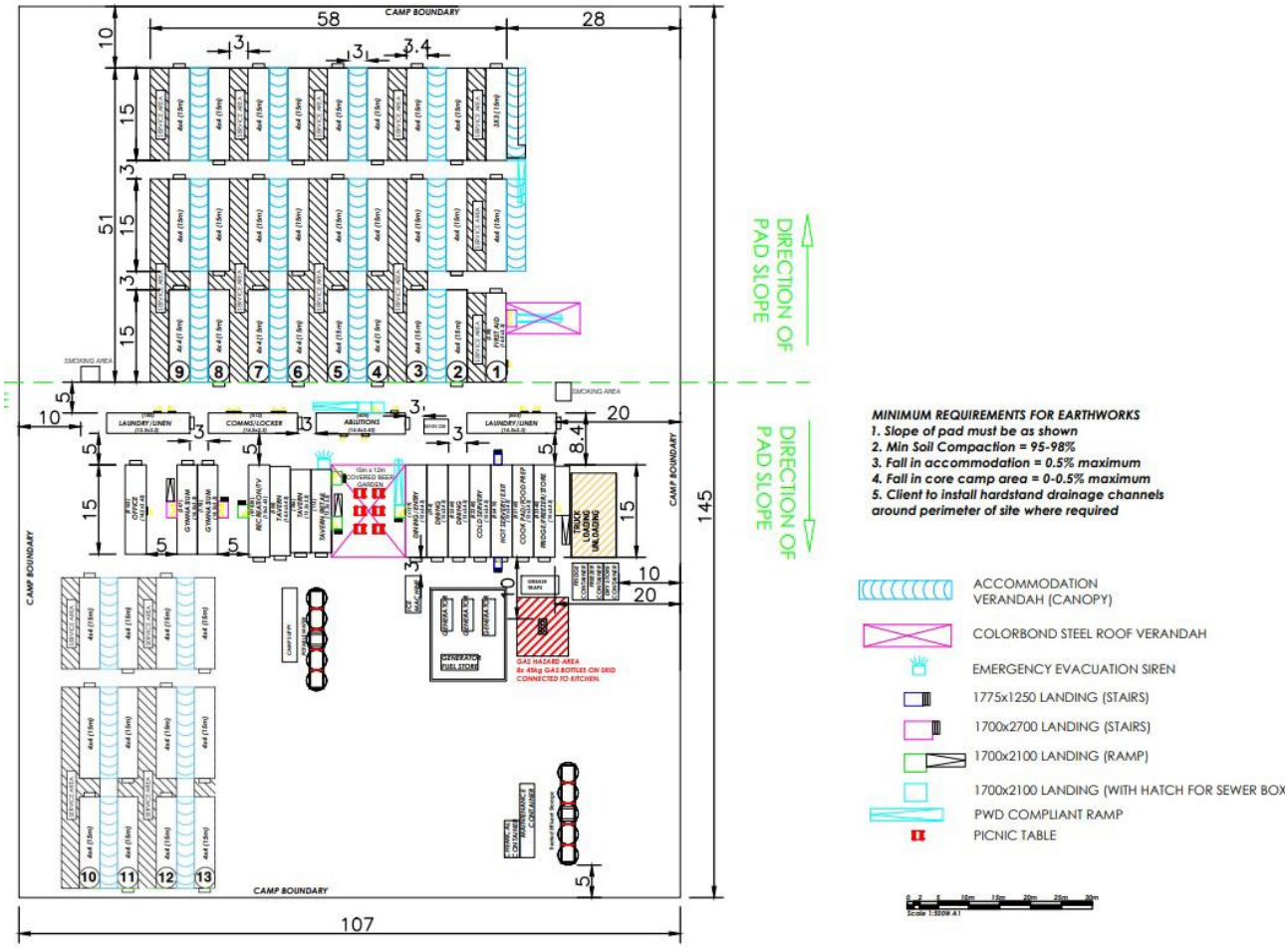
The Applicant understands the concerns related to workforce recruitment and accommodation in the CWOREZ. The cumulative workforce from up to 30 other nearby SSD projects either within the planning approval or early construction phases, could have significant impacts on accommodation availability, social infrastructure/social cohesion, noise, and/or visual impacts if not adaptively and effectively mitigated and managed. As such, the Applicant intends to address this issue through the construction of a temporary workers' accommodation camp to house up to 150 workers.

The proposed temporary workers' camp, though currently in the design phase, will likely include:

- Demountable, single-storey, two- or four-person demountable air-conditioned buildings.
- various single-storey buildings for supporting facilities.
- utilities (potable water, on-site wastewater treatment, electricity, gas, fuel storage, emergency generators, and waste disposal).
- communications services including phone and internet
- car park.

The temporary workers' accommodation camp would be managed by an experienced operator engaged by the EPC contractor. Subject to selection criteria including reliability, quality and financial competitiveness, local businesses could be engaged where possible to service the workforce accommodation camp. This would typically include maintenance, laundry, cleaning, catering, waste management, transport, hospitality workers, a medical practitioner, and security services. The temporary workers' accommodation camp layout is shown in Figure 57.

Figure 57 Indicative Temporary Workers Accommodation Camp Layout



Source: Accent Environmental, 2024

It is anticipated that the construction and operation of the workers' accommodation camp will significantly decrease impacts on housing and local services during the construction phase. It is expected that prior to the construction of the camp, consultation will be undertaken in conjunction with Council and NSW Police Force as required.

Table 58 below summarises mitigation measures and actions to follow to minimise social and economic impacts onto the Mid-Western Council community. These measures include reference to the abovementioned camp as services, as well as the expected code of conduct to be followed by the camp workers to ensure social cohesion.

Table 58 Accommodation Strategies During Construction

ID	Matter	Mitigation measure	Action	Responsibility	Timing	Compliance record
WAP-1	Accommodation strategy required	Prepare interim accommodation strategy as per SEARs requirement	Draft WAP in consultation with Council.	Principal	Planning Phase	The interim WAP and evidence of consultation with Council.
WAP-2	Accommodation strategy required	Update interim accommodation strategy as per development consent	Update interim WAP in consultation with Council to allow consideration of changing accommodation and worker circumstances closer to the construction start date.	Principal and EPC contractor	Planning Phase	WAP revision history and evidence of consultation with Council and DPHI.
WAP-3	Preservation of local short-term accommodation	Construction of a temporary workers' accommodation camp on-site	Install and operate a camp to accommodate up to 150 workers	Principal and EPC contractor	Prior to and throughout construction	▪ Approved camp plans. ▪ Construction certificates. ▪ Camp operator contract.
WAP-4	Preservation of local short-term accommodation	Ensure all non-local workers not staying in the camp are informed not to stay in hotels in the Gulgong-Mudgee area to fulfil Council requirements safeguarding the supply of local short-term accommodation to service the tourist industry.	At the earliest possible opportunity, EPC contractor will inform non-local workers not to seek local (Gulgong-Mudgee area) hotel and motel accommodation (auditors, specialist consultants and company executives etc. are exempt from this requirement). Establish and maintain a register of forecasted worker accommodation requirements and accommodation options to prioritise accommodation	Principal and EPC contractor	Prior to and throughout construction	▪ Monthly records and register of workers and accommodation forecasts. ▪ Up to date events calendar. ▪ Induction module. ▪ Worker induction records.

ID	Matter	Mitigation measure	Action	Responsibility	Timing	Compliance record
			sharing or clustering within and beyond LGA boundary. Maintain an annual events calendar to indicate peaks of tourist activity and adjust works schedule accordingly.			
WAP-5	Housing for management personnel	Secure long-term housing for project management staff	A limited number of personnel will have longer-term contracts e.g. 12-months, and will require a stable accommodation base for the duration of their employment	EPC contractor	Pre-construction	Rental lease(s)
WAP-6	Impacts identification/mitigation and benefit enhancement	Participate in EnergyCo's coordination of impacts and benefits to affected communities	Collaborate with EnergyCo regarding potential project-related impacts	Principal	Planning Phase	▪ Consultation records. ▪ Meeting minutes.
WAP-7	Explore potential accommodation options	Consult with EnergyCo regarding use of temporary worker camps by workers from other projects.	Explore opportunities with EnergyCo to optimise the use of established temporary camps by workers from multiple projects	Principal	Planning Phase	Consultation records
WAP-8	Explore potential accommodation options	Preservation of local short-term accommodation	Operate and maintain a Housing and Accommodation register to enable landowners, local businesses, real estate agents, property owners, and landlords to register their interest in supplying accommodation to project	Principal and EPC contractor	Ongoing with monthly review during construction phase	▪ Create and maintain a Housing and Accommodation register, throughout the construction phase. ▪ Provision of the register to non-local personnel.

ID	Matter	Mitigation measure	Action	Responsibility	Timing	Compliance record
			workers and provide to EPC contractors.			
WAP-9	Explore potential accommodation options	Preservation of local short-term accommodation	Consult with DR, WS and UHS LGAs regarding the Project and the potential commercial opportunities it presents for accommodation providers within their boundaries.	Principal	Prior to construction	Consultation records
WAP-10	Cumulative impacts - accommodation	Reduce the risk of potential cumulative impacts on local accommodation and social infrastructure/services. Preservation of seasonal worker and tourist accommodation stock.	Establish and maintain a register of forecasted worker accommodation requirements and accommodation options to prioritise accommodation sharing or clustering within any remits agreed with Council. Ongoing regular liaison with Council and other local project managers regarding project-related matters including accommodation, worker numbers, project schedules and pending major events.	Principal and EPC contractor and managers from other projects	Monthly throughout the construction phase unless otherwise agreed by all parties.	Accommodation forecast document
WAP-11	Accommodation	Actively reduce worker accommodation requirements	Prioritise and select workers and subcontractors that can demonstrate a large proportion of workers live in the MWR LGA with weighting scores related to the proportion of locals employed	EPC Contractor, Operational personnel	Throughout construction and the operational phase	Maintain a report on workers and subcontractors and include proportion of jobs filled by locals of MWR LGA and proportion of subcontractors appointed with businesses located in MWR LGA to be

ID	Matter	Mitigation measure	Action	Responsibility	Timing	Compliance record
			to ensure the recruitment of local workers is prioritised.			provided in quarterly reports: recipients to include officials from the Applicant, EPC contractor and Council.
WAP-12	Health services	Preservation of local health facilities for local use	Investigate opportunities to preserve or enhance local health services by: – advising the workforce regarding the limited medical services in the area and the need of their preservation for locals (via induction process). – the employment of a registered medical practitioner to provide general health services to project workforce. – the installation of a fully equipped and stocked first aid room on-site. – training of some staff as first aiders. – the promotion and use of telehealth services.	EPC Contractor	Prior to and during construction	▪ Induction records ▪ Medical professional employment record ▪ First aid room stock level records defibrillator check and maintenance records. ▪ First aider training records.
WAP-13	Preservation of social cohesion	All project workers to comply with relevant Applicant, EPA contractor and subcontractor policies and procedures	Prospective workers to be informed of expected behaviours on- and off-site during interview:	Principal and EPC contractor, project workers	Throughout construction and operation	▪ Personnel induction records. ▪ Signed employment contracts. ▪ Disciplinary process.

ID	Matter	Mitigation measure	Action	Responsibility	Timing	Compliance record
		including Code of Conduct.	– expectations regarding worker behaviour /conduct on-site and off-site to be included as an induction module. – Compliance with Code of Conduct to be an employment contract requirement.			
WAP-14	Project-related traffic impacts	Explore actions to reduce the number of project worker light vehicles commuting in the local area	Optimise potential location of any site worker camp to reduce commuting traffic movements. Encourage carpooling possible use of shuttle buses to reduce light vehicle movements.	EPC Contractor	Prior to and during construction	▪ Car-pooling records. ▪ Shuttle bus provider. Agreements/contracts.

Source: Accent Environmental, 2024

The Applicant's employment and procurement strategies are devised to generate positive social outcomes together with the efficient delivery of goods, services and works. Wherever feasible, workers and businesses from the local and regional areas will be prioritised for project employment and contracting opportunities, to help maximise the benefits for local communities.

The objectives of the Project for employment and procurement are as follows:

- Employing at least 10% personnel from within the MWR LGA locally or from the surrounding LGAs regionally that can demonstrate project-relevant skills and experience and a cultural fit with the Applicant, the EPC contractor, and the relevant subcontractors, where practicable.
- Subcontracting at least 10% of the contract value to businesses from within the MWR LGA or from the surrounding LGAs regionally via a competitive tender process where practicable, particularly where eligible businesses are able to demonstrate:
  - Value for money.
  - Experience with major projects.
  - High proportion of local personnel.
  - Ethical procurement and employment (such as employment of women, Aboriginal and Torres Strait Islander people, or people with disabilities).
- At least 1.5% the contract value being subcontracted to Aboriginal-owned businesses where practicable particularly where eligible businesses can demonstrate:
  - Value for money.
  - Experience with major projects.
  - A high proportion of local personnel.
  - Ethical procurement and employment (such as employment of women, Aboriginal and Torres Strait Islander people, or people with disabilities).
- Ongoing engagement with local Aboriginal groups such as the Mudgee Local Aboriginal Land Council, regarding project employment and business opportunities/tenders and how and when to apply.
- Ongoing regular engagement with relevant stakeholders (such as Council, Business Mudgee, Mudgee Region Business, Gulgong Chamber of Commerce and Rylstone Kandos Business Chamber) prior to and during construction, and on an 'as needed' basis during the construction stage of the Project, communicating the timing of upcoming construction activities, providing local businesses with advanced notice of resource needs and allowing the businesses to plan for material needs and peaks and troughs in demand.

There is likely to be strong competition for local workers, goods and services from multiple local, potentially concurrent large-scale projects (where their construction phases partly or completely overlap). This may make the aspirational local employment and local business participation targets listed above difficult to achieve.

Nevertheless, targets will be revised upon commencement of the procurement phase to review cumulative impacts from other projects and avoid the pressure on the local tightened job market, skill shortage, and other local services.

6.2. STANDARD ASSESSMENT IMPACTS

6.2.1. Non-Aboriginal Cultural Heritage

A Heritage Impact Statement (HIS) has been prepared by Urbis in line with the *Assessing Heritage Significance, Statements of Heritage Impact* and *NSW Heritage Manual* in satisfaction of the SEARs.

6.2.1.1. Existing Environment

The Site is not identified as a heritage item and is not located within a heritage conservation area. The closest heritage item is located approximately 3.5 kilometres to the south-west of the Site, being *"The Lagoon", Homestead* (Item No. I391) under the MWR LEP. The historic town of Gulgong is located

approximately 5km to the south of the Site, and includes several identified heritage items, as well as the Gulgong Heritage Conservation Area (C2) under the MRW LEP.

There are no heritage items located in the immediate vicinity of the Site, or within a distance that could be within the same context as the Site (in terms of potential for heritage impacts).

The Site has been used for agricultural purposes since the mid to late 19th Century but from the early 20th Century remained largely vacant and undeveloped. During the 20th century the Site was used for grazing, crop production and included the construction of fences and posts. At the time of writing, this continues, with the Site characterised by minimal structures, undulating topography, ephemeral creek lines, rivers and intermittent stands of trees and linear vegetation.

6.2.1.2. Potential Impacts

The HIS undertaken by Urbis concludes that the Site is not a listed heritage item and is not in a conservation area. There are no items within the Site that are identified to be of any heritage significance.

There are no heritage items located in the immediate vicinity of the Site, or within a distance that could be within the same context as the Site (in terms of potential for heritage impacts).

The change in the landscape character would be minor and likely imperceptible in views from the closest listed heritage item.

6.2.1.3. Mitigation Measures

A HIS has been prepared to assess the potential heritage impacts of the proposed works.

As stated above, the HIS found that there is no potential for the Project to have any heritage impacts, thus no mitigation measures are deemed required.

6.2.2. Waste

MRA Consulting Group (MRA) was engaged to prepare a Waste Management Plan (WMP). The purpose of the WMP is to encourage the efficient use of resources and maximise the diversion of waste from landfill, and thus increasing the recycling rate. With reference to the NSW Waste and Sustainable Materials Strategy 2041 (WSMS) (Stage 1, 2021-2027) and consideration given to the MWR DCP 2013, this WMP will help manage the waste likely to generate on-site and follow the hierarchy:

- Reduce waste production.
- Recover resources (including reuse, reprocessing, recycling and energy recovery).
- Appropriate disposal of waste.

6.2.2.1. Existing Environment

The WSMS) published in 2021 sets out targets and actions consistent with the National Waste Policy. The WSMS aims to support investment in waste infrastructure, encourage innovation, improve recycling behaviour, promote the development of new markets for recycled materials and reduce litter and illegal dumping.

Key actions include:

- Reduce total waste generated by 10% per person by 2030.
- Have an 80% average recovery rate from all waste streams by 2030.
- Significantly increase the use of recycled content by governments and industry.
- Phase out problematic and unnecessary plastics by 2025.
- Halve the amount of organic waste sent to landfill by 2030.

The Project will be established in line with the above targets, taking into consideration sustainable methods of waste management and resource recovery at each applicable stage of the Project. Targets relating to overall recycling rates and specifically, construction and demolition waste apply to the Project.

The Waste Classification Guidelines (NSW EPA) gives an outline of requirements for licensing under the *POEO Act 1997* and provides measures for managing and disposal of different waste streams. No waste produced by the Project will be generated in quantities that require licencing under the POEO Act.

Section 3 of the Guidelines classifies waste into types of liquid and non-liquid waste. Solid waste that is classified as “inert” in the Guidelines includes building and construction waste, which is the primary type of waste generated by the Project. Other solid waste includes biosolids, such as nightsoil as collected by portable toilets or food.

Landfilling of waste is also discussed in the Guideline. All licensed landfill facilities exist in one of the five classes or subclasses as follows:

- Inert: Class 1 or Class 2.
- Solid: Class 1 or Class 2.
- Industrial.

6.2.2.2. Potential Impacts

During the development phases of the Project, a range of waste will be generated from construction operations. This will include materials associated with packaging such as cardboard, as well as excavated material, excess building materials, general waste and other non-putrescible waste that will result from general site operation.

The key contribution of waste to be considered in the WMP are the quantities of waste generated from the major components during the installation process including:

- Vegetation from site land clearing.
- Surplus spoil from the earthworks.
- Corrugated cardboard and honey comb paper.
- Plastics.

The Site does not require the demolition of any buildings or structures, therefore the only waste in consideration is in relation to the construction (installation) phase. Some minor vegetation removal and excavation will occur during the installation process, however, will be reused on-site as infill.

The key contribution to waste generation at the Site will be generated through the installation of the solar farm and includes (but is not limited to) packaging materials used to transport PV modules and other components.

The estimated compositional breakdown of waste per MW is detailed in Table 59.

Table 59 Solar Farm Construction Waste Breakdown Estimates

Waste type	**Estimated tonnes per MW solar installed**
Wood/timber	6
Cardboard	2
Metal	2
Liquid waste (sewerage)	1
Haz Liquid Waste	<1
General Waste	1
PV Modules	<1

Waste type	Estimated tonnes per MW solar installed
Cable Cuts	<1
Plastic Wrap	<1
Rigid Packing Plastics	<1
Polystyrene Sheets or Honeycomb Paper	<1
Total (excl. sewerage)	**13**

Source: MRA, 2024

Major components of the construction phase include (but are not limited to) PV modules, torque tubes, cable harnesses and cable drums.

The construction phase, requiring a substantial workforce to undertake and complete works is also likely to generate a range of other general wastes from ongoing operations at the Site, including but not limited to:

- Food waste.
- Nightsoil.
- Co-mingled recyclables (paper, cardboard, plastic, glass, mixed metals).
- Residual non-putrescible material.

During the construction phase hazardous materials may be utilised in small amounts. Hazardous waste that may be generated on-site includes but is not limited to:

- Fuels.
- Lubricants.
- Chemicals.
- Herbicides.

MRA has conducted research regarding the amount and types of materials most generated during the construction phases of solar farms. Although there are considerable differences due to poor waste data captured in some projects and variation between amounts and type of packing used between projects, an estimated range has been calculated on a per megawatt (MW) basis. Excavated materials such as soil and rock have been excluded as this material will be re-used on-site.

A total of approximately 630 tonnes of waste is expected to be generated from installation of the proposed solar farm (Table 59, Table 60 & Table 61). It is expected that construction will span across a duration of approximately 12 months with a peak period over four months. It is expected this peak period has the potential to generate 40 tonnes of waste per week.

Table 60 Estimated Waste Material Type and Quantity from Packaging Materials

Material Type	Material Quantity (tonnes)
Timber	353.8
P&C	158
Plastic Film	9.0
Plastic Strapping	1.1
Hard Plastic	16.2

Material Type	Material Quantity (tonnes)
Other Plastic	<1
Aluminium	32.0
Steel	59.3
Total	**630**

Source: MRA, 2024

Table 61 Detailed Estimated Waste Generation

Waste Type	Total Weight of Waste (Tonnes)				Total Material
	PV Modules	Torque Tubes	Cable Harness	Cable Drums	
Timber Pallet	270.3	35.8	5.0	0.0	311.1
Cardboard Box	135.2	0.0	6.0	0.0	141.2
Plastic Bags	7.8	0.0	1.2	0.0	9.0
Honeycomb Paper	16.8	0.0	0.0	0.0	16.8
Plastic Corner Pieces	15.6	0.0	0.0	0.0	15.6
Aluminium Straps	26.6	0.0	0.0	0.0	26.6
Plastic Warp Ends	0.0	0.6	0.0	0.0	0.6
Aluminium Banding	0.0	1.4	0.0	0.2	1.7
Plastic Banding	0.0	1.1	0.0	0.0	1.1
Steel Supports	0.0	47.8	0.0	0.0	47.8
Other Timber (Drums & Bracing)	0.0	0.0	0.0	42.7	42.7
Aluminium Casing	0.0	0.0	0.0	3.8	3.8
Steel Cable Drums	0.0	0.0	0.0	11.5	11.5

Waste Type	Total Weight of Waste (Tonnes)				Total Material
	PV Modules	Torque Tubes	Cable Harness	Cable Drums	
Polystyrene / Other Plastic	<1	0.0	0.0	0.0	<1
Total	**472.2**	**86.7**	**12.2**	**58.3**	**630**

Source: MRA, 2024

6.2.2.3. Construction Waste Management Measures

The following general site management measures are recommended during preliminary site works:

- Uncontaminated soils may be reused on-site to even out cut and fill, or otherwise applied to land for rehabilitation purposes.
- If contaminated soils are present, they will require disposal at an appropriately licensed landfill.
- Organic waste from clearing of trees may be chipped or shredded and reapplied as mulch or delivered to an organic's processor.
- No vegetation will be pushed into or applied to ecologically sensitive areas.
- Materials will be reused or recycled wherever possible.
- Excess supply of construction materials will be avoided where possible.
- Separate bins will be provided for source separation of waste types where possible.
- Residual waste will be collected and disposed of at a licensed landfill.
- In the unlikely event that asbestos is found on-site it will be disposed of in the following manner:
  - A risk assessment will be conducted to determine appropriate management measures.
  - Asbestos waste will be disposed of in a landfill which is licensed to receive asbestos waste.
  - Asbestos waste will be wet, wrapped in 200µm thick plastic, and sealed with tape before it is transported.
  - It will be clearly labelled as "asbestos waste".
  - It will be transported in a covered, leak-proof vehicle.
  - Copies of receipts from landfills where asbestos was taken will be retained.
  - If the amount of asbestos is more than $10m^2$, a qualified asbestos removalist will be engaged.
- Hazardous and problem wastes will be stored separately on-site and disposed of or recycled at a facility which are licensed to receive the substance.
- Litter on the Site will be managed on a regular basis to maintain a tidy environment.
- The disposal of nightsoil from portable toilets and other effluent from ablution will be managed by a licenced contractor.
- Transport of waste will be managed by a licenced operator.
- Records will be kept of transport and disposal of materials.

Most material expected to be generated at the Site will have some reuse or resource recovery potential. Considering the remote nature of the Site in terms of comprehensive waste services, the proximity to collection, reuse and resource recovery facilities will determine the viability of recovering different materials.

Nearby waste facilities operated by regional councils such as Mid-Western Regional Council and Warrumbungle Shire Council are unlikely to accept waste due to the large amount of waste generated as a State significant development. Mudgee Waste Facility may accept reduced quantities of recyclable waste with Council approval.

A qualified waste management contractor shall be responsible for management and offtake of all waste and recyclables from the Site for delivery to a suitably qualified and licenced site.

Additionally, there is extensive resource recovery potential for certain material types, as outlined in Table 5 of the WMP.

On-site management of construction and packaging waste will be a key focus during construction of the Project. To ensure that site waste management occurs efficiently, and resource recovery practices are followed, a dedicated site waste manager should be employed to monitor and conduct waste management at the Site. Responsibilities of a site waste manager would include:

- Maintenance of site waste storage areas as necessary.
- Maintenance of waste bins, equipment and infrastructure.
- Maintaining contracts and liaising with waste service providers.
- Ensure appropriate WHS and waste management signage (Appendix S) is presented and maintained for all waste management areas, equipment and infrastructure – to encourage effective resource recovery, disposal and equipment handling.
- Oversee the operation of on-site equipment (baler, compactor, bin lifter, woodchipper, etc) including WHS practices.
- Ensure all staff are informed of waste management practices for best resource recovery and landfill diversion outcomes.

A centralised area located within the laydown area off Jackson Lane is proposed for site operations, this will include site waste management. Site waste management in this area is proposed to occur according to the following procedures:

- A centralised location for the final storage of waste to allow convenient access for waste collection contractor vehicles to collect waste in various forms.
- Solar panel modules and associated components shall be unpacked at this area to reduce the amount of packaging material (timber pallets for example) being transported out into the field. Packaging material shall only be removed at this area if it will not impede the safe and efficient transport of solar panel parts to areas of installation.
- This area is to retain waste volume reduction equipment, bulk storage containers and additional infrastructure to centralise handling of equipment and machinery. The following equipment may be utilised at the Site (if selected):
  - Waste baler (suitable for paper/cardboard, plastic film, containers).
  - Pallet shredder.
  - Bin lifter.
  - Skip and bulk bins.
  - Spare Mobile Garbage Bins (MGBs).

The final major consideration for the management of waste in this phase of the Project is across the Site at areas where solar panels will be installed. It is assumed that solar panels will be installed in sections across the Site and will therefore require a mobile waste management solution The following methods are proposed for the management of waste in the field, ensuring mobility and access to bins for separation of materials at the source:

- Use of mobile bin trailers capable of carrying various sized MGBs and that can be transported easily around areas undergoing installation.

- Trailers can be customised to facilitate the transportation of up to 10 x 240L bins, 5 x 660L bins, 4 x 1,100L bins or a combination of various sizes. This will ensure that multiple bins can be transported efficiently around the Site and allow separation of waste material to occur at the installation areas directly.
  - Depending on supplier, trailers can be modified to be attached to a standard road vehicle towbar or can be transferred by a specialised electric cart.
  - Use of plastic MGBs means that waste can still be disposed of out in the field in wet and windy conditions without risk of material getting wet, blown away or otherwise damaged.

A single car/cart and trailer could service a wide area and will have fast access to the main unloading and waste management area for the changeover of bins.

Small-scale commercial/industrial equipment such as a baler, bin carts, tugs and bin lifters may be used to handle some of the waste streams into more manageable stock. Cardboard, polystyrene, plastic film and plastic banding can all be baled into compact bales of approximately 350-550kg (depending on baler size). Once baled, material would be easier to store and transport. It is possible that facilities accepting baled material would have to cut and re-bale material due to differences in transport and storage method, therefore a baler should only be considered if it presents considerable space and/or cost saving at the Site.

Furthermore, it is recommended that timber pallets and other timber material has significant reuse potential on-site if it can be returned to a resource recovery facility (first preference) or shredded into a mulch product (second preference). This assumes timber materials are not chemically treated and when mulched, do not have physical contaminants such as nails. Should pallets or other timber material be unsuitable for resource recovery or shredding into mulch for application to land at the Site, timber would require storage and sent to a licenced landfill/facility for disposal.

Other considerations that may be adopted will include the covering of waste storage areas to avoid the impacts of adverse weather conditions and on-site composting, if feasible, of some organic materials to be reused for landscaping purposes.

6.2.2.4. Operational Waste Management Measures

Personnel associated with the ongoing operation of the solar farm will generally operate out of a central location, with relevant personnel travelling out to specific areas to conduct monitoring, repairs, or general upkeep. To ensure waste is managed effectively during the operation of the solar farm, it is proposed that waste infrastructure be maintained in central areas that experience the highest amount of personnel use.

Field personnel conducting monitoring or maintenance on solar panels and substations will be encouraged to return waste materials generated during fieldwork to centralised waste management facilities for appropriate recycling and disposal. This will reduce management costs associated with having several collection points or requiring specific personnel to consolidate waste from other points across the Site.

Waste generated during the ongoing management of the solar farm will typically consist of general refuse generated by site personnel, including but not limited to the following waste streams:

- Food waste.
- General waste (residual and non-recyclable material).
- Co-mingled recycling (paper/cardboard, aluminium, steel, plastic and glass).
- Sewage (effluent from ablutions and administration buildings).

The above wastes will be generated in volumes that reflect the number of staff frequenting the Site and centralised facilities. Waste generation rates for the ongoing operation of the Site has been considered in relation to the maximum number of personnel expected to utilise central site facilities. Indicative waste generation rates for the operational phase of the Project have been developed with reference to the *Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities (NSW EPA, 2012)*.Table 62 outlines the expected waste generation rates assuming the key site function will be 'office' use.

Table 62 Estimated Waste Generation Rates During Operation

Waste Type	Volume (L/person/day)	Volume (L/person/week)
General Waste	1	9
Recycling (Containers)	2	18
Recycling (Paper and Cardboard)	2	18
Food and Organic Waste	1	9
Total	**6**	**54**

Source: MRA, 2024

Waste bin infrastructure retained at the Site shall include general waste (red bin) and co-mingled recycling (yellow bin) at a minimum. Due to ongoing use of offices/administration facilities, it may be beneficial to include an independent paper and cardboard bin to separate this waste for collection and recycling. In addition, food waste will be generated by site personnel which may be composted on-site in a pre-manufactured composting unit or a composting pile, and material applied to landscaped areas in a similar manner.

Sewage waste generated through use of office and other facilities will require regular management by the contracted waste or sewage management contractor, on a schedule to be determined between site management and the contractor.

6.2.2.5. Decommissioning

Once operations at the solar farm have ceased, it is expected that the Site will be decommissioned and rehabilitated in accordance with the *Large-Scale Solar Energy Guidelines*.

All infrastructure inclusive of underground systems such as wires or cabling must be removed, and land must be restored to its existing condition. Underground infrastructure may remain if there is significant justification for retaining it such as any cabling or similar infrastructure that is imbedded deep within soil. This infrastructure may be retained as to not place any extra disturbance on soils or native vegetation.

The Applicant and its contractors are encouraged to dismantle and separate decommissioned solar panels in a way that promotes recycling and resource recovery wherever possible. Any residual material that cannot be recycled will be transported to an appropriate landfill. Table 63 outlines the expected materials required to be managed through the decommissioning phase of the Project.

Table 63 Decommissioning Waste Management

Material Type	Description	Classification	Quantity	Management Method
PV modules and associated infrastructure	Glass, copper cables, aluminium framing, silicon, silver, inverters, steel supports, and other materials	General Solid Waste (non-putrescible)	113,640 panels	Collection of PV panels by a specialised contractor for resource recovery. Trackers separated for reuse or recycling. Collection of PCUs by a specialised contractor for

Material Type	Description	Classification	Quantity	Management Method
				recycling or disposal at a suitably qualified facility if required.
BESS Units, PCUs and associated infrastructure	Retired batteries, inverters, transformers, enclosures, heating, ventilation, air conditioning	General Solid Waste (non-putrescible)	18 BESS inverters, 54 BESS containers	Collection by a specialised contractor for resource recovery or disposal if required.
Ancillary infrastructure	Cables, fencing, amenities and support facilities	General Solid Waste (non-putrescible)	As required through decommissioning	Collection by a specialised contractor for resource recovery or disposal if required.

Source: MRA, 2024

It is expected that personnel required for the decommissioning of the Site will reflect that of the construction phase.

Solar panel recycling is still in its infancy in the Australian market, although there are several schemes in place supporting the future options for management and recovery of PV panels. The NSW Government has provided several grant initiatives around research and development for recovery of solar panels which are likely to result in future developments in solar panel recycling. Furthermore, Product Stewardship Centre of Excellence was engaged by the Commonwealth Department of Agriculture, Water and the Environment (DAWE) in November 2021, to facilitate the establishment of the co-design process to include solar industry stakeholders and government to further the development of a product stewardship scheme for PV systems.

A detailed decommissioning plan should be developed at least three months prior to commencement of decommissioning activities associated with the proposed solar farm. In this plan, specific detail surrounding the quantity and recovery of materials should be detailed, to be carried out through decommissioning.

6.2.3. Developer Contributions

In parallel with the SSDA, the Applicant is separately seeking to enter to into a Planning Agreement with Mid-Western Regional Council for the following:

- Council for contributions to a community benefit sharing scheme administered by Council.
- The Planning Agreement is being negotiated in accordance with the NSW Draft Energy Policy Framework Benefit Sharing Guidelines, with a proposed benefit sharing rate of $850 per megawatt per annum paid over the life of the Project.
- The Planning Agreement will exclude the application of sections 7.11, 7.12 and 7.24 contributions.

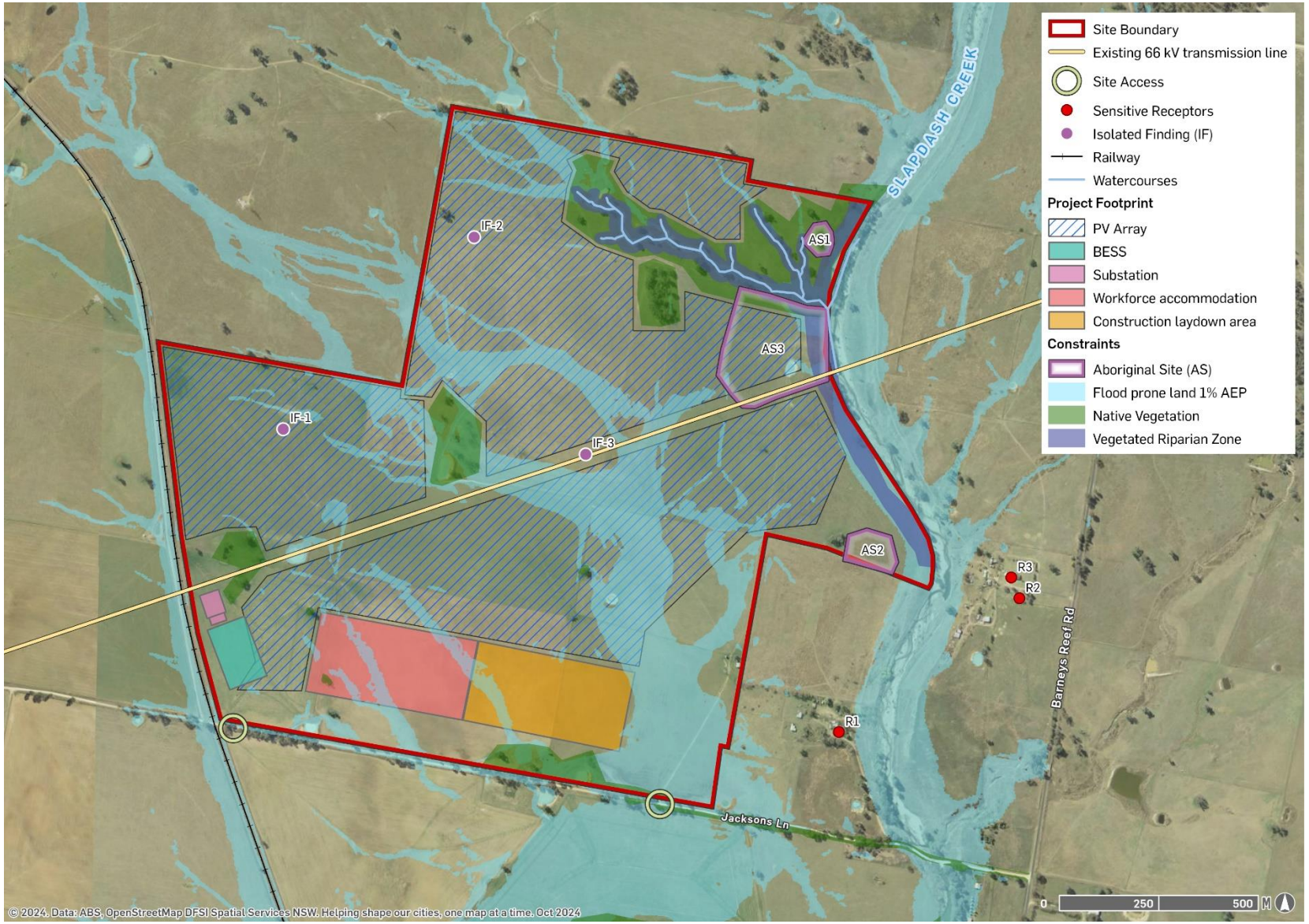
A draft VPA will be submitted with the SSDA and will be finalised and executed prior to the determination of the SSDA.

6.3. OVERVIEW OF SITE CONSTRAINTS

Figure 54 illustrates the combined mapping constraints informed by environmental assessment that have informed the final layout of the proposed Project:

- Flooding – Figure 54 shows the extent of the 1% AEP. The full extent of the flooded area was considered, although it was concluded that areas with less than 0.5 metre in depth during these events will not adversely impact the structure of the PV arrays and can be mitigated as identified in Section 6.1.8.3.
- Native Vegetation – Iterations during the design phase showed appropriate avoidance of the majority of the natural values of the area. Vegetated Riparian Zones and patches of native vegetation were avoided as much as feasible. Approximately, 75% of the existing native vegetation cover has been completely avoided. Mitigation and minimisation measures are provided as part of this EIS where impacts cannot be avoided.
- Aboriginal Cultural Heritage – Important Aboriginal Sites were avoided were possible. Mitigation measures are proposed to recover, salvage and appropriately manage, in consultation with the RAPs, all heritage items that cannot be avoided.
- Visual Amenity – As shown in Figure 1, a significant 500-metre buffer has been provided for nearby sensitive receivers. In addition, extensive mitigation measures will be provided to ensure the visual amenity of nearby sensitive receivers is not significantly impacted.

Figure 58 Site Impact Assessment Constraints Map



Source: Urbis, 2024

6.4. CUMULATIVE IMPACT ASSESSMENT

This section addresses the matters which have the potential to present a cumulative impact when considering the surrounding proposed, under construction, approved and operational SSD projects, as identified in **Section 2.4.** The Project will contribute to the overall development of the Central-West Orana Renewable Energy Zone, but if the abovementioned mitigation measures are not implemented appropriately, has the potential to increase the environmental and social impacts of the Project's around the region.

An assessment has been completed in accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE, 2022). The assessment has included consideration of:

- **Incremental impacts**: involves adding the impacts of the Project to the baseline condition of each relevant matter. The impacts from existing projects (such as nearby renewable energy and other major developments) have been assumed as part of the baseline conditions evaluated and have been considered against any baseline changes as part of each EIA.
- **Combined incremental impacts**: involves the combined effect of different impacts of the Project. The combined have been considered as part of each technical evaluation (e.g., increase of noise as part of increased traffic levels from the Project, economic effects derived from the loss of agricultural land or impacts on productivity, if any, etc.).
- **Issue-specific cumulative impacts**: involves consideration of the impacts of the Project together with key matters with other relevant future projects. Existing and approved developments within the catchment area (known at the time of EIS finalisation) have been considered within each technical assessment for visual, noise, traffic, social, workforce accommodation plan, biodiversity, waste and agriculture.
- **Combined cumulative impacts**: involves consideration of the total synergised cumulative impacts of the Project with operational, under construction, approved and other relevant projects. Due to the range of uncertainties in the future and the nature of some of these impacts, this level of assessment is qualitative. The range of uncertainties that affect this section includes:
  - The level of detail from future projects, particularly those who have been not approved yet and may modify their footprint, scope and quantities relating to construction and operation.
  - The likelihood that those projects will proceed, due to planning, environmental or financial constraints, which are unknown during the finalisation of this EIS. This includes contingency regarding securing connection rights to the CWOREZ; any delays on the EnergyCo's transmission project may impact the delivery of several of these projects.
  - The timing of future projects, not only for approval but for their Final Investment Decisions, construction time, staging and operational life, which could affect the level of overlapping with the Project.
  - The uncertainty regarding environmental and social changes, due to climate changes impacts and/or demographic and built environment changes.

As identified in **Section 0,** there are several SSD projects under construction, recently approved, under assessment and proposed in the catchment area, as identified through DPHI's Major Projects Planning Portal. A radius of approximately 50km from the Project has been used to identify current and future projects for known and potential cumulative impacts. Of the SSD projects:

- 11 have been approved, of which three are under construction and five operational.
- Six have submitted EIS, of which five are under assessment by DPHI.
- 11 are yet to submit their respective EIS but have acquired SEARs.

The potential for cumulative impacts with projects within 50km of the project is provided in Table 64 and Figure 59 below.

- As summarised in Table 64, the potential for cumulative impacts are mainly associated with the construction period of the Project.
- Although the Project will require connection works following construction. These will likely be minor in nature, as the Project will capitalise on access to the existing 66kV line within the project area.

Table 64 Cumulative Impacts with Projects Identified within 50km of the Project

Table Key – In accordance with the *Cumulative Impact Assessment Guidelines for State Significant Projects 2022*.

Detailed Assessment – The Project may result in significant impacts on the matter, including cumulative impacts.	Standard Assessment – The Project is unlikely to result in significant impacts on the matter, including cumulative impacts.	N/A – No potential overlap in impacts between a future project and the Project that would warrant any consideration in the cumulative impact assessment

Project Name	**Approx. Distance to the Project (km)**	**Status**	**Potential overlap and cumulative impacts**			**Cumulative Impact rating**
			Access	**Amenity**	**Housing**	
Mavis Solar Farm	2	EIS Phase				**Medium**
There is significant potential for cumulative impacts related to construction and operation, particularly in relation to workforce demand, workforce accommodation, noise and visual impacts. It is likely that there is some overlap during the construction phases of both projects. Notwithstanding, traffic routes will diverge importantly, since the freight rail line divides the boundary of both projects. Technical assessments have included all relevant considerations to the Project and adjacent neighbours and mitigation measures will be implemented in accordance with the findings.			▪ Overlap on Castlereagh Highway and local roads west of Gulgong. ▪ 1386 vpd worst-case scenario increase for Daily Traffic.	▪ Low visibility within the viewshed catchment area. ▪ No cumulative impacts with noise sources during construction or operation.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Tallawang Solar Farm	2	Under Assessment				**Medium**
There is some potential for cumulative impacts related to construction. The construction timeline of Tallawang Solar Farm, if			▪ Overlap on Castlereagh	▪ Low visibility within the	▪ High potential for cumulative impact	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
approved, is not known, as it has been recently acquired by Enel Green. However, it is likely that both construction periods would overlap during some months of their respective construction times. This may lead to an increased workforce demand and strained social services.			Highway and local roads west of Gulgong. ▪ 1716 vpd worst-case scenario increase for Daily Traffic.	viewshed catchment area ▪ No cumulative impacts with noise sources during construction or operation.	on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Stubbo Solar Farm	4	Under Construction				**Low**
Stubbo Solar Farm has recently started construction at the time of writing this EIS. It is likely that the construction of the Stubbo Solar Farm will be completed by the time of the Project's approval. Therefore, cumulative impacts will be limited to traffic generated by Stubbo Solar Farm during operation and visual impacts, as their visual catchments may overlap in some areas.			▪ Traffic counts during operation will have a negligible impact into the road network.	▪ Medium visibility within the viewshed catchment area. ▪ No cumulative impacts with noise sources during construction or operation.	▪ No overlap on accommodation uses during construction phases or operation.	
Bellambi Heights BESS	4	Approved				**Low**
Originally devised as a hybrid renewable project with an associated Solar Farm, Vena Energy opted to update the Project following			▪ Overlap on Castlereagh	▪ Outside the visual catchment	▪ Low potential for cumulative impact	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
preliminary assessments and reduce the Project to a standalone BESS, due to biodiversity and flooding concerns. It is not known what the construction timeline will be for the Project. It considered likely that the early construction stages of the Project could overlap with the final stages of the Bellambi Heights BESS.			Highway and local roads west of Gulgong. ▪ 80 vpd worst-case scenario increase for Daily Traffic.	area of the Project.	on accommodation.	
Beryl Battery Energy Storage System	7	EIS Phase				**Medium**
Located adjacent to the operational Beryl Solar Farm and proposed by RATCH-Australia, the Beryl BESS is expected to submit the EIS following a similar timeline to the Project. It is considered highly likely that their construction times will overlap, although the construction requirements for Beryl BESS may be relatively lower. As such, there is potential for cumulative impacts on the traffic network, workforce demand and accommodation requirements			▪ Overlap on Castlereagh Highway and local roads west and south of Gulgong.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Beryl Solar Farm	7	Operational				**N/A**

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
There is little to no potential for cumulative impacts with Beryl Solar Farm, bar some minor trip generation from the operational workforce.			▪ Negligible impacts onto the traffic network during operation.	▪ Outside the visual catchment area of the Project.	▪ No potential for cumulative impacts regarding housing. Negligible impacts on employment sourcing.	
Barneys Reef Wind Farm	9	Withdrawn				**N/A**
Barneys Reef Wind Farm has been withdrawn as of the 9th of October 2024. The project was deemed as not viable citing protracted planning decision-making and significant requirements. Therefore, there will not be any cumulative impact resulting from this development.			▪ No potential for cumulative impacts	▪ No potential for cumulative impacts	▪ No potential for cumulative impacts	
Ulan Solar Farm	13	EIS Phase				**Low**
The Scoping Report by Edify was submitted in July 2022, with no publicly available updates since. It is unclear whether the Project is currently undergoing environmental assessment and community consultation. In a worst-case scenario, there is potential for cumulative impacts overlap regarding traffic generation and workforce accommodation.			▪ Low overlap on road network	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site.	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
					▪ Overlap with skilled workforce sourcing.	
Narragamba Solar Farm	13	EIS Phase				Low
The Scoping Report by ACEN was submitted in July 2023, with no publicly available updates since. It is unclear whether the Project is currently undergoing environmental assessment and community consultation. In a worst-case scenario, there is potential for cumulative impacts overlap regarding traffic generation and workforce accommodation.			▪ Low overlap on road network.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Piambong Wind Farm	18	EIS Phase				Low
The Piambong Wind Farm was formally proposed by Vestas in late 2023. According to the Project website, it is anticipated that the environmental studies will protract between 2023 and 2025, with construction commencing in 2026. Thus, it is considered that the Project and Piambong Wind Farm could have potential overlap regarding traffic generation and workforce accommodation.			▪ Low overlap on road network.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
					accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Birriwa Solar Farm	20	Approved				**Low**
Birriwa Solar Farm received a recommended approval from DPHI in May 2024 with submissions and final consultations closing in mid-June 2024.The IPC finalised its decision in mid-August 2024. It is considered that the Birriwa Solar Farm and the Project cumulative impacts would be relatively low, as the construction of Birriwa would likely be finalising by the time the Project starts.			▪ Low overlap on road network.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Valley of the Winds	20	Under Assessment				**Low**
Valley of the Winds was originally proposed by ACEN in May 2020. Following extensive consultation and environmental assessment, DPHI is currently assessing the Project. However, the IPC will be the			▪ Low overlap on road network.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation.	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
consent authority following objection by 50 unique submissions and Warrumbungle Shire Council. It is considered likely that there will be some overlap between the construction periods of both projects. It is anticipated that there could be cumulative impacts regarding workforce sourcing and accommodation.					This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Orana Wind Farm	21	EIS Phase				**N/A**
The Orana Wind Farm was formally proposed by ACCIONA in June 2023. As of April 2024, ACCIONA decided not to participate in the first round of the CWO REZ access rights process, being unable to develop a feasible project at the proposed location. It is unknown how the design and feasibility assessment has progressed since. It is also unknown when a second application for access rights agreement will open within the CWO REZ. Considering the latest updates from the Orana Wind Farm, it is considered unlikely that the Project will overlap with the Project during construction, thus with little to no cumulative impacts.			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ Negligible impacts on employment sourcing.	
Uungula Wind Farm	22	Under construction				**Low**
Squadron Energy announced in January 2024 the beginning of the construction of the Uungula Wind Farm, which is currently underway. It is considered unlikely that there would be major cumulative impacts			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ Low potential for cumulative impact on accommodation.	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
between the Project and Uungula Wind Farm, and it is believed their construction periods would not overlap significantly.						
Ulan Coal Mine	22	Operational				N/A
The Ulan Coal Mine is owned and operated by Glencore. Although it has experienced important technical changes during its operational history, the Site has been active for several decades in different forms. A well-established industry in the region, the Project provides accommodation for the external workforce via the Ulan Village Green. It is considered that the potential for cumulative impacts would be relatively low, including to the traffic network.			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ Negligible potential for cumulative impact on accommodation, as the mine provides accommodation for most non-local workers.	
Moolarben Coal Mine	23	Operational				N/A
The Moolarben Coal Mine is owned by Yancoal and operated by Moolarben Coal Operations Pty Ltd. The Project has been operational and modified for several years, with operations approved until 2038. Accommodation is also partly provided at the Ulan Village Green. It is considered that the potential for cumulative impacts would be relatively low, including to the traffic network.			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ Negligible potential for cumulative impact on accommodation, as the mine provides accommodation for most non-local workers.	
Avonside Solar Farm	27	EIS Phase				Low
Proposed by Eco Energy World in late 2023, the status of the Avonside Solar Farm is unknown.			▪ Low overlap on road network.	▪ Outside the visual catchment	▪ High potential for cumulative impact on	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
Given surrounding uncertainty regarding the Project, a worst-case scenario has been assumed in which the construction periods of both projects overlap. Therefore, it is considered that there is significant potential for cumulative impacts on workforce sourcing and accommodation.				area of the Project.	accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Cobbora Solar Farm	28	EIS Phase				**Low**
Proposed by Marble Energy in late 2021, the Project extended its issued SEARs in late 2023 before their expiration date. The SEARs will expire in late 2024. The status of the projects is unknown, and information of recent consultation and environmental assessment is not publicly available. Under a worst-case scenario, it is considered that there is significant potential for cumulative impacts on workforce sourcing and accommodation.			▪ Low overlap on road network.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
Dapper Solar Farm	30	EIS Phase				**Low**
The Dapper Solar Farm was formally proposed by Origin in late 2022. It is expected that the EIS will be lodged in August 2024 according to the Project's virtual engagement room. Based on this information, it is considered that both the Project and Dapper Solar Farms will follow a similar planning and construction timeline, thus having a high likelihood for cumulative impacts on workforce resourcing and accommodation.			▪ Low overlap on road network.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Sandy Creek Solar Farm	30	Response to Submissions				**Low**
Sandy Creek Solar Farm was proposed by Lightsource Bp in mid-2022 and submitted its EIS in March 2024. Following exhibition period, the proponent is required to address the submissions compiled by DPHI. It is anticipated that the consent authority will be the IPC, since there are more than 50 unique objections and an objection from Warrumbungle Shire Council. It is considered likely that there will be significant overlap between the Project and Sandy Creek Solar Farms, therefore there is			▪ Low overlap on road network.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation	

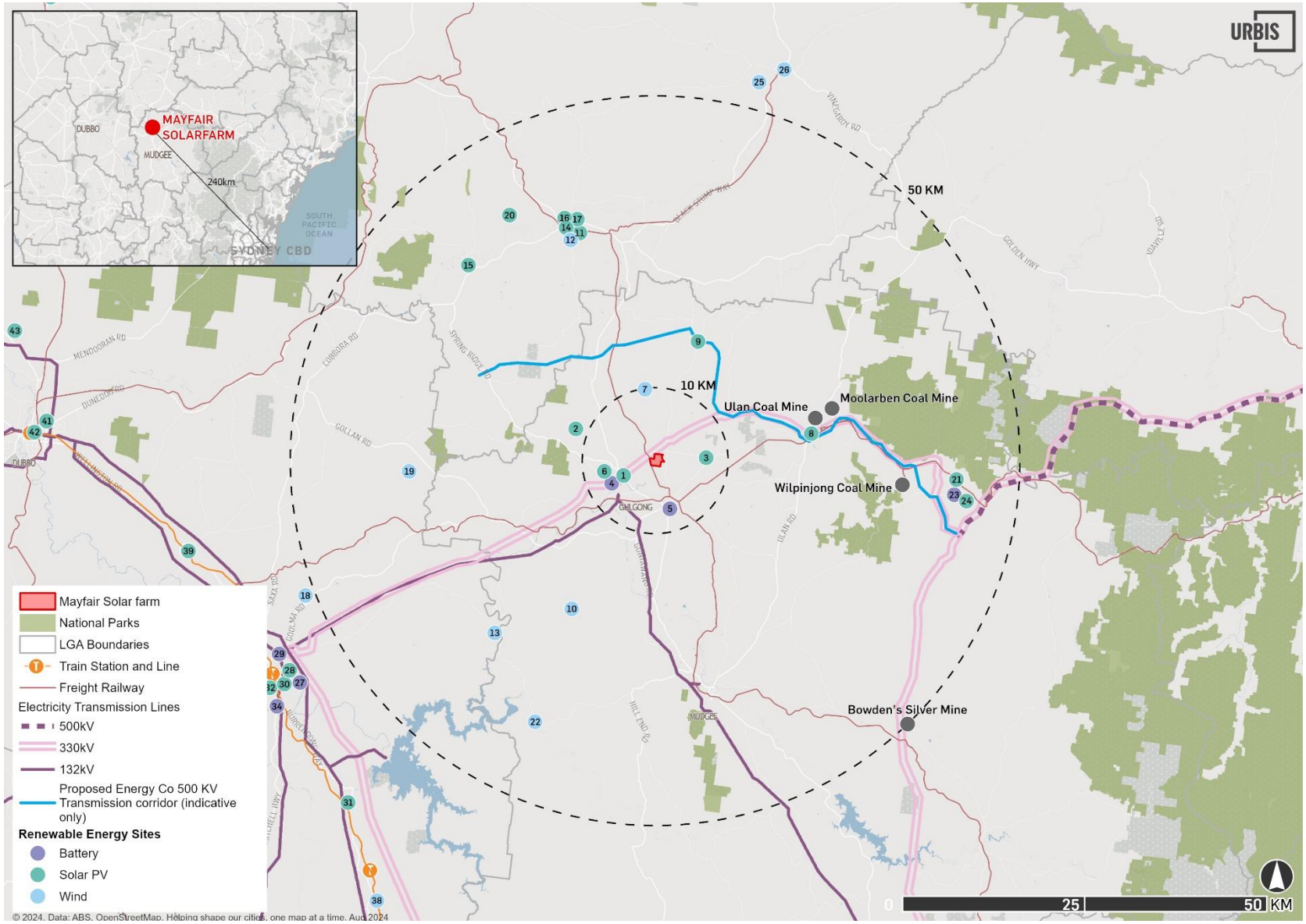
Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
significant potential for cumulative impacts for workforce resourcing and accommodation.					camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Wilpinjong Coal Mine	33	Operational				**N/A**
Approved for operations until 2033, the Wilpinjong Coal Mine is owned and operated by Peabody. Wilpinjong Coal mine partly provides accommodation for its workforce within temporary accommodation and at Wollar, although a significant proportion of its operational staff originate from nearby towns within the region. Therefore, it is considered that the potential for cumulative impacts would be negligible, including workforce accommodation and traffic network.			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ Negligible potential for cumulative impact on accommodation, as the mine provides accommodation for most non-local workers.	
Bodangora Wind Farm	35	Operational				**N/A**
The Bodangora Wind Farm is owned and operated by Iberdrola. Given the Project is operational and significantly outside the visual catchment of the Project, it is considered that there is no potential for cumulative impacts between the projects.			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ Negligible impacts on employment sourcing.	
Spicers Creek Wind Farm	38	Under Assessment				**Low**
Proposed by Squadron Energy, the Spicers Creek Wind Farm has been recently referred to the IPC as of the time of writing this EIS. If approved, it is considered unlikely that there will be an overlap			▪ No overlap during construction.	▪ Outside the visual catchment	▪ Low potential for cumulative impact	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
between the construction periods of the Project and Spicers Creek Wind Farm, thus, low to negligible cumulative impacts on workforce accommodation only are expected.				area of the Project.	on accommodation.	
Dunedoo Solar Farm	38	Approved				**Low**
Approved in late 2021, the Dunedoo Solar Farm is yet to begin construction. The status of the Project and the construction timeline are unknown, but it is considered unlikely that the construction periods of Dunedoo and the Project would overlap significantly. The potential for cumulative impacts has been determined to be low, as it may have some effect on the workforce accommodation during the early stages of the Project.			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ Low potential for cumulative impact on accommodation.	
Central-West Orana Transmission line	40	Approved				**Low**
Approved in June 2024, the proposed twin double circuit 500kV by EnergyCo will be one of the main pillars sustaining the CWO REZ. According to schedule, construction works are expected from late 2024 to late 2027, with operation anticipated in 2028. It is considered likely that there will be some overlap between the construction periods of the CWO line and the Project. There is some potential for cumulative impacts regarding workforce accommodation.			▪ No overlap during construction.	▪ Low Visual Impacts.	▪ Low potential for cumulative impact on accommodation.	
Wollar Solar Farm	42	Under Construction				**N/A**

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
Approved in early 2020, the construction of the Wollar Solar Farm started in early 2023. According to the Project website, construction works are nearing the end, and it is anticipated that the solar farm becomes operational in late 2024. As a result, there will be no cumulative impacts between the Project and Wollar Solar Farm.			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ Negligible impacts on employment sourcing.	
Burrendong Wind Farm	45	Response to Submissions				**Low**
Proposed in mid-2022, the Burrendong Wind Farm is owned by Ark Energy and has recently exhibited its EIS and received submissions from relevant agencies, the community and other stakeholders. It is anticipated that the Project will be referred to the IPC as a consent authority, given it recorded more than 50 unique objections. It is considered likely that there will be significant overlap between the construction periods of the Project and the Burrendong Wind Farms, if approved. Therefore, there could be potential cumulative impacts on workforce demand and accommodation.			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site. ▪ Overlap with skilled workforce sourcing.	
Yarrabin (Phoenix) Pumped Hydro	45	EIS Phase				**Low**
Proposed in mid-2023, the Yarrabin Pumped Hydro Energy Storage is being proposed by Acen Phoenix Pty Ltd near Lake Burrendong in partnership with WaterNSW. The construction timeline is likely to			▪ No overlap during construction.	▪ Outside the visual catchment	▪ High potential for cumulative impact on accommodation.	

Project Name	Approx. Distance to the Project (km)	Status	Potential overlap and cumulative impacts			Cumulative Impact rating
			Access	Amenity	Housing	
overlap with that of Mayfair Solar Farm, therefore there is potential for cumulative impacts.				area of the Project.	This will be largely mitigated with the temporary workforce accommodation camp installed on-site.	
Bowdens Silver	50	Under Construction				**Low**
Bowdens Silver Mine was proposed in 2020 and approved in early 2023. The Project is nearing the early construction stages, and it is anticipated that there will be some overlap with the construction period of the Project. There is significant potential for cumulative impacts.			▪ No overlap during construction.	▪ Outside the visual catchment area of the Project.	▪ High potential for cumulative impact on accommodation. This will be largely mitigated with the temporary workforce accommodation camp installed on-site.	

Figure 59 Nearby SSD Projects



Source: Urbis, 2024

As summarised in Table 64, the potential for cumulative impacts are mainly associated with the construction period of Mayfair Solar Farm.

Although the Project will require connection works following construction. These will likely be minor in nature, as the Project will capitalise on access to the existing transmission line within the Project area.

6.4.1. Assessment of Cumulative Impacts

6.4.1.1. Employment and workforce

The employment demands from the Project the surrounding SSD projects identified could potentially impact the availability of skilled workforce and labourers in the regional catchment area, in a worst-case scenario where construction periods would overlap substantially. Technical assessments have extensively considered this potential impact and assumed that most of the workers will be sourced from outside the region, due to the aforementioned strained workforce demand and low unemployment rate of the region.

This, in turn, has the potential to increase the pressure on local services and existing accommodation, as well as traffic. However, potential cumulative benefits may also materialise in the region, in the form of increased employment opportunities and economic throughput for local businesses and suppliers. There is also potential for the cumulative number of SSDs to drive industry growth in the local areas and the region, which would align with the Future Made in Australia strategy from the federal government.

6.4.1.2. Population change and accommodation

The construction phase of the Project will generate approximately 150 new jobs at peak construction, with approximately 90% of the workforce (135 people) expected to be sourced from outside the regional area. Accent Environmental estimated a potential cumulative workforce demand of 10,770 people. It is unlikely that all of the employees will be sourced from outside the regional area, but a worst-case scenario has been assumed in which they will, as it is not possible to predict the level of net positive migration from other projects. It is also noted that some construction periods will not overlap or have the same intensity. Therefore, the assume number of workers is presented as a highly conservative estimate.

If all the 26 projects identified by Accent Environmental were to overlap construction periods identically, it would lead to an approximate 13.4% increase in the total combined population of the Mid-Western Regional and Dubbo Regional LGAs.

Due to the increase in temporary population and the potential for cumulative impacts as observed by Council, a temporary workforce accommodation camp will be installed on-site. The camp will have enough capacity to accommodate all the construction workers in a worst-case scenario, thus the Project will avoid impacting the housing stock of the region.

Notwithstanding, commitments to local hiring, provision of training and other opportunities for local workers will remain, to preserve the potential for cumulative benefits of the Project to the regional area.

Further discussion on the construction workforce accommodation strategy and mitigation measures are highlighted in Appendix R.

6.4.1.3. Amenity – Visual

Potential cumulative visual impacts could arise from the presence of similar projects, especially those within a 4km visual catchment area. This includes Mavis Solar Farm, Tallawang Solar Farm, Bellambi Heights BESS and Stubbo Solar Farm.

Due to the height of solar panels and ancillary components, it is anticipated that visual impacts could be appropriately mitigated following amelioration. This would decrease the cumulative viewpoints and minimise the number of sensitive receivers.

6.4.1.4. Amenity – Noise

Cumulative impacts regarding noise during construction and operation are expected to be negligible, due to the absence of relevant projects within a 2km buffer area. Where future developments are proposed within these distances, it is recommended that the outcomes of the acoustic report in Appendix L are considered to assess the potential of cumulative noise impacts.

6.4.1.5. Traffic

Surrounding State Significant developments are likely to generate cumulative traffic impacts with the Project. Tallawang Solar Farm, Mavis Solar Farm, Beryl BESS, Barneys Reef Wind Farm and Bellambi Heights BESS are considered the more likely to overlap more significantly with the construction of the Project and contribute to the cumulative traffic counts. The cumulative assessment of the 10km radius incorporates developments that are likely to utilise the proposed access and haulage routes in the surrounding road context and have overlapping construction traffic.

According to the TIA in Appendix M, the cumulative impacts of these projects combined would translate into the potential increase of approximately 200 to 250% of traffic volumes at Castlereagh Highway and Golden Highway, identified as the most sensitive roads. It is important to know that these figures are deemed highly conservative, since this increase will only occur during a complete overlap of their construction periods, which is considered an unlikely scenario.

Notwithstanding, even considering this increase in traffic flows, Castlereagh Highway will maintain a Level of Service B, defined as a *stable flow where drivers still have reasonable freedom to select their desired speed and to manoeuvre within the traffic stream*, and Golden Highway will remain at a Level of Service A, defined as *free flow conditions where drivers are unaffected by the presence of others in the traffic stream*, thus considered acceptable traffic volumes under the Austroads Guide to Traffic Engineering Practice.

The TIA also includes potential mitigation measures for traffic management and road safety.

6.4.1.6. Services

Local population growth, permanent or temporary, associated with the combined proposed SSD projects can increase the need for enhanced local social and health services and their funding. Although the accommodation strategy proposes some level of health and entertainment services, there is still an increased probability of increased use in case of emergencies or need of extra supply.

A potential cumulative benefit of the combined number of projects would be the combined community contributions (from benefit-sharing agreements or other contribution schemes), which will provide needed funding to enhance service offerings and infrastructure across the region.

As Council has advised that their waste management facilities would be inadequate to process generated waste and sewage streams from SSD projects, the waste will be managed by a commercial agreement between a contractor(s) appointed by the Applicant for the construction of the Project and a suitable and approved waste management contractor to handle the transport of all the generated waste that cannot be re-used on-site.

There is also potential for cumulative impacts on town water supply if not properly managed. The Project will likely source its potable water supply via road water trucks. The solar farm will collect water from rainwater tanks for dust suppression purposes and other construction activities and will source non-potable water via road during acutely dry periods if needed.

It is considered that the additional demand for health care due to the workforce could impact the current services available. Mitigation measures include the accommodation of one on-site nurse to attend minor injuries and medical issues, as well as worker briefings via lecture and visual aids regarding the issue of limited local medical and health facilities, particularly in the smaller townships.

There are also limited law enforcement services available throughout the MWR LGA. Anti-social behaviour by non-local project workers could cause social cohesion issues and contention between locals and renewable energy projects. With the possibility of multiple SSD and SSI projects occurring concurrently or overlapping in the general area, proponents will need to consider and implement measures to ensure their workers behave appropriately within and outside of the Site. As a mitigation measure, Elgin has prepared a Workers' Code of Conduct to which all workers will need to adhere to.

7. JUSTIFICATION OF THE PROJECT

This section of the report provides a comprehensive evaluation of the project having regard to its economic, environmental and social impacts, including the principles of ecologically sustainable development.

It assesses the potential benefits and impacts of the Project, considering the interaction between the findings in the detailed assessments and the compliance of the Project within the relevant controls and policies.

7.1. PROJECT DESIGN

The Project has been designed to:

- Provide the most efficient use of available land.
- Minimise the footprint of physical disturbance (such as vegetation clearance or soil and water disturbance).
- Minimise impacts to sensitive landforms and the local environment through the provision of high-quality management measures and processes.
- Minimise the clearing of native vegetation through the adoption of exclusion areas within the development footprint to minimise impacts to sensitive vegetation and habitat.
- Minimise the likelihood of pollution to the soil and water environment through adoption of industry standard controls.
- Minimise any risks from the nature of the Project and conflict with surrounding land uses.

7.2. STRATEGIC CONTEXT

The Project supports the delivery of a sustainable supply of power and battery storage to benefit the local and regional communities in respect to reliable and cost-effective power. The Project assists in delivering the objectives outlined in the NSW Electricity Strategy and Climate Change Act. Additionally, the Project is consistent with the NSW Electricity Infrastructure Roadmap.

Renewable energy is one of the fundamental pillars in achieving the transition from fossil fuels, establishing energy independence and security and achieving Net Zero. This is line with the international and national need for achieving a decarbonised economy and the Paris Agreement and signatory targets as a key step in mitigating the impacts of climate change.

Regionally, the Project aligns with both the Central-West and Orana Regional Plan 2041 (CWORP) and the Mid-Western Region Community Plan: Towards 2040 regarding environmental protection and economic goals, particularly towards Objective 2 of the CWORP 2041. This objective aims to support the State's transition to its Net Zero 2050 objective. The Central-West Orana region is one of the Renewable Energy Zones across NSW and is expected to attract $5.2 billion in investment by 2030.

The Project is located within the CWOREZ on a site with easy road access, which helps connecting the Site to both the Newcastle and Sydney Ports and allows for easy access during the construction. Additionally, the presence of a 66kV line traversing the Site precludes the need for the Project to depend on the construction of the EnergyCo 550kV transmission line upgrade and capitalises on existing infrastructure to firm renewable energy capacity as early as possible.

7.3. STATUTORY CONTEXT

The relevant State and local environmental planning instruments are listed in **Section 4.** The assessment concludes that the Project complies with the relevant provisions within the relevant instruments as summarised below:

- The Project has been assessed and designed in respect to the relevant objects of the EP&A Act as defined in Section 1.3 the Act and addressed in Table 65.
- This EIS has been prepared in accordance with the SEARs as required by Schedule 2 of the EP&A Regulations.

- Consideration is given to the relevant matters for consideration as required under the BC Act and the SSD is supported by a BDAR accordingly.
- This SSDA pathway has been undertaken in accordance with the Planning Systems SEPP as the Project is classified as SSD.
- The Project complies with all of the relevant provisions under the MWR LEP 2012.
- The Project been assessed in accordance with the R&H SEPP and it complies with the relevant clauses.
- The Project generally accords with the relevant provisions of the MWR DCP 2015 as outlined in **Appendix C**.

Table 65 Project Consistency

Object	**Consistency with the Project**
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	Resources within the Project area include both the land that is being used for agricultural production and land with biodiversity, hydrology and Aboriginal Cultural Heritage values. This constitutes the *natural resources* that must be properly managed, developed or conserved. The Project has avoided as much as possible the biodiversity values of the land. The Project is also proposing the use of agrivoltaics on-site, by allowing sheep grazing during the operational phase. This will provide the double benefit of retaining part of the agricultural value of the land while assisting with the grassland maintenance. The development footprint can be returned to its original agricultural land use at the completion of the Project's operation. Measures to avoid and minimise will be implemented during the construction and operational phases to ensure the appropriate management and conservation of natural resources. The residual biodiversity values impacted by the Project will be offset through ecosystem credits. Revegetation works are proposed to restore and rehabilitate some portions of both avoided and impacted areas to ensure a nature-positive outcome.
To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment	The EIS describes the economic, environmental and social context of the Project as well as its potential impacts, which would allow informed consideration of these aspects in determining the application. The Project will contribute to the sustainable and continued production of net-zero and clean energy generation and storage.

Object	Consistency with the Project
To promote the orderly and economic use and development of land	The orderly and economic use of the land can be best achieved by development that is permissible by the relevant environmental planning instruments in accordance with prevailing controls. The Project is permissible with consent and consistent with statutory and strategic planning controls. As detailed in Section 6, the Project will be result in a positive economic benefit, with appropriate mitigation and management measures to reduce adverse environmental and social impacts.
To promote the delivery and maintenance of affordable housing	The Project will incorporate a temporary workforce accommodation, which in turn will reduce the pressure onto the housing stock of the region, assisting with its continued affordability.
To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats	Measures to avoid and minimise impacts to native vegetation and threatened species' habitat have been considered during the design phase, resulting in significant avoidance of the existing biodiversity values. The road upgrades on Jacksons Lane have been designed to avoid more valuable vegetation areas and minimise, to the maximum feasible extent, any residual impacts. All unavoidable impacts will be offset in accordance with NSW Government Policy.
To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)	Avoidance of Aboriginal Cultural Heritage has been a key aspect of the Project refinement and design. Most of the sensitive areas will be avoided. Unavoidable impacts (one Aboriginal Scatter and three Isolated Findings) are proposed to be mitigated through pre-construction salvaging in collaboration with relevant stakeholders and the implementation of an Aboriginal Cultural Heritage Management Plan.
To promote good design and amenity of the built environment	The Project will incorporate measures to avoid and minimise potential visual and noise impacts on sensitive receivers, residential or otherwise. These impacts and proposed measures have been fully addressed in Section 6 of the EIS.
To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants	Over the operational life of the Project, all infrastructure will be maintained or upgraded for a safe and effective operation.

Object	Consistency with the Project
	All construction associated with the Project (such as the workforce accommodation camp) will be complaint with the Building Code of Australia and other statutory requirements.
To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State	A wide range of government agencies, federal, State and local have been consulted throughout the Scoping and EIS phase. Their feedback has been incorporated where feasible during the design and planning phases. As such, it is considered that all levels of government have been provided with sufficient opportunities to share the responsibility for the environmental planning of the Project.
To provide increased opportunity for community participation in environmental planning and assessment	There have been an extensive range of community consultation activities and resources to provide the community with the information about the Project and seek feedback. The EIS provides further information about the Project, potential impacts and mitigation measures. The EIS will go through an Exhibition period once accepted during which the community will be able to place formal submissions about the Project.

7.4. COMMUNITY VIEWS

Community views have expressed both negative and positive aspects of the Project. Consultation has reflected some concerns from the community relating to some environmental and social impacts and the Project has included consideration of these views where possible.

Some of the responses to the Project were:

- The inclusion of a visual buffer for adjoining neighbours to mitigate possible visual impacts.
- The inclusion of acoustic mitigation measures to eliminate any residual noise impacts.
- The inclusion of a workforce accommodation on-site to mitigate any potential conflict with local services and accommodation.
- The arrangement of alternative water and waste services to mitigate any potential stress on local resources.

7.5. LIKELY IMPACTS OF THE PROJECT

The Project has been assessed considering the potential environmental, economic and social impacts as outlined below:

- **Natural Environment**: the Project addresses the principles of ecologically sustainable development **(ESD**) in accordance with Clause 193 of the EPA Regulations 2021 and as outlined below:
  - Precautionary principle: the precautionary principle relates to uncertainty around potential environmental impacts and where a threat of serious or irreversible environmental damage exists, lack of scientific certainty should not be a reason for preventing measures to prevent environmental

degradation. The Project has evaluated measures to avoid environmental impacts where possible and mitigate them if unavoidable; a comprehensive assessment of all the risk-weighted consequences has been undertaken for each environmental impact for all feasible options.

  - Intergenerational equity: the needs of future generations are considered in decision making and that environmental values are maintained or improved for the benefit of future generations. The Project will ensure intergenerational equity is maintained across society by providing a sustainable source of energy that helps decarbonise and mitigate the future impacts of climate change.
  - Conservation of biological diversity and ecological integrity: the Project has been designed to avoid the most important on-site natural values where possible and mitigate and minimise other impacts where unavoidable. Avoidance of impacts includes retaining valuable areas of high biodiversity for conservation, as well as construction measures to ensure no residual impacts are produced on retained native vegetation, such as tree protection zones and protective fencing. The Project also includes the rehabilitation of impacted riparian sections of Slapdash Creek to protect its ecological integrity.
  - Improved valuation, pricing and incentive mechanisms: the holistic consideration of environmental resources that may be affected because of the Project have been considered, including environmental and agricultural. It has been concluded that neither the ecological services of the region nor the agricultural value of the land will be significantly or permanently affected by the Project. It is considered that the economic prospects from the Project will result in a net positive outcome for the region.

- **Social**: The Project considers the potential social impacts of the Project as outlined in Section 6.1.11. It is considered that all feasible options have been included as part of the Project design, such as workforce accommodation and services, to avoid any stress on local resources and the cumulative impacts with other projects onto the socio-economic fabric of the region as much as possible.
- **Economic**: The Project considered the potential economic impacts of the Project as outlined in Section 6.1.11. It is considered that the Project will result in a net positive economic outcome for the region, including the generation of employment for the community during construction and operation. Other land uses, such as surrounding agricultural activities, will not be impacted by the Project, and agricultural activities may be able to continue on the land in the form of sheep grazing.

The potential impacts can be mitigated, minimised or managed through the measures discussed in detail within **Section 6** and as summarised in **Appendix C** to this EIS.

7.6. SUITABILITY OF THE SITE

The Site is considered highly suitable for the Project for the following reasons:

- It is permissible under the MWR LEP 2012 and T&I SEPP.
- It fully complies with all the Statutory Requirements.
- It is considered that it can be developed without significantly impacting surrounding land uses and the environment.
- It has limited environmental values, most of which have been avoided.
- The presence of an existing 66kV line will allow the Project to capitalise on existing electrical infrastructure and deliver sustainable energy as soon as possible.
- Where impacts were not possibly avoided, the physical nature of the Site has allowed for the inclusion of mitigation measures.

The following environmental impacts have been considered during the design phase of the Project, which has resulted into its current form:

- The Project will largely avoid most of the existing biodiversity values on-site, such as native vegetation. The Project is proposing to conserve and rehabilitate some areas as part of the ongoing management and operation. Where impacts are unavoidable, offsets will be secured in accordance with NSW Government policy.

- The provision of stormwater retention works to avoid and minimise any potential impacts from the Project onto the surface water quantity. Other mitigation measures, such as self-bunded containers, will be implemented to avoid impacts onto the water quality of the area. A Soil and Water Management Plan will be prepared prior to the construction of the Project with measures to monitor and mitigate any further residual impacts.
- A 500-metre buffer from adjoining dwellings has been provided to mitigate potential visual impacts from the Project. Significant landscaping has been included as part of the Project to ameliorate the visual impact of the Project on adjacent dwellings and the wider visual catchment.
- The selection of noise-efficient components has been included during the acoustic assessment. This process validated the avoidance of residual acoustic impacts in accordance with the *Noise Policy for Industry 2017 guidelines.*
- Upgrade of Jackson Lane and an appropriate internal road system has been provided to accommodate vehicle movements during construction.
- A workforce accommodation plan has been adopted, including consideration of workforce accommodation, to help avoid significant impacts on the local resources, accommodation and services. Employment and funding will be provided to the wider community, which will affect positively the regional economy.
- The Site is appropriate and compatible with certain agricultural practices during operation, such as sheep grazing. The Site will also be able to be remediated properly after decommissioning, re-instating its inherent agricultural value to the region.
- Consideration has been given to the limitations of the regional waste management systems. A certified waste management contractor will be engaged prior to the construction of the Project, which will assist with the transport of waste streams generated that cannot be re-used on-site.

7.7. PUBLIC INTEREST

The Project is considered in the public interest for the following reasons:

- The Project is consistent with the relevant Commonwealth's Renewable Energy Target, NSW's *Climate Change Act*, NSW's *Climate Change Policy Framework* and *Net Zero Plan Stage 1: 2020-2030*.
- The Project is consistent with the relevant planning controls, including the EP&A Act and relevant EPIs.
- The Project will contribute 60MW of renewable, low carbon energy to the National Electricity Market, including a 60MW/240MWh BESS. This will help achieve the Integrated System Plan 2024 long-term objectives.
- Is located in the CWOREZ, declared by the Minister for Energy in 2022 under section 24(1) of the *Electricity Infrastructure Investment Act 2020.* Whilst located in the CWOREZ, the Project will utilise capacity in the existing transmission network, and will not rely on new infrastructure delivered by EnergyConnect. The Project is consistent with the objectives of the REZ, helping unlock additional reliable capacity in NSW.
- The Site is appropriate, with good solar resources, available connection on the existing electricity network, consistent with the *Large-Scale Solar Energy Guideline*.
- The Project will provide flow-on benefits to the local community, including 150 construction jobs at its peak, up to three operational jobs, and contributions to the Mid-Western Regional Council as stipulated in the Voluntary Planning Agreement to improve local services and infrastructure.
- There will be broader benefits to the State and Commonwealth, with the injection of $200 million of capital into the NSW economy.
- No significant environmental, social and economic impacts will result from the Project. Residual impacts can be minimised, mitigated and/or offset where necessary.

Having considered all relevant matters, it is concluded that the Project is appropriate for the Site and approval is recommended, subject to appropriate conditions of consent.

DISCLAIMER

This report is dated 6th September 2024 and incorporates information and events up to that date only and excludes any information arising, or event occurring, after that date which may affect the validity of Urbis Ltd **(Urbis)** opinion in this report. Urbis prepared this report on the instructions, and for the benefit only, of Elgin **(Instructing Party)** for the purpose of Report Purpose **(Purpose)** and not for any other purpose or use. To the extent permitted by applicable law, Urbis expressly disclaims all liability, whether direct or indirect, to the Instructing Party which relies or purports to rely on this report for any purpose other than the Purpose, and to any other person which relies or purports to rely on this report for any purpose whatsoever (including the Purpose).

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This report has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this report are given in good faith and in the reasonable belief that they are correct and not misleading, subject to the limitations above.

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