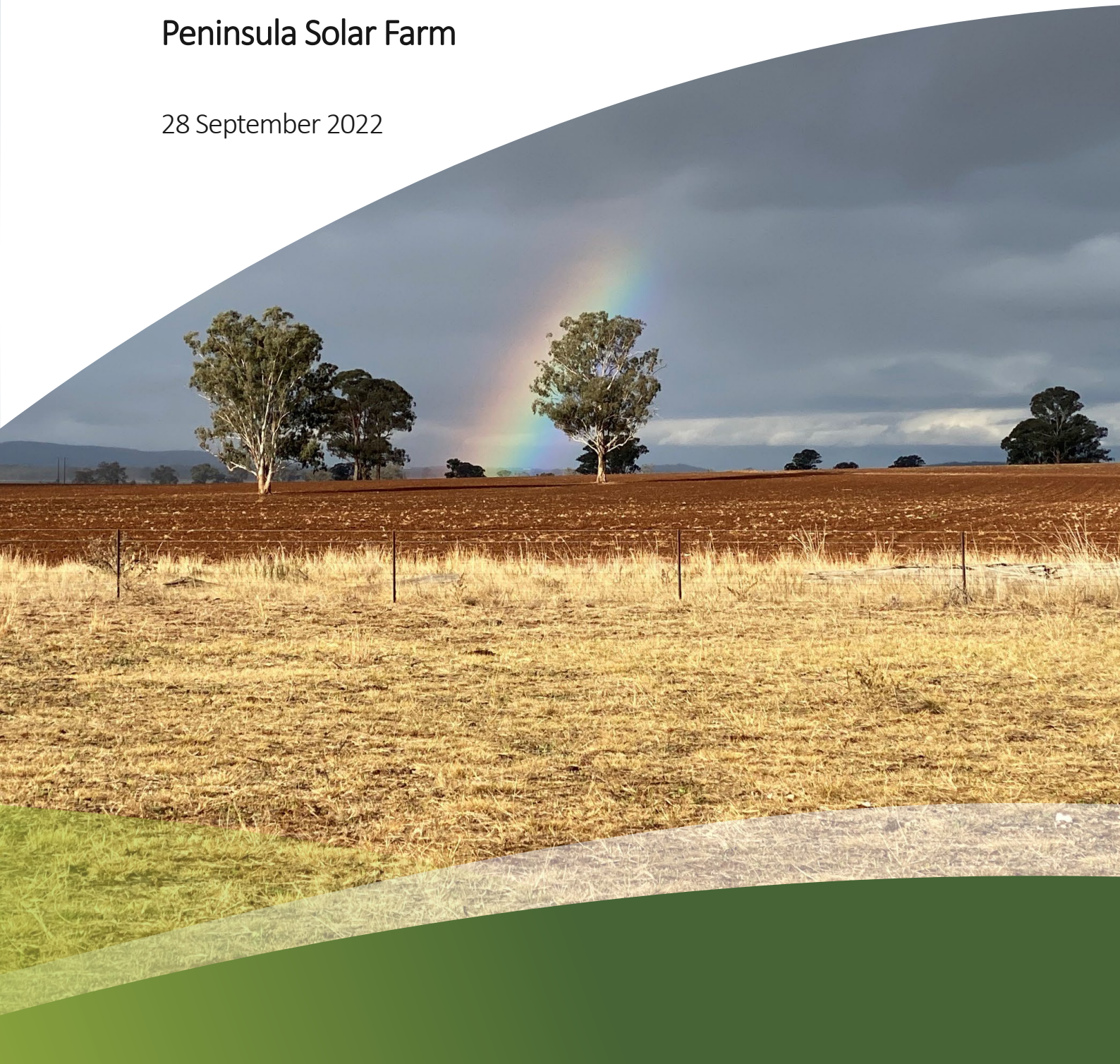
Environmental Impact Statement

Peninsula Solar Farm

28 September 2022



Environmental Impact Statement
Peninsula Solar Farm

AE1173

September 2022

Version V7			
Issued to			
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Previous versions			
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EIS Declaration Form	
Project details	
Project name	Peninsula Solar Farm
Application number	SSD-14757962
Address of the land in respect of which the development application is	Paytens Bridge Road, Paytens Bridge, New South Wales, 2871
Applicant details	
Applicant name	Edify Energy Pty Ltd (ABN 85 606 684 995)
Applicant address	Level 1, 34-35 South Steyne, Manly NSW 2095
Details of person by whom this EIS was prepared	
Name	Michael Cramer
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Professional qualifications	BSc(EarthSc) (Hons), MEnvSc

Declaration

The undersigned declares that this EIS:

- *has been prepared in accordance with Schedule 2 of the Environmental Planning and Assessment Regulation 2000.*
- *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.*
- *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 chapter 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.*

Signature	
Date	28 September 2022

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Abbreviations

%	percent
≤	less than or equal to
°C	degrees Celsius
ABN	Australian business number
ABRI	Australian Battery Recycling Initiative
ABS	Australian Bureau of Statistics
AC	alternating current
ACHAR	Aboriginal cultural heritage assessment
ACHCR	Aboriginal Cultural Heritage Consultation Requirements for Proponents
ACHMP	Aboriginal cultural heritage management plan
ADG Code	*Australian Code for The Transport of Dangerous Goods by Road and Rail*
AEMO	Australian Energy Market Operator
AEP	annual exceedance probability
AES	accommodation and employment strategy
AFARP	as far as is reasonably practicable
AFGM	Aboriginal focus group meeting
AHD	Australian height datum
AHIMS	Aboriginal heritage information management system
Alluvium	Alluvium Consulting Australia Pty Ltd
ANEM	Australian National Electricity Market
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASIRF	Aboriginal site impact recording form
AWS	automatic weather station
BAL	basic left-turn
BAM	biodiversity assessment method
BAM-C	BAM calculator
BAR	basic right-turn
BC Act	*Biodiversity Conservation Act 2016*
BCF	Biodiversity Conservation Fund
BDAR	biodiversity development assessment report
BESS	battery energy storage system
Biosecurity Act	*Biosecurity Act 2015*
BOM	Bureau of Meteorology

BOS	Biodiversity Offsets Scheme
BSAL	biophysical strategic agricultural land
BV Map	biodiversity values map
CBD	central business district
CCTV	closed-circuit television
CEC	Clean Energy Council
CEEC	critically endangered ecological community
CFC	chlorofluorocarbons
CIA	cumulative impact assessment
CIV	capital investment value
cm	centimetre
CO2	carbon dioxide
COP21	21st Conference of the Parties
COP26	26th Conference of the Parties
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSP	community strategic plan
CWA	Country Women's Association
CWORP36	*Central West and Orana Regional Plan 2036*
DA	development application
DAWE	Department of Agriculture, Water and Energy
dB(A)	A-weighted sound levels
DC	direct current
DCP	development control plan
DECCW	Department of Environment, Climate Change and Water
DEM	digital elevation model
DISER	Department of Industry, Science, Energy and Resources
DoE	Department of Education
DoEE	Department of the Energy and Environment
DoP	Department of Planning (now Department of Planning, Industry and Environment)
DP	deposited plan
DPE	Department of Planning and Environment
DPI	Department of Primary Industries (now Department of Planning, Industry and Environment)
DPIE	Department of Planning, Industry and Environment (now Department of Planning and Environment)

Edify	Edify Energy Pty Ltd
EEC	endangered ecological community
EES	energy storage system
EIS	environmental impact statement
EL	exploration licence
ELA	exploration licence application
ELF	extremely low frequency
ELVIS	elevation - foundation spatial data
EMF	electric and magnetic fields
EMS	environmental management strategy
EOI	expression of interest
EP&A Act	*Environmental Planning and Assessment Act*
EPA	Environmental Protection Agency
EPC	engineering, procurement and construction
ERP	emergency response plan
ESD	ecologically sustainable development
ESDSC	Ecologically Sustainable Development Steering Committee
FAQ	frequently asked questions
FR NSW	Fire and Rescue NSW
FRP	flood risk precinct
FSC	Forbes Shire Council
GDEs	groundwater dependent ecosystems
GHG	greenhouse gas
GST	goods and services tax
GW	GigaWatt
ha	hectares
HAZID	HAZard IDentification
HIPAP 4	*Hazardous Industry Planning Advisory Paper No. 4 – Risk Criteria for Land Use Safety Planning*
HiPAP 6	*Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis*
HIPAP 2	*Hazardous Industry Planning Advisory Paper No. 2 – Fire Safety Study Guidelines*
HTE	high threat exotic
HV	high voltage
Hz	hertz

IAP2	International Association for Public Participation
IBRA	Interim Biogeographic Regionalisation of Australia
ICNG	Interim Construction Noise Guideline
ICNIRP	International Commission on Non-Ionizing Radiation Protection
ICOMOS	International Council on Monuments and Sites
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
IMPACT	IMPACT Traffic Engineering Pty Ltd
Transport and Infrastructure SEPP	State Environmental Planning Policy (Transport and Infrastructure) 2021
KFH	key fish habitat
kL	kilolitres
km	kilometres
km/h	kilometres per hour
km2	square kilometres
Koala SEPP	SEPP (Koala Habitat Protection)
KTP	key threatening processes
kV	kilovolt
kV/m	kilovolt/meter
kw/m2	kilowatt per square meter
L	litre
LALC	Cowra Local Aboriginal Land Council
LE	local economy
LEP	local environmental plan
Leq	equivalent continuous sound level
LGA	local government area
LiDAR	light detection and ranging
LIIEMA	Landscape Institute and Institute of Environmental Management & Assessment
LiPF	lithium hexafluorophosphate
LLS	local land services
LRET	Large-scale RET
LSC	land and soil capability
LUCRA	land use conflict risk assessment
LV	low voltage

m	metre
mBGS	metres below ground surface
ML	megalitres
ML	mining lease
ML	mining licence
mm	millimetre
MNES	matters of national environmental significance
MW	megawatt
MWh	megawatt hours
NEG	National Energy Guarantee
NEM	National Electricity Network
NFPA	National Fire Protection Association
NHVR	National Heavy Vehicle Regulator
NML	noise management levels
NMP	noise management plan
NOHSC	National Occupational Health and Safety Commission
NP	national park
NPI	Noise Policy for Industry
NR	nature reserve
NSR	noise-sensitive receivers
NSW	New South Wales
NSW RFS	NSW Rural Fire Service
NTC	National Transport Commission
NTSCORP	National Native Title Services Corporation Ltd
O&M	operations and maintenance
OEH	Office of Environment and Heritage
OM	over-mass
OSOM	oversize and/or over-mass
OzArk	OzArk Environment and Heritage Pty Ltd
PCT	plant community types
PHA	preliminary hazard assessment
PoC	products of combustion
POEO Act	*Protection of the Environment and Operations Act 2001*
POEO Regulation	Protection of the Environment Operations (Waste) Regulation 2005
PRL	protected riparian land

PSNL	project specific noise level
PV	photovoltaic
R	receiver
RAP	registered aboriginal party
RBL	rating background noise level
REDI.E	Regional Enterprise Development Institute Ltd
Resilience and Hazards SEPP	State Environmental Planning Policy (Resilience and Hazards) 2021
Resonate	Resonate Consultants Pty Ltd
RET	Renewable Energy Target
REZ	renewable energy zone
RMS	Roads And Maritime Services (now Transport for NSW)
RNP	Road Noise Policy
RU1	rural zoned land
SAII	serious and irreversible impacts
SCADA	supervisory control and data acquisition
SDS	safety data sheet
SEARs	Secretary's environmental assessment requirements
SEED	sharing and enabling environmental data
SEPP	State Environmental Planning Policy
SF	solar farm
SISD	safe intersection sight distance
SL	soil landscape
SL+	heavy sandy loam
SRES	Small-scale Renewable Energy Scheme
SSD	state significant development
SWL	standing water level
SWMP	soil and water management plan
t	tonne
TAFE	technical and further education
Tastex	Tastex Pty Ltd
TEC	threatened ecological communities
TFG	traditional family group
TfNSW	Transport For NSW
TIA	traffic impact assessment
TMP	traffic management plan

UL	underwriter's laboratory
UNFCCC	United Nations Framework Convention on Climate Change
V/m	volt per meter
VCE	vapour cloud explosions
VI	vegetation integrity
VIA	visual impact assessment
VP	viewpoint
VPA	voluntary planning agreement
W	watt
WARR Act	*Waste Avoidance and Resource Recovery Act 2001*
WHO	World Health Organization
WMP	waste management plan
WON	weed of national significance
WPMP	weed and pest management plan
µT	microtesla

Glossary

applicant	Entity applying for development consent under the EP&A Act, in this case, Edify Energy Pty Ltd (may also be termed proponent).
alternating current	Alternating current (AC) is an electric current which periodically reverses direction, in contrast to direct current (DC) which flows only in one direction.
Australian Height Datum	Vertical height of 0.000m established within the Australian National Levelling Network (ANLN), through taking the mean sea level of 30 tide gauges along the entire Australian coastline during the period of 1966-1968.
battery energy storage system	Battery storage, or battery energy storage systems (BESS), are devices that enable energy from renewables, like solar and wind, to be stored and then released when customers need power most.
BESS unit	Rectangular housing, typically the size of a shipping container, that contains a series of battery racks.
bore	Any well, excavation or artificially constructed or improved underground cavity used - or to be used for the interception, collection, storage or extraction of groundwater for domestic and stock, observation, investigation and commercial purposes.
Colorbond™	Fence material that is lightweight and sturdy steel coated with high-quality paint that is extremely durable and tightly blended into the steel base.
culvert	Structure that channels water past an obstacle or to channel a subterranean waterway.
direct current	An electric current flowing in one direction only.
electromagnetic interference	Electromagnetic interference (EMI), also called radio-frequency interference (RFI) when in the radio frequency spectrum, is a disturbance generated by an external source that affects an electrical circuit by electromagnetic induction, electrostatic coupling, or conduction.
geographical information system	A geographic information system (GIS) is a computer system for capturing, storing, checking, and displaying data related to positions on the Earth's surface.
geotextile	Permeable fabrics which when used with soils, has the ability to separate, filter, protect or drain.
inverters	An apparatus which converts direct current into alternating current
lithium-ion battery	A lithium-ion battery or Li-ion battery is a type of rechargeable battery in which lithium ions move from the negative electrode through an electrolyte to the positive electrode during discharge, and back when charging.
movement (vehicle)	A vehicle movement is a round trip, which includes both the trip to and from the destination.

non-development zone	An area within the project site that has been excluded from disturbance (e.g. to protect biodiversity)
power conversion unit	Device used to convert power from one form to another e.g. from DC to AC or changing the voltage or frequency.
photovoltaic cell	An electronic device consisting of layers of semiconductor materials fabricated to form a junction (adjacent layers of materials with different electronic characteristics) and electrical contacts and being capable of converting incident light directly into electricity (direct current).
photovoltaic modules	An integrated assembly of interconnected photovoltaic cells designed to deliver a selected level of working voltage and current at its output terminals, packaged for protection against environmental degradation, and suited for incorporation in photovoltaic power systems.
project footprint	The area that will be directly disturbed by the construction and/or operation of project facilities and infrastructure (for the Peninsula SF, the area of the project site less the area of the non-development zones).
project site	The project site is the area within which the project will be located (usually defined during operation by a high-security fence).
putrescible	Liable to decay; subject to putrefaction.
radiant heat flux	Heat transfer rate per unit area as thermal radiation.
responsible authority	The relevant consent authority or determining authority. In the case of State significant infrastructure, the Minister.
ring main unit	In an electrical power distribution system, a ring main unit (RMU) is a factory assembled, metal enclosed set of switchgear used at the load connection points of a ring-type distribution network.
riparian land	Lands that occur along watercourses and water bodies.
risk assessment	Risk assessment is the process of identifying, evaluating and controlling risks associated with hazards for the project, including identifying a clear pathway to one or more receptors, and assessing the potential impacts on the receptors as a result of the hazard.
SCADA system	SCADA is an acronym for Supervisory Control and Data Acquisition. SCADA generally refers to an industrial computer system that monitors and controls a process. The SCADA system will monitor substations, transformers and other electrical assets.
solar array	A line of solar panels mounted on a frame.
substation	A set of equipment reducing the high voltage of electrical power transmission to that suitable for supply to consumers.
transformer	Transformers are used to increase or decrease the alternating voltages in electric power applications.
truck and dog trailer	Truck and dog combinations consist of a rigid truck towing a dog trailer and are not more than 19 m in length. A dog trailer is a trailer with axles at either end of the trailer.

Summary report

Edify Energy Pty Ltd (Edify) is proposing to construct and operate a utility-scale solar farm and integrated battery storage project located at Paytens Bridge, southeast of Forbes, in central west New South Wales (NSW) (Figure S1). The proposed Peninsula Solar Farm (Peninsula SF) (the project) will have a generation capacity up to 80 megawatt (MW) alternating current (AC)and a storage capacity of up to 80 MW/160 megawatt hours (MWh).

The Peninsula SF will comprise up to 192,000 photovoltaic (PV) modules (assuming each module is 500 watts), known more commonly as solar panels. The solar panels use the same type of technology as is commonly used in residential solar installations throughout Australia but are larger in size. The panels will be mounted in rows on horizontal tracking or fixed tilt systems.

The solar panels will generate direct current (DC) electricity that will be inverted to AC electricity (which is the standard form of electricity used throughout Australia). The solar panels interconnect to form a solar array of up to either 4 MW (AC) or 8 MW (AC) capacity. Associated with each array will be a prefabricated, containerised inverter and integrated transformer to convert and step up the voltage level.

The project will also feature a battery energy storage system (BESS) comprising sealed lithium-ion batteries housed in multiple secure, climate-controlled enclosures (BESS units). Subject to economic and technical considerations, the BESS is anticipated to be an approximate 80 MW/160 MWh rated capacity battery storage system. The BESS units will be distributed throughout the site or consolidated in a centralised location next to the substation.

The solar arrays and inverter enclosures will be installed on frames supported by steel piles and will sit above ground level. The arrays will have a maximum height of 4.2 m at full solar panel tilt and the inverter enclosures a height of up to 3 m.

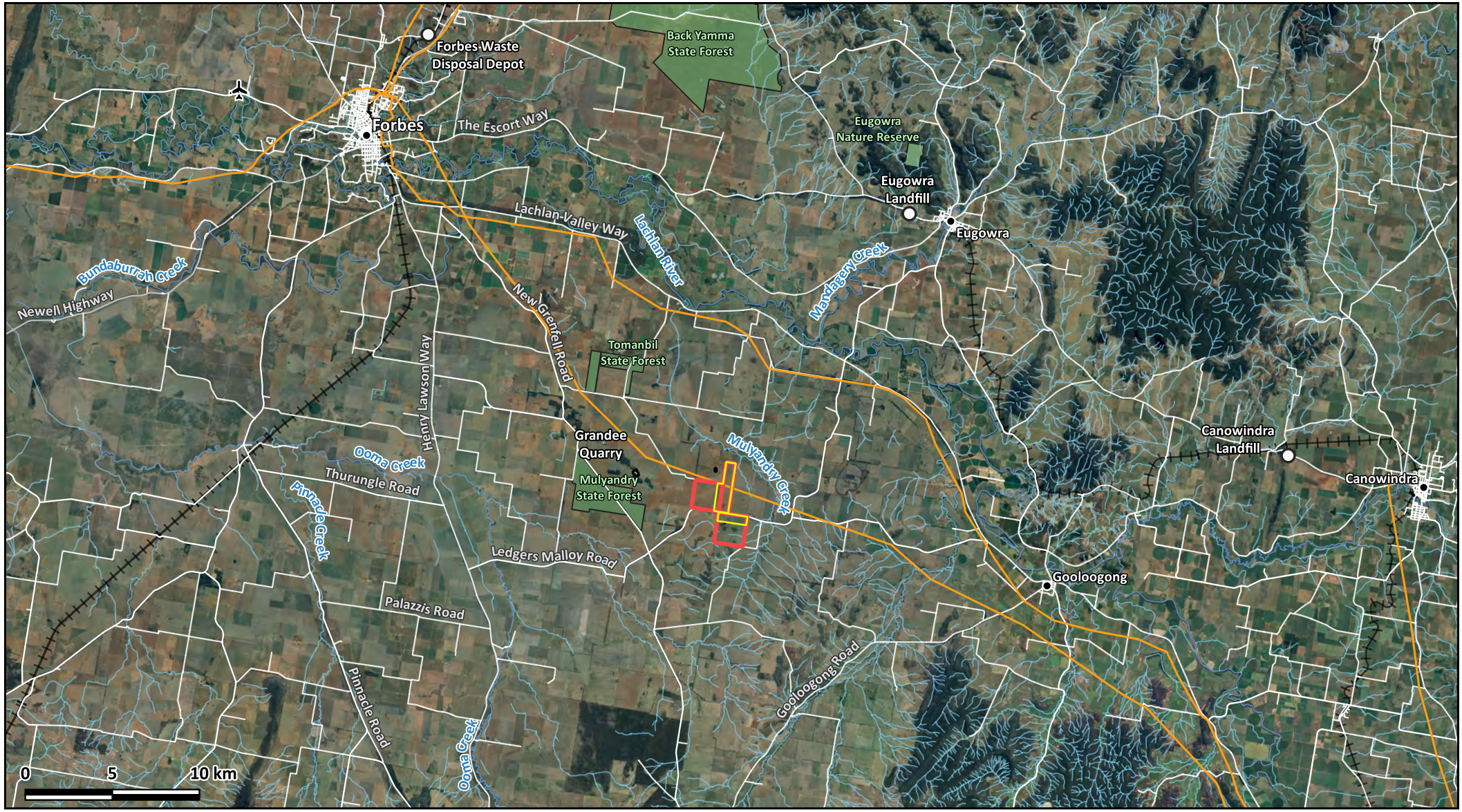
Electrical connections will also be installed between the solar arrays, as well as associated monitoring and protection equipment and central inverters, via underground or frame-secured cabling.

Each inverter will be connected to a central 33 kilovolt (kV) switchboard by underground medium voltage cable reticulation.

The switchboard will be connected to a high voltage substation occupying a footprint of approximately 120 m by 120 m. The substation will connect the SF to the 132 kV above-ground transmission line, owned and operated by Transgrid.

The proposed site layout is shown in Figure S2. The land to be directly disturbed by the project is estimated to be 235 ha.

The project is expected to have a workforce of up to 250 during construction and five full time equivalent positions during operation. Construction is expected to take approximately 16 months and the project is anticipated to have an operational life of 30 years or more.



Project site
Lot boundary
Landfill site
Quarry
Railway
Existing transmission line
State Forest and Nature Reserve
Main watercourse
Watercourse - tributary

N

AE1173.1 Peninsula SF
Figure S1. Local context
Created: 6/05/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4
Base map: Google Satellite [Mar 2022]
Additional data: NSW RoadSegment, NSW Hydroline, NSW_Rail, NSW ElectricityTransmissionLine, NSW_Six_Forbes_Lot_Cadastral_data.

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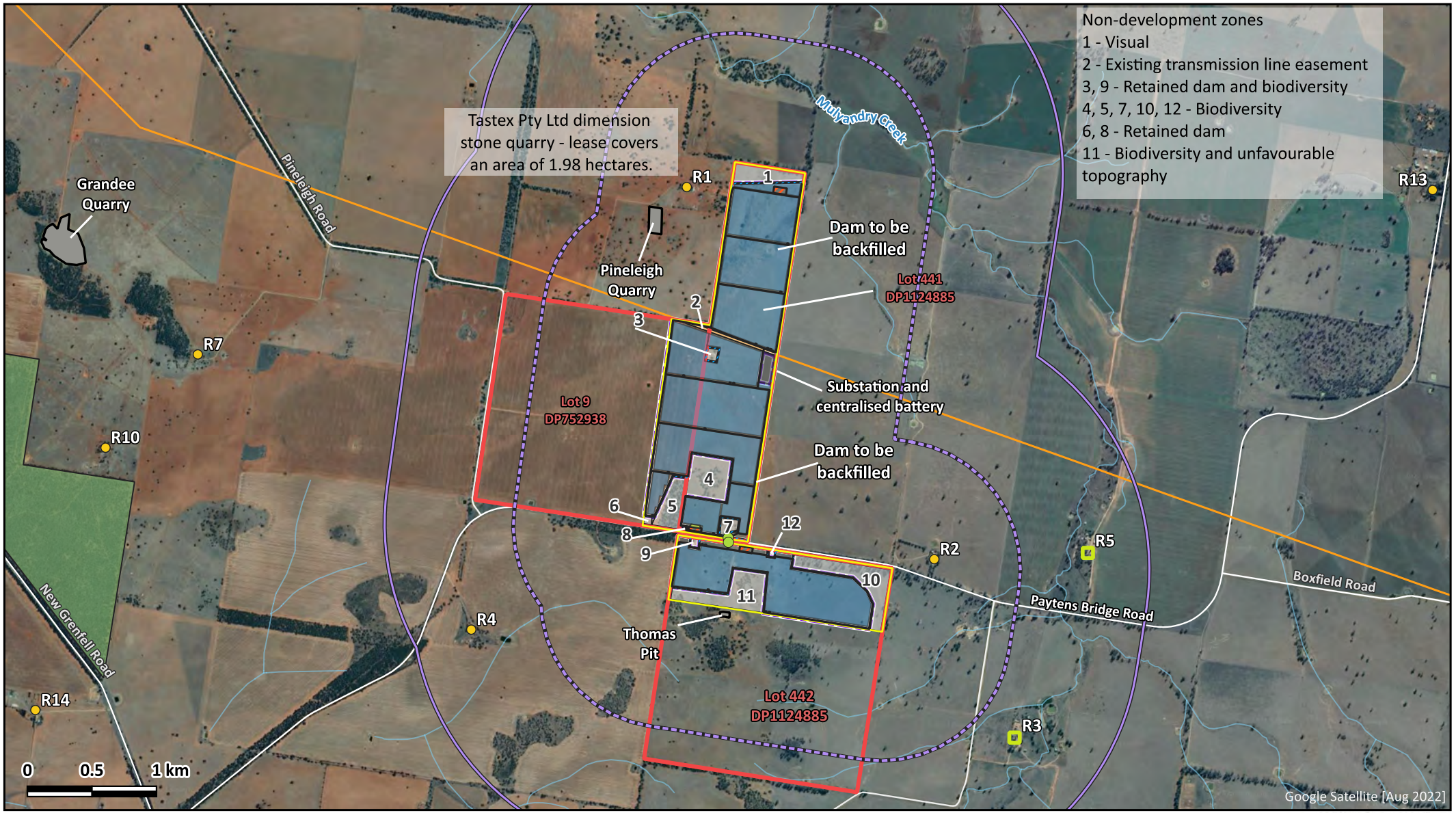

- Project site
- Lot boundary
- Non-development zone
- Asset protection zone
- BESS Enclosure and Power Conversion Unit
- Laydown area
- Indicative solar panel extent
- Operations and maintenance building
- Substation and centralised battery
- Site road
- Access point
- Site security fence
- Non-associated residence
- Associated residence
- Existing transmission line
- Quarry
- State forest
- 1 km radius from project site
- 2 km radius from project site
- 5 km radius from project site
- Watercourse - tributary

N

AE1173.1 Peninsula SF

Figure S2. Proposed site layout

Created: 18/08/2022

CRS: GDA 1994 MGA Zone 55

Page size: A4

Additional data: NSW RoadSegment, NSW Hydroline, NSW ElectricityTransmissionLine, NSW_Six_Forbes_Lot, MinView Min_occ_all_construction

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The total capital investment value of the Peninsula SF is approximately A$194.9 million, thereby meeting criteria for classification as a State Significant Development (SSD) to be assessed by the NSW Department of Planning and Environment (DPE). As an SSD, the project requires the preparation of an EIS under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of the EIS is to identify and assess potential environmental, social and economic impacts associated with the construction, operation and decommissioning of the Peninsula SF and develop effective mitigation measures. The EIS has been prepared in accordance with the Secretary's Environmental Assessment Requirements (SEARs) and agency comments, issued by DPE on 18 March 2021, and outcomes of community and stakeholder consultation.

Project applicant

The project applicant, Edify, is an Australian-owned renewable energy company with significant experience in developing and financing renewable projects across Australia. Edify has financed six large-scale solar and energy storage projects in Australia, currently owns and operates the largest operational solar farm in NSW and has also finalised agreements to develop the State's largest energy storage project in 2022.

Headquartered in Manly, NSW, Edify's current portfolio provides more than 796 MW installed capacity of renewable energy, producing enough electricity to power over 280,000 Australian homes – nearly 3% of all homes in the country. Edify has broad energy expertise, covering project development, project design and engineering, financing, construction management and asset management.

Project site

The project site is located in the Forbes region of central-western NSW which is predominantly agricultural land, with the region's main sources of income being agriculture, forestry and fishing.

The site is neither regionally nor locally unique and is surrounded by comparable land in terms of topography, hydrology, soils, vegetation and land use. At the end of the project life, it is expected that rehabilitation will be able to return the land to its current agricultural use. The project therefore involves the temporary loss of 290 ha of agricultural land within a broad and consistent landscape. This temporary loss may be partially offset if sheep grazing occurs on site as part of ongoing land management.

The 290 ha of rural land within the project site (including the project footprint of about 235 ha) is highly modified due to its history of agriculture and grazing, and currently comprises both cropping and grazing land. The site is generally flat, with undulating rises towards the southern section of the site, south of Paytens Bridge Road, and a single rise in the northern section of the site. The site is zoned RU1 primary production under the provisions of the Forbes Local Environmental Plan (LEP) 2013.

Native vegetation is largely absent.

The site comprises three blocks of land, two north of Paytens Bridge Road and one to the south (see Figure S2). The main parcel of land north of Paytens Bridge Road is the Peninsula

Block (Lot 441). The other northern parcel is part of unnamed Lot 9. The land to the south of Paytens Bridge Road is part of unnamed Lot 442.

Photo S1
The site as viewed from the west looking east

Lot 441 is currently used for cropping and irregular grazing. Three dams are present on the lot and, with the exception of the dam near the mid-point of the allotment (non-development zone 3 on Figure S2), these may be infilled during construction.

Patches of remnant vegetation in the northeastern corner of the block (in non-development zone 1), and the southern part of the block (non-development zones 4 and 7 on Figure S2) have been excluded from the development footprint. A small number of paddock trees which will be removed.

No built structures or formed tracks are present on this allotment. The existing transmission line easement bisects Lot 441.

Lot 9 is currently used for cropping. One dam is present within the project site and this has been excluded from the development footprint (non-development zone 6 on Figure S2). Lot 9 has a patch of remnant vegetation in its southeastern corner that has also been excluded from the development footprint (non-development zone 5 on Figure S2). Two paddock trees that are present near the eastern fenceline, bordering Lot 441, may be removed.

No built structures or formed tracks are present on this allotment within the project site. The existing transmission line easement also bisects Lot 9.

Lot 442 is currently used for grazing. One dam is present and this has been excluded from the development footprint (non-development zone 9 on Figure S2). Lot 442 has patches of remnant vegetation in its northeastern corner and in the central and southern parts of the block, which have been excluded from the development footprint (non-development zones 10, 11 and 12 on Figure S2). A small number of paddock trees are also present and will be removed.

No built structures are present on this allotment within the project site. An old quarry (Thomas Pit) is present just south of the southern boundary of this allotment. A dirt track leads south across the allotment towards the quarry from an entrance gate on Paytens Bridge Road. The proposed access point to the southern section of the project is located at the existing entrance gate (see Figure S2).

Five scattered residences (R1 to R5) are at a distance of 0.32 m to 1.74 km from the development footprint, as shown in Figure S3. An additional nine residences (R6 to R14) are located between 2 km and 5 km of the site.

Alternatives considered

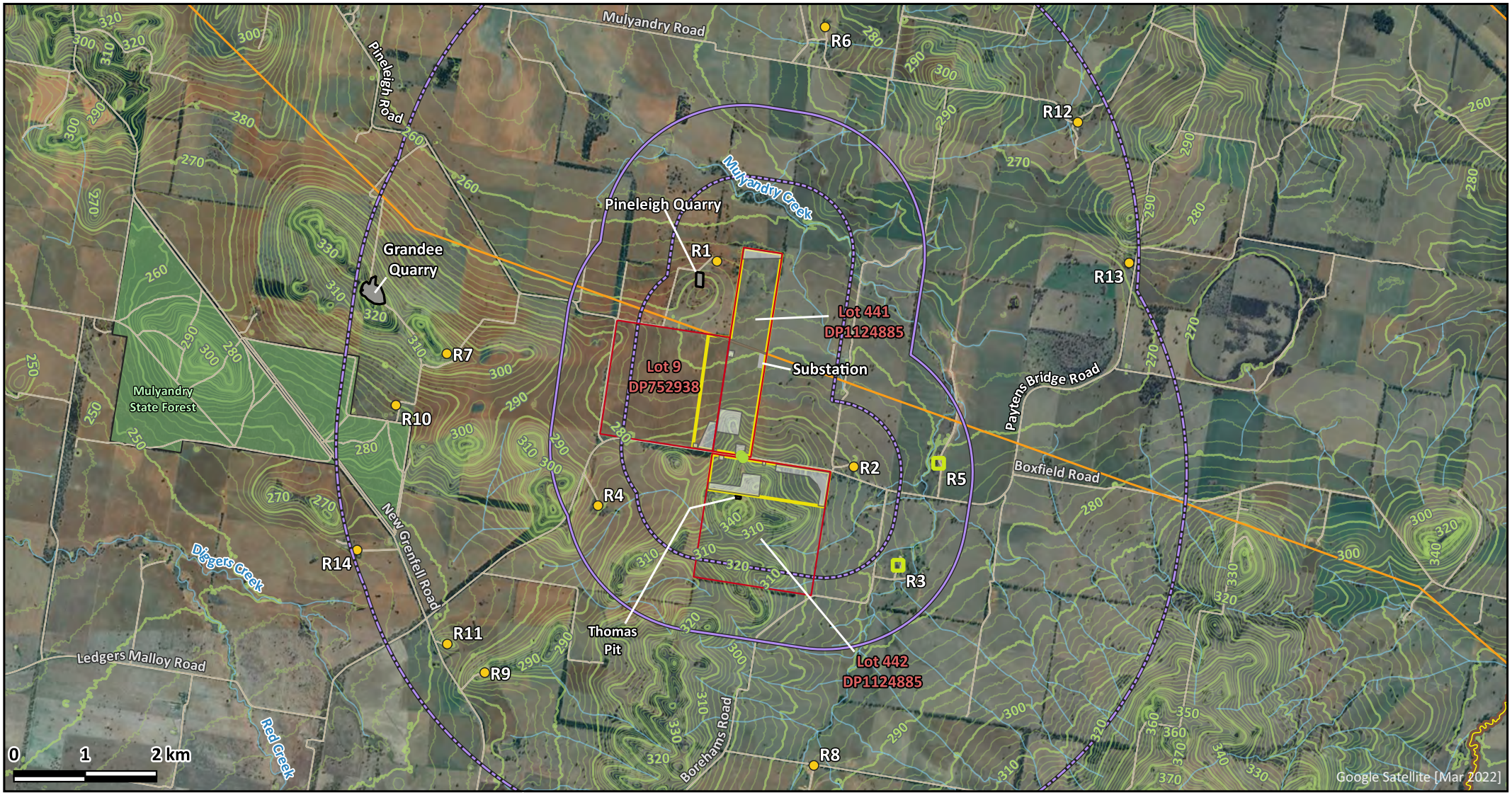
Edify has undertaken a process of constraints and opportunities analysis to identify potential development sites in NSW and other states. This process has included consideration of factors such as regulatory settings for energy projects, solar irradiation levels, access to and capacity of existing energy grids, potential for land acquisition, land suitability and the need to minimise environmental and social impacts. Therefore, avoidance and minimisation of impacts, such as clearance of native vegetation, was initially achieved through appropriate site selection.

The region in which the project is located, the Central West region of NSW, has been selected primarily due to its proximity to one of NSW's renewable energy zones (REZs) – the Central-West Orana REZ. Within this region the location of the project site has been constrained by the need to be as close as possible to an existing transmission line with capacity to accept electricity from the Peninsula SF.

Operating within these constraints, Edify searched for a site that not only meets construction and operational requirements (such as suitable topography and accessibility by major transport routes) but has low environmental values and limited potential for adverse community impact. The project site meets these selection criteria. In addition, land use conflicts with existing surrounding land uses are minimal and agricultural land use is expected to be able to be restored at the end of project life.

As Edify is considering the option of a decentralised BESS configuration where smaller BESS groupings would be distributed around the site, there is a degree of flexibility in siting these groupings within the project footprint. Accordingly, during the EIS study period, potential BESS unit locations were evaluated to establish minimum allowable distances from nearest sensitive receivers, primarily to minimise noise impacts from inverters. These locational constraints will be key inputs to the detailed design phase, should the decentralised BESS configuration be chosen.

Furthermore, Edify has some additional flexibility when choosing the location for the substation (and the centralised BESS option should this be chosen). During the EIS study period, western and eastern locations proximal to the existing 132 kV transmission line were evaluated in relation to noise, potential flood risk, visual impacts and other factors which resulted in the eastern location option being adopted.



Project site
Lot boundary
Substation
Exclusion zone
Residence - associated
Residence - non-associated
Project site access point
State Forest

1 km radius from project site
2 km radius from project site
5 km radius from project site
Main watercourse
Watercourse - tributary
Existing transmission line
Contour AHD (10 m interval)
Contour AHD (2 m interval)

N

AE1173.1 Peninsula SF
Figure S3. Sensitive receivers and topography
Created: 18/03/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4
Additional data: NSW RoadSegment, NSW Hydroline, NSW_Six_Forbes_Cadastral_data

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Edify also recognised that the location of some of the solar infrastructure in the northernmost part of the site could visually impact the nearest residence, R1, and also adversely impact on a vegetation community and threatened species. Accordingly, after assessing the visual impact, Edify decided not to develop a section of Lot 441 to minimise visual impacts on that sensitive receiver. Following the biodiversity surveys, Edify also decided to minimise impacts on native vegetation by excluding development along part of the eastern fenceline at the northern end of Lot 441 (non-development zone 1).

Additional areas within the project site were excluded from development, primarily to avoid impacts on areas of biodiversity value. A total of twelve non-development zones have been designated within the project site, as shown in Figure S2.

Photo S2 Looking southeast from the site with Forbes-Cowra Transmission line

The selection of BESS technology during the detailed design phase will provide a further opportunity to reduce environmental risk. The controls and safeguards that the BESS units are equipped with, or that are added by Edify, will be an important design consideration. Such measures are likely to include ventilation systems and fire prevention or control features.

The site is of a scale that allows for flexibility in design, thereby allowing Edify to avoid ecological and other constraints that may be identified during the EIS process.

The long-term lease arrangements for Lot 441 and Lot 442 ensure the landowners maintain their participation in the community.

A final alternative that was considered was for the project not to proceed (the 'do nothing' approach). If this were to occur, then the benefits outlined in Section 8 would be forgone.

Community engagement

Edify has prepared a high-level Community and Stakeholder Engagement Plan to guide consultation during the EIS process and the approvals phase of the project. The plan includes various methods of information dissemination (such as letter box drops and face-to-face meetings with local landholders) and opportunities for stakeholder engagement at key project milestones. The consultation program has included a four-stage Aboriginal consultation process which is being undertaken in accordance with the *Aboriginal Cultural Heritage Consultation Requirements* (ACHCRs).

The Forbes Shire Council, State agencies and the community are generally supportive of the project to date.

Edify will continue undertaking community engagement throughout the development, operation and eventual decommissioning of the project, including during the EIS exhibition and review period.

Project information has been provided on the Peninsula SF website https://edifyenergy.com/project/peninsula-solar-power-station.

The website includes an up-to-date overview of the project and offers stakeholders the opportunity to provide feedback on the project or raise concerns via a contact form.

Assessment and mitigation of impacts

Project issues and risks

The Peninsula SF project may result in a number of potential environmental and social impacts, both positive and negative. The nature and extent of these potential impacts has been assessed during the EIS process and avoidance, management and mitigation measures have been incorporated into project design, construction, operation and eventual decommissioning.

Nine higher priority issues that required assessment during the preparation of the EIS were identified, as follows:

- potential impacts on biodiversity such as plant communities and threatened and endangered species
- potential disturbance of Aboriginal cultural heritage
- potential impacts on land use and capability
- potential impacts on watercourses and hydrology
- potential traffic and transport impacts, particularly on local roads
- potential noise impacts on nearest sensitive receivers
- potential impacts on visual amenity for the nearest sensitive receivers
- hazards associated with the operation of BESS units
- social and economic impacts (positive and negative), particularly on the local community.

The project also considered a number of other issues including:

- potential impacts of waste on the environment
- the cumulative impacts of the project and other developments in the region.

Biodiversity

A biodiversity assessment was undertaken and a biodiversity development assessment report (BDAR) was prepared for the project.

The project site has been subjected to extensive historical clearing, and non-development zones have been designated by Edify within the project site to exclude most of the remaining native vegetation from project-related disturbance. Consequently, biodiversity impacts have been substantially reduced due to site selection and design. Vegetation to be disturbed consists primarily of isolated paddock trees, derived grassland and non-native vegetation. This includes the removal of up to 56.55 ha of native vegetation from two plant community types (PCTs) (PCT 267 and 282), as shown on Figure S4. The PCTs meet the condition criteria to be considered critically endangered ecological communities under the *Biodiversity Conservation Act 2016*. Additionally, one vegetation zone was found to meet the threshold criteria for listing under the *Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)*. No threatened flora species were recorded during surveys of relevant habitat and no impacts to threatened flora are therefore anticipated.

In addition to the ecosystem species generated by the biodiversity assessment method (BAM), two species credit species (Superb Parrot and Masked Owl) have been assumed to be present on the site, although only the Superb Parrot was observed during field surveys.

Offsetting is required for 278 ecosystem credits and 214 species credits.

Due to the largely cleared nature of the project site and the approach being implemented by Edify to avoid, minimise and mitigate disturbance (including proposed offsetting), impacts on biodiversity as a result of the project are expected to be minor compared with many comparably sized projects.

Cultural heritage

ABORIGINAL CULTURAL HERITAGE

The project will have an impact to Aboriginal cultural heritage values as one Aboriginal site was recorded. This artefact was identified as having high social or cultural value but low archaeological/scientific and aesthetic value and nil historical value. The artefact will be retrieved following project approval and moved to a location where it will not be impacted by the project.

With regards to intangible heritage, no specific locations were identified by the Aboriginal community within the study area as having intangible cultural significance.

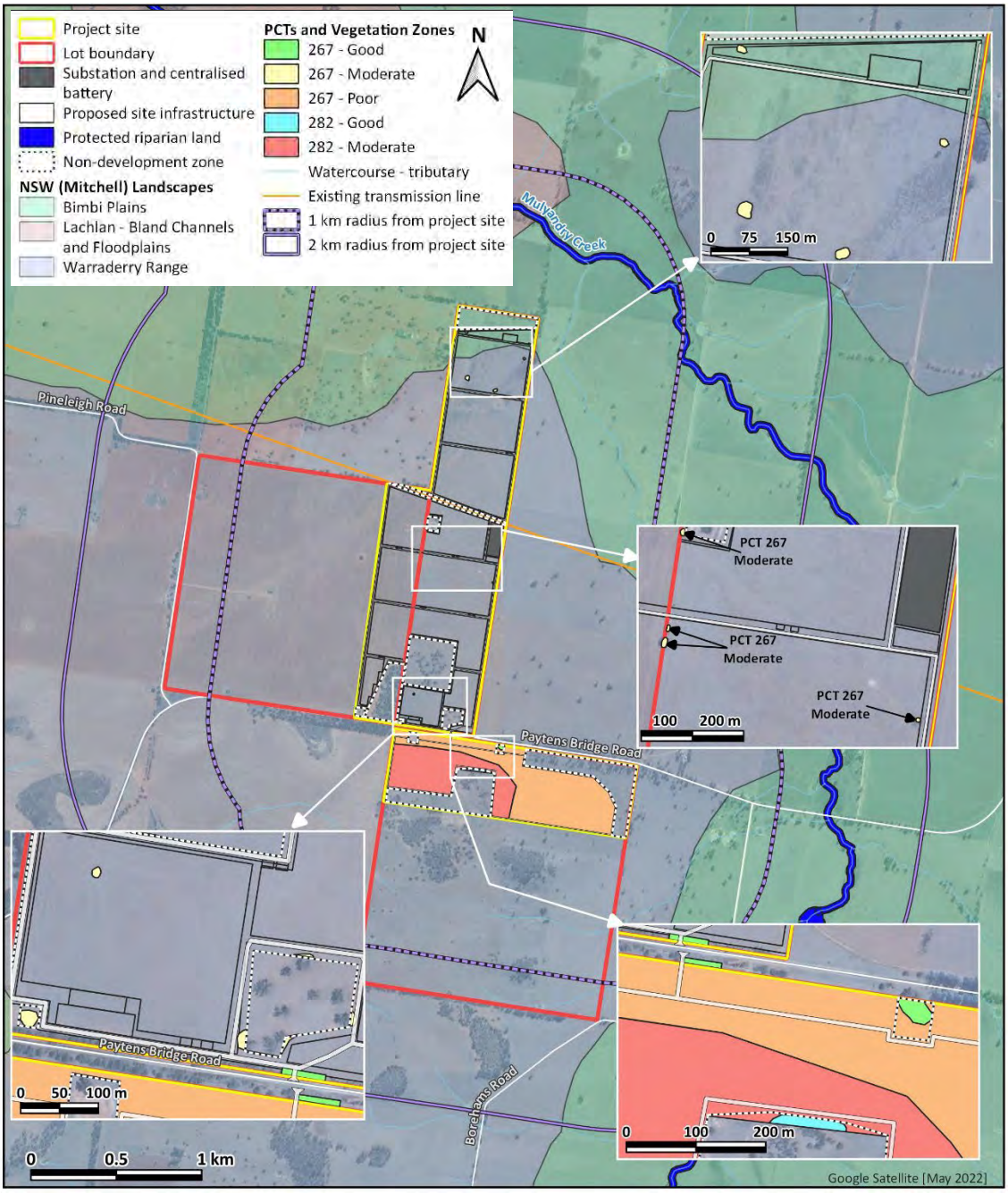


Figure S4 *Plant community types and vegetation zones identified during the vegetation survey*

HISTORIC HERITAGE

The project is not expected to result in any significant impacts on historic heritage. One item of historic heritage identified during the assessment was assessed as having no historic heritage significance under the current Heritage NSW guidelines and the Burra Charter.

Land

More than half of the project site is mapped as land and soil capability (LSC) Class 5 (moderate to low) and Class 4 (moderate), although 46.0% of the site is Class 3 (high). The nearest biophysical strategic agricultural land (BSAL) is located approximately 70 km southeast of the site.

Direct and indirect project impacts on soils, land use and agriculture are expected to be largely confined to the disturbance areas of the project site, limited in magnitude and largely reversible, provided that the proposed land management measures are implemented effectively. In particular, effective management of erosion risk during construction, drainage management during construction and operation, weed and pest species control during construction and operation, and a strong emphasis on site rehabilitation at the end of project life are required to avoid long term impacts.

The project is considered to represent a temporary change in rural land use that is compatible with the existing use of the project site for power transmission. No major land use conflicts were identified.

Water

The assessment of water and water resource impacts has identified only minor project impacts. Changes to site hydrology will be minor and reversible, although runoff controls will be required to minimise erosion risk. No impacts on groundwater are anticipated and risks to water quality are expected to be readily manageable. Modelling indicates that the project site will have no impact on flooding, as the footprint is located on the floodplain where water velocity is low. Water use during construction and operation will be minor, with water supplied from off site.

Traffic and transport

Paytens Bridge Road in the vicinity of the project site may experience an increase in traffic volumes of up to 20% during the peak construction period. This additional traffic can be comfortably accommodated without any material impact on the operation or safety of this road, although some road maintenance may be required. No turn treatments are considered to be required at the site access points to accommodate construction traffic and no line of site issues were identified. A basic right turn (BAR) treatment is proposed at the intersection of Lachlan Valley Way/Paytens Bridge Road.

Traffic impacts during operation will be negligible. Impacts during decommissioning are expected to be generally comparable to construction, although likely extending over a shorter period.

Noise and vibration

Noise levels during construction are predicted to comply with noise criteria. Increases in traffic noise will be minor and will not require mitigation.

Noise during operation is predicted to comply with noise criteria given that the eastern substation option has been adopted and the inverters will be located greater than specified minimum distances from receivers.

Vibration impacts during construction and operation are expected to be negligible.

Visual amenity

The project facilities are expected to be visible from the surrounds of three nearby sensitive receivers (residences R1, R2 and R4). However, visual impacts from within the residential compounds are expected to be negligible, provided that development is excluded, as proposed, from the northernmost area of the site. Visual impacts from local roads will be moderate to low and no mitigation is proposed. Figures S5 and S6 show views of the site from Paytens Bridge Road. Figure S5 presents the current view and Figure S6 presents the simulated view of solar infrastructure.

Hazards

A Preliminary Hazard Analysis (PHA) has been undertaken in accordance with applicable guidelines and has considered risks such as radiant heat exposure from a BESS fire, overpressure impacts from a BESS explosion, stored chemicals, and electromagnetic fields (EMFs).

The PHA has shown that risks to the public associated with the operation of the solar farm (including the BESS units) can be effectively managed by establishing appropriate separation distances between the units and the site boundary.

Bushfire risk can be effectively managed by implementing appropriate fire prevention and control measures in consultation with Fire and Rescue NSW and the NSW Rural Fire Service.

Socio-economic

The social and economic impacts of the project are expected to be positive at a state level in relation to the transition to renewable energy, and the level of investment. At a local and regional level, positive impacts will include employment and commercial opportunities (particularly during construction), and the multiplier effect i.e. the additional economic benefit accrued to the area from money being spent in the local economy. Potential adverse social impacts include reduced availability of local accommodation and services during construction due to a proportion of the workforce moving into the Forbes region from other locations.

Waste management

The project will generate a range of wastes during construction, operation and decommissioning which will be managed as far as practicable in accordance with the waste hierarchy and applicable legislation and guidelines. Many of the wastes generated are expected to be suitable for reuse or recycling. Edify is committed to recycling the solar panels and the lithium-ion batteries used in the project, where recycling opportunities exist, when they have reached the end of their life. Accordingly, no significant environmental impacts are anticipated in relation to waste management and disposal.

Figure S5 Current view of proposed Peninsula SF project site looking southwest from Paytens Bridge Road

Figure S1. Simulated view of proposed Peninsula SF project site looking southwest from Paytens Bridge Road

Cumulative impacts

There are currently eight approved or proposed energy-related SSDs in the region listed on the DPE Major Projects website in addition to the Peninsula SF. If these or other projects are developed at the same time as the Peninsula SF, then there is the potential for cumulative impacts on aspects such as land use, noise, traffic and the availability of local accommodation and services.

Cumulative impacts on aspects such as land use, noise and traffic are difficult to predict and quantify due to the uncertain timeframes of other potential developments in the region. However, such impacts will be restricted to the project's construction period, which is estimated to be approximately 16-months, given that the potential for cumulative impacts during operations will be negligible.

Strategic justification

By supporting the development of renewable energy, the project demonstrates consistency with strategic Commonwealth and State government objectives in relation to the transition from fossil fuel-based energy generation to renewable energy, including:

- the Australian Government's recent commitment to achieve net zero GHG emissions by 2050
- The NSW Government's commitment to deliver a 35% cut in emissions by 2030 under its Net Zero Plan Stage 1: 2020-2030
- The NSW Government's commitment to deliver 12 GW of network capacity within the five declared Renewable Energy Zones (REZs) under the *Electricity Infrastructure Investment Act 2020 (NSW)*. The Peninsula SF project is located within the Central-West Orana REZ.

At a regional level, the proposed project is consistent with the aims of the Forbes LEP 2013 including in relation to meeting encouraging and managing ecologically sustainable development (ESD) in Forbes.

The NSW Environmental Planning and Assessment Regulation 2000 requires the EIS to include justifications for the development, with regard to biophysical, economic and social considerations, including the principles of ESD. The project is consistent with these principles as described in the regulation.

Although the land within the project site is zoned RU1 Primary Production, State Environmental Planning Policy (Infrastructure) 2007 allows for the development, with consent, of electricity generating works in a prescribed rural zone.

Project benefits

The Peninsula SF project is expected to provide the following benefits:

- providing renewable generating capacity to the electricity grid
- providing reliability and security to the electricity grid

- providing firming capacity in the transition to renewable energy from fossil fuel generation
- employment opportunities, mainly during construction, including engagement of local contractors and materials and service providers
- increasing the capacity and experience of local workforce, contractors and service providers
- local business stimulus.

A 'do nothing' approach would forgo the benefits of the project outlined above. The project is assessed as having significant socio-economic benefits and low to negligible environmental impacts when appropriate management and mitigation measures are implemented. Not proceeding with the proposal would result in:

- the loss of a source of renewable energy that would assist the Australian and NSW Governments to reach their targets
- the loss of cleaner energy and reduced greenhouse gas emissions
- the loss of a source of additional electricity generation and supply into the grid
- the loss of social and economic benefit through the provision of direct and indirect employment and economic stimulus.

The 'do nothing' approach would avoid adverse impacts. However, the benefits of the proposed Peninsula SF outweigh such impacts.

Conclusion

Based on the findings of the EIS and the outcomes of community engagement, the project is expected to be a relatively low impact development due to the relatively simple project rehabilitation at the end-of-life (e.g. in comparison to a mine or quarry which normally require extensive end-of-life rehabilitation), and the project's location on land that has been substantially disturbed by agricultural and grazing activities, is adjacent to existing electrical infrastructure, and is remote from areas of high environmental sensitivity.

The project site does not have high environmental values. The land is neither regionally nor locally unique and is surrounded by comparable land in terms of topography, hydrology, soils, vegetation and land use. At the end of the project life, it is expected that rehabilitation will return the land to its current agricultural use. In addition, Edify is considering the potential for the site to accommodate 'agrisolar' use – the grazing of sheep among and beneath the solar panels. The project therefore involves the temporary loss of a relatively small area of land (estimated to be 290 ha) within a broad and consistent landscape.

The operation of the Peninsula SF will require very little handling of hazardous materials and will generate very little hazardous pollution or waste, other than the eventual removal of the solar panels, lithium-ion batteries and other infrastructure (which are expected to be mostly recovered/recycled) at the end of their operational life.

The project is expected to result in significant benefits to the local community and NSW by generating economic activity and contributing to the transition to cleaner electricity generation and increased energy security.

1 Introduction

1.1 Project overview

This Environmental Impact Statement (EIS) is submitted by Edify Energy Pty Ltd (Edify - the applicant) to support a Development Application (DA) for the construction and operation of a utility-scale solar farm and integrated battery energy storage system (BESS) at Paytens Bridge, southeast of Forbes, New South Wales (NSW) – the Peninsula Solar Farm (Peninsula SF) (Figure 1.1).

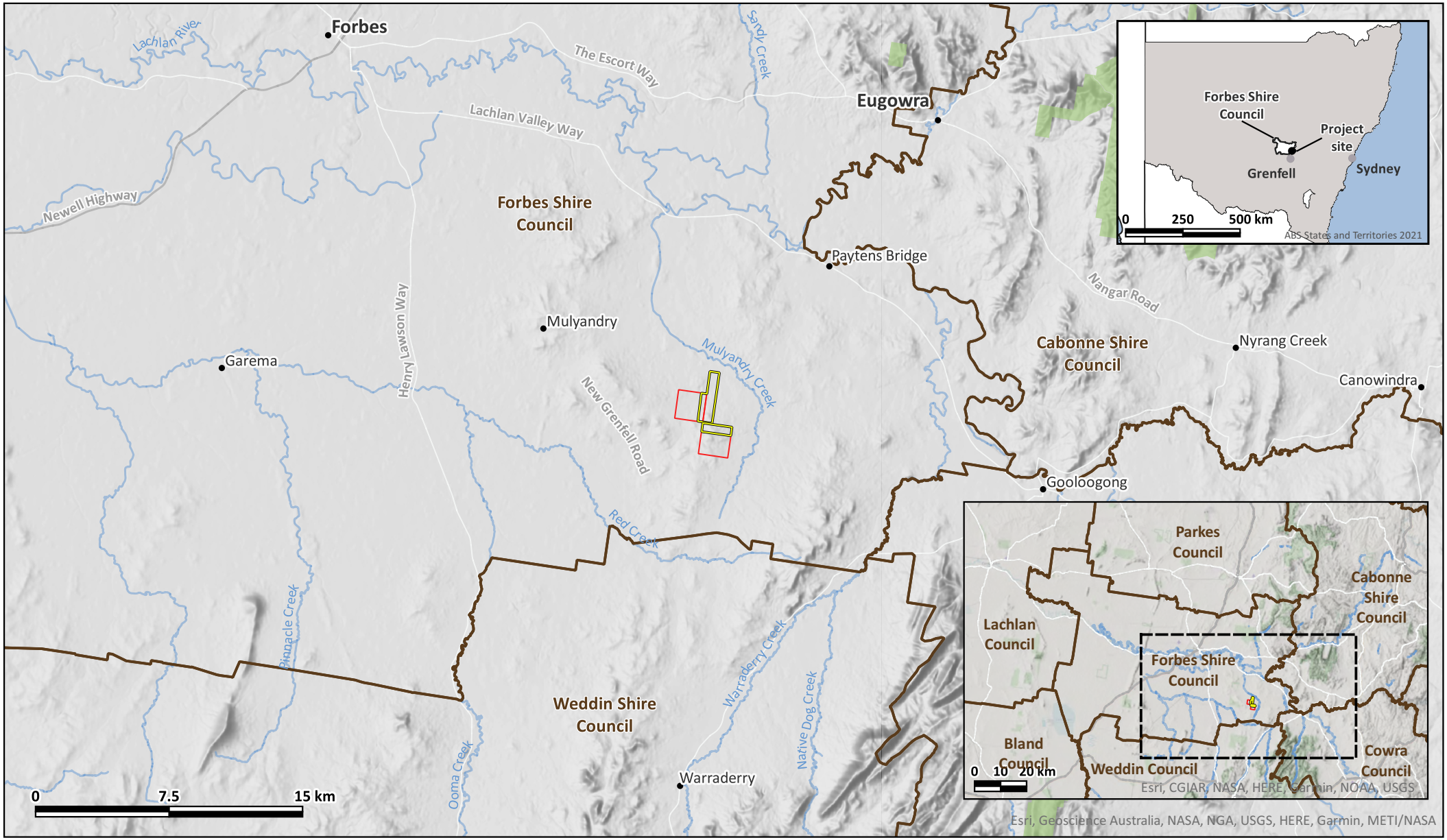
The solar farm will occupy up to approximately 290 hectares (ha) of rural land currently used for cropping and grazing comprising allotments north and south of Paytens Bridge Road and will[1] have a generation capacity up to 80 megawatt (MW) direct alternating (AC). The local context is provided in Figure 1.2 and the proposed site layout is shown in Figure 1.3. General information about the project is provided in Table 1.1 and the project is described in detail in Chapter 3.

The project site is crossed by an existing 132 kilovolt (kV) above-ground transmission line which traverses northwest-southeast through the central part of the northern section of the site. The transmission line is owned and operated by Transgrid (Line No 998) and runs from Forbes to Cowra. The line provides a suitable grid connection point for the project due to its available network capacity.

Edify refer to their fully-integrated solar farm and BESS developments, such as the proposed Peninsula Solar Farm, as 'solar power stations'. The projects use grid forming inverters with the batteries and solar photovoltaic integrated as a single, fully-integrated hybrid project, capable of controlling and dispatching the solar electricity via a control system. The key point of difference from traditional, weather-dependent 'solar farms' is that Edify's hybrid projects support the solar generation via this integrated battery system. The hybrid design provides the power system with critical services such as flexible control, congestion relief and various network support services that are integral to help maintain energy supply. To distinguish these advanced features from traditional 'solar farms', it is increasingly common to refer to fully-integrated hybrid projects as 'solar power stations'.

Project infrastructure includes solar panels, inverters, transformers, underground cabling, an integrated BESS up to 80 MW/160 megawatt hours (MWh), site office and maintenance building, access tracks, road and electrical easement crossings, perimeter security fencing, and a substation to connect the solar farm to the existing transmission line. The project will increase NSW's electricity generation capacity and provide increased dispatchable energy via the battery storage system.

[1] The use of 'will' rather than 'would' in this EIS is for stylistic purposes and is not intended to imply that the outcomes of either the project approvals process or the detailed design process are known.



Project site
Lot boundary
LGA boundary
Study area
NSW

N

AE1173.1 Peninsula SF
Figure 1.1. Regional context
Created: 16/03/2022
CRS: GDA 94 MGA 55
Page size: A4
Additional data: NSW Hydroline, NSW RoadSegment, NSW_LGA_POLYGON, NSW_STATE_POLYGON, STE_2021_AUST_GDA2020

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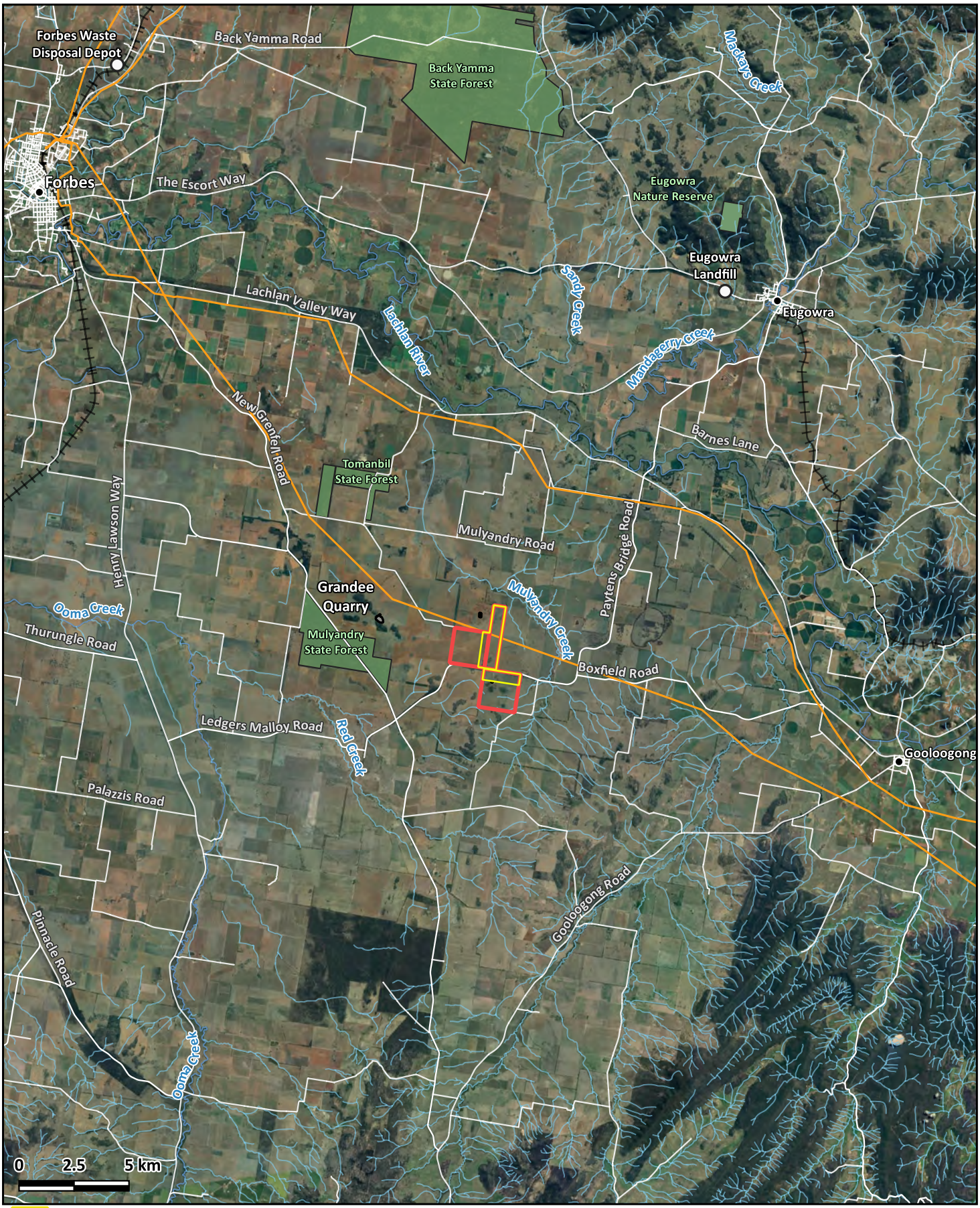

Project site
Lot boundary
State Forest and Nature Reserve
Landfill site
Quarry
Railway
Existing transmission line
Main watercourse
Watercourse - tributary

N

AE1173.1 Peninsula SF
Figure 1.2. Local context
Created: 5/05/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4
Base map: Google Satellite [Mar 2022]
Additional data: NSW RoadSegment, NSW Hydroline, NSW_Rail, NSW ElectricityTransmissionLine, NSW_Six_Forbes_Lot_Cadastral_data.

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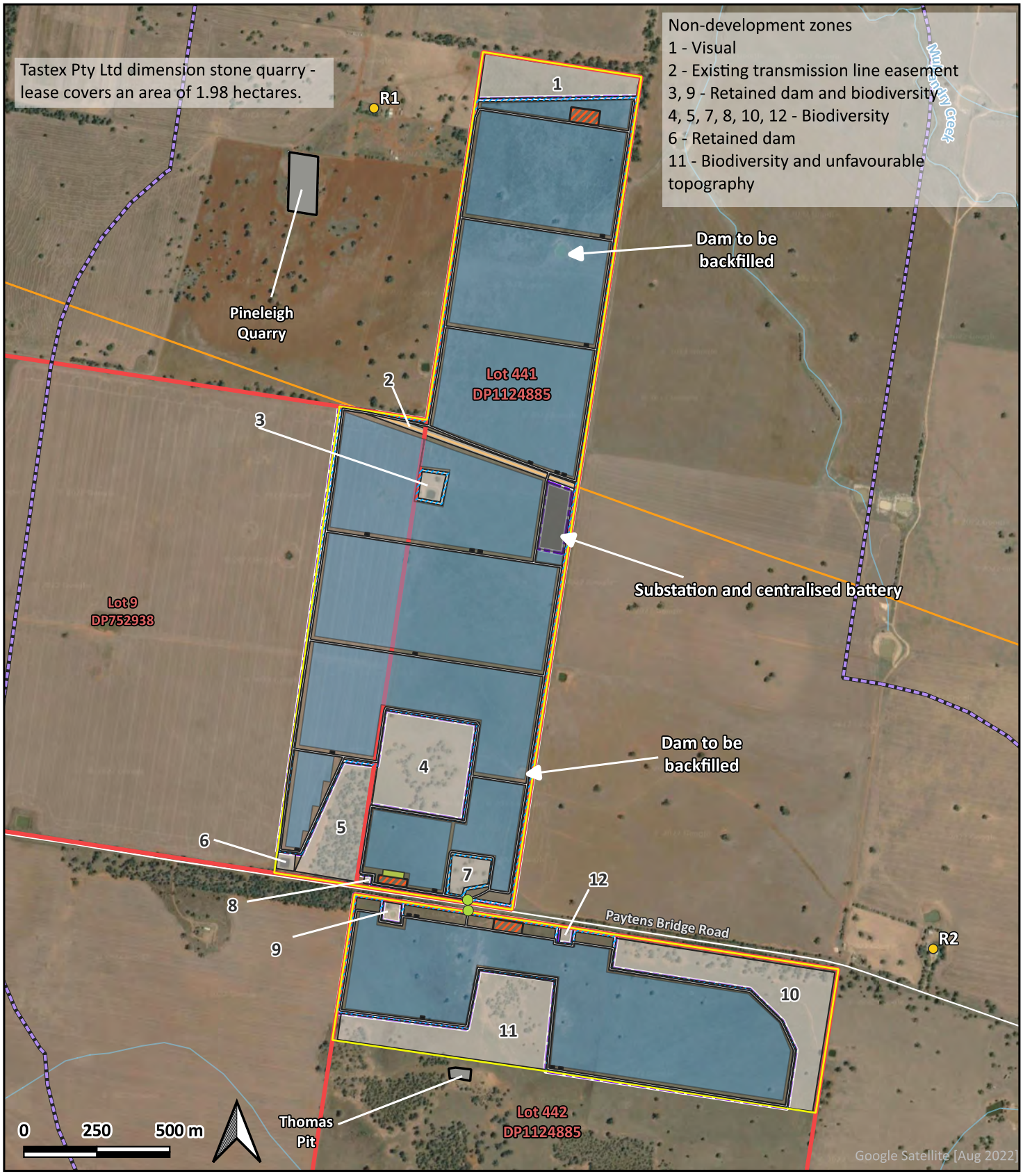

- Project site
- Lot boundary
- Non-development zone
- Asset protection zone
- BESS Enclosure and Power Conversion Unit
- Laydown area
- Operations and maintenance building
- Indicative solar panel extent
- Substation and centralised battery
- Site road
- Access point
- Site security fence
- Non-associated residence
- Existing transmission line
- Quarry
- 1 km radius from project site
- Watercourse - tributary

AE1173.1 Peninsula SF
Figure 1.3. Proposed site layout
Created: 18/08/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4

Additional data: NSW RoadSegment, NSW Hydroline, NSW ElectricityTransmissionLine, NSW bl_titlePolygon, MinView Min_occ_all_construction

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The project is located approximately 27 kilometres (km) southeast of Forbes, 34 km north of Grenfell and 270 km west of Sydney, within the Forbes Shire Local Government Area (LGA) (see Figure 1.1). The Forbes region is located in the Central West and Orana NSW region and is a predominantly rural area with the primary income being derived from agriculture. The region includes National Parks, State Forests and nature reserves (.id undated).

The project is a large infrastructure project that is expected to create up to 250 jobs during construction and up to five full-time jobs when operational. Construction is expected to take approximately 16 months.

Table 1.1 Peninsula SF project overview

Project aspect	Description
Address	Paytens Bridge Road, Paytens Bridge, New South Wales, 2871
Applicant	Edify Energy Pty Ltd, Australian Business Number (ABN) 85 606 684 995 Level 1, 34-35 South Steyne, Manly NSW 2095
Local government	Forbes Shire Council
Titles	Lot 441 DP 1124885 Lot 442 DP1124885 (part) Lot 9 DP752938 (part)
Total secured area ('project site')	Approximately 289.8 ha, comprising: 157.8 ha – Lot 441 84.2 ha – Lot 442 47.8 ha – Lot 9
Project footprint	Approximately 235.4 ha, comprising: 139.0 ha – Lot 441 56.3 ha – Lot 442 40.1 ha – Lot 9
Land use zoning	Rural zoned land (RU1), predominantly used for grazing and cropping.
Permissibility	The solar farm is permissible on land zoned RU1 under State Environmental Planning Policy (Infrastructure) 2007.
Proposed solar farm capacity	80 MW generation 80 MW/160 MWh storage
Connection	From the proposed substation to the existing Forbes-Cowra Transgrid 132 kV Transmission Line that crosses the site.
Capital investment value	A$194,894,844 (exclusive of GST)

The project site has been selected due to its proximity to electrical infrastructure, specifically the 132 kV Forbes-Cowra transmission line, its low environmental sensitivity and a lack of

locational constraints (see Section 2.6). The site is located on land zoned Rural 1 (RU1) that is used for grazing and cropping.

The project site is located within three allotments. Lot 441 DP1124885 (termed the Peninsula Block) is located wholly within the site. Lot 442 DP1124885 and Lot 9 DP 752938 will be used in part for the development (see Figure 1.3). Edify has secured land tenure with the existing landholders of Lot 441 and Lot 442 and with the landholder of Lot 9.

Two associated[1] receivers (R3 and R5) and three non-associated receivers (R1, R2 and R4) are located within 2 km of the project site (Figure 1.4).

The project site comprises three large paddocks (one on each lot) that are generally flat and largely cleared for cultivation. Native vegetation, including remnant woodland, scattered paddock trees and (in the southern section) native grasses, is found in a number of locations within and next to the site. However, remnant woodland areas have been excluded from the project footprint (see Figure 1.3 and Section 6.2)

There have been no development approvals for the project site or immediate vicinity, other than those provided for the establishment of residential dwellings and associated farm infrastructure and a small quarry (Pineleigh Quarry) approximately 500 m to the west of the project site. No restrictions or covenants are known to apply to the site.

1.2 Project objectives

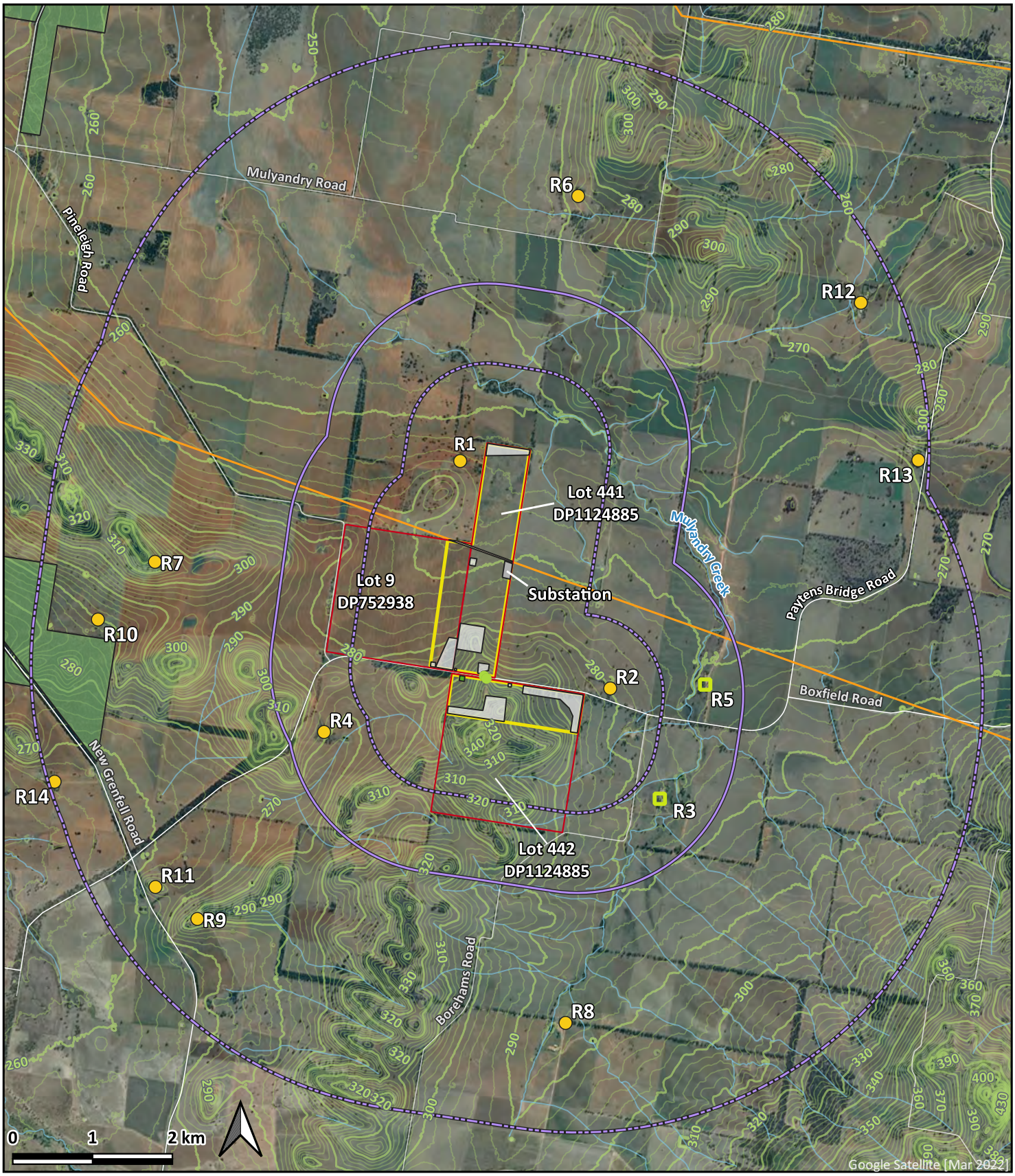
The objectives of the project are to construct a utility-scale solar farm including solar panels, BESS and associated infrastructure that will:

- dispatch up to 80 MW of electricity to the grid
- store up to 80 MW in the BESS
- generate up to 276,000 MWh per annum
- provide increased grid reliability and security during times of peak electricity demand
- support the State government objective of increasing renewable energy generation in NSW.

1.3 Project applicant

Edify is an Australian-owned renewable energy company with significant experience in developing and financing renewable projects across Australia. Edify has financed six large-scale solar and energy storage projects in Australia, currently owns and operates the largest operational solar farm in NSW and has also finalised agreements to develop the State's largest energy storage project in 2022.

[1] An associated receiver has a direct financial interest in the project proceeding, such as the owner of the land on which the project is to be located.



- Project site
- Lot boundary
- Substation location option
- Exclusion zone
- Residence - associated
- Residence - non-associated
- Project site access point
- State Forest
- 1 km radius from project site
- 2 km radius from project site
- 5 km radius from project site
- Main watercourse
- Watercourse - tributary
- Existing transmission line
- Contour AHD (10 m interval)

AE1173.1 Peninsula SPS
Figure 1.4. Sensitive receivers and topography
Created: 9/03/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4
Additional data: NSW RoadSegment, NSW Hydroline, NSW_Six_Forbes_Cadastral_data, NSW ElectricityTransmissionLine

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Headquartered in Manly, NSW, Edify's current portfolio provides more than 770 MW installed capacity[1] of renewable energy, producing enough electricity to power over 280,000 Australian homes – nearly 3% of all homes in the country. Edify has broad energy expertise, covering project development, project design and engineering, financing, construction management and asset management.

In addition to the proposed Peninsula SF, Edify has developed, or is in the process of developing, a number of renewable energy assets in NSW, including:

- the utility-scale 333 MW Darlington Point Solar Farm project, near Darlington Point in the Murrumbidgee shire, completed in 2020
- the 150 MW / 300 MWh Riverina Energy Storage System project, which will be located next to Transgrid's Darlington Point Substation and is currently under development.

1.4 Project background

The project represents Edify's continued investment in renewable energy projects throughout NSW. In particular, proximity to the Central West and Orana Renewable Energy Zone (REZ) (DPIE 2020a) was an important factor in selecting the project site, particularly as the region's power system is expected to undergo various transmission network upgrades in the coming years.

Edify spent considerable time identifying land options for the proposed project in the local and regional area. The proposed site was selected due to its proximity to existing electrical infrastructure with available capacity, its high-quality solar resource, its low environmental sensitivity, and the absence of locational constraints (see Section 2.6.1).

The project is expected to deliver benefits including:

- the creation of local employment opportunities, including approximately 250 full-time equivalent jobs during the peak construction period
- approximately five permanent jobs during the operation of the project
- indirect employment generated during construction and operation through the provision of services such as: accommodation, plant/equipment/vehicle hire, protective clothing/equipment, food/catering, cleaning, ground/fencing/building maintenance, engineering, 24 hour monitoring, project management, vegetation control and calibration services.
- increasing the capacity and experience of local workforce, contractors and service providers
- direct local investment via a Community Benefit Fund
- increased electricity generation capacity and grid support, via the solar asset.
- increased dispatchable electricity, firming and system strength services, via the BESS.

[1] The installed capacity MW values quoted in this EIS are alternating current (AC) values.

1.5 Capital investment value

The total CIV of the project (as defined in clause 3 of the Environmental Planning and Assessment Regulation 2000) is estimated to be $194,894,844 (exclusive of GST, land, marketing, financial costs and staging).

1.6 This document

The CIV of the project exceeds the A$30 million threshold that classifies the project as a State significant development (SSD). As an SSD, the project is to be assessed by the NSW Department of Planning and Environment (DPE) and requires the preparation of an EIS under Schedule 2 of the Environmental Planning and Assessment Regulation 2000 to support the Development Application (DA) for the project.

The purpose of the EIS is to identify and assess potential economic, environmental and social impacts associated with the construction, operation and decommissioning of the project and to develop effective mitigation measures where necessary. The EIS seeks to provide the community, Forbes Shire Council, the consent authority (DPE) and other government agencies with the information they require to make informed submissions or decisions on the merits of the project.

To initiate the environmental approvals process for the project, a Scoping Report (Edify 2021) was prepared to support a request to DPE for issue of the Secretary's Environmental Assessment Requirements (SEARs) for the project. The SEARs are intended to provide guidance on the process for environmental assessment and the structure and general content of the EIS.

In accordance with Clause 3, Schedule 2 of the EP&A Regulations, a written application accompanied with the Scoping Report was made to the Secretary on 22 February 2021 requesting the SEARs (Application number: SSD-14757962). The SEARs document was issued by DPE[1] on 18 March 2021.

This EIS has been prepared in accordance with the SEARs and agency comments and the outcomes of community and stakeholder consultation. The EIS has also been prepared with consideration of the *Large-Scale Solar Energy Guideline for State Significant Development* (NSW Government 2018a). The scope and structure of the EIS is consistent with the requirements of the *State Significant Development guidelines – preparing an environmental impact statement* (SSD guidelines – EIS) (DPIE 2021a).

The SEARs and agency inputs to the SEARs are provided in tabulated form in Appendix A. Each requirement is cross-referenced with the section of the EIS in which it is addressed.

The key issues listed in the SEARs fall under the following headings:

- biodiversity
- heritage
- land

[1] The SEARs were issued under the previous departmental name of Department of Planning, Industry and Environment (DPIE)

- visual
- noise
- transport
- water
- hazards
- socio-economic
- waste.

The management and mitigation measures proposed in the EIS (see Chapter 6) have been compiled in Appendix B, 'Statement of commitments'.

Where quoted, references for software used in the various studies can be found in the relevant appendices.

1.7 Project team

This EIS has been prepared by a project team from Accent along with a number of specialist consultants who were engaged by Edify and Accent to undertake the required technical assessments. Table 1.2 lists the project team members and their relevant areas of assessment.

Table 1.2 Project team

Name	Organisation	Area of assessment
Michael Cramer	Accent Environmental	Project Director and technical review
Michael Jones	Accent Environmental	Peer review
Ian Finlay	Accent Environmental	Project Manager and EIS preparation
Mark Nan Tie, Neil Wines, Dr Stanley Bellgard, Pratima Koirala, Fu Rong Mah and Jorge Orostegui	Accent Environmental	EIS preparation and technical inputs
Pratima Koirala, Jacqueline Mallinson and Lisa Singleton	Accent Environmental	Landscape and visual impact assessment
Lisa Singleton	Accent Environmental	GIS and graphics
Raymond Sim	Resonate	Noise impact assessment
Crystal Graham and Madeline Walsh	OzArk	Biodiversity impact assessment
Dr Jodie Benton and Stephanie Rusden	OzArk	Aboriginal and historic cultural heritage assessment

Name	Organisation	Area of assessment
Will Drew and Henry Ma	Impact Traffic Engineering	Traffic impact assessment
Andrew Chapman and Davide Di Mauro	Alluvium Consulting	Flood risk assessment
Dr Frank Mendham	Mendham Consultants	Preliminary hazard assessment
Michael Pilbrow	Strategic Development	Community engagement
Ryan Thomson	Denary Quantity Surveying	Capital Investment Valuation

2 Strategic context

In accordance with the SSD guidelines – EIS (DPIE 2021a), this section identifies the key strategic issues that are relevant to the assessment of the project.

2.1 Strategic project justification

A number of Government commitments and plans, at both Commonwealth and State level that provide strategic context for this project are associated with the response to climate change within the energy sector. These commitments and plans are aimed at achieving greenhouse gas (GHG) reduction while improving energy security, reducing prices for consumers, diversifying the energy mix, and facilitating the adoption of renewable technologies.

Key strategic Government and LGA commitments and plans in relation to climate change and energy generation are discussed below. They provide strong strategic support for the project at a Government policy level. A detailed justification and evaluation for the project as a whole is presented in Chapter 7, having regard to the economic, environmental and social impacts of the project and the principles of ecologically sustainable development.

2.1.1 Climate change and renewable energy

The greenhouse effect is a natural process whereby some of the sun's energy is absorbed by GHGs, increasing the temperature of the Earth's surface. Human activities, particularly burning of fossil fuels (coal, oil and natural gas), agriculture and land clearance, are dramatically increasing the concentration of GHGs and resulting in an enhanced greenhouse effect. GHGs include water vapour, carbon dioxide, ozone, methane, nitrous oxide and chlorofluorocarbons (CFCs) (DoEE 2018).

In Australia, climate change as a result of the enhanced greenhouse effect is resulting in (DoEE 2018):

- a significant increase in the frequency and intensity of global extreme weather events such as bushfires, extreme rainfall, droughts and tropical cyclones
- an increase in ocean and sea levels (and their acidity)
- changes in rainfall patterns (with wet regions becoming wetter and dry regions becoming drier).

Climate change poses a threat to Australia due to its environmental, social and economic impacts, particularly to water security, agriculture, coastal communities and infrastructure. This threat was acknowledged by scientists and politicians around the world at the 21st Conference of the Parties (COP21) in Paris in November/December 2015, where a historic global climate agreement was agreed to under the United Nations Framework Convention on Climate Change (UNFCCC), referred to as the Paris Agreement. Policies adopted in the Paris Agreement were strengthened in the recent 26th Conference of the Parties (COP26) in Glasgow in November 2021.

The Paris Agreement established a framework for all countries to take climate action from 2020, and build on existing efforts in the period up to 2020. Key objectives of the agreement include:

- A global goal to hold average temperature increase to well below 2°C and pursue efforts to keep warming below 1.5°C above pre-industrial levels.
- All countries to set mitigation targets from 2020 and review targets every 5 years to build ambition over time, informed by a global stocktake.
- Robust transparency and accountability rules to provide confidence in countries' actions and track progress towards targets.
- Promoting action to adapt and build resilience to climate impacts.
- Financial, technological and capacity building support to help developing countries implement the Agreement.

Australia signed the Paris Agreement in 2016 and has recently committed to achieving net zero GHG emissions by 2050 (DISER 2021).

The replacement of energy from fossil fuel sources with energy from renewable sources, such as solar and wind power, is a key mechanism for reducing GHGs. The Australian and NSW governments are making efforts to reduce GHG emissions through development of targets and plans in relation to renewable energy generation, which are discussed in Section 2.1.2 below. In the context of the transition to renewables, utility-scale battery projects will play a crucial role in providing firming capacity in the shift from baseload to renewable power.

2.1.2 Electricity generation in Australia

RENEWABLE ENERGY TARGET

Since 2001, the Australian Government has mandated the use of energy from renewable resources in electricity generation. In 2009, the Renewable Energy Target (RET) scheme mandated that 20% of Australia's electricity supply was to come from renewable sources by 2020.

In 2011, the RET was split into two parts comprising a large-scale RET (LRET) and a small-scale renewable energy scheme (SRES). The LRET created a financial incentive to establish and expand renewable power stations such as solar farms, wind farms and hydro-electric power stations and deliver the majority of the 2020 target. Reforms were made to the RET in 2015 with a target for large-scale energy generation of 33,000 GWh by 2020 (i.e. 23.5% of Australia's electricity supply was to come from renewable sources by 2020).

The LRET's 33,000 GWh target was met in September 2019. However, the scheme will continue to require high-energy users to meet their obligations under the policy until 2030 (CEC 2018).

The LRET scheme sits within the broader context of Australia's need to reduce GHG emissions to meet its commitments under the 1997 Kyoto Protocol and 2016 Paris Agreement.

2.1.3 Electricity generation in NSW

NET ZERO PLAN STAGE 1: 2020-2030

The NSW Government's *Net Zero Plan Stage 1: 2020-2030* (DPIE 2020b) aims to enhance the prosperity and quality of life of the people of NSW, while helping the state to deliver a 35% cut in emissions by 2030 compared to 2005 levels. A component of the plan is to develop three REZs which are intended to play a critical role in replacing retiring generators in NSW over the next two decades and bringing up to 17,700 MW of cheaper, renewable power into the grid. The REZs combine renewable energy generation, storage and electricity distribution.

ELECTRICITY INFRASTRUCTURE ROADMAP

Subsequently, the NSW Government's *Electricity Infrastructure Roadmap* (Energy NSW undated), enabled by the *Electricity Infrastructure Investment Act 2020 (NSW)*, has declared five REZs in the Central-West Orana, Illawarra, New England, South West and Hunter-Central Coast regions. These zones are to deliver an intended network capacity of 12 GW.

The Peninsula SF is located close to the Central-West Orana REZ, which aims to attract at least 3,000 MW of new renewable energy and energy storage capacity. The proposal will therefore support the goals of the NSW Electricity Strategy (NSW Government 2018), which include:

- delivering Australia's first coordinated REZ
- saving energy, especially for times of peak demand
- supporting the development of new electricity generators
- establishing a target to bolster the state's energy resilience.

2.2 Land use planning

The planning context for the project at a regional and local level is primarily described in the Forbes Local Environmental Plan (LEP) 2013, which is supported by the Forbes Development Control Plan (DCP) 2013 (FSC 2014) and the Forbes Community Strategic Plan (CSP) 2018 – 2028 (FSC 2018). In addition, the Central West and Orana Regional Plan 2036 (DPE 2017) is a State-level planning strategy document that provides context for land use planning in the region.

These four documents are discussed below in relation to the project.

The project is not linked to any existing planning process that has addressed the relevant environmental impacts.

2.2.1 Forbes Local Environmental Plan 2013

The project site is located within the Forbes Shire Council boundaries and is therefore subject to the relevant provisions of the Forbes LEP 2013.

The LEP provides local environmental planning provisions for land in the Forbes region in accordance with the relevant standard environmental planning instrument under Division 3.2 of the EP&A Act.

AIMS OF THE LEP

The aims of the LEP include the following that are of particular relevance to the proposed Peninsula SF project:

- encourage and manage ecologically sustainable development in Forbes
- reinforce the rural character of Forbes while promoting sustainable development
- protect the agricultural land of Forbes for continued agricultural production while allowing for planned expansion at the urban fringe
- protect, enhance and conserve the natural environment, including the Lachlan River, Lake Forbes, wetlands, native vegetation, environmentally sensitive land and other natural features that provide habitat for fauna and flora, provide scenic amenity and that may prevent or mitigate land degradation.

The proposed project is consistent with the aims of the LEP, particularly in relation to meeting encouraging and managing ecologically sustainable development in Forbes, as discussed in further detail in Chapter 7.

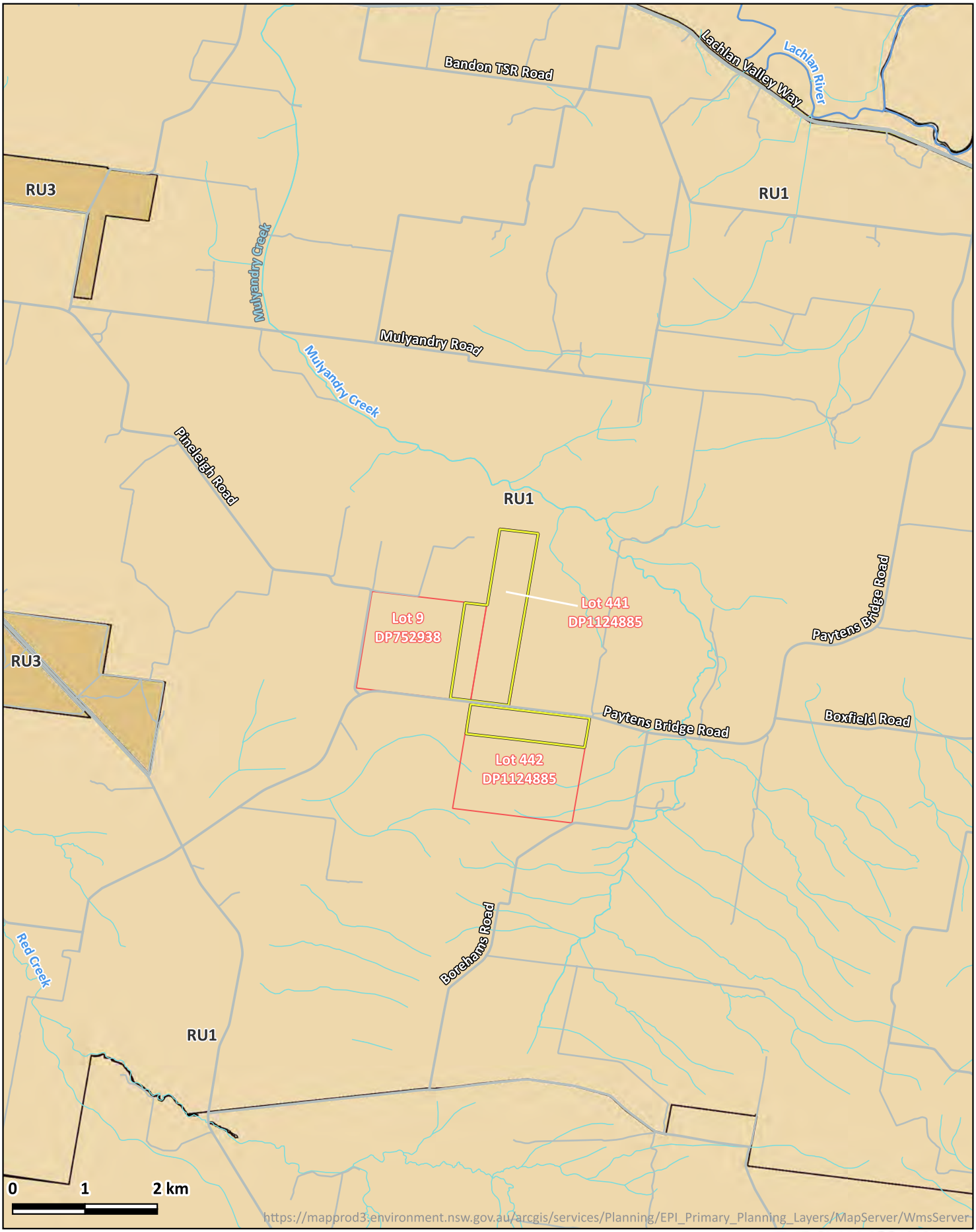
LAND ZONING

The proposed Peninsula SF is located on land zoned RU1 Primary Production (Figure 2.1). The objectives of the RU1 zone, as set out in the LEP, are to:

- encourage sustainable primary industry production by maintaining and enhancing the natural resource base
- encourage diversity in primary industry enterprises and systems appropriate for the area
- minimise the fragmentation and alienation of resource lands
- minimise conflict between land uses within this zone and land uses within adjoining zones
- provide opportunities for intensive and extensive agriculture in appropriate locations consistent with the environmental capability of the land.

Although not a primary industry project and being a project that requires consent, the Peninsula SF project is not otherwise inconsistent with these objectives. The project is not incompatible with primary industry use of adjacent land or land uses (see Section 6.5.5) within adjoining zones and will help promote local diversity and employment opportunities. In addition, it is anticipated that the site will be decommissioned and rehabilitated to return the land to its existing use at the end of its operational life.

The State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP) allows for the development, with consent, of electricity generating works or solar energy systems in a prescribed rural zone (see Section 4.2). Under Chapter 2 (Infrastructure) Part 2.3 (Development controls) Division 4 (Electricity generating works or solar energy systems) of the Transport and Infrastructure SEPP, land zoned RU1 is classified as a prescribed rural zone.



Project site
Lot boundary
RU1 - Primary Production
RU3 - Forestry
Main watercourse
Watercourse - tributary

N

AE1173.1. Peninsula SF
Figure 2.1. Project site land zoning

Date created: 14/02/2022
CRS: GDA 94 MGA 55
Page size: A4
Additional data: NSW Hydroline, NSW RoadSegment and NSW Land Parcel and Property Theme - Lot

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ADDITIONAL LOCAL PROVISIONS

The LEP contains a number of additional local provisions relating to matters such as earthworks, terrestrial biodiversity, groundwater vulnerability, riparian land and watercourses, wetlands, salinity and essential services. These provisions are considered further, where relevant, in Chapters 6 and 7.

SUBDIVISION

The project site is located within Zone RU1 for subdivision. Section 4.2 of the LEP states that the size of any lot resulting from a subdivision of land to which this clause applies is not to be less than 200 ha.

Part of Lot 442 will be subdivided from the proposal as it is not ideal for the proposal layout, and thus the landowner can continue farming practices. A subdivision is also required at Lot 9, to enable the western portion of the Lot to be separate from the project and continue to be used for agricultural purposes.

As part of Lot 441 will be leased, subdivision for the purpose of the internal substation and battery facility will be required. Forbes Shire Council has indicated its support of subdivision in initial consultation with Edify.

The lots intersecting the project site and the proposed subdivision of lots is shown in Figure 2.2.

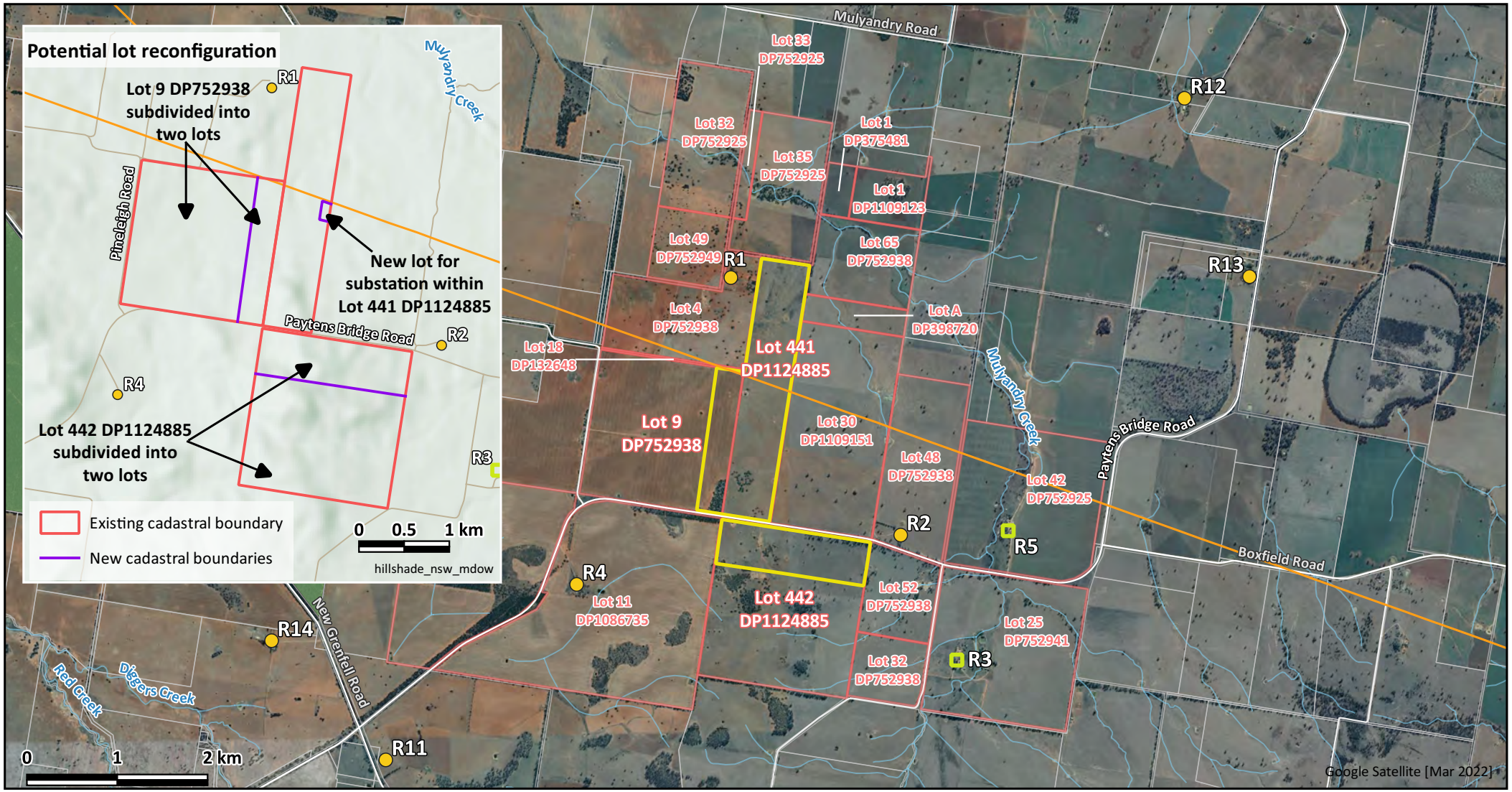
2.2.2 Forbes Development Control Plan 2013

The Forbes DCP (FSC 2014) has been prepared pursuant to Part 3 of the EP&A Act. Where the Forbes LEP 2013 permits a development and a DA must be submitted, the DCP provides further guidance and more detailed requirements that specific proposals must address.

The objectives of the DCP that are of particular relevance to the Peninsula SF project are to:

- ensure a high quality of subdivision and delineation of allotment boundaries throughout the Forbes Shire
- encourage site responsive development which reflects the opportunities and constraints of individual sites and preserves or enhances its special qualities
- ensure development is consistent and compatible with the established streetscape and character and enhances the amenity of residential areas
- assist developers and applicants in the preparation and submission of applications in order to expedite the assessment process.

The proposed project is consistent with the objectives of the DCP, including in relation to encouraging site responsive development reflecting the opportunities and constraints and preserving or enhancing its special qualities (as outlined, as relevant, in Chapter 6), and ensuring development is consistent and compatible with the established streetscape and character as outlined in Chapter 7.



Project site
Lot boundary
Non-associated residence
Associated residence
Existing transmission line
Watercourse - tributary

N

AE1173.1 Peninsula SF
Figure 2.2. Project lots and proposed subdivision
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Additional data: NSW RoadSegment, NSW Hydroline, NSW_Six_Forbes_Lot_Cadastral_data

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Section 2 of the DCP outlines the preparation of an application process, including matters to be addressed in an environmental effects statement, including issues such as site suitability, present and previous uses, compliance with development standards, DCP and/or other design guidelines, operation and management, access and traffic, general pedestrian or other accessibility, privacy, views and overshadowing, air and noise, drainage, erosion and sediment control, heritage, waste and site management.

These aspects are considered, where relevant, in Chapter 6.

2.2.3 Forbes Community Strategic Plan 2018 – 2028

The *Forbes Community Strategic Plan 2018 – 2028* (FSC 2018) has been prepared pursuant to the *Local Government Act 1993*. The Forbes CSP is the overarching strategy that provides Council, community and other stakeholders with priority issues to address and goals for achievement in the longer term. The goals of the Forbes CSP of particular relevance to the Peninsula SF project are to:

- foster and support the sourcing of local skilled and unskilled labour by public and private sector employers (Strategy LE3)
- ensure that public and private sector entities and business work co-operatively to strengthen and expand the Shire's economic base (Strategy LE6)
- promote the Shire as an ideal location for investment and the establishment of innovative, sustainable businesses and light industry (Strategy LE7)
- foster an ethic in community spending to first "try local" when purchasing goods and services (Strategy LE10)
- identify and develop appropriate sustainable energy supply options, such as wind and solar power generation (Strategy NE7)

The development of the project is consistent with these goals, in particular Strategy NE7.

2.2.4 Central West and Orana Regional Plan 2036

The Central West and Orana Regional Plan 2036 (DPE 2017) describes the NSW Government's vision for the Central West and Orana – the region in which the Peninsula SF project is located – which is to create a leading and diverse regional economy in NSW, with a vibrant network of centres building on the opportunities associated with being at the geographical centre of NSW.

The Government has set four goals for the region to achieve this vision. These are to create:

- the most diverse regional economy in NSW
- a stronger, healthier environment and diverse heritage
- quality freight, transport and infrastructure networks
- dynamic, vibrant and healthy communities.

The development of the project is consistent with these objectives, in particular the development of a diverse regional economy and infrastructure networks.

2.3 Key features of the site

The Forbes LGA is part of the NSW South Western Slopes Bioregion (NSW NPWS 2003). This bioregion is dominated by a subhumid climate that generally experiences hot summers and cool wet winters. The Bureau of Meteorology (BOM) climate records available from the nearest climate station at Grenfell automatic weather station (AWS) (Station Number 073014) approximately 37 km southeast of the site, consists of data recorded since 1885 as follows (BOM 2021a):

- the highest mean maximum temperature occurs in January (31.9°C) and the lowest mean maximum temperature occurs in July (13.0°C)
- the highest mean minimum temperature occurs in January (16.4°C) and the lowest mean minimum temperature occurs in July (3.0°C)
- the highest monthly rainfall occurs in June (58.6 millimetres (mm)) and the lowest monthly rainfall occurs in June (46.5 mm)
- mean annual rainfall of 620 mm, with rainfall generally being greatest over summer and winter, with the mean number of days of rain being 69.1.
- wind speeds average between 8.2 and 13.5 kilometres per hour (km/h) at 9 am, with the strongest winds during the spring and summer months (predominantly from the north and northwest).

Most of the project site is flat with low hills present towards the southern section (south of Paytens Bridge Road) and a single low hill in the southern part of the northern section (north of Paytens Bridge Road) (see Figure 1.4). No defined natural waterways occur across the site. Mulyandry Creek is located to the east and north of the project site (within approximately 600 metres (m) at its closest point), within the catchment of the Lachlan River which is located approximately 9 km to the north (see Figure 1.2).

The three large paddocks on which the project site is located are largely cleared and cultivated for agricultural purposes. Native vegetation is found in a number of locations within and next to the site, including (see Figure 1.3):

- Lot 441, within the site: patches of remnant woodland, occasional scattered paddock trees and some fence-line vegetation
- Lot 442, within the site: patches of remnant woodland, primarily confined to hilly areas, scattered paddock trees and fence-line vegetation with patches of native grasses
- Lot 9, within site: a 5-ha patch of remnant woodland in the southeast corner, and fence-line vegetation
- Paytens Bridge Road: verge vegetation on both sides of the road.

Lot 441 DP1124885 (the Peninsula Block) is the main lot for project development and will contain the proposed substation and grid connection. Up to 62 ha of Lot 442 DP1124885 and up to 43 ha of Lot 9 DP 752938 will also be occupied by the project.

Paytens Bridge Road (a dual lane council road) bisects the site, running between the northern section (comprising lots 9 and 441) and the southern section (Lot 442) (see Figure 1.3). The only built infrastructure within the project site is the 132 kV Transgrid Forbes-Cowra Transmission Line passing diagonally across the northern section of the site (Photo 2.1). No houses or farm buildings are located on the site.

Photo 2.1 The 132 kV Transgrid Forbes-Cowra Transmission Line crossing the project site, looking east

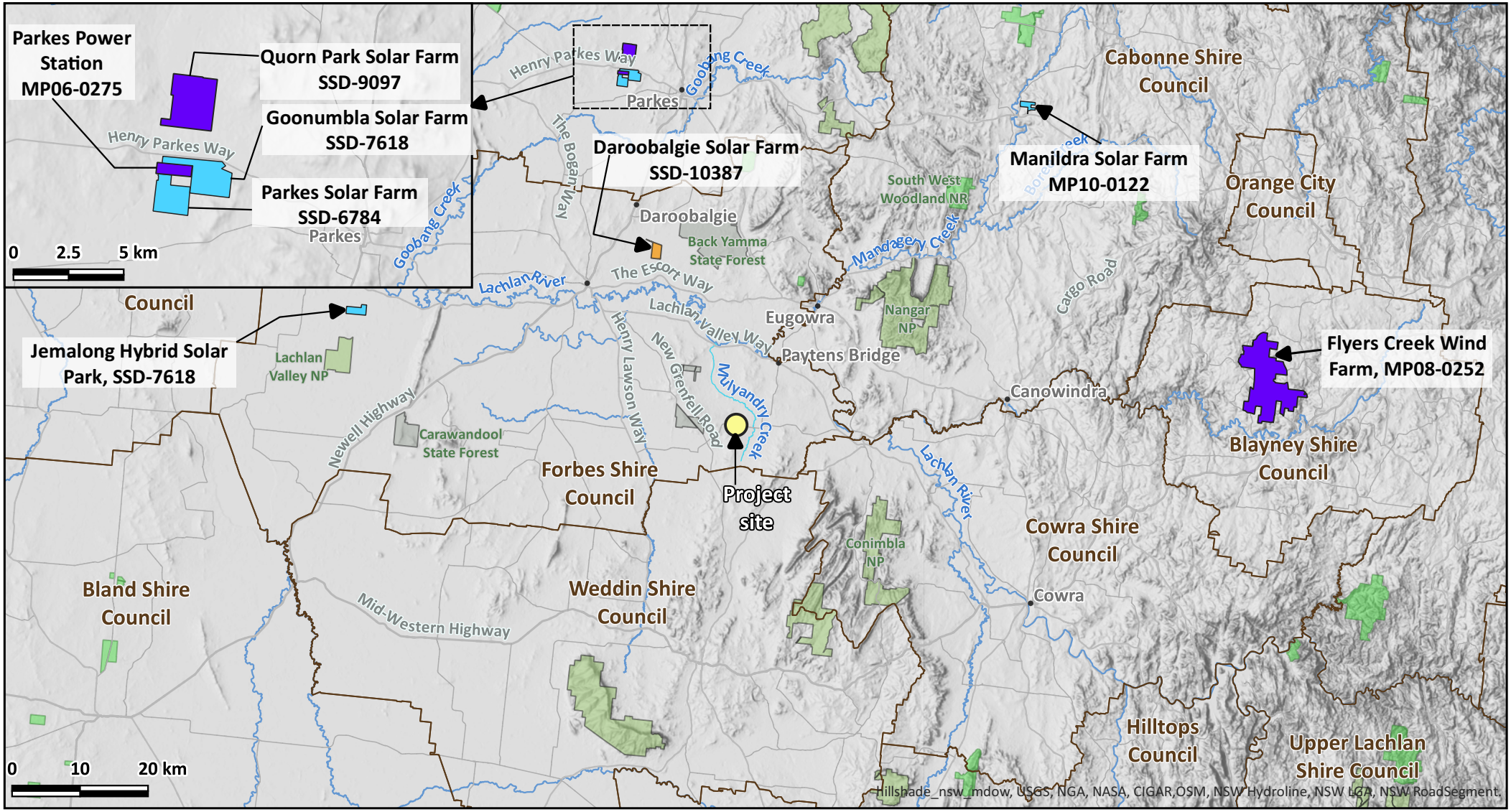
The three non-associated receivers that are located within 2 km of the project site (R1, R2 and R4) are owned by local landholders. Only R1 and R2 were occupied at the time of the assessment but R4 has recently been sold so could soon become occupied. The closest receivers are R1 located 300 m west of the northern area of the site and R2 located 580 m northeast of the southern area of the site (see Figure 1.4).

2.4 Potential for cumulative impacts

The Peninsula SF project has the potential to generate cumulative impacts with other existing, approved or proposed developments in the region. A search of the Major Projects website (NSW Government 2021a) was conducted on 15 December 2021 to identify SSDs in the area that may impact on the proposed Peninsula SF project and/or which may be impacted by the project.

ENERGY-RELATED SSDS

There are currently eight developed, approved or proposed energy-related SSDs listed on the Major Projects website in the Forbes LGA and neighbouring LGAs, in addition to the Peninsula SF project. The closest of the SSDs is the Daroobalgie Solar Farm, approximately 25 km northwest of the site. The SSDs are shown in Figure 2.3 and listed in Table 2.1.



Project site
LGA boundary

Other energy-related SSDs

Proposal
Approved
Operational

National Park
Nature Reserve
State Forest
Main watercourse
Watercourse - tributary

N

AE1173.1 Peninsula SF
Figure 2.3. Energy-related SSDs in the vicinity of the project
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NON-ENERGY-RELATED SSDS

There are currently two developed, approved or proposed non energy-related SSDs listed on the DPE Major Projects website in the Forbes LGA and neighbouring LGAs. These two SSDs are listed in Table 2.2.

Table 2.1 Other energy-related SSDs in the vicinity of the project

Name	Number	Status	Distance from Peninsula SF
Forbes LGA			
Jemalong Hybrid Solar Park	SSD-8803	Operational	55 km west-northwest
Daroobalgie Solar Farm	SSD-10387	Proposed - EIS was submitted to NSW DPE in March 2022 and concluded public exhibition 19 April 2022.	25 km north-northwest
Cabonne LGA			
Manildra Solar Farm	MP10_0122	Operational	60 km northeast
Blayney Shire LGA			
Flyers Creek Wind Farm	MP08_0252	Approved	70 km east
Parkes LGA			
Parkes Power Station	MP06_0275	Approved	50 km north-northwest
Quorn Park Solar Farm	SSD-9097	Approved	50 km north-northwest
Parkes Solar Farm	SSD-6784	Operational	50 km north-northwest
Goonumbla Solar Farm	SSD-7618	Operational	50 km north-northwest

Table 2.2 Other non-energy SSDs in the vicinity of the project

Name	Number	Status	Distance from Peninsula SF
Weddin Shire LGA			
Grenfell Poultry Breeder Farm	SSD-13855453	Exhibition	25 km south
Parkes LGA			
Parkes Hospital Redevelopment	SSD-6107-MOD-2	Approved	45 km north-northwest

2.5 Agreements with other parties

Edify is considering agreements with other parties to mitigate or offset the impacts of the project. These may take the form of a voluntary planning agreement (VPA) or benefit-sharing scheme. Edify is currently negotiating a VPA with the Forbes Shire Council (see Section 5.4.4).

Edify has executed agreements with the landholders of Lot 441 DP1124885 and Lot 442 DP1124885 for the long term lease of the land within the project site and has also negotiated an agreement with the owner of Lot 9 DP752938 to purchase part of this lot. However, the terms of these landholder agreements are not relevant to the assessment of project impacts.

As only part of Lot 441 in DP 1124885 will be leased, subdivision for the purpose of the internal substation and battery facility will be required. Forbes Shire Council has indicated its support of subdivision in initial consultation with Edify.

2.6 Alternatives considered

2.6.1 Site selection

Edify has undertaken a process of constraints and opportunities analysis to identify potential project sites in NSW and other states. This has been undertaken using a combination of computer modelling and analysis, and on-the-ground surveying and observation, together with Edify's experience in successfully developing projects in NSW and across Australia. This process has included consideration of factors such as:

- regulatory settings for renewable energy projects
- solar irradiation levels
- access to and capacity of existing energy grids
- potential for land acquisition
- land suitability (e.g. topography, existing land-use, flood risk, zoning)
- need to minimise environmental and social impacts (e.g. avoiding sensitive environments or areas of cultural heritage value).

The Peninsula site was chosen because it provides the optimal combination of:

- access to existing transmission network connecting to the national grid, specifically the 132 kV Forbes-Cowra Transmission Line
- high levels of available capacity on the grid transmission system
- high quality solar resource
- low environmental sensitivity and absence of locational constraints due to:
  - the project site comprising predominantly cleared cropping land, with little remaining native vegetation
  - the flat terrain of the site, for cost effective construction

- an acceptably low flood risk
- the low density of the surrounding population and limited number of neighbouring properties
- the suitable planning context of the site including an absence of zoning issues or restrictive planning overlays
- the access of the site to a suitable road network.

The site is of a scale that allows for flexibility in design, allowing Edify to avoid ecological and other constraints that may be identified during the EIS process.

The long-term lease arrangements for Lot 441 and Lot 442 ensure the landowners maintain their participation in the community.

2.6.2 Project design and configuration

The Peninsula SF project will have the ability to generate and supply power to the grid during higher demand periods and will also have the ability to store power during lower demand periods for feeding back into the grid during higher demand periods. The Peninsula SF project provides increased reliability and security to the network during peak periods.

The substation's size is based on the generation capacity of the photovoltaic (PV) array and the storage capacity of the BESS.

PV solar technology was chosen because it is cost effective, low profile, durable and flexible in relation to layout and siting. It is a proven and mature technology that is readily available for broad scale deployment at the project site.

The solar farm will consist of a number of solar array areas or blocks comprised of PV modules (solar panels) arranged in a series of long rows. The modules are mounted on frames which are fixed to piles driven into the soil. This method of installation includes an ability to track the sun's path throughout the day, in order to maximise the electricity yield that is generated. This installation was chosen for its simplicity, maturity and cost-effectiveness, and because it allows retention of existing grassland vegetation in situ with minimal ground disturbance.

As the solar farm arrangement is flexible and adaptable, it can be designed to avoid environmental impacts, where feasible, and minimise/mitigate impacts if avoidance is not possible.

Battery technology was selected over mechanical or physical storage methods because it enables modular installation without major infrastructure or specialised landform features. Batteries also generally have lower weight and physical volume and better scalability compared to other technologies.

Depending on an economic and technical assessment that will be undertaken during the project's Connection Application phase with Transgrid and the Australian Energy Market Operator (AEMO), the BESS will be located either:

- in a single, centralised location, next to the substation, or
- distributed in modular enclosures throughout the site, in a decentralised manner similar to typical solar inverter enclosures.

The selection of PV and BESS technologies for the Peninsula SF project, including supporting components such as inverters, transformers and switchgear, will be an outcome of detailed design, and the engineering, procurement and construction (EPC) process. The selection of technologies will be based on factors such as the project performance parameters, capital and operational costs, the proven reliability and performance of the technologies, and safety and amenity considerations.

2.6.3 Project footprint and micro-siting

As a result of the studies undertaken for this EIS, and discussions with neighbouring landowners, Edify has gained a detailed understanding of key environmental and social constraints of the current project site, thereby enabling further refinement of the project to avoid key issues.

A number of areas within the site have been avoided to minimise project impacts. These areas have been designated non-development zones and include (see Figure 1.3):

- retained dams and biodiversity areas, such as woodland areas (see Section 6.2)
- a zone in the north of the site that has been excluded from development to minimise visual impacts (see Section 6.9).

The availability of land within the project site is also constrained to a minor extent by the presence of the easement for the existing transmission line crossing the site (see Figure 1.3).

Based on the outcomes of the preliminary hazard assessment (see Section 6.10), a separation distance of approximately 25 m between the BESS units and the site boundary has been provisionally adopted. This separation distance does not account for risk mitigation measures that are likely to be incorporated into the BESS unit technology, when selected, or adopted during the detailed design phase, and the distance may therefore be reduced.

Edify's preferred site entry points are directly off Paytens Bridge Road with both the northern and southern access locations shown on Figure 1.3. These provide greatest ease of access and sufficient sighting distances from both directions, thereby avoiding potential safety hazards.

The avoidance of key areas of environmental significance within the project site, in combination with appropriate environmental safeguards during construction of the project (to be detailed in the project's environmental management plans), is expected to ensure that the development meets the requirements to avoid and minimise impacts on environmental values.

2.6.4 Access route evaluation

Various site access route options were evaluated. Rail was considered a safer and more efficient option than long distance haulage for transporting project components into the region (to a rail siding at Forbes) during construction. Road haulage to site from Forbes via Lachlan Valley Way and Paytens Bridge Road is the preferred option as it minimises the use of local roads and involves fewer intersections.

2.6.5 A ‘do nothing’ approach

A ‘do nothing’ approach would forgo the benefits of the project outlined in Chapter 7. The project is assessed as having significant socio-economic benefits and low to negligible environmental impacts when appropriate management and mitigation measures are implemented.

Not proceeding with the proposal would result in:

- the loss of a source of renewable energy that would assist the Australian and NSW Governments to reach their targets
- the loss of cleaner energy and reduced greenhouse gas emissions
- the loss of a source of additional electricity generation and supply into the grid
- the loss of social and economic benefit through the provision of direct and indirect employment and economic stimulus.

The ‘do nothing’ approach may avoid adverse impacts. However, it is considered the benefits of the proposed solar farm outweighs any such impacts.

3 Project description

3.1 Overview

The Peninsula SF will comprise up to 192,000 PV modules (assuming each module is 500 watts (W)), known more commonly as solar panels. The solar panels use the same type of technology as commonly used in residential solar installations throughout Australia but are larger in size. The panels will be mounted in rows on horizontal tracking or fixed tilt systems.

The solar panels will generate direct current (DC) electricity that will be inverted to alternating current (AC) electricity (which is the standard form of electricity used throughout Australia). The solar panels interconnect to form a solar array of up to either 4 MW (AC) or 8 MW (AC) capacity. Associated with each array will be a prefabricated, containerised inverter and integrated transformer to convert and step up the voltage level.

The project will also feature a BESS comprising sealed lithium-ion batteries housed in multiple secure, climate-controlled enclosures (BESS units). Subject to economic and technical considerations, the BESS is anticipated to be an approximate 80 MW/160 MWh rated capacity battery storage system. The BESS units will be distributed throughout the site or consolidated in a centralised location next to the substation.

The solar arrays and inverter enclosures will be installed on frames supported by steel piles and will sit above ground level. The arrays will have a maximum height of 4.2 m at full solar panel tilt and the inverter enclosures a height of up to 3 m**.**

Electrical connections will also be installed between the solar arrays, as well as associated monitoring and protection equipment and central inverters, via underground or frame-secured cabling.

Each inverter will be connected to a central 33 kV switchboard by underground medium voltage cable reticulation.

The switchboard will be connected to a high voltage substation occupying a footprint of approximately 120 m by 120 m**.** The substation will connect the solar farm to the 132 kV above-ground transmission line, owned and operated by Transgrid.

The project is expected to have a workforce of up to 250 during construction. The workforce during operation is expected to be five full time equivalent positions. Construction is expected to take approximately 16 months.

3.2 Physical layout and design

The infrastructure design and site layout aspects of the Peninsula SF are discussed below.

Edify is seeking to maintain flexibility in design to allow for the outcomes of technology selection and detailed design. Edify has therefore not finalised the selection of BESS technology and has two BESS concepts that are being considered; one being a centralised BESS and the other being a decentralised or distributed BESS layout.

The impact assessment studies have been scoped to take both these BESS concepts into account.

After considering two options for the location of the substation (both of which were next to the 132 kV transmission line that crosses the project area), Edify has adopted the location adjacent to the eastern site boundary (see Figure 1.3) to minimise noise impacts during operation (see Section 6.8).

3.2.1 Key project components

Key infrastructure items to be installed for the project include:

- PV modules (solar panels) interconnected to form solar arrays of up to either 4 MW (AC) or 8 MW (AC) capacity
- inverters and integrated transformers combined in prefabricated enclosures to convert and step up the voltage level (one inverter and transformer for each solar array)
- metal mounting structures
- above-ground and underground DC cabling (low voltage (LV)) between solar arrays and inverters, as well as associated monitoring and protection equipment and central inverters via underground or frame-secured cabling
- central 33 kV switchboard (ring main unit)
- underground medium voltage cabling between inverters and central switchboard
- BESS units comprising sealed lithium-ion batteries housed in a secure, climate-controlled enclosure
- a high voltage (HV) substation to connect the solar farm to the national transmission network
- a prefabricated operations and maintenance (O&M) building with a footprint of approximately 10 m by 8 m.
- supervisory control and data acquisition (SCADA) control systems
- permanent staff and contractor car parking area
- permanent all-weather site access and access road approximately 10m wide leading to office and substation
- internal vehicle access tracks (4 m wide) leading to solar arrays and power control units (PCUs)
- perimeter safety fencing and a fixed, closed-circuit television (CCTV) system
- temporary site compound, lay-down area, and equipment storage areas during construction.

The above components are discussed in further detail in the following sections. The design within the project site is currently conceptual but is sufficient for impact assessment purposes.

3.2.2 Solar arrays

The development will consist of a number of solar arrays, comprised of solar panels, arranged in a series of long rows. The solar arrays, in total, will comprise approximately 192,000 individual solar panels. The arrays are mounted on steel frames with tracking systems which follow the sun to optimise energy generation. The frames are fixed to steel piles driven into the soil without the need for any excavation work or use of concrete, thus minimising ground disturbance. The maximum height of the mounted arrays will be 4.2 m at full solar panel tilt.

Associated with each array will be a prefabricated, containerised inverter and integrated transformer to convert and step up the voltage level. The solar arrays will have up to 4 MW (AC) or 8 MW (AC) capacity, depending on the capacity of the associated inverter/transformer. Electrical connections will also be constructed between the solar arrays, as well as associated monitoring and protection equipment and central inverters via underground or frame-secured cabling.

Photo 3.1 shows typical solar panels at a solar farm grouped in solar arrays.

Source: Array Technologies

Photo 3.1 Typical solar panels and solar arrays

3.2.3 Battery modules and layout

The project will include an approximate 80 MW/160 MWh rated BESS, with the final rating subject to economic and technical considerations during the project's Connection Application phase with Transgrid and AEMO. Depending on the outcomes of these considerations, the BESS will be either:

- centralised – with the BESS units located in a single location adjacent to the substation
- decentralised – with the BESS units dispersed throughout the site, in a decentralised manner similar to typical solar inverter enclosures.

The BESS will comprise sealed lithium-ion batteries housed in multiple, secure, climate-controlled BESS units. The BESS units will be modular and externally-accessed and are expected to be comparable in dimensions to a shipping container.

The battery technology provider will be identified in the procurement phase along with the technology provider of other components of the modules. The selected battery will have undergone the required hazard assessment to ensure the product meets Australian Standards and legislated safety requirements.

The module configuration is conceptual and could change, based on technology selection. An example of a BESS unit is shown in Photo 3.2 and an example of an inverter enclosure (including transformer) is shown in Photo 3.3. Both the battery unit and inverter enclosure will be up to 3 m in height.

Photo 3.2 Example of BESS unit (for illustrative purposes)

3.2.4 Inverters and PCUs

The inverters and PCUs associated with each solar and battery array will convert the DC electricity generated by the solar panels into AC electricity, suitable (when voltage-adjusted) for transmission to the grid. Each inverter will be connected to the central 33 kV switchboard (ring main unit) by underground medium voltage cable reticulation. The cables will be installed in trenches not below 1 m in depth and typically 1 m in width.

Source: SMA Solar Technology

Photo 3.3 Example of an inverter enclosure (for illustrative purposes)

3.2.5 Transformers

Transformers will be housed within each inverter enclosure to step the low voltage electricity received from the solar arrays up into medium voltage (33 kV) electricity for transmission to the centralised switchboard.

A main step-up transformer and associated equipment will be located at the substation to convert the on-site AC reticulated 33 kV electricity to 132 kV electricity.

3.2.6 Substation

The substation is where power from the site is delivered prior to connection to the 132 kV transmission grid and, accordingly, is normally located near the transmission line. Edify is planning to locate the substation on the eastern side of the site (in Lot 441) where the transmission line crosses the site (see Figure 1.3).

The substation will provide switching and protection of the electrical network and will be fenced separately from the solar farm for safety reasons. The substation footprint will be approximately 120 m x 120 m. The main components of the substation are not expected to exceed 10 m in height. The lightning rods required to protect the electrical circuitry may extend to a height of 12 m.

The 132 kV electricity supply produced at the substation will be connected into the grid via a high voltage cable to the existing Transgrid transmission line. The connection will be owned and operated by Transgrid and will form part of the National Electricity Network (NEM).

A typical substation for a solar project is presented in Photo 3.4.

Photo 3.4
Picture of a typical substation

3.2.7 AC cabling

Underground AC cabling will connect the inverter enclosures to the centralised switchboard. The cables will be installed in trenches not greater than 1 m in depth and typically 1 m in width. The connecting transmission line from the substation to the existing 132 kV transmission line will be above-ground.

AC cabling will be installed in accordance with Australian Standards with the requirements of *Primefact 1063: Infrastructure Proposals on Rural Land* (DPE 2013).

3.2.8 System monitoring

The entire solar farm and BESS will be monitored through a SCADA system that will monitor the performance of all the solar equipment on site. The SCADA system will also be capable of automatically notifying staff onsite and remotely of system issues, underperformance and failures.

3.2.9 Site access and internal roads

Site access for both the northern and southern sections of the project site will be via Paytens Bridge Road (see Figure 1.3 and Section 6.7). The construction of the site access may require minor vegetation clearance (see Section 6.2).

Internal vehicle access tracks will be constructed to each inverter enclosure and to the substation to allow for site maintenance. On-site tracks will be constructed of compacted gravel and, where required, geotextile fabric will be laid between the soil and the gravel. Internal access tracks will be up to 4 m wide to allow for the safe delivery, unloading and installation of key components such as the solar panels, inverters, transformers and BESS units.

The access road leading to the substation will be designed in accordance with Transgrid's requirements to enable access by their inspection and maintenance vehicles.

The internal roads will also provide adequate access to the site, including the BESS units, for emergency vehicle access in accordance with Fire and Rescue NSW and NSW Rural Fire Service requirements (see Section 6.10).

The position of internal roads will be determined during the detailed design phase when the layout of the solar arrays and the BESS units is finalised. The internal roads are private roads designed and constructed only for construction, operation and maintenance purposes.

3.2.10 Operations and maintenance building

The proposed O&M building will be a prefabricated design with a footprint of approximately 10 m x 8 m and single story. The facility will provide a working area for staff, ablutions and amenities including:

- maintenance building, including workshop
- office
- toilet and showers
- kitchen/lunch-room
- first-aid area
- meeting room
- reception area.

All visitors and contractors will be required to report to the site office upon entry to the site. The office building will include staff offices and a control room. Staff amenities will include toilets, showers, a lunch-room and a first-aid room. The O&M building is expected to be located close to the substation.

The maintenance building will provide storage for spare parts and maintenance equipment.

3.2.11 Parking

A vehicle parking area will be located next to the site office, with 10 parking spaces provided for operational and maintenance staff. Parking for construction vehicles will be either at designated lay-down areas, storage locations, or in suitable, designated locations where construction activities are concentrated at any given time.

3.3 Site services and utilities

3.3.1 Site power

Diesel generators will be available for power supply during construction. Should low voltage power be available in the vicinity, the project may use power from the existing network.

Once operational, it is anticipated that the project will use power from the existing network. An on-site generator will be used for power during decommissioning.

3.3.2 Water supply and sewerage

At least two 20,000 litre (L) steel or concrete tanks will be installed at the site to store water for bushfire protection and other non-potable water uses. The project will ensure a minimum of 20,000 L is reserved for firefighting purposes. At least one of these tanks will be located next to the project's substation, to support the centralised battery configuration, which would also be located adjacent to the substation under this design arrangement.

It is envisaged that the water used during the construction period will be minimal and largely used on a continual basis for dust suppression on unsealed roads, as well as for the construction of new road surfaces. However, the required quantity of water will vary, dependent on weather conditions, and is estimated to be up to 30 megalitres (ML) in total. Of this, approximately 1.2 to 1.4 ML will be potable water, required by the employees and contractors. Edify's preferred option is for water to be trucked to site to meet requirements during construction and decommissioning.

Temporary toilets will be available throughout the construction period for use by contractors. The toilets will be pumped out by a local, licenced waste contractor.

Once operational, it is anticipated that the development will collect water from building roofs and use onsite water storage tanks (e.g. 2 x 35 kilolitre (kL) tanks). It is anticipated that 350 to 500 kL of water will be used during operation each year for cleaning, maintenance and staff amenities. Water will be trucked in during periods when the onsite water tanks contain insufficient water.

Sewage generated during operation will either be treated by an onsite bio-cycle system, installed to comply with regulatory requirements, or collected and disposed off-site.

3.3.3 Communications

The project is expected to use both mobile and fixed line networks for communication purposes. Where a connection is made to the fixed line network, cabling will follow existing access tracks and road reserves to minimise ground disturbance.

3.4 Construction

3.4.1 Construction materials

Most of the construction materials and components are likely to be sourced from overseas due to the specialised nature of the equipment. Materials will be transported by road from port facilities in either Sydney or via international logistics (sea freight) through the port of Botany Bay in 12 m shipping containers. Civil materials such as aggregate and concrete will be sourced where available from local suppliers. The main construction materials will include:

- aggregates, road base and concrete
- steel fencing materials
- steel piles and ground screws
- steel mounts and bolts
- cabling, conduit and weather-proof junction boxes

- solar panels and mounting structures
- BESS units
- inverters, transformers and enclosures
- substation components
- steel framing and Colorbond™ sheeting for operations and maintenance building and control room
- timber and fixtures for building fit-out.

3.4.2 Site preparation

Once final project consents are obtained, site preparation will commence immediately across the development area to allow for the timely installation of access points, internal roads and drainage, and to undertake preparatory earthworks. Site preparation activities will generally involve the following:

- undertaking land survey, geotechnical and other preliminary investigations
- removing paddock trees approved for removal
- removing existing fencing and establishing boundary fencing
- establishing the site access points and internal roads for delivery of machinery and equipment
- establishing temporary ancillary facilities for use during construction including lay-down areas and contractor facilities.

3.4.3 Infrastructure installation

The installation of infrastructure will commence directly after site preparation works are finalised. The key infrastructure activities will include:

- backfilling and levelling of dams to match the immediate contour around the redundant dam (where required)
- installing internal roads and access tracks
- installing drainage works and regrading of surface features (where required)
- constructing the O&M building and associated site facilities
- installing mounting structure foundations by driving steel piles pneumatically into the ground using specialist equipment (dependant on ground conditions ground screws may be used)
- attaching steel mounting structures to the ground piles
- installing solar panels onto the mounting structures, including tracker units
- installing and connecting the solar panels to the DC boxes with above-ground cabling
- installing BESS units
- installing the inverter enclosures, containing inverters and transformers

- laying concrete slab for substation and installing substation components, including transformers
- connecting the DC boxes to the inverter enclosures and connecting the inverter enclosures to the centralised switchboard, by trenching and underground cabling
- connecting the BESS units to the centralised switchboard
- grid connection through the installation of an above-ground transmission line from the substation to the Transgrid transmission line
- commissioning and testing of solar panels, inverters, BESS units switch equipment, step-up transformers, monitoring systems, and electrical protection systems.

3.4.4 Construction equipment

Construction equipment will be limited to the heavy machinery and plant generally used across the wider construction industry. It is envisaged that most of this machinery and plant will be sourced locally. Typical construction equipment to be used on-site will include but may not be limited to:

- truck and dog trailers for civil works
- piling rigs for installing solar array piles
- D6 dozers or equivalent for levelling and road development
- 24 tonne (t) excavators (or similar) for earthworks
- graders for road development and levelling activities
- mulchers for the mulching and re-use of vegetation material on-site
- 7 t vibrating rollers for road construction
- front end loaders for moving and loading soil and aggregate materials
- 1 x water carts for road construction and dust suppression
- Franna cranes for lifting loads, erecting steel and moving heavy plant
- trenchers for installing underground conduits and cabling
- portable generators for temporary site power
- hand power tools and equipment.

3.4.5 Construction schedule

The construction of the project is expected to take approximately 16 months to allow for the gradual development and commissioning of the facility and will typically be undertaken in four stages. While the project is yet to undertake a detailed EPC tender process, the typical construction stages are as follows (Figure 3.1):

- **Stage 1**: Site mobilisation, including establishment, earthworks and drainage requirements, construction of concrete hardstands, civil works – approximately 2 months
- **Stage 2**: Site setup, including delivery of solar and battery infrastructure – approximately 5.5 months

The estimated construction schedule is shown in Figure 3.1.

Stage	Month															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Site mobilisation																
Site setup																
Solar panel and battery structures																
Substation works																

Figure 3.1 Estimated construction schedule

- **Stage 3**: Installation of infrastructure solar panels, BESS units, transformers, switchroom, control room, operations and maintenance building and electrical works – approximately 3.5 months (may overlap with Stage 2)
- **Stage 4**: Installation of substation and connections – approximately 6 months.

3.4.6 Intersection upgrade

The Lachlan Valley Way / Paytens Bridge Road intersection is where heavy vehicles will turn off a major State road (Lachlan Valley Way) onto a local road (Paytens Bridge Road) (see Figure 1.2). Currently there is no formal turning infrastructure available at the Lachlan Valley Way / Paytens Bridge Road intersection. However, based on the existing traffic and anticipated construction traffic volumes along Lachlan Valley Way, a Basic Right Turn (BAR) is proposed for the intersection to cater for an increase in right-turning movements for vehicles travelling from Forbes to the project site (see Section 6.7). As vehicles will only be turning right into Paytens Bridge Road from Lachlan Valley Way, no left turning infrastructure is considered necessary.

The proposed intersection upgrade would be an initial construction step to enable the movement of heavy vehicles to and from site and the transport to site of major project components.

The proposed intersection upgrade in relation to the neighbouring lot boundaries is shown on Figure 3.2. The NSW Six Maps lot cadastre (shown in purple) is taken from the Spatial Services NSW database (NSW Government 2022) and is presented in comparison with a field survey of lot boundaries recently undertaken by Edify (shown in red).

The NSW Six Maps lot cadastre indicates that the intersection upgrade will impact on neighbouring lots outside the road reserve (principally Lot 112 DP704736). However, the survey completed by Edify shows that the apparent impact to neighbouring lots is caused by a misalignment of the cadastre, whereby NSW Six Maps indicates erroneous lot boundaries. The surveyed lot boundaries show that the intersection upgrade will not impact on any land outside the road corridor.

No other intersection upgrades are proposed, other than at the site access points (see Section 3.2.9).

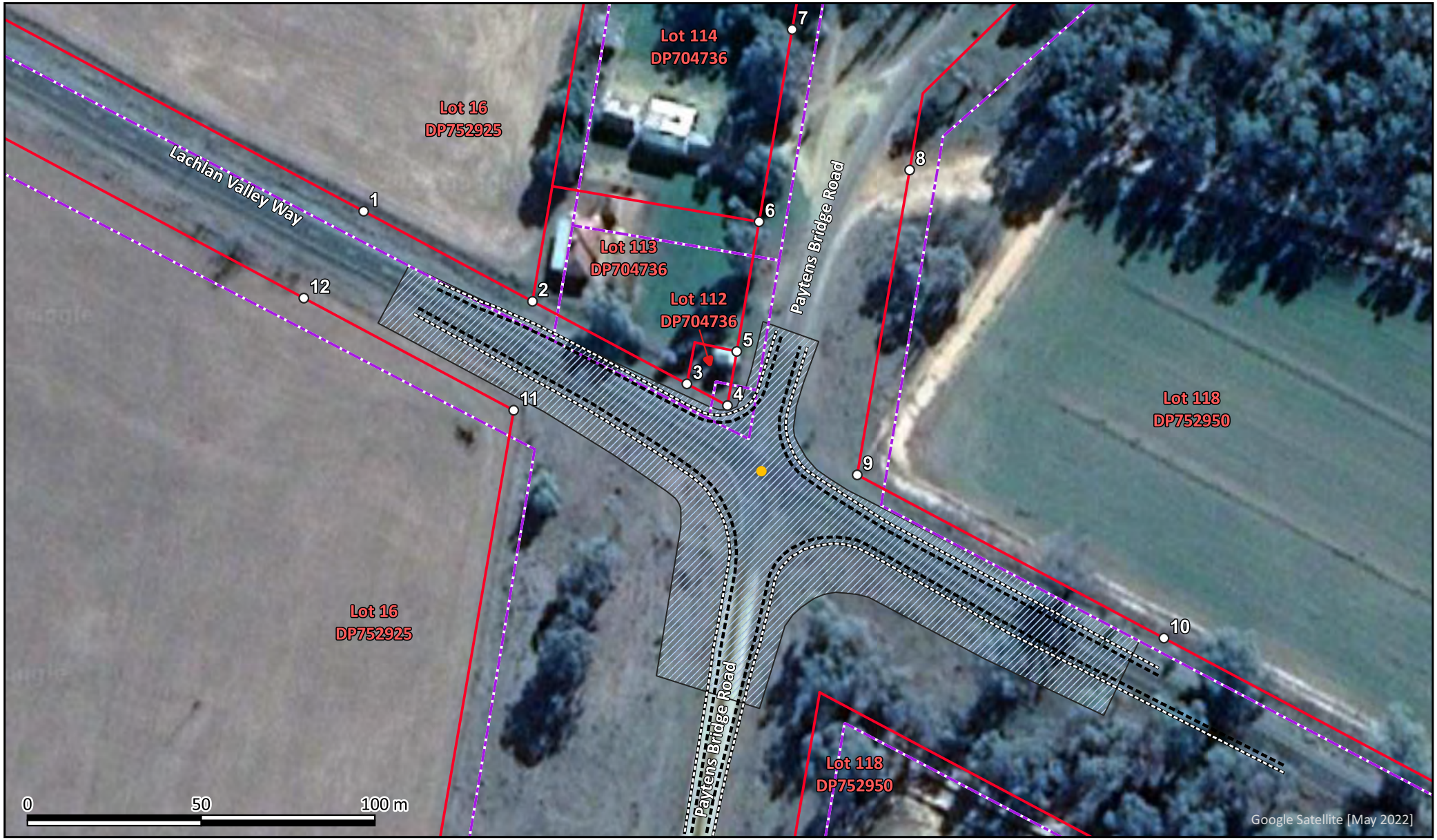
3.5 Commissioning and operation

3.5.1 Commissioning activities

Commissioning of the solar farm will be undertaken once equipment is installed to ensure that the solar panels and associated infrastructure are structurally and electrically safe. Commissioning will also ensure that the BESS is operating within its design and performance parameters.

Commissioning of the solar farm will involve testing the following components:

- solar panel strings
- central inverters
- transformers



- Survey points
- Surveyed lot boundary
- NSW SIX Maps lot cadastre
- Road junction centroid
- Turn treatment footprint
- Proposed edge of bitumen
- Proposed edge of road

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AE1173.1 Peninsula SF

Figure 3.2. Proposed intersection upgrade – Lachlan Valley Way / Paytens Bridge Road

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ACCENT ENVIRONMENTAL

ARÊTE SURVEY SOLUTIONS

Surveyed lot boundary data courtesy of Arete Survey Solutions, NSW SIX Maps lot cadastre (Forbes LGA)

- switching equipment
- BESS units
- lightning protection systems
- earthing protection systems
- electrical protection systems
- grid connection compliance protection and disconnection systems
- SCADA system (including meteorological stations)
- support structures
- security systems.

The components of the solar farm will be subject to a maintenance and inspection regime for the life of the development.

3.5.2 Operational activities

Operational activities involve monitoring of equipment on a daily basis, full servicing of inverters, the BESS and substation equipment on an annual basis, and cleaning of the solar panels at regular intervals depending on system performance benchmarked to weather conditions.

The solar panels are expected to need cleaning up to two times per year. Edify's experience is that cleaning of solar panels may not be required each year, due to rainfall providing a natural cleaning mechanism. Any water required for cleaning of the panels will be brought to site in water trucks.

Land between the panels and along the boundary of the solar farm will require maintenance to control vegetation growth. Such maintenance will be undertaken either through the use of livestock (sheep) or by mowing with a slasher.

There will be minimal storage of hazardous or dangerous goods or materials on site during the operation of the project (see Section 6.10).

3.6 Workforce

3.6.1 Construction

Up to 250 full-time equivalent jobs are expected to be created during construction. The expected average workforce during the construction period is anticipated as follows:

- general across the construction phase – 30 (16 months)
- site mobilisation – 60 (2 months)
- site setup – 150 (5.5 months)
- solar panel and battery construction – 250 (2.5 months)
- substation construction – 60 (6 months).

Peak construction workforce levels will be reached during solar array and battery construction when up to 250 workers may be on site at the same time, including Edify staff and personnel from the EPC contractor and sub-contractors.

Most of the workforce is expected to be sourced from the local area. Non-local workforce or contractors are likely to come from other areas of NSW and are likely to seek accommodation in Forbes or Grenfell and other nearby towns (see Section 6.11). It is expected that a significant proportion of the construction staff movements will be made to and from site using buses from either of those two towns. Some contractors will need to travel to and from site using their own vehicles due to the equipment required.

3.6.2 Operation

During operation, it is expected that there will be up to five full-time equivalent personnel based at the solar farm to manage site activities and to support routine plant operation and maintenance. The operational staff are likely to originate from Forbes or the surrounding region.

3.7 Hours of operation

3.7.1 Construction

Construction activities will be undertaken during standard hours for construction works (i.e. 7 am to 6 pm Monday to Friday and from 8 am to 1 pm on Saturdays). Any construction or commissioning activities outside these standard working hours will require approval from relevant authorities. Any affected local residents will be informed of the timing and duration of the proposed activities, prior to the commencement of any works.

3.7.2 Operation

The operational hours of the solar farm will be 24 hours per day, 7 days per week.

3.8 Traffic generation

3.8.1 Construction

Construction traffic is expected to peak at approximately 45 vehicles per day (return vehicle trips) during the site setup phase (approximately 5.5 months) reducing to approximately 37 vehicles per day (return vehicle trips) during the subsequent solar panel and battery construction phase (approximately 3.5 months). Traffic during the site setup phase is estimated to comprise approximately 10 light vehicles, 29 heavy vehicles and 6 busses per day. In addition, it is estimated that three over-mass (OM) vehicle return trips (each over two days) to site will be required during substation construction works.

Further detail on construction traffic movements and impacts is provided in Section 6.7.

3.8.2 Operation

The average traffic generation during operation will not exceed two vehicle movements per day (single trips to or from the project site).

Further detail on operational traffic movements and impacts is provided in Section 6.7.

3.9 Drainage management

The project site is generally flat. Erosion and sediment controls in accordance with *Managing Urban Stormwater: Soils & Construction* (Landcom 2004) will be implemented, particularly during construction, to minimise the loss of soil and off-site release of turbid and/or sediment-laden water (see Section 6.6). Standard engineering controls, such as the installation of a culvert under the site access points, will also be implemented to manage drainage and site runoff during project operation.

3.10 Fire management

On-site fire prevention and management measures will be in accordance with Fire Rescue NSW and NSW Rural Fire Service requirements. Such measures will include the installation of a dedicated water tank to be used solely for fire protection purposes.

As noted in Section 3.3.2, the site will have on-site water available and, for firefighting this will include:

- at least two 20,000 L steel or concrete tanks and a minimum of 20,000 L will be reserved for firefighting purposes
- at least one tank will be located near to the project's substation, to support the centralised battery configuration.

The BESS units may come equipped with their own fire prevention and/or suppression systems. Standard fire suppression systems will be installed for other project facilities in accordance with Fire Rescue NSW and NSW Rural Fire Service requirements and applicable Australian Standards.

Once the solar farm is constructed and operational, the vegetation close to the solar arrays and other project components will require ongoing maintenance to ensure that the potential for fire is minimised (e.g. ground cover will be kept low).

Response to bushfires and equipment fires will be part of emergency management planning for the project. An emergency response plan (ERP) will be prepared for the site prior to construction.

Fire risks and their management are discussed in more detail in Section 6.10.

3.11 External lighting

Lighting requirements will be minimal. Lighting will be designed to minimise off-site impacts and will be installed in accordance with relevant guidelines/Australian Standards (see Section 6.9). Low-intensity lighting will be used (except where required for safety or emergency purposes) and lights will not shine above the horizontal. Impact sensor lighting is being considered to further minimise impacts.

3.12 Site security

Security fencing will be installed around the site, to a height of about 2.3 m, allowing for adequate access points for project maintenance, land management purposes and emergency egress. The perimeter fence will not be solid and will not incorporate barbed wire at the apex.

An additional security fence will be installed around the substation to maintain site security and public safety.

3.13 Landscaping

Based on the visual impact assessment, no visual screening is proposed for the site. Visual impact is discussed further in Section 6.9.

4 Statutory context

4.1 Summary of relevant legislation, regulations and planning instruments

Key legislation, regulations and planning instruments of relevance to the determination of the development application for the proposed Peninsula SF project are listed in Table 4.1. Further detail is provided in Appendix C, including assessment of other legislation (including Commonwealth legislation) and planning instruments that have been reviewed and determined not to be relevant.

Table 4.1 Relevant legislation, regulations and planning instruments

Category	Statutory reference
State legislation and regulations	*EP&A Act 1979*
	Environmental Planning and Assessment Regulation 2000
	Roads Act 1993
	Biodiversity Conservation Act 2016
	Biodiversity Conservation Regulation 2017
	Fisheries Management Act 1994
	Biosecurity Act 2015
	National Parks and Wildlife Act 1974
	Heritage Act 1977
	Waste Avoidance and Resource Recovery Act 2001
	Rural Fires Act 1997
	Crown Lands Management Act 2016
	Water Management Act 2000
	Local Land Services Act 2013
	Conveyancing Act 1919
Environmental planning instruments	State Environmental Planning Policy (Planning Systems) 2021
	State Environmental Planning Policy (Transport and Infrastructure) 2021
	State Environmental Planning Policy (Resilience and Hazards) 2021
	State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
	State Environmental Planning Policy (Primary Production) 2021
	State Environmental Planning Policy – Koala Habitat Protection 2020 and 2021

Category	Statutory reference
	Forbes LEP 2013
Development control plans	Forbes DCP 2013
Regional strategies	Central West and Orana Regional Plan 2036
Commonwealth legislation	*Environmental Protection and Biodiversity Conservation Act 1999*
	Native Title Act 1993

4.2 Power to grant consent

4.2.1 Classification of project as State Significant Development

The State Environmental Planning Policy (SEPP) (Planning Systems) 2021 aims to identify development that is of State significance and confers functions on joint regional planning panels to determine development applications.

Under Chapter 2, Part 2.2, Section 2.6 of the SEPP, a development is declared to be a State significant development (SSD) for the purposes of the *EP&A Act* if (among other things) the development is specified in Schedule 1 or 2 of the SEPP.

Under Schedule 1, Section 20 of the SEPP, the following is considered an SSD:

> *Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that:*
>
> *(a) has a capital investment value of more than $30 million, or*
>
> *(b) has a capital investment value of more than $10 million and is located in an environmentally sensitive area of State significance.*

The Transport and Infrastructure SEPP aims to facilitate the effective delivery of infrastructure across the State. Division 4 of the Transport and Infrastructure SEPP defines 'electricity generating works' as having the same meaning as it has in the Standard Instrument.

Under the Standard Instrument:

> *electricity generating works means a building or place used for the purpose of—*
>
> *(a) making or generating electricity, or*
>
> *(b) electricity storage.*

The Peninsula SF project is classified as an SSD as it has a capital investment value of more than A$30 million and will be used for the purpose of electricity generation and storage.

4.2.2 Consent for a State Significant Development

The *EP&A Act*, together with the *Environmental and Planning Assessment Regulation 2000* (*EP&A Regulation*) and other regulations and instruments, provides the framework for environmental planning and assessment in NSW and is administered by DPE.

The consent authority for an SSD is determined under Part 4, Division 4.2, Section 4.5 of the *EP&A Act*:

> *For the purposes of this Act, the consent authority is as follows—*
>
> *(a) in the case of State significant development—the Independent Planning Commission (if the development is of a kind for which the Commission is declared the consent authority by an environmental planning instrument) or the Minister (if the development is not of that kind)*

The Minister for Planning and Environment is therefore the consent authority for the Peninsula SF project.

Consent for an SSD is granted under Part 4, Division 4.7, Section 4.38 of the EP&A Act:

> *(1) The consent authority is to determine a development application in respect of State significant development by—*
>
> *(a) granting consent to the application with such modifications of the proposed development or on such conditions as the consent authority may determine, or*
>
> *(b) refusing consent to the application.*

Under Part 4, Division 4.3, Section 4.12 of the *EP&A Act*:

> *(8) A development application for State significant development or designated development is to be accompanied by an environmental impact statement prepared by or on behalf of the applicant in the form prescribed by the regulations.*

Development of the Peninsula SF project will be assessed under Part 4 'Development Assessment' of the EP&A Act, the Minister for Planning and Environment will be the consent authority, and the preparation of an EIS is required to accompany the development application.

4.3 Permissibility

The project site is zoned as RU1 Primary Production (see Figure 2.1). Crown Land is not present within the project site and no Crown Land permits will be required for the project.

The Forbes LEP 2013 does not specify electricity generating works within Zone RU1 land as either a land use permitted without consent or a land use permitted with consent. Electricity generating works therefore fall under the definition of a prohibited land use.

However, Chapter 2, Part 2.3, Division 4, Section 2.36 of the Transport and Infrastructure SEPP states that development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed rural, industrial or special use zone.

Chapter 2, Part 2.1, Section 2.7 of the Transport and Infrastructure SEPP, states that:

> *(1) … if there is an inconsistency between this Chapter and any other environmental planning instrument, whether made before or after the commencement of this Chapter, this Chapter prevails to the extent of the inconsistency.*

The Peninsula SF project is therefore a permissible development with consent as an SSD under clauses 2.36 and 2.7 of the Transport and Infrastructure SEPP.

The Transport and Infrastructure SEPP will allow for the development of the Peninsula SF project, with consent, even on land prescribed for primary production.

4.4 Other approvals

4.4.1 Consistent approvals

Under Section 138 of the *Roads Act*, consent from the relevant roads authority (Council or Transport for NSW (TfNSW)) is required for any works or activities in a public reserve, public roadway or footpath (nature strip). Section 138 requires that all activities undertaken within council road reserves be approved by Council prior to the activities being undertaken.

It is anticipated that the site access points on Paytens Bridge Road will require minor works including minor vegetation removal. Approval will be required from the TfNSW or Council under Section 138 of the *Roads Act*, as applicable.

Under Part 4, Division 4.7, Section 4.2 of the *EP&A Act*, consent for any required road upgrades cannot be refused if it is necessary for carrying out the SSD and is to be substantially consistent with the SSD consent.

No other approvals consistent with the SSD consent are expected to be required.

4.4.2 Additional approvals and permits

Additional approvals that are expected to be required for the Peninsula SF project include:

- approvals for connecting the Peninsula SF to the grid as part of the connection processes agreement with Transgrid
- Council approval for subdivision of the project lots
- construction certificate from Council for the construction of certain structures
- occupation certificate from Council to allow the use of on-site buildings
- relevant permits under the Heavy Vehicle National Law (NSW) for the use of oversize and/or over-mass (OSOM) vehicles on the road network during the construction phase.

If the project were not an SSD, the following approvals may also have been required (see Section 4.41 of the *EP&A Act*):

- a bushfire safety authority under Section 100B of the *Rural Fires Act 1997*
- a water management work approval under Section 90 of the *Water Management Act 2000*.

4.5 Pre-conditions to consent

A number of pre-conditions to exercising the power to grant consent for the project have been identified and are listed in Table 4.2.

Table 4.2 Pre-conditions to consent

Statutory reference	Pre-condition	Relevance	Section in EIS
***Environmental Planning and Assessment Act 1979* - Part 4, Division 4.3, Section 4.12**	A development application for an SSD is to be accompanied by an environmental impact statement prepared by or on behalf of the applicant in the form prescribed by the regulations.	The project is an SSD and requires an EIS.	This document
***Biodiversity Conservation Act 2016* - Part 7.9**	An application for development consent under Part 4 of the *EP&A Act* for an SSD is to be accompanied by a biodiversity development assessment report (BDAR), unless the Planning Agency Head and the Environment Agency Head have determined that the proposed development is not likely to have any significant impact on biodiversity values.	A BDAR has been prepared to determine whether the project is likely to have any significant impact on biodiversity values.	Section 6.2
State Environmental Planning Policy (Resilience and Hazards), 2021 Chapter 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 site is in a rural area that is unlikely to have significant existing contamination. In addition, the project is expected to require only minor excavation works.	Section 6.5

4.6 Mandatory matters for consideration

Matters that are mandatory for the consent authority to consider in deciding whether to grant consent to the development application for the project are listed in Table 4.3.

Table 4.3 Mandatory matters for consideration

Statutory reference	Pre-condition	Relevance	Section in EIS
***Environmental Planning and Assessment Act 1979* - Part 4, Division 4.3 Section 4.15**	In determining a development application, a consent authority is to take into consideration matters including (among others):	The EIS provides information in relation to relevant matters the consent authority is required to take into consideration,	See below

Statutory reference	Pre-condition	Relevance	Section in EIS
		pursuant to Section 4.15 of the *EP&A Act*.	
	• the provisions of – any environmental planning instrument – any development control plan • that apply to the land to which the development application relates.	Applicable environmental planning instruments, as listed in Table 4.1. Applicable development control plans: • Forbes DCP 2013.	Section 4.1 and Section 7 for the SEPPs Section 2.2 and Section 7 for the LEP and DCP
	• the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality	The project will have environmental impacts on the natural and built environments, and social and economic impacts in the locality.	Section 6
	• the suitability of the site for the development	The suitability of the project site for the proposed development has been assessed.	Section 6
	• the public interest.	The public interest has been assessed both directly, through consultation, and indirectly.	Section 5 and Section 7
***Environmental Planning and Assessment Act 1979* - Part 5, Subdivision 2 Section 5.5**	A determining authority, in its consideration of an activity, shall take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.	The EIS provides information in relation to matters affecting or likely to affect the environment.	Section 6
State Environmental Planning Policy (Resilience and	In determining an application to carry out development to which this Part applies, the	A Resilience and Hazards SEPP assessment has been	Section 6.10 for the Resilience and

Statutory reference	Pre-condition	Relevance	Section in EIS
Hazards), 2021 Chapter 3, Part .12	consent authority must consider: • current circulars or guidelines published by the Department of Planning relating to hazardous or offensive development • whether any public authority should be consulted concerning any environmental and land use safety requirements with which the development should comply • in the case of development for the purpose of a potentially hazardous industry—a preliminary hazard analysis prepared by or on behalf of the applicant • any feasible alternatives to the carrying out of the development and the reasons for choosing the development (including any feasible alternatives for the location of the development and the reasons for choosing the location the subject of the application) • any likely future use of the land surrounding the development.	undertaken for the project and a Preliminary Hazard Assessment (PHA) has been undertaken in accordance with the guidance documents *Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis* and *Multi-Level Risk Assessment*. Alternatives to the proposed development and the potential for future use of surrounding land have been considered in the EIS.	Hazards SEPP and PHA assessments Section 2.6 for alternatives considered Section 6.5 for the potential for future use of surrounding land

5 Community engagement

Edify recognises that major solar farm developments, particularly those that include large-scale BESS, are still relatively new to NSW. Accordingly, a strong emphasis needs to be placed on engagement to inform stakeholders as to the nature of such projects, to fully describe potential project impacts, to explain proposed measures for impact management and mitigation, and to provide opportunities for stakeholder input into the development process.

The EIS process requires project proponents to undertake detailed consultation with affected landowners surrounding the development, the local community, local council and other regulatory agencies. Current and proposed community engagement for the Peninsula SF project is outlined below.

Edify commenced community engagement as part of the site selection process and has continued that engagement throughout the impact assessment process. The initial engagement has been reported in the Scoping Report (Edify 2021).

5.1 Formal consultation requirements

The SEARs for the project state that:

> *"During the preparation of the EIS, you should consult with relevant local, State or Commonwealth Government authorities, infrastructure and service providers, community groups, affected landowners and any exploration licence and mineral title holders.*
>
> *In particular, you must undertake detailed consultation with affected landowners surrounding the development and Forbes Shire Council.*
>
> *The EIS must describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided."*

Furthermore, the SEARs state that the EIS must address the following specific matters:

> "*Heritage – including … consultation with the local Aboriginal community in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents.*"
>
> and
>
> *"Visual – including … a draft landscaping plan for on-site perimeter planting, with evidence it has been developed in consultation with affected landowners)."*
>
> and
>
> *"Transport – including … details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), road*

maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road and rail authorities (if required).”

5.2 Approach to engagement

Engagement with the community has been undertaken directly by the proponent, Edify Energy, and by a team of independent community engagement specialists from Strategic Development Group. Strategic Development Group is a member of the International Association for Public Participation (IAP2) and uses IAP2’s international best practice principles for community participation, as reflected in the five levels of the IAP2’s spectrum of public participation (Figure 5.1). The Peninsula SF is at the ‘Consult’ point on this spectrum, reflecting the nature of the project and the community concerns it raises.

Working at the ‘Consult’ level, a combination of face to face and online consultation opportunities was considered appropriate in order to:

- capture views of the general community on the project, answer questions and provide opportunity for suggestions
- include targeted consultations with key stakeholders.

A consultation report prepared for the project by Strategic Development Group is presented in Appendix D.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION 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 TO THE PUBLIC	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.

Figure 5.1 International Association for Public Participation (IAP2) Spectrum – used with permission

Project information is provided on the Peninsula SF website in support of the engagement process https://edifyenergy.com/project/peninsula-solar-power-station/.

The website includes an up-to-date overview of the project, refers interested parties to the NSW Government Planning Portal for links to the solar farm’s planning documents, allows

registration for regular email updates, and provides a link to a Frequently Asked Questions (FAQ) booklet (see Appendix D).

5.3 Stakeholder identification

The stakeholders identified for engagement fall into in three main categories – neighbours, community groups and members, and government (local/state/federal). The following stakeholders for engagement have been identified:

Neighbours

- neighbours of the project site

Community groups and members

- NSW Rural Fire Service (NSW RFS)
- Forbes Business Chamber
- Wiradjuri Condobolin Corporation
- Forbes Wiradjuri Dreaming Centre
- Regional Enterprise Development Institute Ltd (REDI.E)
- Bimbadeen Aboriginal Training College
- Forbes Aboriginal Community Working Party
- Lachlan 'Galari' Reconciliation Group – which covers Forbes and Parkes
- Condobolin & Cowra Aboriginal Land Council
- Wiradjuri Elders (Russell Dunn & Ralph Smith)
- Intract Indigenous Contractors
- Traditional Family Group (TFG)
- Central West Lachlan Landcare
- Forbes Wiradjuri Men's Shed & Forbes Men's Shed
- Programmed Skilled Workforce
- Rotary Club of Forbes
- Forbes District Lions Club
- Forbes View Club
- Forbes College for Seniors
- Forbes Country Women's Association (CWA) and Evening Branch
- Forbes Generocity Church
- St Laurence O'Toole Church
- Forbes Baptist Church
- St. John's Anglican Church
- Wirinya Progress and Sports Association
- Forbes Rugby League & Union Club

Government

- Forbes Shire Council
- DPE
- State MP for Orange, Phillip Donato
- Federal MP for Riverina, Hon. Michael McCormack
- Fire and Rescue NSW (FR NSW), Forbes
- Forbes Technical and Further Education (TAFE) NSW.

Engagement has also been undertaken with Transgrid, comprising the lodgement of a Detailed Connection Enquiry and subsequent discussions relating to network connection standards and general requirements to establish a new point of connection to the transmission network. The Telstra Network Integrity Team has also been consulted regarding the potential need for an intersection upgrade adjacent to one of their properties (see Section 6.7).

Edify will continue to update its consultation database (see Appendix D) as new stakeholders are identified.

5.4 Engagement carried out

The process of engagement to date has involved:

- **Neighbours:** direct contact has been initiated with neighbours of the project site offering opportunities to discuss the proposal, and its potential impacts and opportunities.
- **Community**: consultation opportunities have been (and will continue to be) offered to the community living in the Forbes Shire Council LGA, structured to enable community members to:
  - hear directly from Edify about the project, including aspirations, key features, work undertaken to date and future process/timing
  - ask questions, raise concerns and suggest ideas.
- **Government:** Government/elected representatives have been made an offer of a briefing on the project.

Aboriginal community consultation is discussed below in relation to the obligations of Edify under the *Aboriginal Cultural Heritage Consultation Requirements* (ACHCRs) (DECCW 2010a). The engagement undertaken to date with neighbours, non-Aboriginal community groups, and government is then outlined.

5.4.1 Aboriginal community consultation

Aboriginal consultation for the project has been undertaken in accordance with the publication ACHCRs (DECCW 2010a). Aboriginal consultation is regulated under Clause 80C of the *National Parks and Wildlife Regulation 2009*. The process includes a four-stage Aboriginal consultation process that stipulates specific timeframes for components of each stage. All stages have been completed.

The four-stage consultation process is described below along with an outline of consultation activities undertaken to date for each stage. A log and copies of correspondence with Aboriginal community stakeholders is presented in Appendix 1 of the Aboriginal cultural heritage assessment report (ACHAR) (Appendix E).

ACHCRS STAGE 1: IDENTIFYING ABORIGINAL STAKEHOLDERS TO BE LISTED AS REGISTERED ABORIGINAL PARTIES

Stage 1 of the ACHCRs requires that Aboriginal people who hold cultural information are identified, notified and invited to register an expression of interest in the assessment.

Letters were therefore sent (22/04/2021) to the:

- Office of the Registrar, Aboriginal Land Rights Act 1983
- Heritage NSW
- National Native Title Tribunal
- National Native Title Services Corporation Ltd (NTSCORP)
- Cowra Local Aboriginal Land Council (LALC)
- Forbes Shire Council
- Central West Local Land Services.

Letters were also sent to local and regional individuals and groups whose contact details had been provided by the government agencies. Advertisements of the Expression of Interest (EOI) 'Cultural Heritage Management' was placed in the Forbes Advocate and the Cowra Guardian on 27/04/2021.

By the closing date for the registration of the proposal, eight groups or individuals responded to be registered as Registered Aboriginal Parties (RAPs) (Table 5.1).

STAGES 2 AND 3

The aim of Stages 2 and 3 of the ACHCRs is to provide information about the proposal to the RAPs and to acquire information regarding Aboriginal cultural values associated with the proposal either through consultation and/or field work. Often these two stages are concurrent, which was the case for the Peninsula SF project, and the detailed project information is provided in the assessment methodology that is issued to all RAPs for their consideration.

On Wednesday 26 May 2021, all RAPs were sent information about the proposal and a draft of the assessment methodology. RAPs were provided the stipulated 28 days to review and comment on these documents as per Stage 3 of the ACHCRs. The closing date for comment was Thursday 23 June 2021.

A response was received from Rob Clegg from the Wiradjuri Council of Elders on 27 May 2021 supporting the proposed assessment methodology. No additional feedback on the methodology was received.

Table 5.1 Registered Aboriginal Parties

RAP	Contact	Date of expression of interest
Cowra LALC	-	Not applicable*
Wiradjuri Council of Elders	-	30 April 2021
Yoorana Gunya	-	6 May 2021
Wiradjuri Cultural and Environmental Rangers	-	30 April 2021
Monica Ingram	Monica Ingram	4 May 2021
Stakeholder 1	-	10 May 2021
Stakeholder 2	-	10 May 2021
Russell Dunn	Russell Dunn	30 April 2021
Ralph Smith	Ralph Smith	4 May 2021

*Note: The Cowra LALC didn't send through a registration for this project. However, they were included in the consultation process for transparency

Russell Dunn, a member of the Wiradjuri Council of Elders who also registered as an individual, requested a meeting with all RAPs be held to discuss the project. As such, an invitation to attend an Aboriginal Focus Group Meeting (AFGM) was sent to all RAPs on 10 June 2021. The AFGM was held on 24 June 2021 and attended by the following people:

- Russell Dunn (registered as an individual and a member of the Wiradjuri Council of Elders)
- Stephanie Rusden (OzArk)
- Ian Finlay (Accent Environmental)
- Claire Driessen (Edify Energy)
- Patrick Dale (Edify Energy).

The minutes of the AFGM were distributed to all RAPs on 1 July 2021.

Following the AFGM, the Cowra LALC requested a meeting with OzArk to discuss the project as they were unable to attend the AFGM. On 16 July 2021, a teleconference was held with Esther Cutmore and Dan Rose from Cowra LALC and Stephanie Rusden from OzArk. Details of the project and the proposed assessment methodology were outlined. During the discussion, Ms Cutmore noted that the preference of Cowra LALC is that any artefacts that need to be collected following project approval are to be reburied somewhere on site.

The field assessment of the study area took place with the assistance of RAPs from 20 to 22 July 2021.

STAGE 4 – DRAFT REPORT

Stage 4 of the ACHCRs requires the applicant to prepare a draft cultural heritage assessment report and provide a copy to the registered Aboriginal stakeholders for comment, with a

minimum 28-day comment period being allowed. The draft ACHAR was finalised and submitted to RAPs on 7 October 2021 and the period for comments closed on 5 November 2021.

No responses were received on the draft ACHAR. The report was finalised and provided to the registered Aboriginal stakeholders and the Cowra LALC.

5.4.2 Engagement with neighbours

Engagement with the neighbours in proximity to the site has been undertaken by Edify since late 2020 using various methods, including phone calls, email, text messages and in-person meetings. All neighbours have been given equal opportunity to meet or be involved in the project and all have been given information to enter discussions or join in group discussions with Edify.

The residences of the identified neighbours within 5 km of the project site are shown on Figure 1.4. Table 5.2 outlines the engagement undertaken with neighbours to date.

Table 5.2 Engagement with neighbours of the project

Neighbour*	Comments
Associated landholders	
R3 (1.42 km southeast of the southern section of the project site)	The landholders are relations to the involved landholder family and are supportive of the project. Therefore all engagements have been via the involved landholder.
R5 (1.74 km east of the southern section of the project site)	R5 is an involved landholder, who owns Lot 9//DP752938.
Non-associated landholders	
R1 (320 m west of the northern section of the project site)	Engagement began with initial contact in November 2020. Proponent met with landholder in December 2020 at their residence. Edify has shared ongoing emails, calls and text messages with the landholder since engagement began. Advance copies of key reports have been shared. The most recent engagement was on 13 December 2021, when the neighbour was provided with the FAQ document and an opportunity to complete and submit a survey in relation to the project (see Section 5.2.5). In addition, the neighbour was invited to attend the Community Information Session (March 2022), however the company did not receive a response to this invitation (email, call, text).
R2 (340 m northeast of the southern section of the project site),	Edify began engagement proceedings in January 2021 and met with the family's advocate in May 2021 to discuss the project's site boundary. Edify has shared multiple phone calls and emails. Advance copies of key reports have been offered.

Neighbour*	Comments
R6 (3.27 km north) and **R12** (4.57 km northeast)	On 13 December 2021, the neighbour was provided with the FAQ document and an opportunity to complete and submit a survey in relation to the project (see Section 5.2.5). On 24 March 2022, the neighbour attended the drop-in sessions at Forbes Town Hall.
R4 (1.56 km southwest of the southern section of the project site)	Edify has made multiple attempts at engaging with this landholder in various methods (calls, voicemails, text) over several months, from July to December 2021, without success. Edify sent postal mail to the residence in January 2022. This included an overview of Edify, an introduction to the project, links to the Scoping Report (NSW Major Projects webpage), contact details for the project team and the FAQ document.
R7 (3.60 km west of the project site) and **R10** (4.19 km west)	Edify has made attempts to engage with the landholder without success and has been advised of the recent sale of the property by another project landholder (off-market sale, September 2021). Edify is attempting to obtain the contact details of the new landholder/s, with Edify sending postal mail to the residence in January 2022. This included an overview of Edify, an introduction to the project, links to the Scoping Report (NSW Major Projects webpage), contact details for the project team and the FAQ document.
R8 (3.64 km southeast of the project site)	This landholder is also being represented by the family representative of R2, R6 and R12. Engagement has been undertaken with this individual as stated above for R2, R6 and R12. However, the impact of the project on this receiver is considered likely to be low due to the distance of the residence from the project.
R9 (4.04 km southwest of the project site) and **R11** (4.24 km southwest)	Edify has contacted the R9/R11 landholder despite the likely low impact of the project due to its distance from the residence. The landholder has and will be kept up to date to all future developments on the project due to the opportunity for construction for their earth moving business. They have previously been involved in Jemalong Solar Farm and road construction and expressed interest in participating in civil road works associated with the project.
R13 (4.90 km east of the project site)	Edify has been unable to contact this receiver as they do not have any contact details. However, the impact of the project on this receiver is considered likely to be low due to the distance of the residence from the project. Edify sent postal mail to the residence in January 2022. This included an overview of Edify, an introduction to the project, links to the Scoping Report (NSW Major Projects webpage), contact details for the project team and the FAQ document.

Neighbour*	Comments
R14 (4.92 km southwest of the project site)	Edify has contacted this landholder despite the distance of the residence from the project. The landholder has expressed support of renewables and has and will be kept up to date with project information, so they are able to be involved and/or help with the project.

*Some neighbours own more than one residence within 5 km of the project site

Specific consultation has also been undertaken with receivers R1 and R2 in relation to the visual impacts of the project and the potential need for mitigation. One outcome of these discussions has been the exclusion of the northernmost section of the project site from development to minimise visual impacts to receiver R1. Consultation in relation to visual impacts is discussed further in Section 6.9.

5.4.3 Engagement with community groups and members

Engagement opportunities offered to the community include:

- online and face to face consultation sessions
- phone/email discussion
- online survey
- engagement through the Edify website.

A number of online and face to face consultation sessions with community stakeholders were planned and advertised by Edify for November 2021. Due to the large-scale flooding in the township of Forbes and the surrounding area at the time of the sessions, most of the planned engagement had to be postponed until early 2022, including:

- two drop-in information sessions in Forbes
- a number of online consultation sessions.

However, one online information session was able to be held on Thursday 18 November 2021. The consultation session targeted community groups in the areas of business, agriculture, community service, religion, arts, education and health.

This session was advertised in the following ways:

- advertisement in the Forbes Advocate newspaper, published on 4th and 11th November (half-page advertisements)
- direct contact with community groups via phone and email.

Representatives from the following organisations attended the online consultation session:

- Condobolin LALC
- TAFE – Forbes
- McMahons/Intract Indigenous Contractors
- Energy Corporation of NSW
- a representative for the Federal Member of the Riverina, MP Michael McCormack.

Due to the postponement of the face-to-face sessions and the other proposed online sessions, a short survey was also offered to stakeholders as an alternative method of engagement (see the Consultation Report in Appendix D). As of April 2022, there has been a small number of responses to the survey, which will continue post-EIS submission.

The drop-in sessions were rescheduled for 24 March 2022 in Forbes, and advertised in the Forbes Advocate newspaper, published on 10 and 17 March. Two drop-in sessions were held in the Forbes Town Hall and attracted 12 attendees, including local: community members and organisations, neighbours and local MP staff. A range of feedback was received and is included in Section 5.5.

5.4.4 Engagement with Government

Consultation was undertaken by Edify with the Forbes Shire Council and a number of government agencies during the preparation of the EIS to clarify agency requirements, discuss methodologies, and seek feedback. This included consultation with:

- Energy Assessments section of DPE regarding the EIS process, including the request for SEARs
- Energy NSW regarding the development of the project.

Consultation with Council and relevant agencies was also initiated by DPE during the preparation of the SEARs. Government agencies that provided a response to DPE for inclusion in the SEARs included:

- Forbes Shire Council
- DPE Biodiversity and Conservation and Science Directorate
- DPE Primary Industries Agriculture
- DPE Water and the Natural Resources Access Regulator
- Heritage NSW
- NSW Department of Regional NSW – Mining, Exploration and Geoscience
- TfNSW
- Transgrid
- FR NSW, Forbes
- NSW RFS.

With respect to elected representatives, the Federal Member for Riverina, the Hon Michael McCormack, was represented at the 18 November 2021 online consultation session and the 24 March 2022 drop-in session, and a video call was held in December 2021 with the State Member for Orange, MP Philip Donato. A letter of support for the project has been received from the Hon Michael McCormack (see Appendix D).

The Forbes Shire Council has certain obligations under the *Local Government Act 1993* and the EP&A Act to notify owners of land whose enjoyment of that land may be affected by the proposed development. Edify will support the council in providing information to landholders as part of the notification process.

Consultation with council has included preliminary discussions regarding a VPA with Edify Energy on 10 November 2021. Council has informed Edify by letter that prior to determining a position on the VPA, it requires an analysis of the EIS to understand the full extent of the project and its environmental, social and economic impacts. Council has also stated that it wishes to see the EIS publicly exhibited prior to finalisation of the VPA to gain an appreciation of community sentiment.

Specific consultation has also been undertaken with council in relation to measures to mitigate and/or manage potential traffic and transport impacts, the need for road maintenance contributions and for other traffic control measures. TfNSW were contacted in relation to the potential need for an intersection upgrade, but a response is expected once TfNSW is formally engaged during the public exhibition phase of the EIS. Consultation in relation to traffic impacts is discussed further in Section 6.7.

5.5 Community views

Community consultation is ongoing. Issues raised to date are summarised in Table 5.3 and are cross-referenced to relevant sections in the EIS where they are addressed.

Some key observations from the feedback include: is a general acceptance in the community of the kind of solar energy development being proposed; some concerns about impact on the part of the neighbours; and ongoing community interest in engagement with the project in implementation for the benefit of the local community.

Table 5.3 Summary of community views

Category	Issue	Section of EIS
Strategic context	No specific issues have been raised to date in relation to strategic context.	-
Project design and alternatives	Footprint and visual representation of the project and impact on neighbours.	Section 2.6.3
Relevant statutory issues	Voluntary Planning Agreement with Council	-
Community engagement	Ongoing industry/education engagement.	Section 6.11
	Further engagement with the community when the area is not affected by flooding (or harvest season).	This chapter
	Ongoing engagement with the community once operational.	This chapter
Economic, environmental and social impacts	Environmental sustainability.	-
	Approach to cultural heritage assessment.	Section 6.2

Category	Issue	Section of EIS
	Business opportunities for local companies.	Section 6.11
	Procurement approach for construction works (including indigenous procurement policy compliance).	Section 6.11
Justification and evaluation of the project	No specific issues have been raised to date in relation to the justification and evaluation of the project.	-

Edify has responded to a number of the issues raised during consultation and will continue to respond to issues as they emerge during the remaining project approvals and development phases.

For example, the occupants of the 'Pineleigh' residence (R1) have raised concerns about the visual impact of the proposed solar farm. Due to those concerns, Edify has modified the proposed design by excluding an area of approximately 7 ha at the northern end of Lot 441 so that the line-of-site to the northernmost part of the solar array is screened by existing sheds and vegetation on the landholder's land.

Edify has also provided advanced copies of the key reports such as the noise impact assessment to the nearest landholders in response to concerns.

More generally, the FAQ booklet (see Appendix D) was updated following the engagement undertaken up to December 2021, to provide relevant information in relation to comments and questions raised by community members. Progressively updating the document allows community members to see Edify's responses to matters raised by themselves and by others.

5.6 Engagement to be carried out

Stakeholder engagement will continue to be carried out across the remaining phases of the project including the:

- EIS exhibition and approvals phase
- project development phase
- construction, operation and decommissioning phases.

The engagement will be proportionate to the issues raised by the project and the level of stakeholder interest in the project and will be undertaken in a manner consistent with the requirements of *Undertaking Engagement Guidelines for State Significant Projects* (DPIE 2021).

Community engagement will follow the objectives set out in DPE's *Community Participation Plan* (DPIE 2019), i.e. engagement will be:

- open and inclusive
- easy to access
- relevant

- timely
- meaningful.

Future engagement will directly address the issues identified during the engagement undertaken to date (see Table 5.3) as well as any issues yet to emerge.

5.6.1 Nature of proposed engagement

Edify will continue to undertake both structured and informal engagement with stakeholders including:

- during EIS public exhibition and in response to submissions
- following key project development milestones
- at any other time as interest levels dictate
- as otherwise recommended by DPE.

Lines of communication between Edify and stakeholders will remain open through the project website and Edify's proactive engagement activities, such as face-to-face meetings with landholders and provision of project information.

EIS EXHIBITION AND APPROVALS PHASE

Due to the interruption to engagement process as a result of the severe flooding experienced in the Forbes area in November-December 2021, Edify undertook limited engagement in late 2021 and continued with further engagement in early 2022, incorporating the following opportunities:

- face to face engagement sessions in Forbes
- further online engagement sessions
- online survey
- offer to community groups for briefings/presentations
- correspondence on specific issues by email or phone
- regular update of the website.

The EIS will be placed on public exhibition for a minimum period of 30 days. Formal consultation with Council, DPE and other regulators will occur as part of the formal EIS response process. In addition, Edify will continue to commit resources to actively engage with project neighbours and community stakeholders during this period and to ensure that key stakeholders are aware the EIS is on exhibition.

Information about the EIS will be made available on:

- the project website
- the DPE Major Projects website.

Contact details for Edify will continue to be made available on the project website and on any distributed material. Mechanisms for community feedback and response will be maintained.

DURING PROJECT DEVELOPMENT PHASE

Edify will continue to undertake consultation with stakeholders as necessary post determination of the EIS for the project.

During the project development phase, the neighbours and the broader community will be kept informed (e.g. by calls, emails and website updates) as key milestones are approached and achieved. Information regarding the status of the project in relation to development consent, connection processes agreement, EPC contract agreements, project construction and expected project timing will be provided on the website and updated as appropriate. Stakeholders will continue to have opportunities to raise any issues of concern or discuss project opportunities.

Consultation with Council and DPE will be ongoing as secondary consents are obtained and construction and operations environmental management plans are developed.

DURING PROJECT CONSTRUCTION, OPERATION AND DECOMMISSIONING

Consultation with neighbours and the broader community will continue throughout the construction, operation and eventual decommissioning of the project, including:

- receiving, documenting and responding to community issues via a formally implemented feedback/response process
- correspondence on specific issues by email or phone
- regular update of the website.

Ongoing reporting to and communication with regulatory agencies as required under consent conditions, and informally as needed.

5.6.2 Response to key issues

Responses supported by relevant information will be made as required to engage with issues raised by stakeholders. Such response may involve, calls, emails, face to face meetings, website updates or updates to the FAQ document. If relevant, a project update will be provided to concerned stakeholders outlining any information and/or amendments made to the project design or timeline.

Edify will continue to consider community views in the refinement of proposed mitigation measures, particularly in relation to concerns over visual impact or other amenity issues. Edify will also provide opportunities through tendering and advertising for local services and workforce, particularly during project construction.

6 Assessment and mitigation of impacts

6.1 Project issues and assessment

6.1.1 Issues

The Peninsula SF project may result in a number of potential environmental and social impacts, both positive and negative. The nature and extent of these potential impacts has been assessed during the EIS process and avoidance, management and mitigation measures have been incorporated into project design, construction, operation and eventual decommissioning.

The scoping of potential environmental and social impacts, undertaken initially for the Scoping Report (Edify 2021) and refined following the issuing of the SEARs (see Appendix A), has identified nine higher priority issues requiring particular focus, as follows:

- potential impacts on biodiversity such as plant communities and threatened and endangered species
- potential disturbance of Aboriginal cultural heritage
- potential impacts on land use and capability
- potential impacts on watercourses and hydrology
- potential traffic and transport impacts, particularly on local roads
- potential noise impacts on nearest sensitive receivers
- potential impacts on visual amenity for the nearest sensitive receivers
- hazards associated with the operation of BESS units
- social and economic impacts (positive and negative), particularly on the local community.

Although the above issues were identified as higher priority in terms of requiring assessment, this does not mean that there is necessarily a high risk of associated impacts. As outlined in this chapter, the technical investigations undertaken have determined that there is little inherent risk of adverse impacts associated with the majority of these issues.

The scoping process has also identified a number of environmental or social issues that are considered to be lower priority due to their lower risk of impact, but which nonetheless require assessment in the EIS to confirm levels of impact and the need for management. These lower priority issues include:

- potential impacts on historic heritage
- potential for disturbance of existing site contamination
- potential vibration impacts on nearest sensitive receivers
- hazards associated with electric and magnetic fields (EMF) and bushfires
- potential air quality impacts (in particular, dust impacts)
- management of waste generated by the project.

6.1.2 Assessment

Table 6.1 summarises the level of assessment undertaken for each category of environmental issue identified in the SEARs, including whether the assessment was standard or detailed, and whether cumulative impacts were considered. Table 6.1 also cross-references each issue to the relevant section of Chapter 6.

The *State significant development guidelines – preparing a scoping report* (DPIE 2021c), define standard and detailed assessments as follows:

- **Detailed assessment** – The project may result in significant impacts on the matter, including cumulative impacts. The assessment of the impacts of the project on the matter will require detailed studies and investigations to be carried out by technical specialists.
- **Standard assessment** – The project is unlikely to result in significant impacts on the matter, including cumulative impacts. While the assessment of the impacts of the project on the matter will involve technical specialists, these impacts are likely to be well understood, relatively easy to predict using standard methods, and capable of being mitigated to comply with relevant standards or performance measures.

Table 6.1 Environmental issues and level of assessment

Impact category	Level of assessment	Form of assessment	CIA	Section of EIS
Higher priority issues				
Biodiversity	Detailed	Biodiversity Assessment Development Report (BDAR) (Appendix F)	No	Section 6.2
Aboriginal cultural heritage	Detailed	ACHAR (Appendix E)	No	Section 6.3
Land use and capability	Standard	Site inspection and desktop review, supported by Land Use Conflict Risk Assessment (LUCRA) (Appendix H)	Yes	Section 6.5, Section 6.13
Watercourses and hydrology	Standard (Detailed for flood risk)	Site inspection and desktop review, supported by Flood Impact Assessment (Appendix I)	No	Section 6.6
Traffic and transport	Detailed	Traffic Impact Assessment (Appendix J)	Yes	Section 6.7, Section 6.13
Noise	Detailed	Noise Impact Assessment, including vibration (Appendix K)	Yes	Section 6.8, Section 6.13

Impact category	Level of assessment	Form of assessment	CIA	Section of EIS
Visual amenity	Detailed	Visual Impact Assessment (Appendix L)	No	Section 6.9
Hazards – BESS units	Detailed	PHA (Appendix M)	No	Section 6.10
Social and economic	Standard	Desktop review	Yes	Section 6.11, Section 6.13
Lower priority issues				
Historic heritage	Standard	Site survey and desktop review (Appendix N)	No	Section 6.4
Existing site contamination	Standard	Site inspection and desktop review	No	Section 6.5
Vibration	Detailed	Noise Impact Assessment (Appendix K)	No	Section 6.8
Hazards – EMF and bushfires	Standard	Site inspection and desktop review	No	Section 6.10
Air quality	Standard	Desktop review	No	Section 6.5
Waste	Standard	Desktop review	No	Section 6.12

Where possible, impacts have been assessed in relation to compliance with relevant standards or performance measures (e.g. noise assessment criteria). For some potential impacts, standards and performance measures are less well-defined and impacts have been described in a more qualitative manner, based on factors such as their extent, magnitude, duration and reversibility, taking into account the sensitivity of the receiving biophysical and social environment.

6.2 Biodiversity

Under the *Biodiversity Conservation Act 2016* (BC Act), the priority for SSD proposals is to avoid impacting on important biodiversity, such as may result from the direct or indirect disturbance of native vegetation and habitat. This section quantifies the extent and quality of the remnant vegetation within the project site and the direct and potential indirect impacts to vegetation and wildlife habitat due to the project.

A Biodiversity Assessment Report (BDAR) was prepared by OzArk Environment and Heritage Pty Ltd (OzArk) to identify the biodiversity values of the project site and potential project impacts. The BDAR is provided in Appendix F and summarised below.

A desktop assessment of biodiversity values associated with a potential intersection upgrade was also undertaken by OzArk (Appendix G) and is discussed in Section 6.7.

6.2.1 Level of assessment

The SEARS required an assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the BC Act and the biodiversity assessment method (BAM), with the assessment being documented in a BDAR. Accordingly, a ***detailed assessment*** of biodiversity has been undertaken.

6.2.2 Methodology

The land that is the subject of the BDAR is the land to be directly disturbed by the project (i.e. the project footprint). This is assumed to be all the land within the project site, with the exception of land within the designated non-development zones (see Figure 1.3). This area of assumed direct disturbance is referred to as the 'subject land' in the BDAR and in this section.

The biodiversity assessment was carried out in three stages:

- desktop searches and review of ecological databases and information to identify threatened species, populations or ecological communities listed in the BC Act, *Fisheries Management Act 1994* or the EPBC Act that have the potential to occur in the study area
- field survey of the subject land (Photo 6.1) to collate species lists so as to identify the vegetation communities present and target predicted threatened species and ecological communities. Where a threatened species or community or habitat feature is identified, document the nature and extent of the protected matter and describe its 'viable local population' or occurrence
- BAM assessment and preparation of the BDAR that describes the impacts of the proposed activity on native vegetation and threatened species, populations and ecological communities, and provides recommendations to avoid, minimise and mitigate these impacts.

The BDAR also includes a biodiversity credit summary that identifies the number of ecosystem credits and species credits required to offset the development.

6.2.3 Existing conditions

LANDSCAPE FEATURES

Bioregion

The study area is situated in the Lower Slopes subregion of the NSW South Western Slopes Bioregion, as per the *Interim Biogeographic Regionalisation of Australia* (IBRA) (Thackway and Cresswell 1995).

The subject land has been subjected to extensive historical clearing. Consequently, vegetation within the site consists of small wooded remnants, isolated paddock trees, derived grassland and non-native vegetation.

NSW (Mitchell) Landscapes

The subject land occurs almost entirely within the Warraderry Range NSW (Mitchell) Landscape, except for the northern tip which is located within the Bimbi Plains landscape. The

Lachlan – Bland Channels and Floodplains landscape occurs north of the site along the lower regions of Mulyandry Creek. These three landscapes have a clearing status of 'overcleared' and are 81%, 93% and 82% cleared, respectively.

Photo 6.1
Survey of vegetation zone 267_good, located in non-development zone 10

Biodiversity values

The Biodiversity Values Map (BV Map) (DPIE 2020c) identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. The subject land does not contain land identified on the BV Map. The nearest land mapped on the BV Map is located along Mulyandry Creek (approximately 580 m to the north).

The site does not contain any currently listed Areas of Outstanding Biodiversity Value.

SEPP (Koala Habitat Protection) 2020 and 2021

Forbes LGA is listed in Schedule 1 – Local Government Areas of the SEPP (Koala Habitat Protection) (Koala SEPP) and therefore is subject to the requirements of the SEPP. As the subject land is zone RU1 (Primary Production), it falls within the remit of the 2020 SEPP. While the vegetation within the subject land is highly disturbed, it nevertheless contains areas of sparse woodland with Koala feed trees (White Box, Yellow Box, Grey Box, and Blakely's Red Gum). Of these four feed trees, White Box is listed under Schedule 2 of the Koala SEPP 2020. In some areas, White Box made up more than 15% of the total number of trees in the upper canopy, therefore the subject land could potentially be considered core Koala habitat. However, as there are no recent records of Koalas within 10 km of the subject land and Koalas

were not recorded on site, OzArk do not consider it to be core Koala habitat. The only record within 10 km is from 1972, approximately 4.3 km east-southeast of the subject land.

The subject land was further assessed under the EPBC Act Referral Guidelines for the vulnerable koala. The assessment determined the subject land does not constitute critical habitat for the koala.

Native vegetation cover

Native vegetation cover (woody vegetation, including regrowth and plantations comprised of plants native to New South Wales and non-woody vegetation with no apparent signs of cultivation) was assessed within the study area and the subject land. For the purposes of the BAM, the native vegetation cover class has been determined as >10-30%.

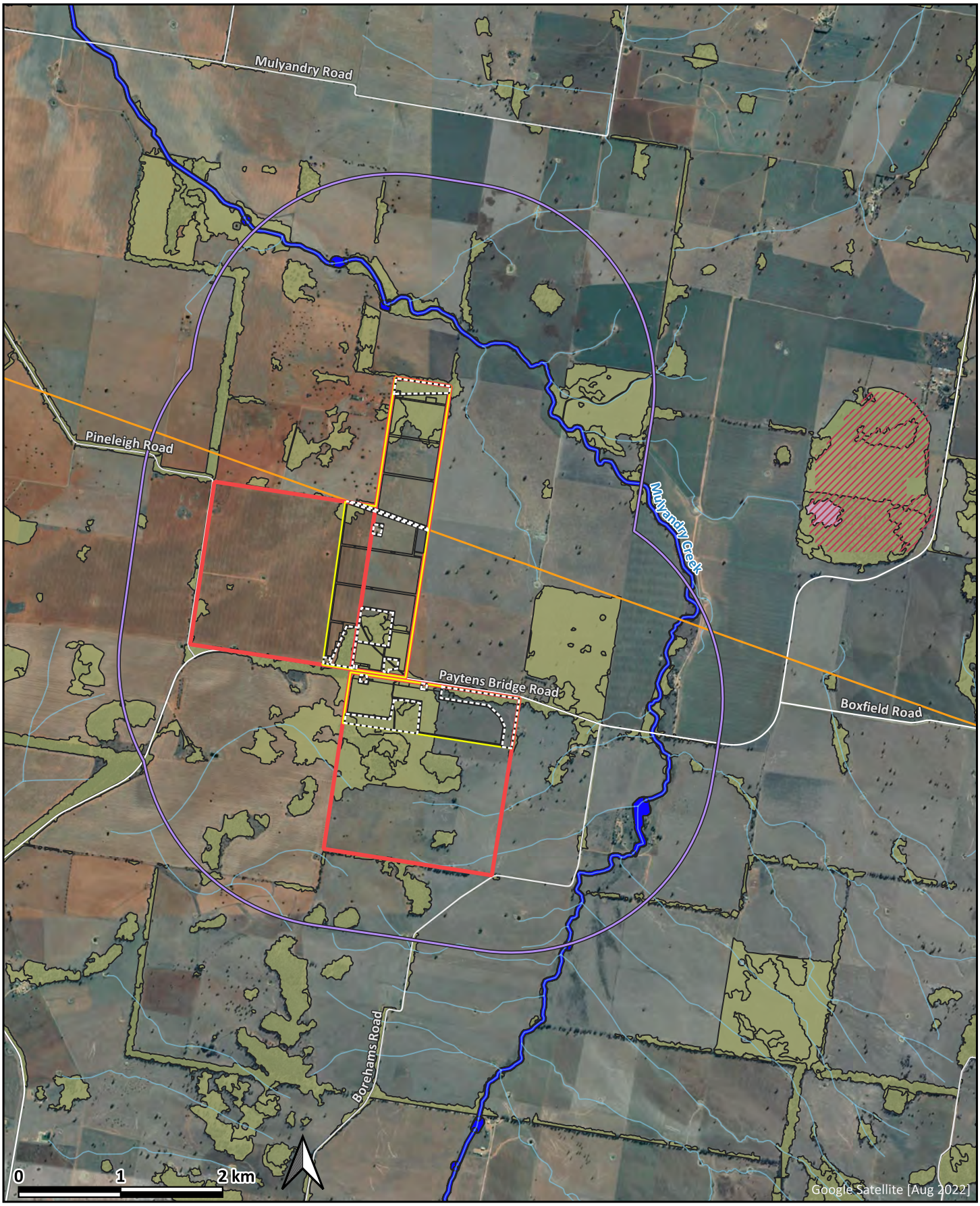
Rivers, streams, wetlands and Key Fish Habitat

No watercourses are mapped as occurring on the subject land (Figure 6.1).

Mulyandry Creek (Photo 6.2) has been mapped as Key Fish Habitat (KFH) by the Department of Primary Industries – Fisheries and identified as Protected Riparian Land (PRL) by DPE. Mulyandry Creek is 580 m east of the project site and flows north and northwest to its confluence with the Lachlan River approximately 9 km north of the site.

There are no wetlands mapped with the subject land or study area, therefore it is determined that the proposal does not impact the KFH associated with Mulyandry Creek. The nearest mapped wetlands – two floodplain wetlands – are located approximately 3.6 km and 5.9 km to the east.

Photo 6.2 View upstream (south) along Mulyandry Creek from Paytens Bridge Road



- Project site
- Lot boundary
- Proposed site infrastructure
- Aquatic GDE - high potential GDE - from national assessment
- Terrestrial GDE - high potential GDE - from regional studies
- Terrestrial GDE - low potential GDE - from regional studies
- Protected Riparian Land
- Existing transmission line
- Watercourse - tributary
- 2 km radius from project site
- Non-development zone

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Figure 6.1. Watercourses, groundwater dependent ecosystems and Protected Riparian Land
Created: 18/08/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4
Additional data: NSW RoadSegment, NSW Hydroline, NSW_Six_Forbes_cadastral_data, NSW Biodiversity Values Map - spatial data pack v. 12.1

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Groundwater dependent ecosystems

Groundwater plays an important ecological role in supporting terrestrial and aquatic ecosystems, both directly and indirectly. Ecosystems supported by groundwater are called groundwater dependent ecosystems (GDEs).

The Bureau of Meteorology *Atlas of Groundwater Dependent Ecosystems* identified areas of low potential for interaction with terrestrial GDEs within the subject land and study area (BOM 2021b). No high- or moderate-potential GDEs occur on the subject land or within the study area and no aquatic GDEs are mapped within the study area. The closest mapped aquatic GDEs are associated with the two floodplain wetlands located to the east (see Figure 6.1).

Connectivity features

The subject land has been cleared for agricultural use, including both grazing and cropping, and only small remnants and isolated paddock trees remain of the original vegetation. The most notable remaining connectivity features in the surrounding landscape occur in the corridor associated with Paytens Bridge Rd, which retains an intermittent covering of woody vegetation, and in the numerous small remnants located in adjacent paddocks, which may act as stepping-stones between larger remnants. Many of these remnants are identified in the Forbes LEP as possessing high terrestrial biodiversity value.

NATIVE VEGETATION

Plant community types

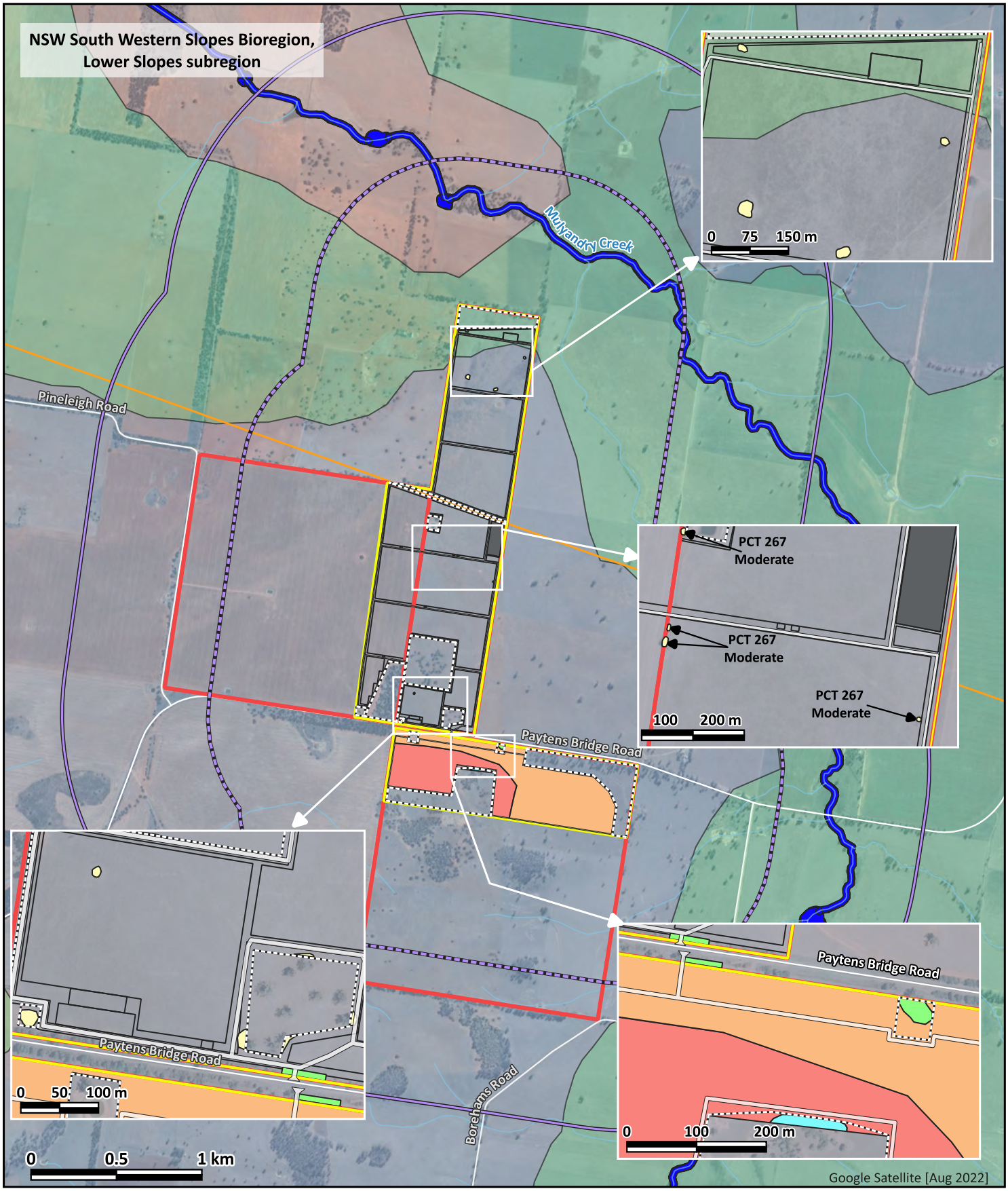
The subject land has been subjected to extensive historical clearing. Consequently, vegetation within the subject land consists of small wooded remnants, isolated paddock trees, derived grassland and non-native vegetation.

Vegetation mapping (DPIE 2020d) available for the Central West/Lachlan region models three plant community types (PCTs) within the subject land:

- PCT 45 – Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion
- PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions
- PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW

The field assessment determined that this modelling is largely incorrect. Instead, the following two PCTs were recorded within the project footprint, occurring in a total of five condition states (Figure 6.2):

- PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion
- PCT 282 – Blakely's Red Gum – White Box – Yellow Box – Black Cypress Pine box grass/shrub woodland on clay loam soils on undulating hills of central NSW South Western Slopes Bioregion



Project site
Lot boundary
Substation and centralised battery
Proposed site infrastructure
Protected riparian land
Non-development zone

NSW (Mitchell) Landscapes
Bimbi Plains
Lachlan - Bland Channels and Floodplains
Warraderry Range

PCTs and Vegetation Zones
267 - Good
267 - Moderate
267 - Poor
282 - Good
282 - Moderate
Watercourse - tributary
Existing transmission line
1 km radius from project site
2 km radius from project site

N

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Figure 6.2. Plant vegetation types and vegetation zones identified during the vegetation survey
Created: 18/08/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4
PCT and vegetation zone data courtesy of OzArk Environment and Heritage
Additional data: NSW (Mitchell) Landscapes v3.1_s,
Map - Protected Riparian Land (wms), NSW RoadSegment,
NSW Hydroline, NSW_Six_Forbes_Cadastral_data,
NSW ElectricityTransmissionLine

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The PCTs are described in greater detail in Table 4.1 of Appendix F.

The locations of BAM plots are shown in Figure 6.3 (the mapping was subsequently refined to match the final development footprint and the exclusion of higher quality wooded areas).

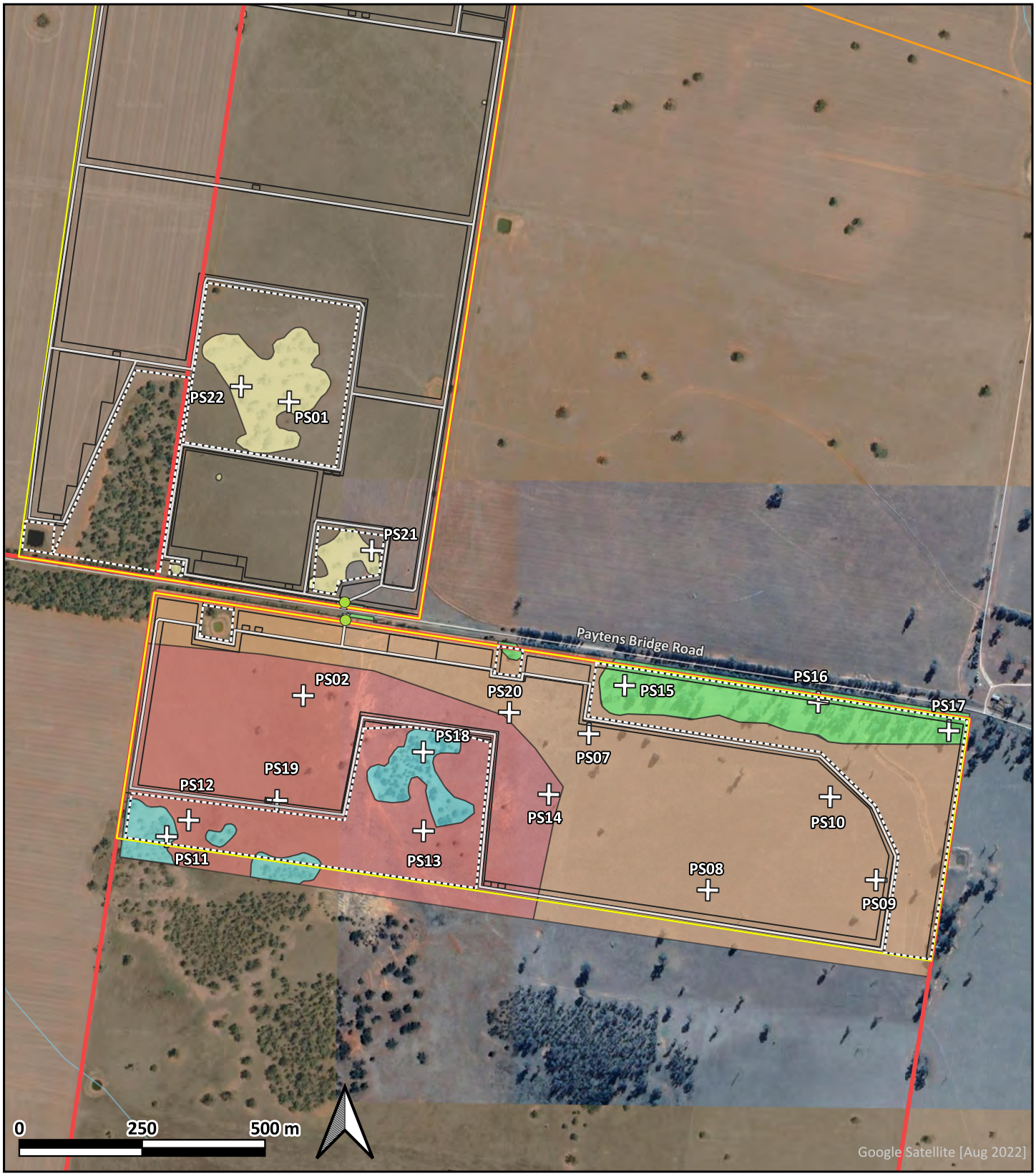
The modelled occurrence of PCT 250 corresponds to examples of PCT 267 and PCT 282 in poor condition. While the derived grassland community PCT 250 may broadly describe the vegetation present within the subject land, the BAM states that derived communities should be mapped to their most likely parent PCT; for this reason, mapping of these derived areas to PCT 267 and PCT 282 has been preferred. These communities were identified on the basis of proximity to higher-quality examples of these PCTs and on the basis of surviving groundcover composition.

Within the northeastern extent of the site, there is a small section of PCT 76 that appears to be overlapping the subject land, this represents overhanging tree canopy and these trees will not be removed or impacted by the proposal.

Vegetation zones, patch size and vegetation integrity

To be assessed under the BAM, native vegetation on the subject land has been assigned a zone, based on its condition state and the patch to which it belongs. A description of each vegetation zone is provided below:

- **Vegetation zone 267_good** – a woodland or open woodland (canopy approximately 40%) featuring a canopy dominated by White Box (*Eucalyptus albens*), Grey Box (*Eucalyptus microcarpa*), and Buloke (*Allocasuarina luehmannii*) (see Photo 6.1). Some Yellow Box (*Eucalyptus melliodora*) was also noted in this zone and White Cypress-pine (*Callitris glaucophylla*) was common in roadside occurrences of this community. The shrub layer was sparse to absent. Wingless Bluebush (*Maireana enchylaenoides*), a component of PCT 267, was noted in places, as were the associated understorey species Ringed Wallaby Grass (*Rytidosperma caespitosum*), Curly Windmill Grass (*Enteropogon acicularis*), Rough Speargrass (*Austrostipa scabra*), Climbing Saltbush (*Einadia nutans*), and Fuzzweed (*Vittadinia cuneata*). This zone was observed to feature a relatively high diversity of native forbs and graminoids. Minor occurrences of the High-threat Exotic species Bathurst Burr (*Xanthium spinosum*) were noted.
- **Vegetation zone 267_moderate** – open woodland to derived grassland (canopy approximately 19%). Where canopy species were present, White Box (*Eucalyptus albens*) or Yellow Box (*Eucalyptus melliodora*) dominated. Isolated Grey Box (*Eucalyptus microcarpa*) and White Cypress-pine (*Callitris glaucophylla*) paddock trees were also noted. The shrub layer was largely absent. Wingless Bluebush (*Maireana enchylaenoides*) occurs in this zone, along with a small number of species considered to form components of PCT 267, including Climbing Saltbush (*Einadia nutans*) and Curly Windmill Grass (*Enteropogon acicularis*). The understorey is generally sparser, less diverse in native plants, and more strongly invaded by exotic species than 267_good. Bathurst Burr (*Xanthium spinosum*) and Silverleaf Nightshade (*Solanum elaeagnifolium*) both occur in this zone.



Project site
Lot boundary
Exclusion zone
BAM plot location
Existing transmission line
Proposed site infrastructure
Site road
Site access point

Vegetation Zones

267_Good
267_Mod
267_Poor
282_Good
282_Mod

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Figure 6.3. Locations of BAM vegetation integrity plots
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CRS: GDA 1994 MGA Zone 55
Page size: A4
BAM plot location and PCT data courtesy of OzArk Environment and Heritage
Additional data: NSW RoadSegment, NSW ElectricityTransmissionLine

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- **Vegetation zone 267_poor** – derived grassland with infrequent paddock trees. These were largely White Box (*Eucalyptus albens*), but some Kurrajong (*Brachychiton populneus*) occurs in disturbed areas. The shrub layer was largely absent, though minor occurrences of Western Silver Wattle (*Acacia decora*) were noted. Exotic species were common in the mid- and ground-layers, but significant occurrences of native forbs and tussock grasses were noted. These included Fuzzweed (*Vittadinia cuneata*), Ringed Wallaby Grass (*Rytidosperma caespitosum*), Windmill Grass (*Chloris truncata*), and Red Grass (*Bothriochloa macra*). The High-threat Exotic weed Saffron Thistle (*Carthamus lanatus*) was common, and occurrences of Bathurst Burr (*Xanthium spinosum*) were noted.
- **Vegetation zone 282_moderate** – derived grassland with paddock trees or isolated paddock trees in an otherwise agricultural landscape. While retaining a relatively high diversity of native forbs and grasses, significant weed encroachment was noted in this zone. The High-threat Exotic weed Saffron Thistle (*Carthamus lanatus*) was reasonably common, and occurrences of Bathurst Burr (*Xanthium spinosum*) and Silverleaf Nightshade (*Solanum elaeagnifolium*) were noted.
- **Bare ground and non-native vegetation** – this encompasses cropped areas lacking native vegetation communities, derived grasslands or pastures now dominated by exotic species, road surfaces, bare earth, and similar areas that could not be assigned to a PCT.

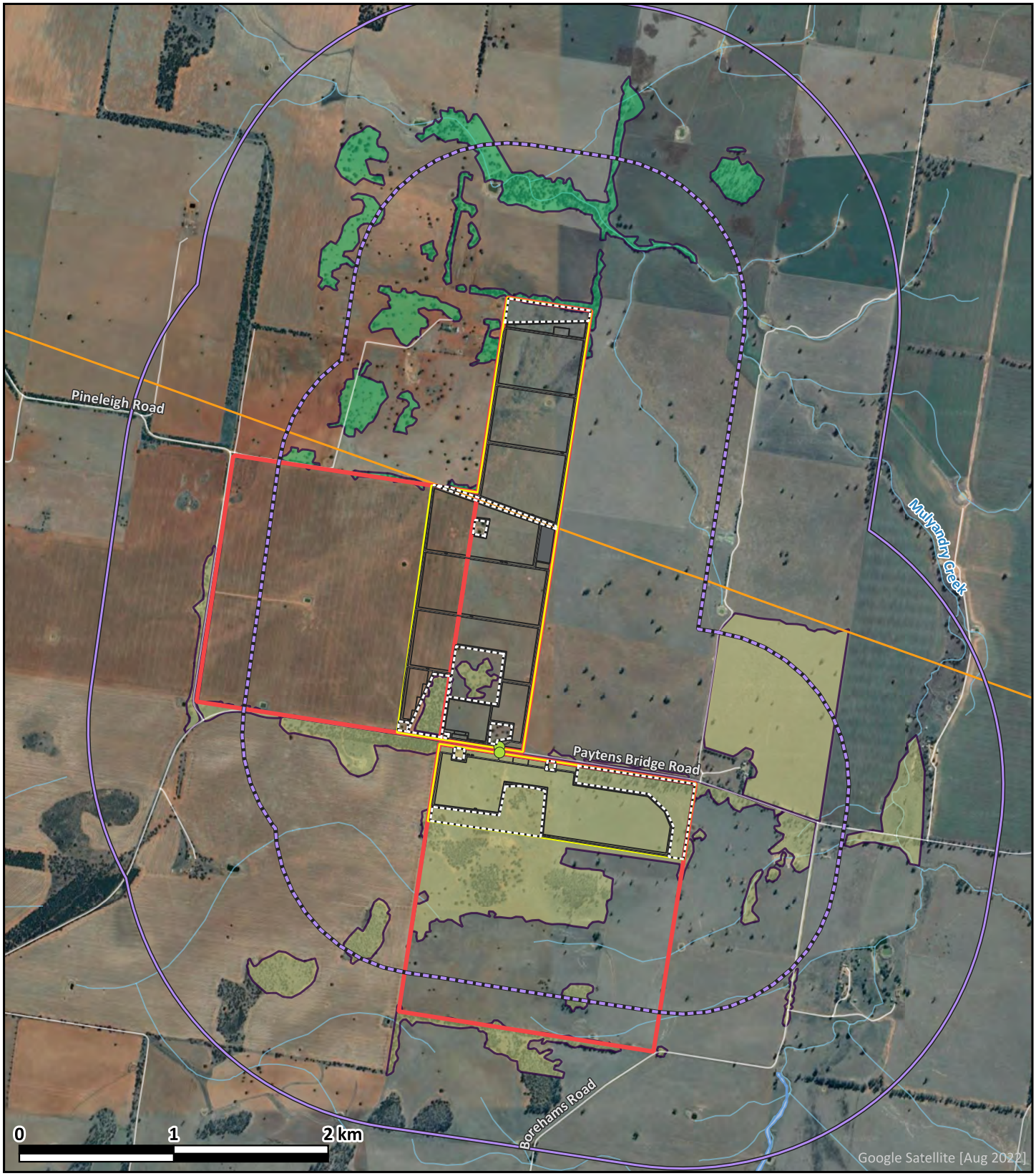
Vegetation patches were also identified, with a patch defined in the BAM operational manual – Stage 1 (DPIE 2020e) as an area of native vegetation that occurs on the subject land and includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). The patch may extend onto land adjoining the subject land.

Two native vegetation patches associated with the vegetation zones were mapped – a northern one located north of the northern section of the subject land and a southern one that includes the entire southern section of the site and extends beyond the site (Figure 6.4).

Flora species observed

The field survey identified a total of 81 flora species within the subject land and wider assessment area. Of these, 57 species (70.37%) were native and 24 (29.63%) exotic. Three of the recorded exotic species – Bathurst Burr (*Xanthium spinosum*), Silverleaf Nightshade (*Solanum elaeagnifolium*), and Saffron Thistle (*Carthamus lanatus*) – are listed as High Threat Exotic (HTE) species under BAM and therefore the BC Act.

Plot photographs, BAM plot datasheets and a list of all flora species observed during the field assessment are provided in Appendices B and C of Appendix F.



- Project site
- Lot boundary
- Substation and centralised battery
- Proposed site infrastructure
- Non-development zone

Native vegetation patch

- Northern patch
- South patch
- Existing transmission line
- 1 km radius from project site
- 2 km radius from project site

N

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Figure 6.4. Native vegetation patches associated with the vegetation zones

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CRS: GDA 1994 MGA Zone 55

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Native vegetation data courtesy of OzArk Environment and Heritage

Additional data: NSW RoadSegment, NSW ElectricityTransmissionLine, NSW Six cadastral data, NSW Hydroline

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Threatened ecological communities

PCT 267 and PCT 282 are associated with the following threatened ecological communities (TECs):

- BC Act, critically endangered ecological community (CEEC): White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions.
- EPBC Act, CEEC: White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

Additionally, PCT 267 may be associated with the following TECs:

- BC Act, endangered ecological community (EEC): Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions.
- EPBC Act, EEC: Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia.

All vegetation zones recorded on the subject land met the condition thresholds to be considered examples of the White Box – Yellow Box – Blakely's Red Gum CEEC listed under the BC Act. Additionally, the vegetation zone 282_Good was found to meet the condition criteria to be considered an example of the EPBC Act-listed CEEC White Box – Yellow Box – Blakely's Red Gum community.

THREATENED SPECIES

The known or potential presence of threatened species on the subject land is an important factor when calculating the credits required to offset the impacts of project disturbance. For the purpose of credit calculations, these species are listed as either ecosystem credit species or species credit species, where:

- An ecosystem credit species is a species whose likelihood of occurrence can be predicted by vegetation surrogates and landscape features, or for which targeted survey has a low probability of detection. A targeted survey is not required for these species (DPIE 2020e).
- A species credit species is a species whose likelihood of occurrence cannot be predicted by vegetation surrogates and/or landscape features and can be reliably detected by survey. A targeted survey or expert report is required to confirm presence/absence of these species (DPIE 2020e).

Habitat features present

The subject land was assessed for its potential to provide habitat for threatened flora and fauna known or predicted to occur in the study area. Habitat features may include rock outcrops, caves and overhangs, hollow-bearing trees, wetlands (including dams), and watercourses.

An area of outcropping rock is located just south of the site and scatterings of loose surface rock were also identified. Hollow-bearing trees with both large (>20cm diameter) and small (<20 cm diameter) hollows were recorded, as were stags (standing dead trees), with and without hollows.

No waterways, natural water bodies or wetlands are present within the subject land. However, the agricultural dams on the site could provide habitat for certain flora and fauna species (e.g., frogs, turtles, fish and waterbirds).

Ecosystem credit species

In total, 32 ecosystem credit species were generated by the BAM calculator (BAM-C) (see Table 5.1 of Appendix F). The habitat suitability of the subject land for these species was assessed. One species (Painted Honeyeater) was removed from the list due to habitat constraints, two species (Superb Parrot and Grey-crowned Babbler eastern subspecies) were detected during targeted surveys, and 29 species are assumed present. An additional species (Little Pied Bat) not predicted by the BAM-C was detected during acoustic surveys.

Species credit species

In total, 21 species credit species were generated by the BAM-C (see Table 5.2 of Appendix F). The habitat suitability of the subject land for these species was assessed. According to the BAM, if suitable habitat for these species occurs on the subject land, they must be the subject of an expert report or targeted survey according to recommended guidelines, or else assumed present.

After consideration of habitat constraints, four species and one endangered population could be discounted due to distribution or the unsuitability of habitat within the subject land, while 16 species credit species still had the potential to occur.

One species credit species – the Masked Owl (*Tyto novaehollandiae*) was assumed present, as its indicated survey period (May to August) fell outside the window of opportunity for targeted surveys.

Surveys were conducted for the other 15 species in accordance with relevant and approved BAM survey methodologies.

Male and female superb parrots were detected on the subject land during their breeding season. Although no fledglings were observed and no breeding pairs were observed entering or exiting hollows, the species is assumed to breed on the subject land.

The remaining 14 species credit species were determined to be absent based on the results of targeted field surveys or due to habitat constraints.

6.2.4 Impact assessment

The project site was initially selected by Edify in part due to its high level of disturbance from a long history of primary production and its distance from areas of high environmental sensitivity. The potential for biodiversity impacts was then further reduced during initial conceptual planning by the designation of non-development zones within the project site (see Figure 1.3). Eight of these non-development zones have been excluded from development

primarily or partly because of the potential biodiversity values associated with them, due to the presence of native vegetation or farm dams.

The potential direct and indirect impacts of the project on biodiversity are discussed below.

OFFSET SCHEME THRESHOLD

The project has been assessed against the relevant vegetation clearing thresholds under the NSW Biodiversity Offsets Scheme (BOS). The project site is currently zoned RU1 (Primary Production), with a minimum lot size of 200 ha. Clearing of 1 ha or more of native vegetation will require entry into the BOS. The project will clear up to 56.55 ha of native vegetation, hence entry into the BOS is required.

IMPACTS TO WETLANDS, WATERCOURSES AND AQUATIC HABITAT

There are no wetlands on the subject land. Any potential for indirect impact to nearby watercourses from erosion and sedimentation related to construction activities will be avoided and minimised as outlined in Section 6.5.6.

IMPACTS TO NATIVE VEGETATION

The project will result in the clearance of up to 56.55 ha of native vegetation from PCTs 267 and 282. All vegetation zones within both PCTs were found to meet the condition criteria to be considered CEECs under the BC Act. Additionally, the vegetation zone 282_Good (0.14 ha) was found to meet the threshold criteria for listing under the EPBC Act.

The small section of PCT 76 that appears to be overlapping the subject land in the northeast section of the site, represents overhanging tree canopy. The overhanging trees are outside the project boundary and will not be removed or impacted by the proposal.

No threatened flora species were recorded during surveys of relevant habitat. No impacts to threatened flora are therefore anticipated.

SERIOUS AND IRREVERSIBLE IMPACTS

The *Guidance to assist a decision-maker to determine a serious and irreversible impact* (NSW DPIE 2019b) and the NSW threatened species data collection has been used to determine which threatened entities require further assessment for Serious and Irreversible Impacts (SAII). One such entity is relevant to the proposed project: the White Box - Yellow Box - Blakely's Red Gum Grassy Woodland (White Box CEEC) present on the subject land.

White Box CEEC

As all native vegetation recorded on the subject land meets the criteria to be considered either a derived or intact example of the White Box CEEC, an assessment was undertaken as per Section 9.1 of the 2020 Biodiversity Assessment Method manual (NSW Government 2020b). The assessment found that, as the vegetation within the subject land consists principally of modified derived grassland, the proposal is unlikely to significantly exacerbate the existing fragmentation of the local occurrence of this community. Most substantial wooded remnants have been excluded from the development footprint, and these will continue to act as stepping-stones between larger remnants.

At the time of writing, no targeted mitigation or regeneration strategies have been undertaken to ensure the continued survival of the White Box beyond offsetting associated with Part 4 of the EP&A Act, including offsetting requirements relating to relevant clearing thresholds.

PRESCRIBED IMPACTS

The Biodiversity Conservation Regulation 2017 lists eleven impacts as prescribed impacts that must be avoided, minimised and mitigated. An assessment of the project against the eleven impacts (see Table 6.3 of Appendix F), identified four as potential impacts requiring mitigation measures:

- *Impacts of development on the habitat of threatened species or ecological communities associated with rocks*: areas of loose surface rock and outcropping rock will be impacted by the proposal (although no individual Pink-tailed Legless Lizards or other threatened species were recorded during the survey of these areas).
- *Impacts of development on the habitat of threatened species or ecological communities associated with non-native vegetation*: non-native vegetation on the subject land may provide habitat for species or ecosystem credit species, and mitigations associated with fauna interactions apply.
- Impacts of development on the connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range: although the subject land is extensively cleared, the loss of isolated paddock trees may slightly reduce connectivity between larger patches in the local landscape.
- *Impact of vehicle strikes on threatened species of animals or on animals that are part of a TEC*: such impacts may result from the increase in overall traffic movement associated with the project.

If the mitigation measures outlined in Section 6.2.6 are implemented effectively, then impacts in relation to the above prescribed impacts are expected to be acceptably minimised and mitigated in accordance the requirements of the Regulation.

In relation to connectivity, the road corridor and wooded remnants, collectively, may facilitate the movement of fauna species between larger local remnants, including Mulyandry, Tomanbil and Warraderry State Forests, and Conimbla and Nangar National Parks. However, the narrow and intermittent nature of many of these connectivity features is likely to limit their usefulness. Connectivity declines to the north and east of the project site, where isolated paddock trees and tree lines associated with paddock fences represent the totality of the surviving vegetation. However, the existing treeline along the northern boundary of the site will be preserved and maintained – as this is not within the development footprint, thus preserving connectivity.

INDIRECT IMPACTS

The main impacts of the project are expected to be contained within the subject land, provided there is adequate demarcation between operational and non-operational areas.

However, potential indirect impacts could include:

- inadvertent impacts on adjacent habitat or vegetation, such as due to loss of foraging habitat within the site, potential injury or mortality to neighbouring fauna
- reduced viability of adjacent habitat due to edge effects, such as degradation of native vegetation and habitat for threatened flora and fauna
- reduced viability of adjacent habitat due to noise, dust or light spill
- transport of weeds and pathogens from the site to adjacent vegetation
- increased risk of starvation or exposure, and loss of shade or shelter, such as due to loss of foraging habitat within the subject land (although likely at least partially offset by the shade and shelter offered by the solar arrays)
- loss of breeding habitat within the subject land
- trampling of threatened flora species
- rubbish dumping degrading native vegetation and habitat.

Indirect impacts are expected to be minor in comparison with the direct impacts and will be further reduced by proposed management and mitigation measures relating to other environmental aspects such as weed/pest management (see Section 6.5.6), drainage management (see Section 6.6.5), traffic management (see Section 6.7.5), noise management (see Section 6.8.5), lightspill management (see Section 6.9.5), bushfire management (see Section 6.10.7) and waste management (see Section 6.12.5).

KEY THREATENING PROCESSES

A number of key threatening processes (KTPs) under the BC Act and at Federal level are considered likely or very likely to be exacerbated by the proposal (see Table 6.5 of Appendix F). These include:

- aggressive exclusion of birds by abundant Noisy Miners, *Manorina melanocephala*
- anthropogenic climate change (due to emissions associated with construction and operation), although these emissions will be offset by the project's displacement of energy derived from fossil fuels with renewable energy. In their document *PV FAQs*, the U.S. Department of Energy (2004) noted that 'energy pay-back' from ground-mounted PV systems is typically within approximately four years of operation
- clearing of native vegetation
- competition from feral honeybees, *Apis mellifera*
- invasion of native plant communities by exotic perennial grasses
- loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants
- loss of Hollow-bearing Trees
- removal of dead wood and dead trees

- bushrock removal
- loss of hollow-bearing trees.

Threats exacerbated by poor biosecurity controls will be potentially exacerbated by the project. However, the biosecurity management measures set out in Section 6.5.6 will minimise this risk.

MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Under the environmental assessment provisions of the EPBC Act, Matters of National Environmental Significance (MNES) and impacts on Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Government DoEE.

The EPBC Act protected matters search has identified four TECs, 24 threatened species, 11 listed migratory species and 18 listed marine species with the potential to occur in the 10 km search area (see Appendix A of Appendix F). Of these, 10 threatened and seven migratory species possibly occur, based on habitat available on the subject land.

Based on an assessment of impact significance for these threatened species in accordance with EPBC guidelines (see Appendix E of Appendix F), it is concluded that no MNES will be significantly impacted by the proposal.

Targeted Koala surveys failed to detect any Koalas, or signs of Koalas, on the subject land and, the proposal is not likely to significantly impact current or future populations of Koalas and therefore does not require referral.

6.2.5 Biodiversity credit and offset report

The BAM considers future vegetation condition of different areas of the development footprint when calculating biodiversity credits and offsets. It has been assumed that all vegetation within the subject land (i.e. within the project site, but outside the non-development zones – see Figure 1.3) will be managed the same, i.e., cleared. Therefore, offset requirements have been assessed assuming only one management zone. The non-development zones include a number of areas possessing remnant woody vegetation that have been excluded in accordance with the avoid and minimise approach to managing biodiversity impacts.

VEGETATION INTEGRITY

Vegetation integrity (VI) scores have been calculated for each vegetation zone based on patch size, area to be impacted, vegetation composition, structure and function. Benchmark data for the PCTs was also used for calculating VI.

ECOSYSTEM CREDIT SUMMARY

Based on the VI score and area of impact to each PCT, 278 ecosystem credits are required to be offset for the project, as shown in Table 6.2.

Table 6.2 Ecosystem credits requiring offsetting (copied from BAM-C)

Vegetation zone name	TEC name	Area (ha)	Ecosystem credits
282_Mod	White Box - Yellow Box - Blakely's Red Gum Woodland and Derived Native Grassland	20.6	268
267_Good	White Box - Yellow Box - Blakely's Red Gum Woodland and Derived Native Grassland	0.09	4
267_Mod	White Box - Yellow Box - Blakely's Red Gum Woodland and Derived Native Grassland	0.28	6
267_Poor	White Box - Yellow Box - Blakely's Red Gum Woodland and Derived Native Grassland	35.6	0

SPECIES CREDIT SUMMARY

The species credits required for the proposal are summarised in Table 6.3.

Table 6.3 Species credit summary for species assumed present

Common name	Scientific name	Species presence	Impacted area (ha)	Biodivers-ity risk weighting	Potential SAII*	Species credits generated
Masked Owl	*Tyto novaehollandiae*	Assumed present	14.09	2	False	107
Superb Parrot	*Polytelis swainsoni*	Detected	14.09	2	False	107

*Serious and Irreversible Impacts

In total, one species credit species was detected (Superb Parrot) and one species credit species (Masked Owl) was assumed to be present, generating an obligation to retire 214 species credits.

OFFSET REQUIREMENT

Offsetting is required for the 278 ecosystem credits and 214 species credits.

Edify will either choose to purchase and retire the necessary number of credits on the open market or, if not available, to offset credits through a direct payment into the Biodiversity Conservation Fund (BCF).

6.2.6 Management and mitigation

PROJECT DESIGN

Impacts on biodiversity will be minimised as part of project design by:

- excluding and avoiding some of the identified PCT areas and established vegetation, where feasible/practicable

- designing and siting project facilities and infrastructure outside the designated non-development zones within the project site
- selecting site access points that minimise the need to remove native vegetation.

OFFSETTING

Offsets for ecosystem credits and species credits will be in place prior to the commencement of construction.

CONSTRUCTION

Measures identified to manage and mitigate biodiversity impacts during construction are listed in Table 6.14.

Table 6.4 Construction-related biodiversity management measures

Impact	Management measure	Timing
Clearing and prevention of over-clearing	All personnel will be inducted and will be informed that disturbance of any stand of native vegetation outside the development footprint, or otherwise unauthorised disturbance, could have legislative consequences if done without approval. Evidence of all personnel receiving an induction will be kept on file (signed induction sheets).	Pre-disturbance
	Before start of work, the extent of permitted vegetation clearing and areas to be retained as native vegetation will be clearly identified. Fencing or bunting will be installed to demarcate 'no go zones' where vegetation is to be retained. Care will be taken to avoid impacts on native vegetation outside the development footprint, such as the PCT 76 patch just outside the northeastern corner of the project site.	Pre-disturbance
	A pre-clearing process and unexpected threatened species finds procedure will be implemented. Any fauna found during the disturbance will be allowed (or assisted) to relocate into adjoining habitat.	Pre-disturbance
	A suitably qualified ecologist will be employed to conduct pre-clearance surveys at least 24 hours prior to vegetation removal. The ecologist will identify and mark any potential habitat trees that may be impacted by the proposed vegetation removal works.	Pre-disturbance
	A suitably qualified ecologist will be present for the removal of all identified habitat trees to ensure fauna can be relocated safely.	During disturbance
	Vegetation will be removed in such a way as to avoid unnecessary damage to surrounding vegetation.	Pre-disturbance
	Where possible, vegetation to be removed will be mulched or placed on-site and re-used to stabilise disturbed areas. If hollows are found, these will be placed in appropriate areas within the non-development	During and after disturbance

Impact	Management measure	Timing
	project lands to be retained to provide potential fauna habitat.	
Damage to native vegetation outside of impact zone	Soil stockpiles will be located according to the following hierarchical criteria: • at least 40 m away from the nearest waterway • in areas of low ecological conservation significance (i.e. previously disturbed land) • on relatively level ground.	Ongoing
	Stockpiling of materials and equipment, and parking of vehicles will be avoided within the dripline (extent of foliage cover) of any tree.	Ongoing
Disturbance to fallen timber, dead wood, bush rock and anthropogenic habitat	Where practicable, bush rock encountered on site that requires removal will be relocated to the edge of the disturbance area to enhance habitat. In particular, exfoliating rock will be relocated and repositioned such that the exfoliating pieces continue to provide habitat for fauna such as reptiles and bats.	Pre-disturbance and during disturbance
	If fauna is detected, work will be stopped immediately and either the area will be left undisturbed until the individuals have dispersed, or suitably qualified personnel will be engaged to facilitate removal of the fauna.	During disturbance
	Any human structure will be thoroughly searched for evidence of habitation by animals prior to removal. If evidence is detected, a relevant qualified person will be contacted to arrange the relocation of species occupying the structure.	Pre-disturbance
	A suitably qualified ecologist will be present for the removal of all identified potential fauna habitat to ensure fauna can be relocated safely.	During disturbance
Threatened species	A suitably qualified ecologist/fauna spotter catcher will search habitat and animal breeding places for fauna prior to clearing to relocate or mark habitat as 'do not disturb'. A suitably qualified ecologist/fauna spotter catcher will also be present during clearing to inspect tree hollows following felling.	Pre-disturbance
	No new areas will be cleared without further assessment, as threatened flora species may occur in any unassessed impact area.	Ongoing
	If the impact footprint changes from the current extent assessed in the study, re-assessment of the potential impact of the activity will be needed to ensure impacts to threatened species are not inadvertently caused, given that suitable habitat for threatened species occurs elsewhere on the property.	Ongoing

Measures for mitigating indirect impacts on biodiversity during construction include:

- adopting measures to control weeds, plant pest and diseases, and pest animals, as outlined in Section 6.5.6
- implementing dust management measures, as outlined in Section 6.5.6
- implementing a soil and water management plan for the project, as outlined in Section 6.5.6, to protect downgradient aquatic habitat
- implementing appropriate procedures for safely storing, using and disposing fuel and chemicals, as outlined in Section 6.6.5, to protect downstream aquatic habitat
- ensuring that speed limits are adhered to by project-related vehicles, as outlined in Section 6.7.5, to reduce risks to fauna
- adopting noise control measures, as outlined in Section 6.8.5, to minimise disturbance of fauna
- using low illumination lighting and minimising lightspill, as outlined in Section 6.9.5, to minimise disturbance of fauna or attract predatory pest species to the site.

OPERATION

Measures identified to manage and mitigate direct impacts on biodiversity during operation are:

- locating soil stockpiles (e.g. associated with any maintenance earthworks) as required in Table 6.14, above
- avoiding stockpiling of materials and equipment, and parking of vehicles within the dripline (extent of foliage cover) of any tree
- avoiding the clearance of any new areas or any modification to project footprint until a threatened species assessment has been undertaken.

Additional measures for mitigating indirect impacts on biodiversity during operation include:

- adopting measures to control weeds, plant pest and diseases, and pest animals, as outlined in Section 6.5.6
- implementing a soil and water management plan for the project, as outlined in Section 6.5.6, to protect downgradient aquatic habitat
- implementing appropriate procedures for safely storing, using and disposing fuel and chemicals, as outlined in Section 6.6.5, to protect downstream aquatic habitat
- ensuring that speed limits are adhered to by project-related vehicles, as outlined in Section 6.7.5, to reduce risks to fauna
- adopting noise control measures, as outlined in Section 6.8.5, to minimise disturbance of fauna
- using low illumination lighting and minimising lightspill, as outlined in Section 6.9.5, so as not to disturb fauna or attract predatory pest species to the site

- managing bushfire risk, as outlined in Section 6.10.7.

DECOMMISSIONING

Management and mitigation measures to be implemented as part of decommissioning will be similar to those implemented during construction.

Decommissioning will largely focus on reinstatement of the project site to its original (pre-construction) condition and land capability. Consideration will be given to enhancing biodiversity values to the extent that they do not conflict with proposed final land use.

6.2.7 Conclusion

The project site has been subjected to extensive historical clearing, and non-development zones have been designated by Edify within the project site to exclude most of the remaining native vegetation from project-related disturbance. Consequently, biodiversity impacts have been substantially reduced due to careful site selection and design. Vegetation to be disturbed consists primarily of isolated paddock trees, derived grassland and non-native vegetation.

The project will result in the removal of up to 56.55 ha of native vegetation from two PCTs (PCT 267 and 282). The PCTs meet the condition criteria to be considered CEECs under the BC Act. Additionally, one vegetation zone was found to meet the threshold criteria for listing under the EPBC Act. No threatened flora species were recorded during surveys of relevant habitat and no impacts to threatened flora are therefore anticipated.

In addition to the ecosystem species generated by the BAM, two species credit species (Superb Parrot and Masked Owl) have been assumed to be present on the site, although only the Superb Parrot was observed during field surveys.

Offsetting is required for 278 ecosystem credits and 214 species credits.

Due to the largely cleared nature of the project site and the approach being successfully implemented by Edify to avoid, minimise and mitigate disturbance (including proposed offsetting), impacts on biodiversity as a result of the project are expected to be relatively minor compared with many comparably sized projects.

6.3 Aboriginal cultural heritage

Developments that require land disturbance may impact on Aboriginal cultural heritage, particularly during construction, due to activities such as vegetation clearance and topsoil stripping. This section provides an assessment of these potential impacts in relation to the Peninsula SF.

In accordance with the requirements outlined in the SEARs, an ACHAR was completed by OzArk to identify Aboriginal cultural heritage values within the project site and surrounding area. The ACHAR is attached as Appendix E. This section summarises the key findings of the ACHAR and provides an assessment of the potential impacts of the project on Aboriginal cultural heritage.

6.3.1 Level of assessment

In accordance with the SEARs and to determine whether the project is likely to result in significant impacts on Aboriginal cultural heritage, a ***detailed assessment*** (ACHAR) has been undertaken.

6.3.2 Methodology

The following tasks were undertaken to identify the Aboriginal cultural heritage values of the project site and surrounding area:

- a detailed Aboriginal Heritage Information Management System (AHIMS) search, undertaken on 11 May 2021
- a review of Aboriginal cultural heritage studies of the wider Forbes district, undertaken on 11 May 2021
- predictive modelling to identify the potential density of archaeological sites and/or objects
- a process to seek registration of interest in the project, where this process identified nine groups/individuals to be consulted as Registered Aboriginal Parties (RAPs) for the project (including the Cowra Local Aboriginal Land Council (LALC))
- consultation and engagement with the RAPs (see Section 5.2.4)
- a pedestrian archaeological survey (i.e. a field survey) of the project site (the 'study area') to determine the extent of the disturbance and identify whether Aboriginal cultural heritage or any areas of sensitivity were present within the study area.

The field survey was undertaken by OzArk on 20 to 22 July 2021 and the following is noted:

- the study area was assessed by transects with surveyors spaced approximately 15 m apart
- very small areas in the north of the study area were unable to be surveyed as there was substantial water pooling following prolonged recent rainfall
- an amendment was made to the disturbance area resulting in small areas which were not surveyed. However, OzArk noted that sampling of similar landforms at the site has been completed.

Representatives of the RAPs assisted with the field assessment, as detailed in Table 6.5.

The following documents have guided the assessment:

- Aboriginal Cultural Heritage Consultation Requirements for Proponents (ACHCRs) (DECCW 2010a)
- Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW (the Code) (DECCW 2010b)
- Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (the Guide) (OEH 2011).

Table 6.5 RAP assistance with field assessment

Organisation	Representative	Fieldwork days		
		20/07/21	21/07/21	22/07/21
Cowra LALC	Stuart Cutmore	X		
Wiradjuri Council of Elders	Rob Clegg	X	X	
Yoorana Gunya	Jeff Brown		X	
Wiradjuri Cultural and Environmental Rangers	Peter White			X

Note: X indicates attendance

REVIEW OF METHODOLOGY BY RAPS

The RAPs were sent information about the proposal and a draft of the assessment methodology, in accordance with Stages 2 and 3 of the ACHCRS, on 26 May 2021 (see Section 5.2.5). A response was received from Rob Clegg from the Wiradjuri Council of Elders on 27 May 2021 supporting the proposed assessment methodology. No additional feedback on the methodology was received.

6.3.3 Existing conditions

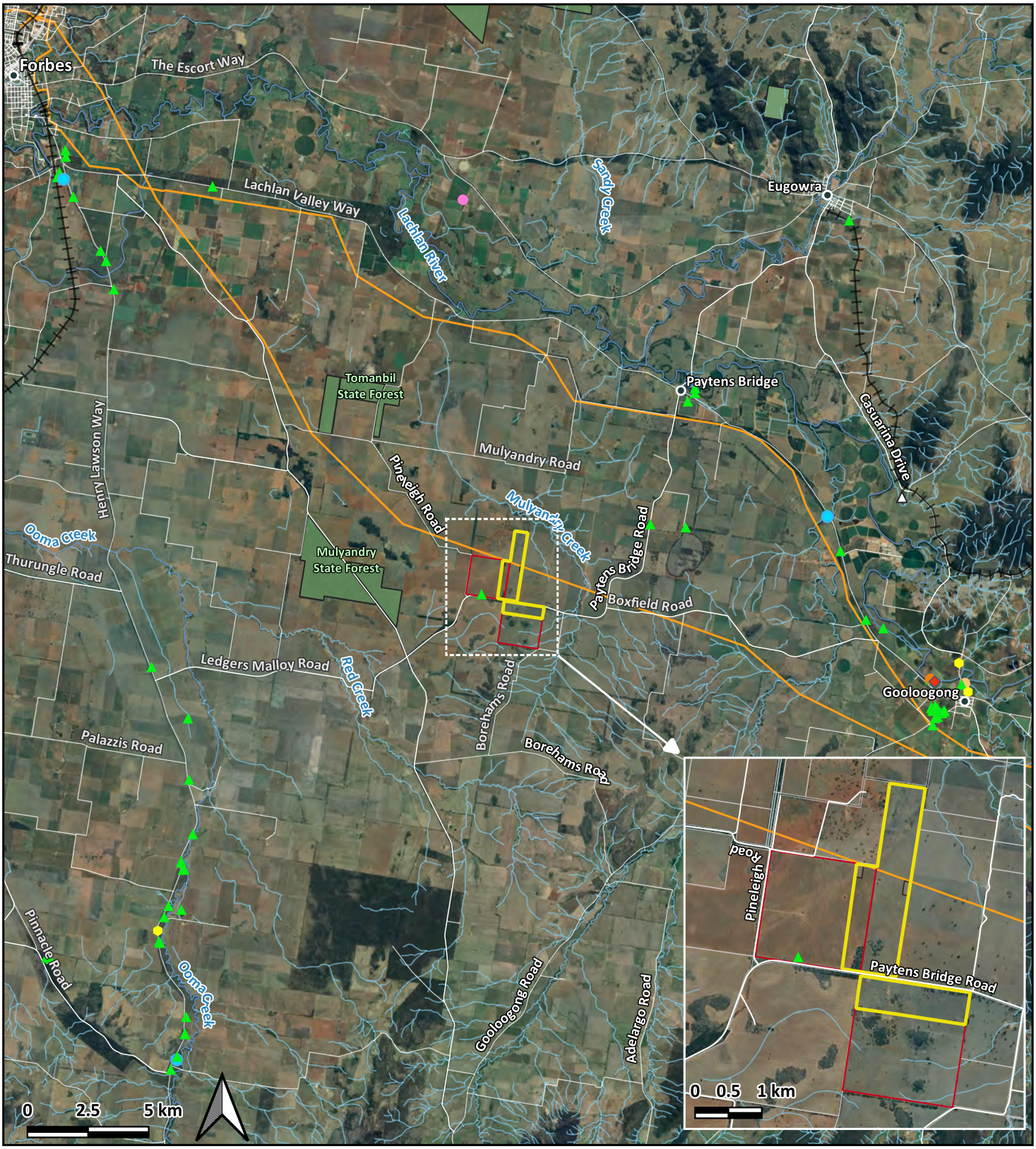
A search of the Heritage NSW administered AHIMS database on 11 May 2021 returned 76 results for Aboriginal sites within a 20 km radius of the study area (GDA94 Zone 55 Eastings: 593223–633223; Northings: 6263830–6303830). Site locations are shown in Figure 6.5 and details of site types within the search area are listed in Table 6.6.

No AHIMS sites were located inside or directly next to the study area. The three closest sites to the project site are modified trees:

- 43-6-0092 (Grenfell St) is located approximately 1 km west of the study area
- 43-6-0083 (Bandon Road South 1) located approximately 5 km northeast of the study area
- 43-6-0081 (Dunns Lane 1) located approximately 6.5 km northeast of the study area.

A National Native Title Claims Search conducted on 11 May 2021 found that no Native Title Claims cover the study area.

One Aboriginal cultural heritage site, an isolated find (named Peninsula IF-1), was recorded during the survey of the study area, as listed in Table 6.7 and shown in Photo 6.3 and Photo 6.4.



Project site

Lot boundary

AHIMS sites

- Aboriginal ceremony and dreaming
- Artefact scatter
- Artefact scatter and hearth
- Artefact scatter and Potential Arcaeological Deposit (PAD)
- Burial
- Isolated find
- Modified tree (carved or scarred)
- Modified tree (carved or scarred) and artefact scatter
- Modified tree (carved or scarred) and burial
- Existing transmission line
- State Forest/Nature Reserve
- Main watercourse
- Watercourse - tributary
- Railway

AE1173.1 Peninsula SPS

Figure 6.5. Previously recorded AHIMS sites

Created: 17/02/2022

CRS: GDA 1994 MGA Zone 55

Page size: A4

AHIMS site data courtesy of of OzArk Environment and Heritage

Base map: Google Satellite [Feb 2022]

Additional data: NSW RoadSegment, NSW Hydroline, NSW ElectricityTransmissionLine NSW_Six_Forbes_Lot_Cadastral_data,

Table 6.6 AHIMS site types and frequencies

Site type	Number	% frequency
Modified tree (carved or scarred)	64	84.2
Isolated find	3	3.9
Artefact scatter	3	3.9
Artefact scatter and hearth	1	1.3
Artefact scatter and potential archaeological deposit	1	1.3
Burial	1	1.3
Modified tree (carved or scarred) and artefact scatter	1	1.3
Modified tree (carved or scarred) and burial	1	1.3
Aboriginal ceremony and dreaming	1	1.3
Total	**76**	**100***

*Frequencies add up to 99.8% due to rounding errors

Table 6.7 Aboriginal cultural heritage site recorded within the project site

AHIMS ID	Site name	Feature(s)	Site extent	Landform	Description
43-6-0117	Peninsula IF-1	Isolated find	1 m x 1 m	Flat	A single, complete flake manufactured from a fine-grained siliceous material. The flake is tertiary and measures 35 (L) x 20 (W) x 5 (D) mm.

Photo 6.3 View west across site location of Peninsula IF-1 artefact

Photo 6.4 Peninsula IF-1 artefact

No landforms within the study area were assessed as likely to contain subsurface archaeological deposits.

6.3.4 Impact assessment

DISCUSSION

The predictions based on landform modelling for the study area concluded that stone artefact sites were the most likely site type to be identified. The overall incidence of these sites was predicted to be low to moderate due to several environmental factors such as the landforms present and distance to permanent water. Should such sites be identified, it was predicted that they would be low-density artefact scatters and/or isolated finds.

The results of the current study conform to the predictive model as only one isolated find was identified in the study area. Culturally modified trees were noted to be abundant in the general region, but due to historic disturbances associated with vegetation clearing in the site, it was predicted that this site type would have a low likelihood of occurring. This was borne out by the results of the assessment, with no modified trees being recorded in the study area.

The identification of one isolated find within the project site indicates that the limited resources of the study area would likely have supported only sporadic visits by Aboriginal people in the past. As described in the regional and local archaeological contexts and the predictive model for site location, watercourses formed an important focus for traditional Aboriginal activities. The use of the study area on a sporadic basis is thought likely to be the result of a combination of the following factors:

- the study area is situated in a generally flat terrain distant from permanent water, with only ephemeral waterways and areas of gilgai (which provide seasonal sources of water) present within and near the study area
- the uniformity of vegetation, landforms, and geological resources implies that there are no distinct or 'special' resources available within the study area compared to the much wider landscape.

The results of the field survey indicate that the site integrity for Peninsula IF-1 is low. The determination that Peninsula IF-1 is not associated with potential archaeological deposits was based on the observation that the site is in secondary contexts (i.e. any deposits would have been moved from their primary location) due to the repeated, extensive ploughing undertaken across the study area.

No specific intangible heritage locations were identified by the Aboriginal community within the study area during the field survey as having intangible cultural significance.

The ACHAR concluded that, based on the results of the survey and consultation with the Aboriginal community, the project will have a minor impact to Aboriginal heritage values.

Further, the study area holds little potential for the existence of any undetected Aboriginal sites due to the nature of the landforms present, the distance from permanent or semi-permanent water sources, and the high levels of past disturbance.

COMMENTS MADE BY RAP REPRESENTATIVES

Comments provided by the RAP site representatives during the survey can be summarised as follows:

- Jeff Brown (Yoorana Gunya) indicated that the study area would have been used as a hunting ground but not for occupation given how much water was evident laying across the ground surface after recent rain.
- Rob Clegg (Wiradjuri Council of Elders) noted larger sites would be present closer to the Lachlan River and requested that any artefacts identified during the survey are reburied nearby if they need to be collected.
- Peter White (Wiradjuri Cultural and Environmental Rangers) identified a scarred tree in the south of the study area during the survey. However, the OzArk archaeologist assessed that the scar appeared to be the result of natural trauma and not cultural modification.

ASSESSED SIGNIFICANCE OF THE STUDY AREA

The significance of the study area (and therefore the project site) was assessed as follows:

- Social or cultural value: No feedback was received relating to the social or cultural value of the newly recorded site or the broader study area. As such, for the purposes of assessing the potential impact to Aboriginal cultural heritage, the recorded site has conservatively been accorded high social and cultural values.
- Scientific (archaeological) value: The scientific significance of item Peninsula IF-1 is assessed as low. The site is located in a secondary context and is an isolated, unmodified artefact.
- Aesthetic value: Item Peninsula IF-1 has been assessed as having low aesthetic value. The site does not have significant aesthetic value as the integrity of the sensory landscape has been altered in historic and modern times. Additionally, the artefact itself is not remarkable.
- Historic value: Item Peninsula IF-1 does not have any association with important persons, places or events. Therefore, the site has no known historic values.

6.3.5 Management and mitigation

Peninsula IF-1 will be impacted by the project in its current location. It is therefore recommended that the artefact be retrieved following project approval and moved to a location where it will not be impacted.

As this artefact has been identified, the following specific methodology is recommended for the surface collection. The collection methodology will be finalised after the approvals process as part of the Aboriginal Cultural Heritage Management Plan (ACHMP), but will include the following measures:

- the artefact will be flagged in the field
- the site will be photographed after flagging and before recording

- the artefact will have the following information recorded:
  - location
  - artefact class
  - artefact type
  - size
  - reduction level
  - raw material
  - notes.
- the artefact will be photographed
- should the collection team encounter a human burial, all work will cease in the immediate area and advice from authorities and RAPs (should the remains be Aboriginal) sought
- the recording of the artefact recovered will largely be completed in the field and this data will be incorporated into a report
- an Aboriginal Site Impact Recording Form (ASIRF) will be submitted by the archaeologist detailing the salvage process and results of the site.

The preference of the RAPs in relation to Peninsula IF-1, determined through consultation, is the reburial of the artefact at a location outside of the project disturbance footprint that adheres to Requirement 26 of the Code of Practice. This includes reburying the artefact at a location where no future impacts are proposed.

Standard management measures will also be implemented for the project in the form of an ACHMP. The ACHMP will be developed in consultation with the RAPs and DPE and will include protocols for the long-term management of Aboriginal objects salvaged for the project.

The ACHMP is expected to include the following general management measures:

- a requirement for further Aboriginal cultural heritage assessment if ground disturbance activities are to occur beyond the assessed area
- a protocol for the long-term management of Aboriginal objects
- an unanticipated finds protocol
- a requirement for all work to stop and the unanticipated finds procedure to be followed should any suspected Aboriginal objects be observed during project construction or operation
- procedures should human skeletal remains be discovered during construction or operation.

Inductions for staff undertaking construction activities will address the legislative protection requirements for Aboriginal cultural heritage sites and items in NSW and the relevant fines for non-compliance.

6.3.6 Conclusion

The project will have a minor impact on Aboriginal cultural heritage values as one Aboriginal site was recorded within the proposed disturbance footprint. A copy of the ACHAR was sent to the RAPs for their comment. However, as no feedback was received relating to the social or cultural value of the newly recorded site or the broader study area, the recorded site has been conservatively accorded high social and cultural values, although it has low archaeological/scientific and aesthetic value and nil historical value.

The ACHAR noted that the artefact should be retrieved following project approval and moved to a location where it will not be impacted by the project. Once this is done the project will have little residual impact on tangible Aboriginal cultural values.

With regards to intangible heritage, no specific locations were identified by the Aboriginal community within the study area as having intangible cultural significance.

6.4 Historic heritage

Under Part 4, Division 4.7 of the EP&A Act, any items of local or state historical heritage significance within the study area are afforded legislative protection under the Heritage Act. The SEARs state that an assessment of the impact to historic heritage, having regard to the NSW Heritage Manual, is required to fulfill the requirements for this EIS.

An historic heritage assessment was undertaken by OzArk to identify historic heritage values of the land within the project site and assess potential impacts as a result of the project. The historic heritage assessment is attached as Appendix N.

6.4.1 Level of assessment

As the project is considered unlikely to result in significant impacts in relation to historic heritage, a ***standard assessment*** of impacts was undertaken based on a site inspection and desktop review.

6.4.2 Methodology

The following register searches were undertaken to identify historic heritage at the project site and surrounding area:

- Commonwealth Heritage Listings
- State Heritage Listings
- Forbes Shire Council LEP 2013.

The fieldwork component of the assessment was undertaken simultaneously with the Aboriginal heritage assessment on 20 to 22 July 2021 (see Section 6.3).

The following documents have guided the assessment:

- Heritage Council's Historical Archaeology Code of Practice (Heritage Council 2006)
- Australia International Council on Monuments and Sites (ICOMOS) Burra Charter (Burra Charter 2013).

6.4.3 Existing conditions

REGISTER SEARCHES

The results of the register searches are summarised in Table 6.8.

Table 6.8 Historic heritage register search results

Name of database searched	Date of search	Type of search	Comment
Commonwealth Heritage Listings	18/8/21	NSW	No items are listed within 5 km of the project site
State Heritage Listings	18/8/21	Forbes LGA	No items are listed within 5 km of the project site
LEP	18/8/21	Forbes Shire Council LEP 2013	No items are listed within 5 km of the project site

A search of the Heritage Council of NSW administered heritage databases and the Forbes Shire Council LEP 2013 returned no records for historical heritage items within the designated search area. The closest LEP listed items are the former Collits Inn/Coach and Horses Inn (I2) and Paytens Bridge (I3) located approximately 8.5 km northwest of the study area.

The historic heritage impact assessment noted that no Commonwealth or National heritage listed places were within the study area, and as such, the heritage provisions of the EPBC Act and other Commonwealth Acts do not apply.

ARCHAEOLOGICAL SURVEY

One historic heritage item was recorded in the project site during the survey. Details on the item (named Peninsula-HS01) are provided in Table 6.9.

Table 6.9 Recorded historic heritage items

Item name	GDA20 Zone 55 coordinates	Type of heritage item
Peninsula-HS01	614437E 6286178N	Farming machinery – seed drill

It was determined that the project site contains no areas that are likely to contain significant historic archaeological deposits of conservation value.

6.4.4 Impact assessment

The project is not expected to result in any significant impacts on historic heritage.

The identified item of historic heritage (Peninsula-HS01) was assessed as having no historic heritage significance under the current Heritage NSW guidelines and the Burra Charter. This assessment reflects the current thresholds and principles of the assessment criteria that emphasise items with collective, aesthetic, technological and/or natural significance.

Peninsula-HS01 is located on the boundary of Lot 441 DP1124885.

6.4.5 Management and mitigation

A desirable heritage outcome would be to conserve the recorded historic heritage item (Peninsula-HS01) in the landscape, if possible. Alternatively, the item could also be moved to a nearby location where it would not create a constraint for the project but remains associated with the landscape in which it was discarded. However, if such actions are not feasible, damage to, or destruction of, the item is acceptable as it represents a relatively common rural item without heritage significance.

As no other items or sites of historic heritage were recorded, no other specific management or mitigation is required, provided that the project works do not extend outside the historic heritage study area.

The following general management measures will be adopted:

- if ground disturbance activities are to occur outside the area assessed in the heritage study, then further archaeological assessment may be required
- an historic heritage unanticipated finds protocol will be developed prior to construction
- should any items suspected of having historic heritage significance be uncovered, work within the immediate area of the find will stop and the unanticipated finds protocol will be followed.

Inductions for staff undertaking construction activities will address the legislative protection requirements for historic sites and items in NSW and the relevant fines for non-compliance.

6.4.6 Conclusion

The project is not expected to have any significant impact on historic heritage.

6.5 Soils and land-use

The proposed development of the project will result in direct and indirect impacts on soils and land capability, both within the project site and its immediate surrounds. The change of land use from agricultural to energy production and storage may also result in conflicts with adjoining land uses that will be managed as described below.

This section considers the potential impacts of the project on agricultural land and flood-prone land, and compatibility with existing land uses on the project site and adjacent land, including nearby mineral and exploration activities. An assessment of the compatibility of the development with existing land uses during construction, operation and after decommissioning is also provided.

6.5.1 Level of assessment

The project is considered unlikely to result in significant impacts in relation to soils and land use since impacts are expected to be limited in extent (given the relatively small area of direct ground disturbance), and reversible at the end of project life. In addition, the receiving

environment is not particularly sensitive to land impacts, as outlined further in this chapter. Accordingly, a ***standard assessment*** of impacts on soils and land use was undertaken based on site inspection and review of literature. Cumulative impacts on land are considered in Section 6.13.

6.5.2 Methodology

A literature review was undertaken to assess the existing land use, land capability and potential for competing interests, including sourcing information from the website tools SEED and eSPADE. A site inspection was also undertaken to assess the condition of the land within and around the project site, understand its context within the broader landscape, and identify land use issues or conflicts.

A land use conflict risk assessment (LUCRA) (Appendix H) was undertaken by Accent, as outlined below, in support of the land use evaluation.

6.5.3 Existing conditions

LAND USE

Project site

The 290 ha of rural land within the project site (which includes a project footprint of about 235 ha) is highly modified due to its history of agriculture and grazing and is currently comprised of both crops and grazing land. The site is generally flat, with undulating rises towards the southern section of the site, south of Paytens Bridge Road, and a single rise in the northern section of the site. The site is zoned RU1 primary production under the provisions of the Forbes LEP 2013 (see Figure 2.1).

Due to the long history of grazing and cropping activities in the area, there has been significant disturbance in the natural environment, and native vegetation is largely absent.

The site comprises three blocks of land, two north of Paytens Bridge Road and one to the south (see Figure 1.3). The main parcel of land north of Paytens Bridge Road is the Peninsula Block (Lot 441). The other northern parcel is Lot 9. The land to the south of Paytens Bridge Road is the unnamed Lot 442.

Lot 441

Lot 441 is currently used for cropping and irregular grazing.

Three dams are present on Lot 441 and, with the exception of the dam near the mid-point of the allotment (non-development zone 3 on Figure 1.3), these dams will be infilled during construction.

As outlined in Section 6.2, the patches of remnant vegetation in the northeastern corner of the block (in non-development zone 1), and in the southern part of the block (non-development zones 4 and 7 on Figure 1.3) have been excluded from the development footprint. A small number of paddock trees are also present, which will be removed.

No built structures or formed tracks are present on this allotment. The existing transmission line easement bisects Lot 441.

Lot 9

Lot 9 is currently used for cropping.

One dam is present on Lot 9 within the project site and has been excluded from the development footprint (non-development zone 6 on Figure 1.3). As outlined in Section 6.2, the lot has a patch of remnant vegetation in its southeastern corner that has been excluded from the development footprint (non-development zone 5 on Figure 1.3). Two paddock trees are present near the eastern fenceline, bordering Lot 441, which may be removed.

No built structures or formed tracks are present on this allotment within the project site.

Lot 442

Lot 442 is currently used for grazing.

One dam is present on Lot 442 and has been excluded from the development footprint (non-development zone 9 on Figure 1.3). As outlined in Section 6.2, the lot has patches of remnant vegetation in its northeastern corner and in the central part and southern part of the block, which has been excluded from the development footprint (non-development zones 10, 11 and 12 on Figure 1.3). A small number of paddock trees are also present and will be removed.

No built structures are present on this allotment within the project site. An old quarry (Thomas Pit) is present just south of the southern boundary of this allotment. A dirt track leads south across the allotment towards the quarry from an entrance gate on Paytens Bridge Road. The proposed access point to the southern section of the project is located at the existing entrance gate (see Figure 1.3).

Immediate surrounding area

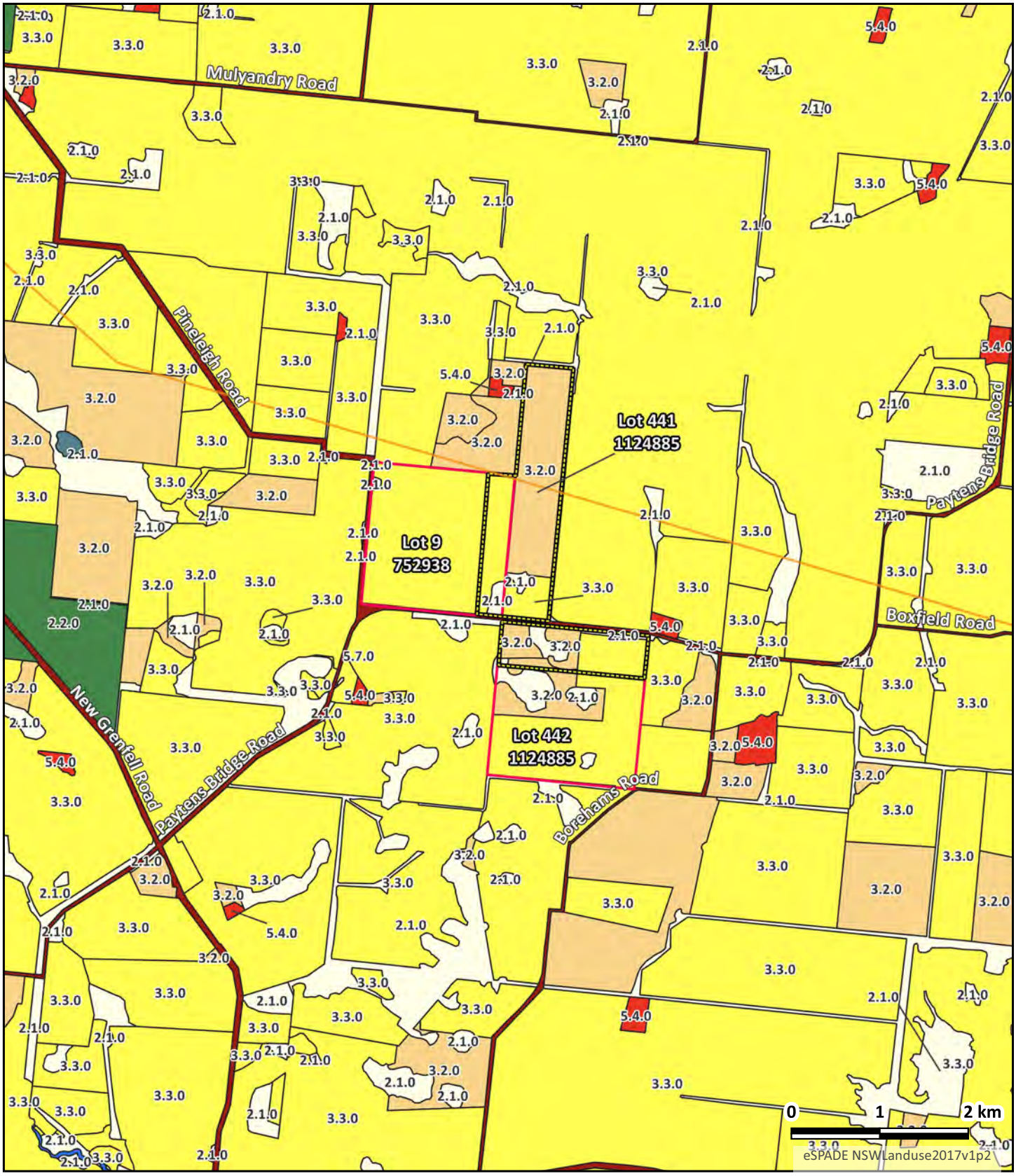
Lots 442 and 9 extend south and west of the project site boundary, respectively. The extended lot areas along with the properties next to the project site (to the southwest, east, north and northwest) are also used for agricultural purposes, with the exception of the existing transmission line easement and a quarry (Pineleigh Quarry) located 500 m west of the northern section of the project site (see Figure 1.3). Pineleigh Quarry and Thomas Pit are discussed further below under 'mineral and forestry resources'.

The wider landscape also consists largely of land historically cleared for agriculture, with vegetation (other than grassland) predominantly found along road reserves, drainage lines, on low-lying hills, fencelines, and surrounding dwellings.

Land use surrounding the project site as shown on eSPADE (2021a) is classified as 'cropping land' except for land to the northwest and south which is classified as 'grazing modified pastures' and several small patches classified as 'grazing native vegetation' (Figure 6.6). The areas of land on which receivers R1 and R2 are located are classified as 'residential and farm infrastructure'.

Broader surrounding area

The project site is located in the Forbes region of central-west NSW which consists predominantly of agricultural land, with the region's main source of income being agriculture, forestry and fishing (FSC 2021).



Project site

Lot boundary

Land use

- 2.1.0 Grazing native vegetation
- 2.2.0 Production native forestry
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 5.4.0 Residential and farm infrastructure
- 5.7.0 Transport and communication

N

AE1173.1 Peninsula SF
Figure 6.6. Local land use
Date created: 16/03/2022
CRS: GDA 94 MGA 55
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ACCENT ENVIRONMENTAL

There are a number of national parks, state forests and nature reserves in the region, including:

- Nangar National Park – 22 km to the northeast of the project site
- Conimbla National Park – 22 km to the southeast
- Mulyandry State Forest – 4 km to the west
- Tomanbil State Forest – 7 km to the northwest
- Warraderry State Forest – 11 km to the south
- Back Yamma Nature Reserve – 20 km to the north
- Eugowra NR – 18 km to the northeast.

The Mulyandry State Forest is the nearest sizeable patch of remnant vegetation within the broader surrounding area and is shown as 'production native forestry' on Figure 6.6.

GEOLOGY, SOILS AND SOIL LANDSCAPES

Geology

The Forbes 1:250 000 Geological Sheet (Raymond et al. 2000) shows that the geology of the area consists of:

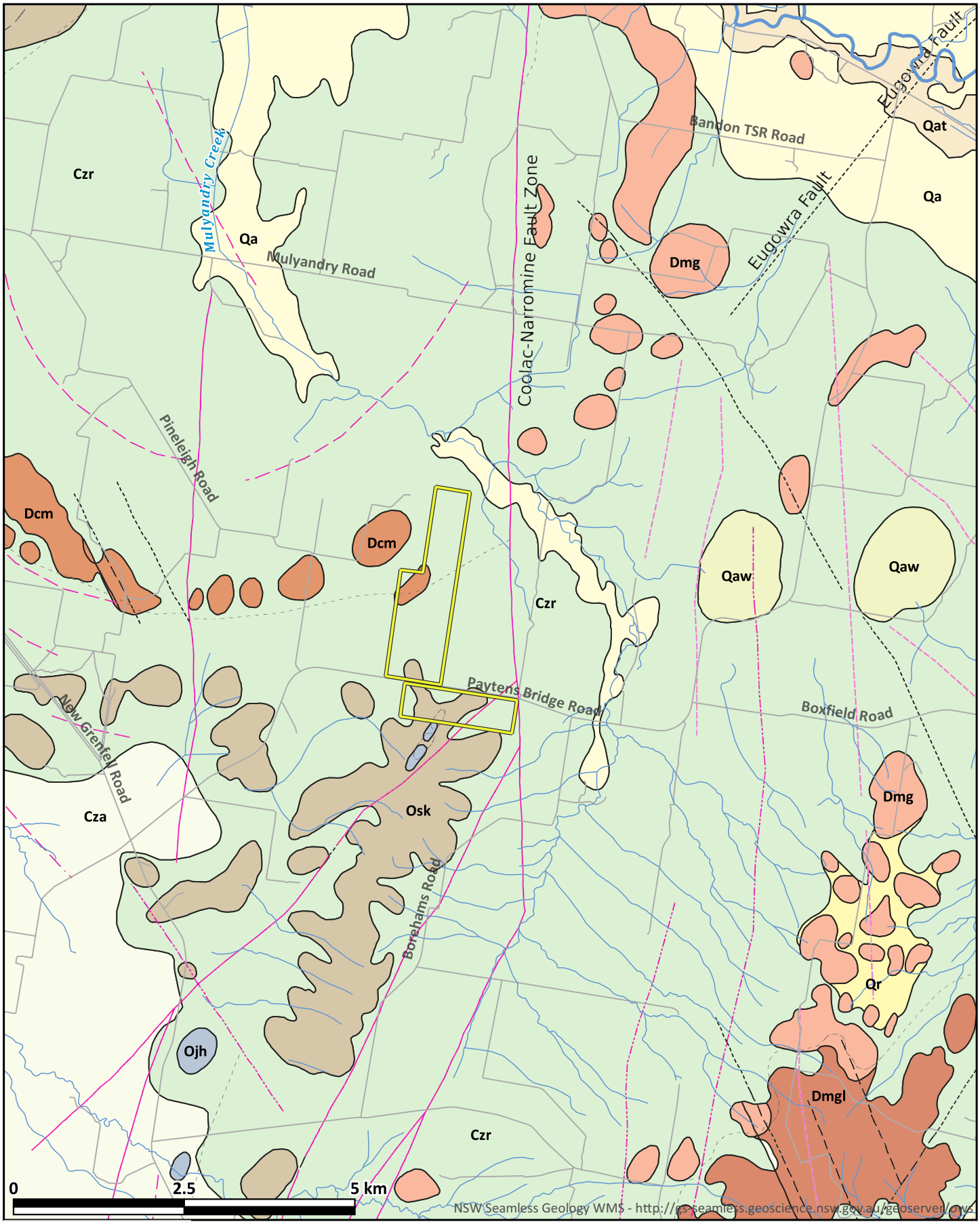
- Early Devonian granitoid Clear Hills Monzodiorite, comprising augite-hypersthene-biotite quartz monzodiorite
- Ordovician sedimentary rocks of the Kirribilli Formation, comprising turbidites; spaced cleavage and stripey layering is widespread in parts
- Middle Ordovician sedimentary rocks of the Hoskins Chert, comprising chert, cherty siltstone, quartz, localised manganese horizons
- Quaternary deposits comprising unconsolidated grey to brown to beige humic (±)micaceous silty clay, quartz-(±)lithic silt, fine- to medium-grained quartz-rich to quartz-lithic sand, polymictic pebble to cobble gravel (as sporadic lenses); sporadic palaeosol horizons
- Quaternary deposits comprising mixed colluvial, alluvial and aeolian deposits

The local geology is shown on Figure 6.7. Cainozoic shallow slope coalluvial plains and rises deposits cover the majority of the site.

Soil types

A review of the eSPADE website (eSPADE 2021b) shows three soil types at the project site (Figure 6.8), namely kurosols, chromosols and kandosols. The Australian Soil Classification (CSIRO 2021) describes these soil groups as follows:

- Kurosols are soils with a clear or abrupt textural B horizon and in which the major part of the upper 0.2 m of the B2t horizon (or the major part of the entire B2t horizon if it is less than 0.2 m thick) is strongly acid



Project site
Major fault
Minor fault
Trend line
Main watercourse
Tributary
Road

Cainozoic Units
Cza - Inactive alluvial plains
Czr - Shallow slope coalluvial plains and rises
Qa - Alluvium
Qat - Low thorium alluvium
Qaw - Swamp, sump basin

Eugowra Suite
Dcm - Clear Hills Monzodiorote
Dmg - Milandra Granite
Dmgl - Loch Lomond Granite

Ungrouped Ordovician Units
Osk - Kirribilli Formation

Jindalee Group
Ojh - Hoskins Chert

N

AE1173.1 Peninsula SPS
Figure 6.7. Local geology
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CRS: GDA 1994 MGA Zone 55
Scale: 1:75,000 @ A4
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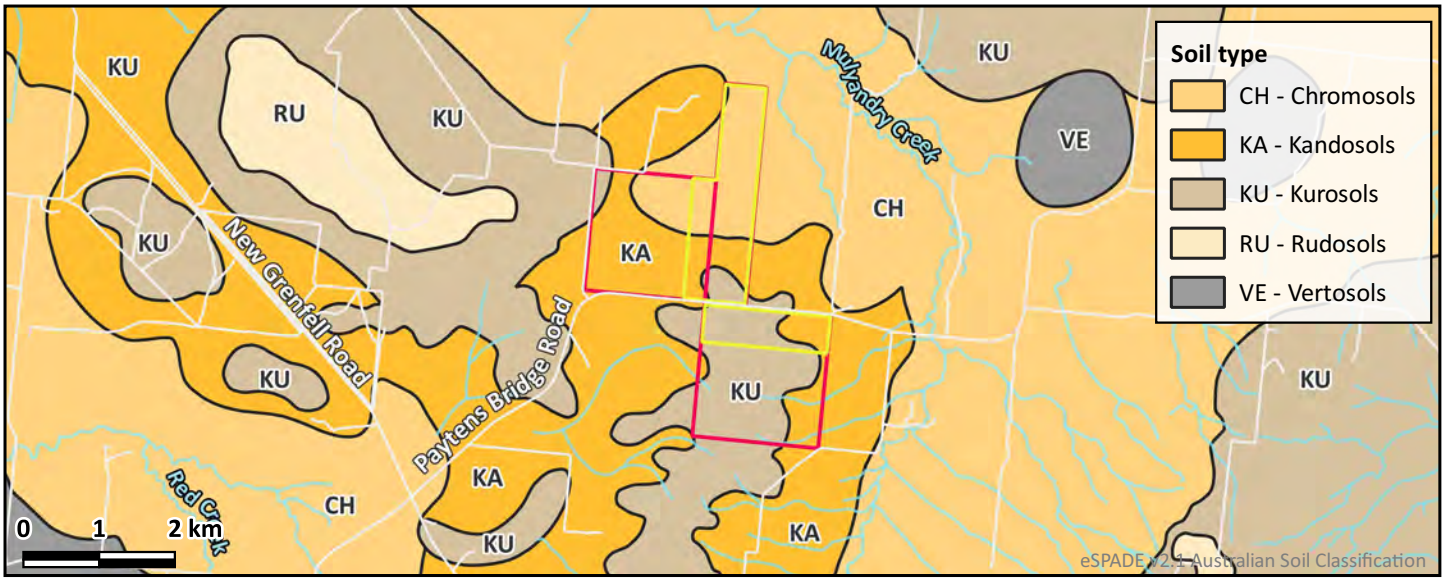
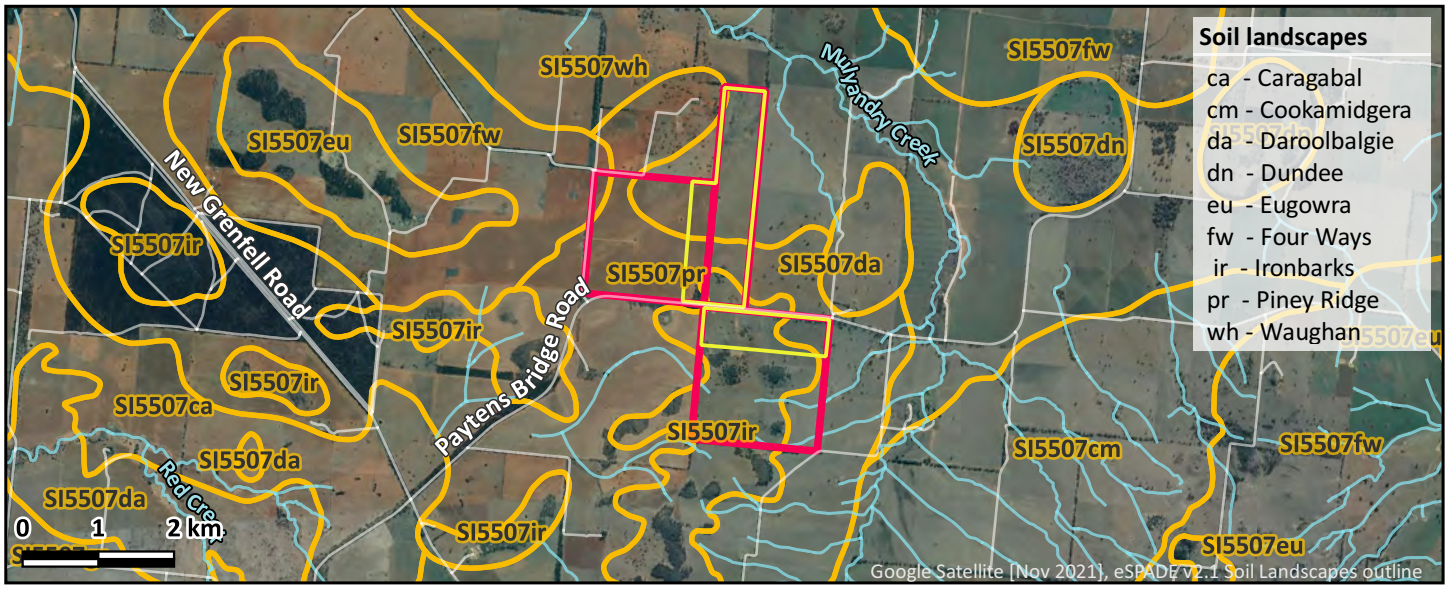
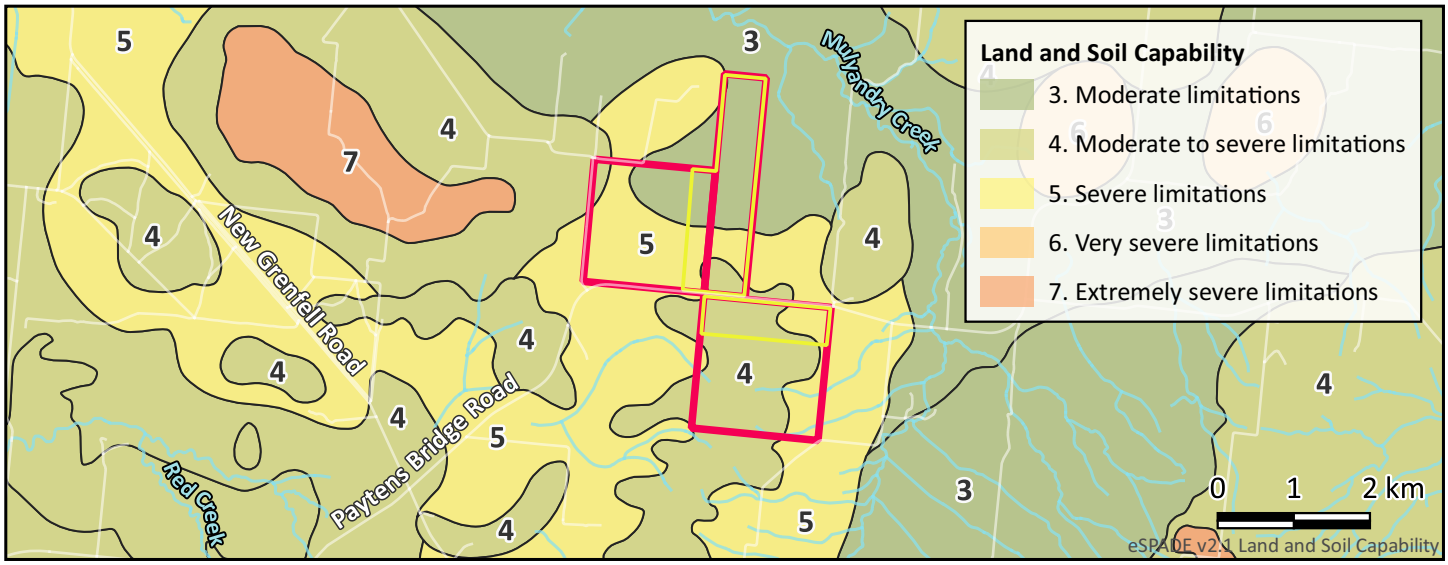
Additional data: NSW RoadSegment and NSW Hydroline

ACCENT ENVIRONMENTAL







Project site
Lot boundary
Main watercourse
Watercourse - tributary

N

AE1173.1 Peninsula SF
Figure 6.8. Land and soil classification
Date created: 16/03/2022
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ACCENT ENVIRONMENTAL

- Chromosols are soils that:
  - are either calcareous throughout the solum – or calcareous at least directly below the A1 or Ap horizon, or within a depth of 0.2 m (whichever is shallower). Carbonate accumulations must be judged to be pedogenic i.e. they are a result of soil forming processes in situ (either current or relict). Soils dominated by non-pedogenic calcareous materials such as particles of limestone or shells are excluded
  - do not have deep sandy profiles that have a field texture of sand, loamy sand or clayey sand in 80% or more of the upper 1.0 m
- Kandosols are soils that have, within the upper 1.0 m of the soil profile:
  - a sandy field texture (i.e. a field texture of sand, loamy sand or clayey sand) in one or more layers or horizons with a combined thickness of at least 0.8 m
  - no layer with a clay content that exceeds 15% (i.e. heavy sandy loam [SL+] or heavier) excluding argic horizon/s
  - ≤10% (by visual abundance and weighted average) of coarse fragments and/or hard segregations >2 mm in size
  - no hard layers (cemented pans, other cemented materials, rock or saprock that do not soften when moist).

Soil Landscapes

The project site falls within the *Soil Landscapes of the Forbes 1:250,000 Sheet* (King 1998) and is located within three soil landscapes, namely the Waughan soil landscape, the Piney Range soil landscape and the Ironbarks soil landscape. These landscapes are shown in Figure 6.8 and described in Table 6.10.

Within the project site (see Figure 6.8):

- The Waughan soils landscape corresponds to the chromosols soil type described above and is found in the northern two-thirds of the northern section of the site.
- The Piney Range soils landscape corresponds to the kandosols soil type described above and is found in the lower third of the northern section of the site and in the northeast corner of the southern section of the site.
- The Ironbarks soils landscape corresponds to the kurosols soil type and is found in the undulating rises located north and south of Paytens Bridge Road.

The project site had good coverage of pasture grasses during site inspections and no significant erosion or downstream sedimentation was evident. Combined with the flat-lying nature of the land and lack of concentrated flow paths outlined in the flood modelling report (Appendix I), these observations suggest that erosion hazard potential may be minor. The erosion risks described in the soil landscape classifications in Table 6.10 suggest that the more severe occurrences of sheet and gully erosion appear to be localised. As severe erosion was not observed within the project site, it has been assumed for the purposes of this assessment that erosion hazard is low to moderate.

Table 6.10 Soil landscapes at the Peninsula project site (from King 1998)

Soil landscape	Description	Existing land degradation	Limitations
Waughan	Mostly high-level floodplains of the Lachlan River on quaternary alluvium: • deep (>150 cm), imperfectly drained red brown earths are commonly found on more highly elevated areas in the landscape • deep (>150 cm), imperfectly drained yellow podzolic soils and occasional poorly drained brown and red clays occur on prior streams, abandoned channels and backswamps • deep (>150 cm) red podzolic soils and red and brown solodic soils occur on some plains • alluvial soils occur along some active stream channels.	• soil structural decline in the form of compacted surfaces is evident in heavily cropped country • wind erosion occurs on bare cultivated paddocks • saline scalds found near Forbes	• flood hazard (localised) • wind erosion hazard • waterlogging (localised) • alkaline, saline (localised) soils of low permeability with sodicity/ dispersibility (localised) • high erodibility (localised) • hard-setting surfaces (localised) • soil structure decline hazard
Piney Range	Gently undulating rises and slopes on colluvium/alluvium derived from Ordovician metasediments and Devonian granites: • soils on small crests are shallow (<30 cm), well-drained lithosols • shallow (<50 cm), moderately well-drained red earths occur on upper slopes • moderately deep (>60 cm), moderately well-drained non-calcic brown soils and red podzolic soils occur on mid and lower slopes • moderately deep to deep (>80 cm), imperfectly drained red brown earths/ red solodic soils intergrades occur on lower slopes and along drainage lines.	• sheet erosion occurs on most slopes • moderate to severe gully erosion is evident near and along some drainage depressions	• water erosion hazard • high run-on • shallow, acid soils with low fertility • localised high erodibility • high organic matter • water repellence (localised topsoils)

Soil landscape	Description	Existing land degradation	Limitations
Ironbarks	Undulating rises near Wirrinya and south of Grenfell: • shallow red podzolic soils and some red earths as well as yellow earths occur on crests and some well-drained sideslopes • yellow podzolic soils, yellow earths and occasional xanthozems occur on less well-drained sideslopes and lower slopes • yellow and red solodic soils occur along some drainage lines.	• soil acidification is widespread • minor sheet erosion over parts of this landscape resulting in the erosion and removal of the thin topsoil layer • evidence of severe sheet erosion is conspicuous in the vicinity of Ironbarks mine[1] and surrounds • moderate gully erosion (<1.5 m deep) is limited to a few sections of some drainage lines	• water erosion hazard (localised) • shallow, stony, acid soils of very low fertility with high organic matter, high aluminium toxicity potential and hardsetting surfaces (localised)

[1] Located approximately 35 km southwest of the project site

LAND AND SOIL CAPABILITY

To assess the land and soil capability (LSC) of the project site (i.e. the inherent physical capacity of the land to sustain a range of land uses and management practices over the long term, without degradation to soil, land, air and water resources), data presented on the Land and Soil Capability Mapping on the eSPADE website (eSPADE 2021c) has been reviewed. This data indicates that the proposed development is mapped as largely LSC Class 3 land and LSC Class 4 land, with some LSC Class 5 land, as shown on Figure 6.8. Capabilities are summarised as follows (OEH 2012):

- **LSC Class 3 High capability land:** Land has moderate limitations and is capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation.
- **LSC Class 4 Moderate capability land:** Land has moderate to high limitations for high-impact land uses. These limitations will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture, and can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology.
- **LSC Class 5 Moderate-low capability land:** Land has high limitations for high-impact land uses. These limitations will largely restrict land use to grazing, some horticulture (orchards), forestry and nature conservation, and need to be carefully managed to prevent long-term degradation.

There is no LSC Class 1 (extremely high capability land) or Class 2 (very high capability land) located within the project site or project footprint. A breakdown of the project site and project footprint by LSC class is provided in Table 6.11. Class 3 land comprises 46.0% of the project site and 53.3% of the project footprint. A higher percentage of Class 3 land is found within the project footprint as most of the Class 3 land has been cleared for agriculture, whereas most of the remnant vegetation (which has been excluded from project disturbance) is located on Class 4 and Class 5 land.

Table 6.11 Breakdown of project site and project footprint by LSC class

Component	Land and soil capability[1]	
	Project site (ha)	Project footprint[2] (ha)
Class 3 (High capability)	133.2 (46.0%)	125.5 (53.3%)
Class 4 (Moderate capability)	79.3 (27.4%)	55.1 (23.4%)
Class 5 (Moderate-low capability)	77.3 (26.7%)	54.8 (23.4%)
Total	**289.8**	**235.4**

[1]Totals do not add up due to rounding errors
[2]Equals area of project site less the area of the non-development zones

As can be seen from Figure 6.8:

- the Class 3 land corresponds to the chromosols/Waughan soils landscape in the northern section of the site
- the Class 4 land corresponds to the kurosols/Ironbarks soils landscape located north and south of Paytens Bridge Road
- the Class 5 land corresponds to the two areas of kandosols/Piney Ridge soils landscape within the site.

Air photo interpretation combined with field observation appears to confirm that the soil boundary between the deeper red loamy Kandasols and the browner Chromosols, crosses the site in approximately the same location as shown on Figure 6.8. However, the boundary appears to cross the western site boundary approximately 300 m further north than mapped before angling southeast at an approximate 45-degree angle. As the boundary between the Kandasols and Chromosols corresponds to the boundary between LSC Class 3 and Class 4 land, this suggests that there may be marginally less Class 3 land than estimated from Figure 6.8 and shown in Table 6.11.

It is noted that Class 3 land is regionally common along the Lachlan River valley to the north of the site.

BIOPHYSICAL STRATEGIC AGRICULTURAL LAND

The NSW government, through the DPE, has assessed the state to map areas of land that are considered to be Biophysical Strategic Agricultural Land (BSAL). BSAL is land with high quality soil and water resources capable of sustaining high levels of productivity (DPIE 2021d). The 'Safeguarding our Agricultural Land' portal (DPIE 2021d) and the NSW Government Sharing

and Enabling Environmental Data in NSW (SEED) database (NSW Government 2021b) was accessed to check whether the proposed solar farm would impact any such designated land. This check found no BSAL area in the vicinity of the project site, which is consistent with the site's LSC Classes 3, 4 and 5 classifications. The nearest BSAL is located approximately 70 km southeast of the site.

WEEDS, PATHOGENS AND PESTS

The BDAR identified a total of 97 flora species, of which 26 (28.57%) were exotic. The cropping land and pasture on the project site is dominated by exotic species. Three of the recorded exotic species – Bathurst burr (*Xanthium spinosum*), Silverleaf nightshade (*Solanum elaeagnifolium*) and Saffron thistle (*Carthamus lanatus*) – are listed as High Threat Exotic (HTE) species under BAM and therefore the BC Act.

Pests such as Black rats *(rattus rattus)*, European rabbits *(Oryctolagus cuniculus),* domestic cats *(Felis catus)*, Red foxes *(Vulpes vulpes),* goats *(Capra hircus)*, wild dogs *(Canis lupus)* and feral pigs (*Sus scrofa*) would likely use the site opportunistically.

EXISTING SITE CONTAMINATION

To assess potential contamination in the area, searches of two publicly available databases were conducted on 26 November 2021. A search of the OEH contaminated land public record (NSW EPA 2021a) was undertaken for contaminated sites within the Forbes LGA and the search returned results only for a site in the Forbes township. A search of the online list of NSW contaminated sites notified to the EPA (NSW EPA 2021b) was also conducted and returned six listings in the Forbes township and two listings in Grenfell. All the sites are at a distance of at least 30 km from the proposed project site and not expected to impact on the site.

Past and present agricultural activities at the site (e.g. use and disposal of herbicides and pesticides) have the potential to pose a contamination risk. However, no indications of soil contamination were observed during site inspections.

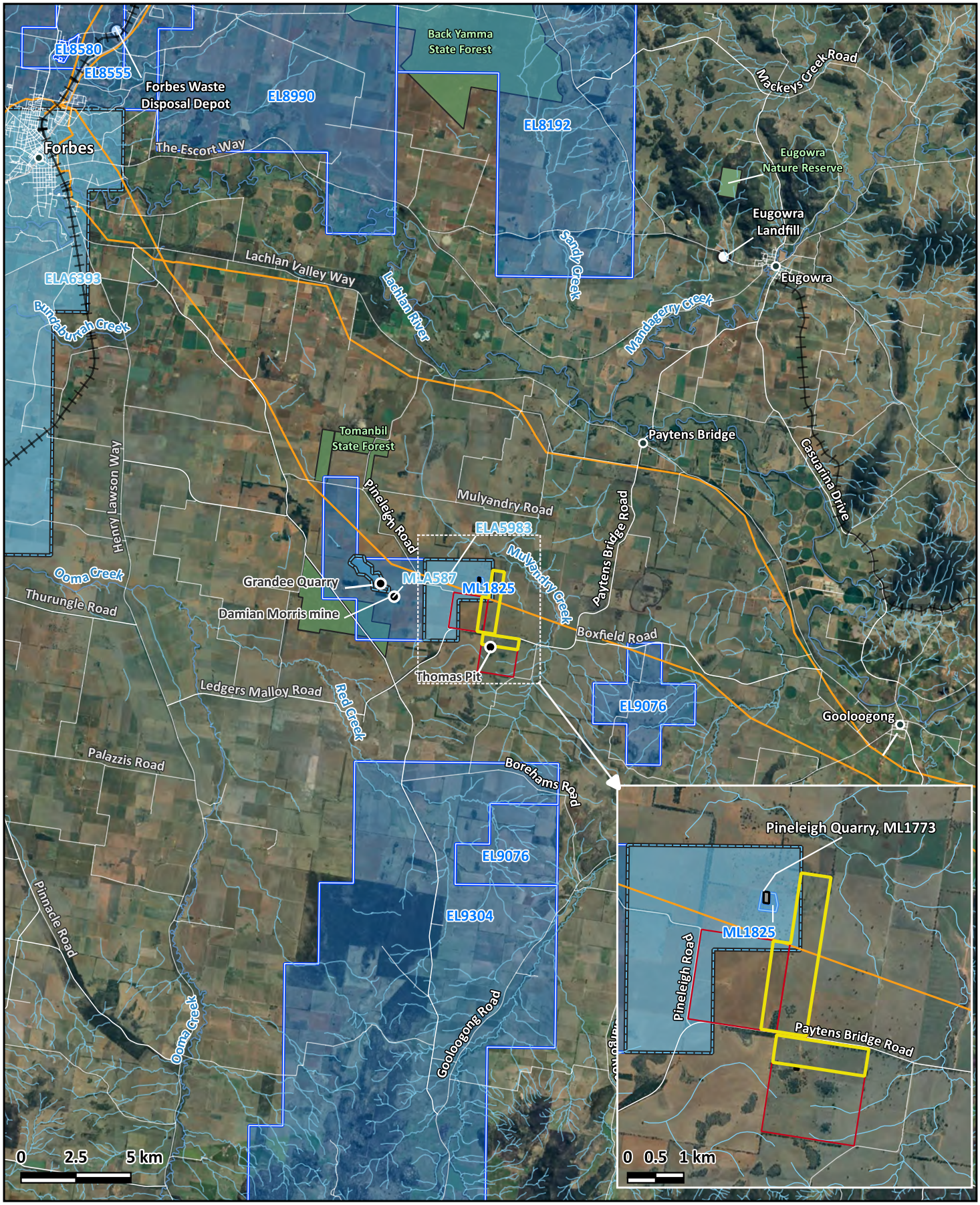
ACID SULPHATE SOILS

Acid sulphate soils are unlikely to be present at the project site. The main risk areas for acid sulphate soils in NSW are low-lying coastal areas (eSPADE 2021d). The Peninsula SF site is located at an elevation of approximately 270 m Australian Height Datum (AHD), i.e. it is not low-lying, and over 270 km inland.

MINERAL RESOURCES

A search of DPE's MinView tool (DPIE 2021e) identified that there are no mining or exploration licenses on the project site (Figure 6.9). However, Tastex Pty Ltd (Tastex) has an existing mining lease (ML1773) over their existing quarry (Pineleigh Quarry, which is approximately 500 m west of the project site, see Figure 1.3). Based on the map of local geology (see Figure 6.7) the quarry is targeting igneous diorite.

Tastex has applied for another mining lease (see Figure 6.9). The proposed mining lease does not overlap with the project site. Tastex has also applied for an exploration licence over their quarry and this application (ELA 5983) slightly overlaps with the proposed Peninsula SF site.



Project site
Lot boundary

Mineral/extraction licence boundary

Titles - applications
Titles - current
Quarry/mine
Existing transmission line
Railway
Main watercourse
Watercourse - tributary

N

AE1173.1 Peninsula SPS

Figure 6.9. Mineral licence and extraction context

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Base map: Google Satellite [Feb 2022]
Additional data: NSW RoadSegment, NSW Hydroline, NSW ElectricityTransmissionLine NSW_Six_Forbes_Lot_Cadastral_data, NationalWasteManagementDatabase, Geoscience Australia bl_titlePolygon wfs, GeoScience AustraliaMinView_Min_occ_all_construction

ACCENT ENVIRONMENTAL

Edify has provided DPIE with evidence of engaging with Tastex during the Scoping phase[1], whereby Tastex has confirmed that the proposed development is unlikely to present conflicts or cumulative impacts to the ongoing operation of the quarry. Edify's engagement will continue with Tastex, to communicate future milestones and intended commencement of construction and associated vehicle movements.

There are no other minerals, petroleum or coal exploration titles or applications over the site.

The MinView search also identified that a construction materials quarry (Thomas Pit) is located immediately south of the project site (see Figure 1.3). This quarry is for 'unprocessed materials' and does not have defined lease boundaries. The geology map (see Figure 6.7) suggests that the quarry is targeting a chert deposit.

In addition to the two quarries within 1 km of the site (Pineleigh Quarry and Thomas Pit), the MinView search identified two other quarries within 5 km of the site (see Figure 6.9). The four quarries are listed in Table 12.

Based on aerial photography, it is assumed that the operations are small and operate only intermittently.

Table 6.12 Mines and quarries identified within 5 km of the site

Site name	Identification number	Status	Distance and direction from site	Ownership	Material quarried
Thomas Pit (Mares Waterhole Pit, Erasa Pit)	215217	Operating – intermittent only	immediately to the south	Owned by Lot 442	Unprocessed construction materials
Pineleigh Quarry	ML1773	Operating – intermittent only	500 m west	Owned by Sensitive Receiver R1	Dimension stone
Damian Morris Mine	220337	Not operating	3.9 km west	Not known	Dimension stone
Grandee Quarry (Mulyandry Quarry)	207022	Operating – intermittent only	4.6 km west	Not known	Dimension stone

Exploration licences (ELs) identified in the area using MinView, include (see Figure 6.9):

- EL8371 – located approximately 2.3 km west of the site, held by Marble Craft & Granite Supplies Pty Ltd

[1] Peninsula Solar Farm Scoping Report (2021). https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSD-14757962%2120210224T111223.708%20GMT

- EL9076 – two parts, one located approximately 3.9 km southeast of site, the other located approximately 6.9 km south of the site, held by Bullseye Gold Pty Ltd
- EL9304 – located approximately 5.3 km south of the site, held by Sozo Resources Pty Ltd
- EL8192 – located approximately 13 km north of the site, held by Ochre Resources Pty Ltd
- EL8990 – located approximately 17 km northwest of the site, held by FMG Resources Pty Ltd.

FORESTRY RESOURCES

Forestry land and/or forestry-related activities are not present at the project site and no such land will be directly affected as a result of the project. The nearest state forests are Mulyandry State Forest, 4 km to the west of the site, and Tomanbil State Forest, 7 km to the northwest (see Figure 6.9).

FLOOD-PRONE LAND

Flood risk and modelling is discussed in Section 6.6. No flood-prone land is located on or near the project site (see Section 6.6.3).

6.5.4 Impact assessment

LAND USE, CAPABILITY AND PRODUCTIVITY

The project will alter the current land use from agriculture to energy generation and storage, thereby reducing the availability of land for agriculture during project operation. During the construction period, agricultural land use on the 290 ha project site (i.e. the secured land) will be interrupted. Following construction and a resting period of approximately one year, Edify anticipates that approximately 1,000 merino sheep will be introduced to graze within the project boundary. This will enable the continuation of agricultural land usage and offset the impacts of the project on agricultural land, including the higher value LSC Class 3 land in the northern area of the site.

The combination of solar and sheep farming ('agrisolar') represents an efficient co-use of land and is consistent with the practice that Edify has established at its Victorian solar, battery and sheep farming enterprise, with the Gannawarra Solar and Battery project, which hosts up to 500 merino sheep throughout the life of the project as shown in Photo 6.5.

An estimated 235 ha of the project site will be occupied by project facilities, with more than approximately 74% of this area occupied by the solar arrays (see Section 3.2.2). As the arrays are fixed to steel piles driven pneumatically into the soil without the need for any excavation work or use of concrete, the area of direct ground disturbance is less than 5% of the area occupied by the arrays. The balance of the area below the arrays will not be directly disturbed, although this area will have increased shading and modified rainfall and runoff due to the presence of the frames and panels.

Once the project has been decommissioned at the end of its operational life, all above-ground infrastructure will be removed, underground infrastructure (e.g. electrical cabling) will be

removed to a depth of 1000 mm, and the land rehabilitated to a safe, stable and non-polluting state. It is anticipated that the pre-existing land use will be re-established following rehabilitation, unless otherwise agreed with the landowner and/or regulatory authorities.

Photo 6.5 Edify's Gannawarra Solar and Battery Project – 'agrisolar' co-use of land

There will be minimal overall loss of land capability at the project site, provided that:

- appropriate controls are put in place to minimise erosion risk during construction and decommissioning (see 'Erosion and sediment risk' below)
- existing site hydrology and drainage is maintained where possible or, where disrupted, managed to limit impacts (see Section 6.6)
- effective land management practices are adopted during project operation (including weed control, see below)
- rehabilitation is planned and executed carefully (see Section 6.14).

The temporary exclusion of 290 ha of land from traditional agricultural use during the life of the project is considered a medium-term and reversible impact that will result only in a minor loss of agricultural output at a local level and a negligible loss at a regional level. In addition, and as noted above, some agricultural use will continue for the life of the project in the form of agrisolar activities. The impact from the exclusion of the land in terms of lost agricultural production is further reduced by the presence on the site of predominantly moderate and moderate-low (Categories 4 and 5) LSC land (approximately 54.1% of the land is mapped as LSC4 or LSC5).

There is no known direct conflict with any existing or potential mining or extractive industry use of the project site. The potential for cumulative impacts in relation to mining and extractive industries is considered in Section 0.

EROSION AND SEDIMENT RISK

Soils can potentially be impacted by construction activities such as excavation and earthworks, resulting in the risk of soil erosion and sedimentation. Due to the relatively flat topography of the site, large-scale excavation will not be required although shallow levelling (to depths of

400 to 600 mm) may be needed for the foundations of the BESS units, inverter enclosures, control room, operations and maintenance building, and substation. Trenching of underground cables will also be required.

As the soil landscapes identified on the project site are known to present erosion risks (see Table 6.10) including the risk of sheet erosion, erosion control will be a key focus during construction.

Key construction works with the potential to result in erosion and sedimentation impacts are:

- slashing/removing areas of vegetation
- installing internal access roads and temporary construction laydown areas
- site preparation (potentially including levelling)
- installing the solar arrays (although associated erosion risk is minimal)
- excavating trenches for installation of underground cabling
- installing drainage works
- levelling/backfilling of the existing farm dam (located in the central part of the northern section of the site)
- the movement of construction vehicles and equipment on the site.

The above activities will potentially reduce soil stability, expose soils to the erosive effects of runoff, and result in the temporary and long-term stockpiling of soils (e.g. short-term trench spoil stockpiles and long-term topsoil stockpiles). Soil stockpiles, unless vegetated, are a potential source of sediment. Disturbance of the soil profile, particularly topsoil, may also result in longer timeframes for vegetation to re-establish. The risk of soil erosion is highest during heavy rainfall.

However, the extent of and potential for soil disturbance will be limited due to the construction techniques employed. As described above, the solar arrays will be mounted on steel piles, thereby minimising disturbance. The BESS units and inverter enclosures (regardless of whether a centralised or decentralised BESS concept is adopted) will require only shallow foundations, these being concrete pads. Other infrastructure such as the substation and buildings will also require only shallow foundations.

Vehicle movement, as well as other construction and decommissioning activities, has the potential to generate dust which can result in soil loss. However, dust issues are expected to be readily manageable by the adoption of standard dust management measures such as watering of access roads and disturbance areas and limiting dust-generating activities during periods of high wind.

Soil compaction in areas such as internal roads and access tracks can result in soil erosion through an increase in runoff during rainfall events due to the reduced soil permeability. This can result in concentrated flows that may erode adjoining areas. Reduced permeability due to the presence of concrete pads will also result in increased runoff and the potential for concentrated flows. Effective drainage design and management is required to control such risks and ensure that runoff is conveyed safely across the site without erosive impact (see Section 6.6).

Erosion risk during operation is expected to be low given that vegetation cover will be maintained over grassed areas, routine road maintenance will be carried out, and site drainage controls will be implemented to effectively convey water away from site facilities and across the site.

ACID SULPHATE SOILS

The disturbance of acid sulphate soils during construction, in the unlikely event that they are present, primarily poses a surface water quality risk and is discussed in Section 6.6.4.

WEEDS, PLANT PESTS AND PLANT DISEASES

Weeds can have harmful effects on agricultural productivity, natural landscapes and biodiversity, including causing damage to agricultural land, water catchments and native plants and animals. Plant pests and diseases are organisms which can affect the health of plants and thereby cause harm to agriculture and natural systems. Such pests and diseases include insects, mites, roundworms and snails, as well as fungi, viruses and bacteria (LLS 2021). Weeds, plant pests and plant diseases can result in significant economic impact (Sinden et al 2004).

Due to the increased movement of people and vehicles to and from the site, particularly during construction and decommissioning, the potential exists for an increase in the spread of weeds, plant pests and plant diseases. New weeds, plant pests and diseases can be introduced to the site and existing occurrences can increase in prevalence. Weeds, plant pests and diseases can spread from the project site to adjacent land (e.g. from seed dispersal by wind, runoff or birds), causing issues for neighbouring, non-associated landholders.

The potential for weed, plant pest and disease introduction and spread is highest during construction due to the relatively high numbers of vehicles entering the site, and the potential for earthmoving equipment to be contaminated from other work sites. However, ongoing management to control spread will also be required during operation.

Perishable waste such as food scraps can attract pest animals to the site or increase existing populations, including rats, cats, foxes, rabbits and pigs.

In addition, the importation of project components to Australia raises the risk that exotic weeds, plant pests, plant diseases or pest animal species could be introduced into the area. Strict biosecurity controls will be followed at ports in accordance with the *Biosecurity Act 2015* (Biosecurity Act), the Biosecurity Regulation 2017 and guidance documents, such as the series of fact sheets produced by the NSW Department of Primary Industries (DPI 2021). Under the Biosecurity Act, land managers and users of land have a General Biosecurity Duty for managing weed biosecurity risks that they know about or could reasonably be expected to know about (DPI 2017).

The risk posed by weeds, plant pests, plant diseases and pest animals will be effectively managed through the adoption of standard biosecurity management and mitigation measures, as outlined below in Section 6.5.6.

EXISTING SITE CONTAMINATION

The site inspection did not identify any evidence of contamination and additional assessment is therefore not considered necessary. However, if areas of suspected contamination are

identified during construction by e.g. changes in visual appearance or odour, then soil assessment and/or remediation may be necessary and will be undertaken as required.

6.5.5 Land use conflict risk assessment

A LUCRA has been prepared by Accent to assess potential land use conflicts between the solar farm and its surrounds in accordance with the *Land Use Conflict Risk Assessment Guide* (DPI 2011). The LUCRA is attached as Appendix H.

INITIAL RISK IDENTIFICATION AND RISK RANKING

The proposed land use activities that are most likely to generate conflict are the operation of the solar farm and adjacent agricultural and quarrying activities.

Each potential conflict between the operation of the solar farm and adjacent agricultural and quarrying activities has been assessed and given a risk ranking based on probability (likelihood) and consequence, based on definitions taken from DPI (2011). Risk rankings have been determined on the basis of probability and consequence using a risk ranking matrix.

Risk rankings greater than 10 are regarded as serious and need to be addressed. Each risk can be reassessed after risk mitigation controls have been introduced to reduce it.

The activities related to livestock grazing (predominantly cattle and sheep), cropping and quarrying that have been identified as most likely to create conflict with the project are outlined in Table 6.13, prior to the application of risk reduction controls.

Table 6.13 Potential conflicts caused to project by adjoining land uses

Activity	Potential conflict	Risk ranking prior to controls
Cultivation and cropping	Dust from cultivation and cropping causing reduced solar panel outputs	12
Sheep or cattle grazing	Dust from cultivation and cropping causing impacts on electrical equipment	13
	Cattle or uncontrolled sheep entering premise causing damage or outages	9
	Dust from fields and farm roads causing reduced solar panel outputs	8
	Dust from fields and farm roads causing impacts on electrical equipment	13
Quarrying	Dust from quarrying causing reduced solar panel outputs	12
	Dust from quarrying causing impacts on electrical equipment	13

The current mix of rural land use and quarrying in the area is not considered likely to change significantly during the life of the project. For example, due to the remote location of the project site relative to major regional towns, it is considered unlikely that surrounding properties will undergo subdivision to accommodate residential or small-block rural developments. Accordingly, it is not expected that future changes to land use will occur that will generate new land use conflicts in addition to those identified below.

Project activities that are most likely to create conflict with adjoining land uses (cropping and grazing) are outlined in Table 6.14, prior to the application of risk reduction controls.

Table 6.14 Potential conflicts caused to adjoining land uses by project

Activity	Potential conflict	Risk ranking prior to controls
Project development	Fire initiates on site and spreads off site, causing loss of infrastructure, crops or livestock	15
	Sprays from weed control adversely affecting adjacent land (including crops or livestock)	8
	Weed, plant pest, plant disease or pest animal introduction and/or spread	13

RISK REDUCTION CONTROLS

Proposed risk reduction controls are shown in Table 6.15 along with the revised risk ranking once the controls are applied.

Table 6.15 Risk mitigation controls and residual risk ranking

Potential conflict	Method of control	Residual risk ranking	Performance target
Conflicts caused to project by adjoining land uses			
Stock entering premises causing damage or outages	• Security fence	3	No cattle or uncontrolled grazing sheep allowed to enter site
Dust from farming or quarrying activities causing reduced solar panel outputs	• Monitor farming and quarrying activities, weather and dust deposition to quantify significance of impact • Routine and event-triggered cleaning of solar panels	5	No significant reduction in power generation

Potential conflict	Method of control	Residual risk ranking	Performance target
Dust from farming or quarrying activities causing impacts on electrical equipment	• Enclose equipment where required • Routine maintenance and cleaning	3	No electrical issues due to dust
Conflicts caused to adjoining land uses by project			
Impact of electrical fire	• Maintain minimum separation distance between adjacent BESS units, and between BESS units and project site boundary in accordance with hazard assessment • Implement and maintain BESS fire prevention systems/technologies • On-site provision for fire-fighting in accordance with Fire Services NSW and Rural Fire Service requirements (including dedicated water tanks, adequate site access for fire engines, hardstands suitable for parking engines)	10	No electrical fires
Sprays from weed control	• Avoid spraying on windy days • Avoid spraying if adjacent crops or livestock are at risk • Communicate with adjacent landholders regarding timing of spraying	2	No crops or livestock affected or vegetation degraded on neighbouring properties (as a result of the project)
Weed and pest introduction and/or spread	• Biosecurity controls on the importation of earthen materials, plants and seeds to site (e.g. for landscaping) and imported site components (e.g. solar panels, BESS units) • Good vehicle hygiene • Routine weed spraying and pest controls • Use of sheep grazing to control weeds • Regular weed inspections	2	No new and/or increased prevalence of weeds on neighbouring properties (as a result of project)

CONCLUSION

The proposed project is consistent with the existing use of the area for electricity transmission. Land use conflicts between adjacent agricultural and quarry land users and the project are

unlikely to result in significant impacts, provided the proposed risk control measures are implemented effectively. Potential conflicts with minor consequences and low residual risk may occur.

It is considered unlikely that future land use changes during the life of the project will generate new conflicts in addition to those identified above.

6.5.6 Management and mitigation

DESIGN

Internal access roads and other project infrastructure and facilities will be designed with adequate run-off controls to prevent erosion from concentrated flows.

CONSTRUCTION

Erosion and sediment control

Potential erosion and sedimentation impacts as a result of construction will be managed in accordance with a soil and water management plan (SWMP) for the project.

The SWMP will be developed in accordance with the requirements of:

- Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition (Landcom 2004)

The SWMP will include the following measures to reduce potential impacts on soils, land capability and agricultural land from erosion and sedimentation:

- constructing and/or installing temporary and long-term erosion and sediment control structures (including a sediment basin if required by Landcom (2004) based on hydrological calculations and soil types), with subsequent regular inspection, particularly following rainfall events
- lining drains with geotextile or plastic, where required to reduce erosion
- maintaining a register of erosion and sediment control activities, including records of inspection and maintenance
- minimising areas of disturbance and rehabilitating disturbed areas as soon as possible with appropriate plant species
- separating topsoil and subsoil and ensuring that soils are reinstated in the correct order
- filling trenches progressively after placement of underground cabling.

In addition, dust generation will be minimised by:

- adopting standard dust control measures for construction sites, such as outlined in Section 6.3.10 ‘Control of Wind Erosion’ in Landcom (2004) i.e. wetting down the internal access roads and other exposed surfaces, particularly during dry and windy conditions.

Weed, plant pest, plant disease and pest animal control

The following measures will be implemented to minimise impacts on soils, land capability and agricultural land from the introduction and/or spread of weeds, plant pest and diseases, and pest animals:

- implementing biosecurity controls and procedures for project components imported to Australia in accordance with requirements under the Biosecurity Act 2015 and the guidance provided in the Department of Primary Industry fact sheets (DPI 2021)
- developing a weed and pest management plan (WPMP) prior to construction. The WPMP will include:
  - identifying the types and prevalence of environmental weeds on the project site, including WONS
  - outlining methods for controlling weeds (e.g. herbicides, physical removal, grazing)
  - implementing a vehicle hygiene protocol when entering and leaving the site to ensure vehicles and earthmoving machinery are free of debris, sediment and weeds
  - ensuring any fill brought to site is weed and pathogen free.

Existing site contamination

The risk of disturbing existing site contamination during earthworks will be managed by implementing a procedure to identify areas of suspected contamination encountered during construction and to assess such areas in accordance with EPA requirements.

OPERATION

The SWMP will be updated for operation and include the following measures to reduce potential impacts on soils, land capability and agricultural land from erosion and sedimentation:

- undertaking regular inspection of drains and erosion and sediment control structures
- maintaining vegetation cover across the project site to minimise soil exposure and reduce erosion potential (including inspecting and maintaining revegetated areas until stable and self-sustaining).

The WPMP will be updated for operation and will include measures for the ongoing monitoring and control of weeds, pathogens and pest species.

DECOMMISSIONING

Management and mitigation measures to be implemented as part of decommissioning will be similar to those implemented during construction. Decommissioning will largely focus on reinstatement of the project site to its original (pre-construction) condition and land capability.

6.5.7 Conclusion

Site inspections and a review of available information has identified that direct and indirect project impacts on soils, land use and agriculture are expected to be largely confined to the

disturbance areas of the project site, limited in magnitude and largely reversible, provided that the proposed land management measures are implemented effectively. In particular, effective management of erosion risk during construction, drainage management during construction and operation, weed and pest species control during construction and operation, and a strong emphasis on site rehabilitation at the end of project life are required to avoid long term impacts.

Although the project will result in reduced agricultural output during the life of the project, including for LSC Class 3 land, the proposed 'agrisolar' co-use of the land (controlled sheep grazing) will help offset these impacts.

The project is considered to represent a temporary change in rural land use during the operational life of the project that is compatible with the existing use of the project site for power transmission. No major land use conflicts were identified.

6.6 Hydrology and water resources

The hydrology of a site and downgradient waterways can be modified due to earthworks or the construction of facilities or infrastructure, potentially increasing flood risk. Groundwater can also be affected by dewatering of excavations or water extraction to meet project supply needs.

Surface water and groundwater quality can be affected by issues such as erosion from soil disturbance or the release of chemicals and hydrocarbons.

Changes to hydrology, hydrogeology or water quality can cause impacts on surface water and groundwater resources affecting beneficial uses of these resources. This section provides an assessment of the potential impacts on water and water resources resulting from the project, including an assessment of flood risk. It aims to address the SEARs and agencies' comments regarding surface water and groundwater resources, water requirements and supply arrangements, and erosion and sediment control.

6.6.1 Level of assessment

As the project is considered unlikely to result in significant impacts in relation to water and water resources, a ***standard assessment*** of impacts was undertaken based on site inspection and review of literature. However, a ***detailed assessment*** of flood risk, involving modelling, was undertaken to determine whether flooding impacts were significant. The flood risk assessment informed the broader assessment of hydrological impacts.

6.6.2 Methodology

A literature review was undertaken to assess the existing hydrology and water resources for the project site, including sourcing information from the NSW DPIE, the Forbes LEP 2013 and website tools (SEED and eSPADE).

Impacts to hydrology and waterways during construction and operation, including flood risk, were assessed, including potential impacts on:

- water movement during localised flood events (see flood impact assessment below)

- surface water and groundwater resources, including watercourses, wetlands, riparian land and groundwater dependent ecosystems (including impacts from acid sulphate soil disturbance), and the associated beneficial uses
- adjacent licensed water users and basic landholder rights.

The potential for water quality impacts associated with erosion risk and acid sulphate soils was assessed based on the relevant findings of Section 6.5, above.

FLOOD IMPACT ASSESSMENT

A flood impact assessment of the project was undertaken by Alluvium Consulting Australia Pty Ltd (Alluvium) to address the flood component of the SEARs and is provided as Appendix I. The assessment considered localised flooding, which originates from rainfall, and runoff impacts across the project site and the area immediately downstream of the site.

A digital elevation model (DEM) using publicly available Light Detection and Ranging (LiDAR) data acquired from ELVIS (Elevation - Foundation Spatial Data), with resolution of 5 m, formed the basis of the flood modelling.

An existing flood model was built using the TUFLOW software based on current conditions and a design scenario. A TUFLOW model was built to identify the effects of the project, with the Direct Rainfall Approach being employed for the flood modelling. Rainstorms were applied to the model for the 20% annual exceedance probability (AEP), 10% AEP, 2% AEP and 1% AEP events for a wide range of storm durations to identify the critical storm event in relation to flood impacts.

Manning's n roughness coefficients (a measure of the roughness or friction along the flow paths) were adopted based on eSPADE's NSW land use (2017) spatial layer (eSPADE 2021a).

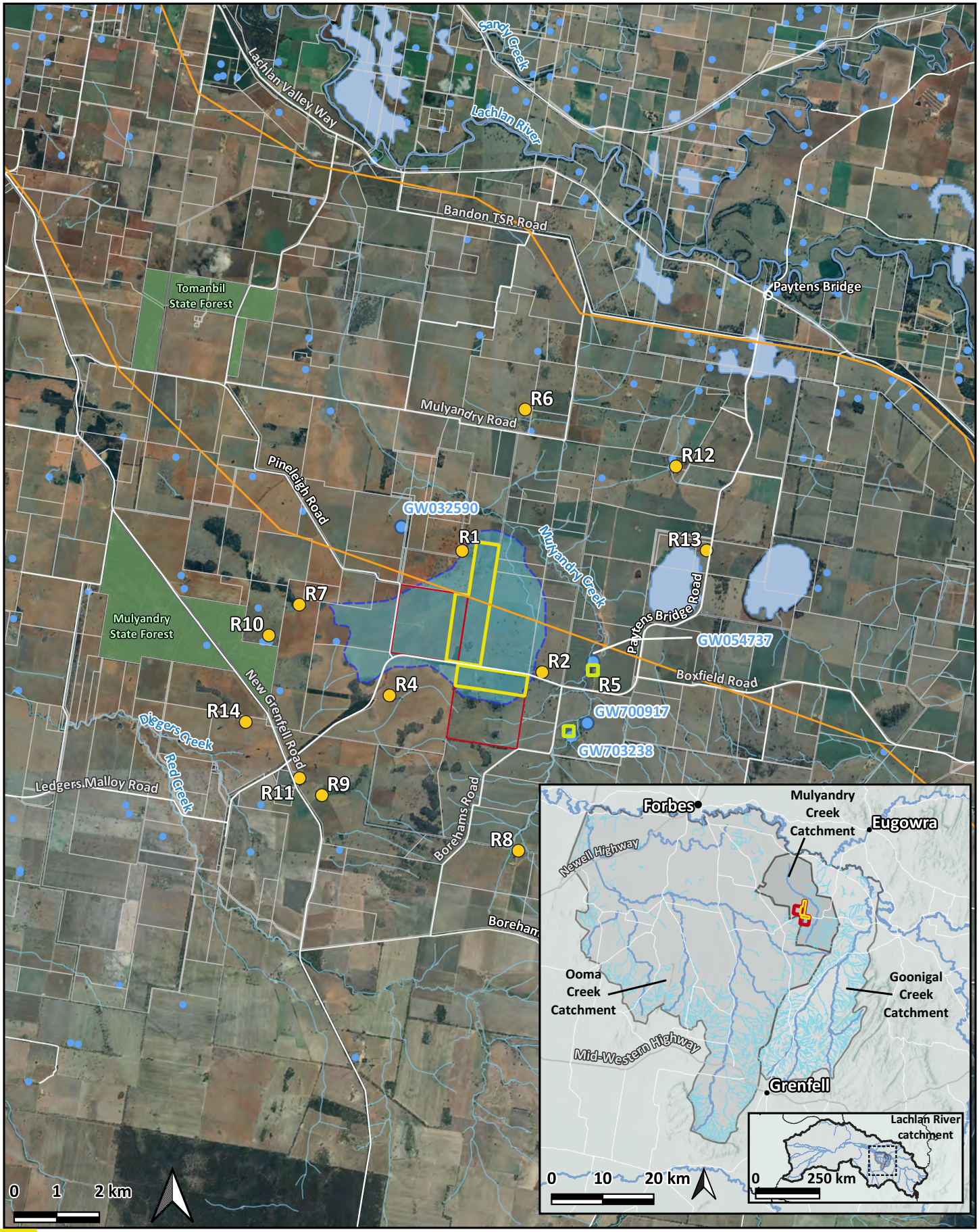
The hydrologic model considers impervious areas but did not include consideration of the substation as its footprint was deemed to be small and would not influence the model results. The modelling also excluded consideration of the BESS footprints – either centralised or decentralised – as these are similarly not expected to have an impact on the results.

6.6.3 Existing conditions

SURFACE WATER HYDROLOGY

The project is located within the Lachlan River catchment. The project site drains towards Mulyandry Creek approximately 580 m to the north (Figure 6.10), which flows northwest into the Lachlan River approximately 8 km from the site. The Lachlan River is a major tributary of the Murrumbidgee River, which in turn flows into the Murray River which reaches the coast at Murray Mouth in South Australia, approximately 880 km southwest of the site.

The project site is generally flat and does not contain any clearly-defined waterways or drainage channels, although the DEM shows that water would flow from south to north in a poorly-defined channel and from there into a more clearly-defined drainage channel approximately 200 m northeast of the site (see Figure 6.10). Some shallow depressions within the site can become waterlogged after rainfall. There is no riparian land on the site.



Project site
Lot boundary (project site)
Residence - non-associated
Residence - associated
Lot boundary
Project area local catchment
NGIS bores within 2 km of project site
NGIS bore
Wetland
Existing transmission line

Catchments - inset maps

Goonigal Creek catchment
Mulyandry Creek catchment
Ooma Creek catchment
Lachlan River catchment (inset map)
Main watercourse
Watercourse - tributary

AE1173.1 Peninsula SPS
Figure 6.10. Hydrology and groundwater
Created: 10/03/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4
Basemaps: Google Satellite [Mar 2022] (main map), ESRI_World_Hillshade (inset maps)
Additional data: NSW RoadSegment, NSW Hydroline, NSW ElectricityTransmissionLine, NSW_Wetlands MDBA_Surface_Water_SDL_Resource_Units

ACCENT ENVIRONMENTAL

No waterways, natural water bodies or wetlands were present within the subject land; however, several small agricultural dams were noted (Photo 6.6), and these could provide habitat for certain flora and fauna species (e.g., frogs, turtles, fish and waterbirds). Three dams (two in the northern section and one in the southern section) will be retained (see Section 6.2.3 and Figure 1.3). Each dam occupies approximately 0.1 ha. There are also 10 or more other small dams on adjacent properties.

Photo 6.6 Farm dam located on eastern border of northern section of project site, looking east

The site and its upstream catchment have an area of approximately 13.1 km^2 (1,310 ha) (see Figure 6.10).

The Forbes DCP (Forbes Shire Council 2014) provides development control guidance for the LGA, including in relation to flooding and flood-affected land. The DCP includes Flood Risk Precincts (FRPs) for the LGA divided into two categories – Forbes Township Floodplain and Other Floodplains in the LGA. The proposed Peninsula SF is located within the second of these categories. The flood-prone areas depicted on the Other Floodplains in the LGA map shows that flood-prone areas are close to the site and proximate to the northern boundary of the site. The resolution of the map is insufficient to accurately determine that the site is not within a designated flood-prone area. However, if the site is a designated flood-prone area, the extent appears to be minimal.

GROUNDWATER

Water NSW records for groundwater bores (Water NSW 2021) show 4 bores located within 2 km of the project site, as shown in Table 6.16. Depths to the aquifer and to the standing water level (SWL) (measured in metres below ground surface (mBGS)) are provided and, when under pressure, the SWL normally rises to a level above the aquifer. However, as the aquifer is where the water is stored, it is important to note this depth.

Table 6.16 Groundwater bores identified within 2 km of the site

Bore ID	Bore depth (mBGS)	Purpose	Depth to aquifer(s) (mBGS)	Depth to SWL (mBGS)	Status	Distance (approx.) and direction from site
GW032590	90.2	Stock and domestic	86.9 to 90.2	47.5	Needs reconditioning	1830 m northwest
GW054737	81.4	Unknown	Unknown	Unknown	Unknown	1550 m northeast
GW700917	74.98	Stock and domestic	Unknown	Unknown	Functioning	1500 m southeast
GW703238	75	Water supply	Unknown	Unknown	Functioning	1250 m southeast

Each of the bores within 2 km of the site has been drilled to over 70 m depth and the depth to the aquifer is available in one bore only. The depth to the aquifer accessed in bore GW032590 is more than 86 mBGS and, given the drilled depths of the other nearby bores, it is inferred that groundwater is being accessed at similar depths (although slightly shallower in the cases of bores GW700917 and GW703238) and likely to be around 70 mBGS.

No wetlands or groundwater dependent ecosystems (GDEs) were identified on the project site during the biodiversity assessment. The BDAR completed by OzArk (2021) (refer to Appendix F of this EIS) noted that the nearest mapped wetlands are two floodplain wetlands to the east of the site, one occupying 152.08 ha and the other occupying 188.68 ha. These wetlands are located approximately 3.6 km and 5.9 km from the project site, respectively and shown in Figure 6.10.

The BDAR noted that the Bureau of Meteorology Atlas of Groundwater Dependent Ecosystems (Bureau of Meteorology 2021) identified areas of low potential for interaction with terrestrial GDEs within the project site and surrounding study area. The BDAR found that no high- or moderate-potential GDEs occur on the subject land or within the study area. No aquatic GDEs are mapped within the study area; the closest mapped aquatic GDEs are associated with the floodplain wetlands cited above.

EROSION AND SEDIMENT

As outlined in Section 6.5.3, the project site falls within the Waughan soil landscape (SL), the Piney Range SL and the Ironbarks SL (King 1998) for which erodibility is classified as moderate, or moderate to high (where concentrated flows are not present), and erosion hazard on grazing land is classed as moderate (where concentrated flows are not present).

The project site had good coverage of pasture grasses during site inspections and no significant erosion or downstream sedimentation was evident. Combined with the flat-lying nature of the land and lack of concentrated flow paths, these observations suggest that erosion hazard

potential may be minor. However, based on the soil landscape classifications of the site, it has been assumed for the purposes of this assessment that erosion hazard is moderate.

6.6.4 Impact assessment

SURFACE WATER HYDROLOGY

Construction

As the project site is relatively flat and with no defined waterways (and just one poorly-defined drainage channel), the potential for and sensitivity to hydrological impacts during construction is low. Minor, localised disruption to drainage will occur during the construction of facilities, associated with activities such as vegetation clearance and earthworks, which may trap or impede surface flows across the site.

The drainage line crossing the northern part of the site does not pass through the proposed footprint of the substation. In addition, due to the small footprint of the substation, it was considered of insufficient extent to influence the hydrologic modelling as an impervious area.

Stockpiles of stripped topsoil, excavated subsoil and construction materials (such as aggregate) will be located away from any obvious flow paths. Any stockpiles remaining at the completion of construction (such as topsoil stored for eventual use during decommissioning) will be located, shaped and revegetated to minimise hydrological disruption.

Once construction has been completed, disturbed areas not occupied by project facilities (such as the temporary lay-down area) will be re-profiled (if required) to match pre-existing topography and revegetated.

Operation

There is expected to be no major disruption to hydrology during operation, apart from the decreased permeability of areas occupied by project facilities and the associated increase in runoff volumes and local redirection of flow (see Flood risk, below).

Standard drainage controls will be implemented in accordance with good engineering design to convey stormwater safely away from project facilities and infrastructure, and through and away from the site, in a manner that minimises hydrological disruption within the project site and avoids off-site hydrological impacts including to downgradient waterways.

No significant hydrological impacts on surrounding lands or downstream waterways are anticipated (see Flood risk, below).

FLOOD RISK

Two categories of flood risk during project operation have been considered:

- impacts on flood levels due to the study area obstructing flow
- impacts on flood levels due the study area producing extra runoff.

Modelling of current conditions

The flood modelling shows that the project site currently becomes inundated by localised rainfall and runoff in all the events modelled (20%, 10%, 2%, 5%, 1% and 0.1% AEP events), a selection of which is shown in Figure 6.11.

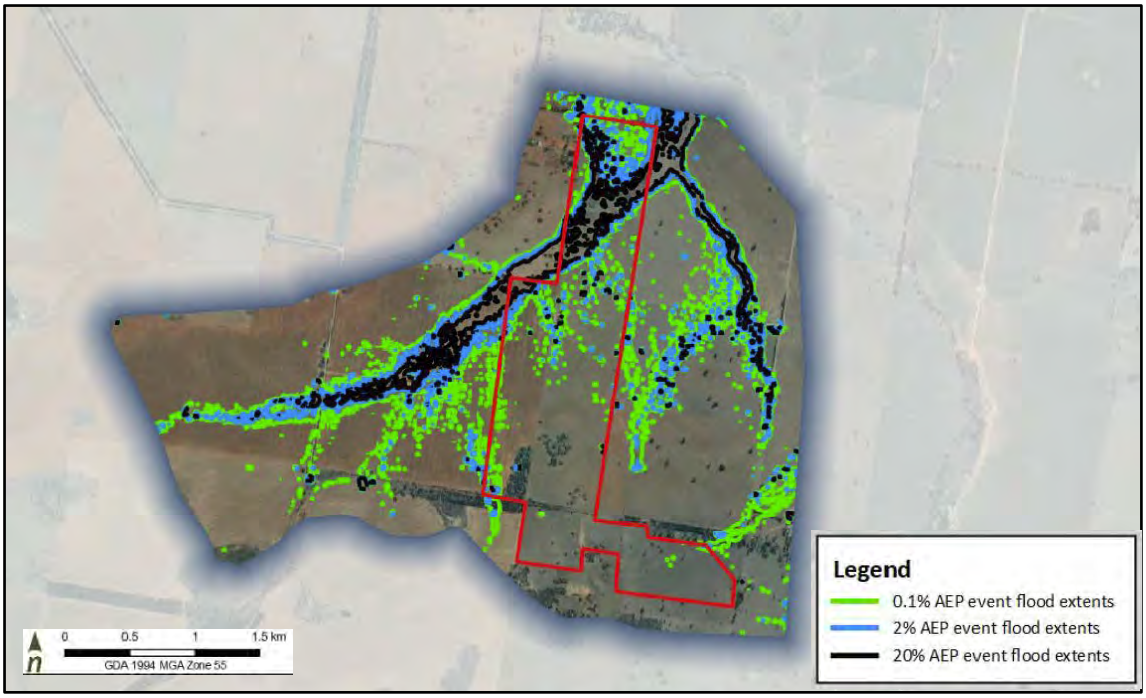


Figure 6.11 Flood extents in the 20%, 2% and 0.1% AEP events (from Alluvium)

Significantly, most of the study area remains clear of floodwater with water depths less than 0.1 m across the site with the exception of the northern area. Figure 6.12 and Figure 6.13 show flood depths for a 1% AEP event as an example. Typically, water depths across the north of the site averaged between 0.11 m and 0.28 m across the events.

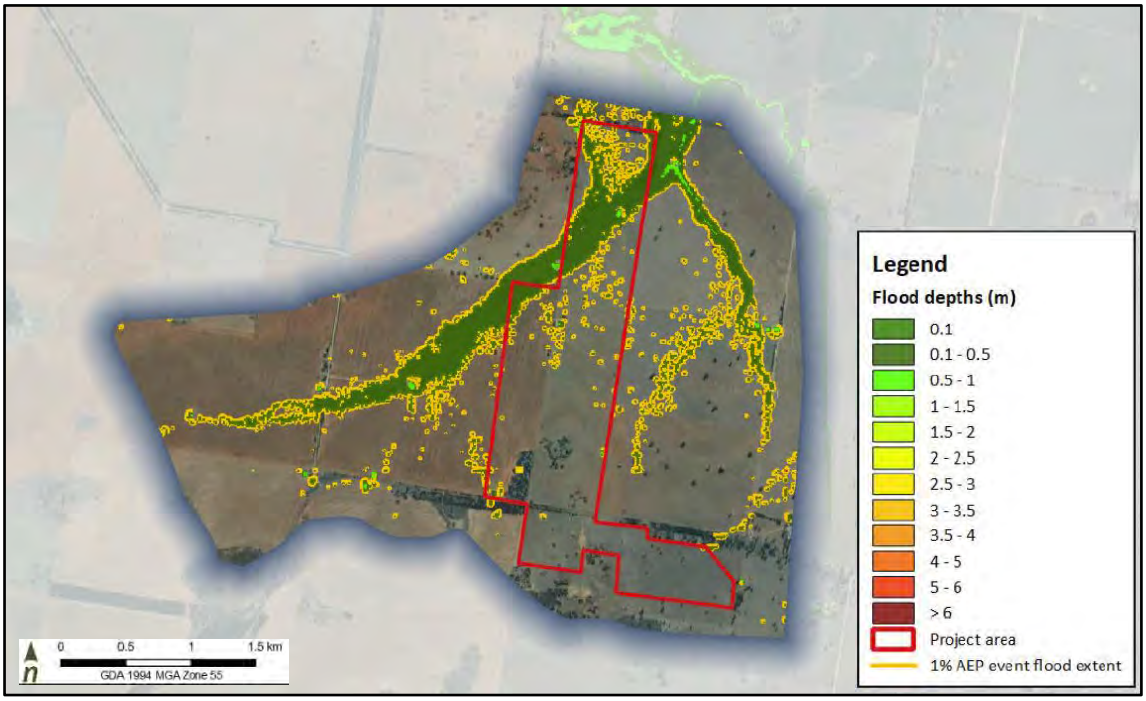


Figure 6.12 1% AEP existing flood depths (from Alluvium)

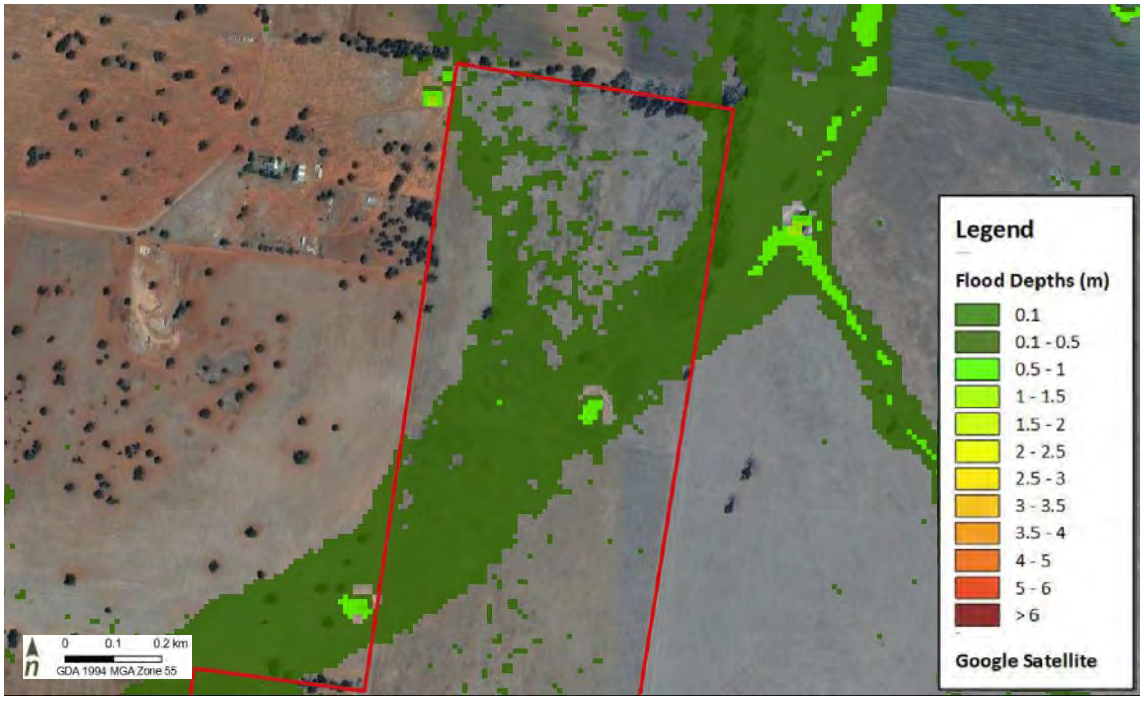


Figure 6.13 1% AEP flood depths close up of the northern area of the site (from Alluvium)

The flood depth modelling illustrates the shallow overland flow across the study area with one exception in the pre-existing farm dams on site where flood depths reached a maximum of 0.74 m to 1.1 m. The site was modelled only on the existing ground surface as no piped stormwater infrastructure within or near the site boundary existed to alter the flow paths.

Figure 6.14 illustrates the potential impact of flood results on the substation, which shows that the substation location is virtually unaffected by the 1% AEP flood event.

Modelling of project impact

The flood impact assessment found that, so long as the project area vegetation conditions are reinstated similar to pre-development conditions following construction, and that impervious areas are not increased substantially, additional runoff from the project area is unlikely to occur even with the introduction of 192,000 solar panels because impervious areas are not increased substantially and additional runoff from the project area is unlikely to occur. Small increases in imperviousness are unlikely to increase peaks due to hydrograph timing effects. Therefore, the existing conditions flood modelling is likely to reflect the impact of the solar panels on the downstream runoff. As such, a post-solar farm construction scenario was not required.

Based on the overland sheet flow that is expected to cross the perimeter security fencing (indicatively 1.8 to 2.7 m high) it is expected there will be minor collection of small woody debris and grass on the fence panels. This issue is concentrated on the western perimeter of the fence where the overland flow is highest. Overall, the catchment does not contain significant debris potential since it is cleared grazing and cropping land. Moreover, the depths of flow and velocities are unlikely to carry any large woody debris to the perimeter fence.

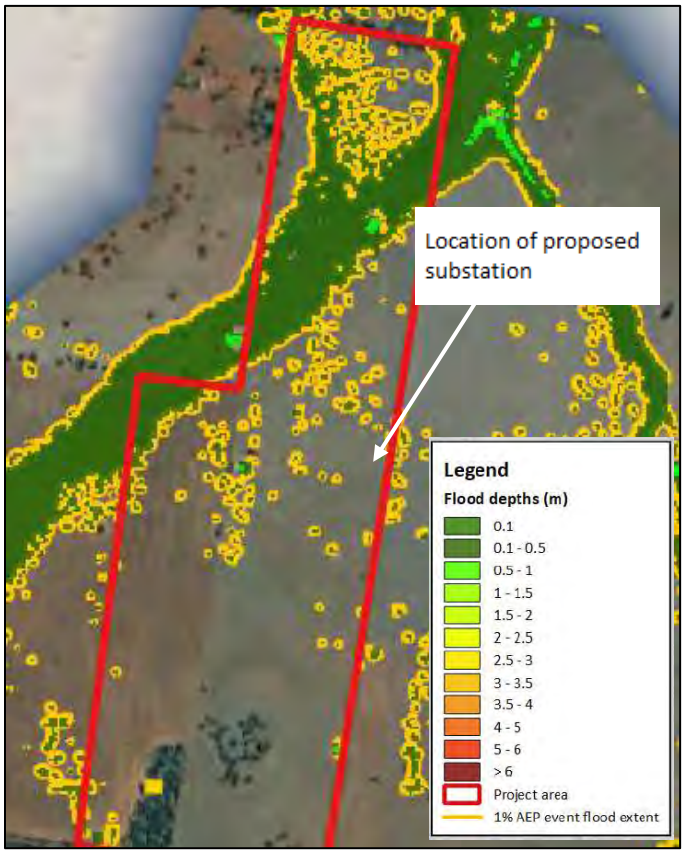


Figure 6.14
1% AEP flood results and the substation location (from Alluvium)

Conclusion

Flood prone areas have been mapped, appropriate flood planning levels identified, and hydraulic categories on the floodplain identified. Medium to high-risk infrastructure in the study area has a high level of flood immunity and is well above designated flood levels. Over most of the study area there is no riverine flooding. However, in the north (adjacent to Mulyandry Creek) extensive but shallow inundation occurred in all the events modelled.

The project site will have no impact on flooding as the footprint is located on the floodplain (notwithstanding the low hills in the southern section and a single low hill in the southern part of the northern section) where water velocity is low. The project area earthworks do not include any infilling or depletion of floodplain storage. The proposed development should not produce increased runoff, provided vegetation and land cover when the development is completed provides similar levels of infiltration and retardance as occurred during pre-development and the development avoids extended periods where vegetation and landcover is not present.

The analyses conducted suggest that the risk to human life and infrastructure is considered to be low during large floods, therefore mitigation measures are not required.

SURFACE WATER QUALITY

Construction

The main risk to surface water quality during construction is erosion leading to elevated turbidity and suspended sediment concentrations, and potentially in-stream sedimentation, in

downgradient waterways. Erosion risk is greatest during construction due to the exposure of soil as a result of vegetation clearance and earthworks.

As noted in Section 6.5.3, the soil landscapes at the site include the Waughan, Piney Range and Ironbarks SLs. These present a moderate erosion hazard, even when concentrated flows are not present. To manage this risk, soil disturbance will be kept to a minimum, sediment and drainage controls measures such as outlined in Landcom (2004) will be implemented, and revegetation of temporarily disturbed areas (such as the temporary construction lay-down area) will be undertaken as soon as construction activities cease and the land becomes available.

Impacts from soil erosion on surface water quality during construction are therefore expected to be minor and readily manageable. Impacts on downgradient waterways that do occur are expected to be of a temporary nature.

The disturbance of acid sulphate soils during construction can result in the discharge of low pH waters. Although such soils are unlikely to be present on site, visual inspections during soil levelling and trenching will be undertaken as a precaution. If these inspections indicate acid sulphate soils may be present, additional actions such as monitoring of pH after rainfall may be considered.

Potential impacts to surface water during construction could also occur due to contamination from unintended spillages of fuel, lubricants, herbicides, sewage and other chemicals.

During the construction of the project, fuels, chemicals or other potential contaminants will be stored and used on site. However, the quantities of chemicals used during construction will be relatively minor (for example, below Resilience and Hazards SEPP threshold levels, see Section 6.10.4). With the adoption of the management and mitigation measures proposed in Section 6.6.5, there are expected to be no significant impacts on surface water quality.

Temporary toilets will be available throughout the construction period for use by contractors. These toilets will be pumped out by a local licenced waste contractor as required.

Any residual water within farm dams that are proposed to be decommissioned will be pumped out prior to infilling. The water will be offered to the landholder for use or storage in another dam, used preferentially as a source of water during construction, or tested and, if of suitable quality, discharged to surface drainage lines in accordance with NSW EPA requirements.

Operation

Potential impacts to surface water quality during operation could occur due to contamination from unintended spillages of fuel, lubricants, herbicides, sewage and other chemicals.

Only minor quantities of chemicals will be stored and used on-site during operation and there will be no fuel storage. With the adoption of the management and mitigation measures proposed in Section 6.6.5, there are expected to be no significant impacts to surface water quality.

WATER USE

At least two 20,000 L steel or concrete tanks will be installed at the site to store water for bushfire protection and other non-potable water uses. The project will ensure a minimum of 20,000 L is reserved for firefighting purposes. At least one of these tanks will be located close to the project's substation, to support the centralised battery configuration (if this becomes the final design chosen), and this would also be located next to the substation under this design arrangement.

It is envisaged that the water used during the construction period will be minimal and largely used on a continual basis for dust suppression on unsealed roads, in addition to the construction of new road surfaces. However, the required quantity of water will vary, depending on weather conditions, and is estimated to be up to a total of 30 ML. Of this, approximately 1.2 to 1.4 ML will be potable water, required by the employees and contractors. Edify's preferred option is for water to be trucked to site to meet requirements during construction and decommissioning.

Truck movements during construction as a result of water delivery have been considered as part of the traffic impact assessment (see Section 6.7).

Once operational, it is anticipated that the development will collect water from building roofs and use on-site water storage tanks (e.g. 2 x 35 kL tanks). It is anticipated that 350 to 500 kL of water will be used during operation each year for cleaning, maintenance and staff amenities. Water will be trucked in during periods when the on-site water tanks contain insufficient water.

Sewage generated during operation will either be treated by an on-site bio-cycle system, installed to comply with regulatory requirements, or collected and disposed of off-site.

Accordingly, the project is not expected to have any impact on the availability of current surface water or groundwater resources to local landholders during either construction or operation.

GROUNDWATER

Construction and operation of the project is expected to result in only minor shallow ground disturbance, primarily associated with the construction of the access road area, the concrete footings for the solar arrays and the BESS units, the foundations of the substation, and the proposed underground transmission line between the substation and the Forbes-Cowra Transmission Line.

Although some levelling of the project site may be required for infrastructure foundations, the depth of excavation is expected to be no more than 400 to 600 mm, reflecting the generally flat terrain. Trenches for underground cables are expected to be 1 to 1.2 m deep. Excavation and trenching depths will be well above the aquifer, which is estimated to be around 70 m (or more) below the ground surface (see Section 6.6.3).

No water supply bores will be required for the project.

No approval for aquifer interference under Section 91 of the *Water Management Act 2000* is expected be required.

As outlined above for surface water quality, the on-site storage and use of hydrocarbons and hazardous materials during construction and operation will be minimal. The risk of significant groundwater contamination from leaks and spills will accordingly also be minimal.

The nearest current use of local groundwater resources is the extraction bore approximately 1200 m southeast of the project site (see Figure 6.10). As groundwater is not expected to be intersected as a result of the project, and the risk of groundwater contamination is low, no impacts on the availability or quality of local groundwater resources are anticipated.

EROSION AND SEDIMENT

For the project in general, the erosion hazard is assumed to be moderate. However, the solar farm construction process typically involves stripping a site of all vegetation and grass, leaving bare earth. In general, soil erodibility is increased when the soil surface is exposed, such as when vegetation is removed and excavation work is undertaken. Therefore, over the lifetime of the project, the construction and decommissioning phases of the project are the phases when this potential is highest and this potential is further increased during and immediately after storm events. The erosion potential is exacerbated further when combined with other factors such as ground slope. However, as the site is generally flat, this increased potential is minimal.

6.6.5 Management and mitigation

DESIGN

To the extent practical, project design will minimise the use of concrete slabs and maximise the permeability of areas occupied by project facilities, to promote infiltration and minimise runoff.

CONSTRUCTION

Potential impacts on water and water resources as a result of construction will be managed in accordance with an SWMP, as outlined in Section 6.5.6, developed in accordance with the requirements of Landcom (2004). An aim of the SWMP will be to ensure post-development flows leaving the site are consistent with pre-development flows.

In addition, the following management and mitigation measures will be implemented during construction to limit the impacts of the project on hydrology and water resources:

- implementing erosion and sediment control measures during construction as outlined in Section 6.5.6, including minimising areas of disturbance and rehabilitating disturbed areas as soon as possible
- installing effective stormwater management and control measures during construction, in accordance with the SWMP, with a focus on protecting downstream waterways flowing north into Mulyandry Creek
- locating temporary stockpiles away from flow paths and locating, shaping and revegetating long-term stockpiles to minimise hydrological disruption
- infilling farm dams on the project site with a gentle batter that is consistent with the local ground slope and directs runoff into the natural drainage path next to the dam

- re-profiling (if required) and revegetating disturbed areas not occupied by project facilities (such as the temporary lay-down area) to match pre-existing topography
- undertaking visual inspections during soil levelling and trenching. If these inspections indicate acid sulphate soils may be present, additional actions such as monitoring of pH after rainfall may be considered to confirm that acid sulphate soils are not present
- developing and implementing procedures for the testing and management of construction wastewater if disposal is required
- storing fuels and chemicals in accordance with the National Code of Practice NOHSC:2017(2001) (NOHSC 2001) and other relevant standards
- storing fuel and chemicals in an impervious bunded area at least 50 m away from water bodies and drainage lines
- refuelling plant and machinery will be undertaken a minimum of 50 m away from water bodies and drainage lines, where practicable in designated bunded refuelling areas, with spill kits available at all times during the refuelling process
- implementing a spill response plan (to be prepared as part of the EMS) which will include containment and remediation procedures, placement of spill kits and SDSs, and training requirements for staff
- disposing all hazardous chemicals and waste off site in accordance with relevant NSW government regulations and guidelines
- daily inspection of all machinery and plant to ensure no leakage of fuels, lubricants or other liquids.

OPERATION

The following management and mitigation measures will be implemented during operation to limit the impacts of the project on hydrology and water resources:

- maintaining vegetation cover under all solar panel arrays to maximise water infiltration
- storing fuels and chemicals in accordance with the National Code of Practice NOHSC:2017(2001) (NOHSC 2001) and other relevant standards
- undertaking regular inspection of equipment and facilities to identify spills or leaks
- implementing a spill response plan (based on that used for construction)
- ensuring the ERP for the project includes procedures to be followed in the event of flooding within the project site or surrounding area, including information on safe evacuation routes.

DECOMMISSIONING

Management and mitigation measures to be implemented as part of decommissioning will be similar to those implemented during construction. Decommissioning will seek to re-establish pre-existing slopes (where modified by the project) and drainage.

6.6.6 Conclusion

The assessment of water and water resource impacts has identified that project impacts are expected to be negligible to minor. Changes to site hydrology will be limited in magnitude and reversible. No impacts on groundwater are anticipated. Water quality risks such as those associated with erosion, or the discharge of fuels or chemicals, are expected to be readily manageable by the application of standard management practices in accordance with relevant guidelines and standards. Water use during construction and operation will be minor, with water supplied from off site.

Local catchment flood modelling was undertaken to provide guidance on the planning of internal infrastructure and to assess the external impacts of the site development. The modelling did not identify any implications for the current conceptual project design or any off-site flood-related impacts.

6.7 Traffic and transport

Increased traffic movements as a result of the project can result in safety and amenity issues for other road users and sensitive receivers and can lead to a deterioration in road pavement condition. The removal of vegetation for site access and improved sighting can lead to biodiversity impacts. This section provides an assessment of the potential impacts associated with traffic and transport.

To undertake the assessment, Edify commissioned a Traffic Impact Assessment (TIA) by IMPACT Traffic Engineering Pty Ltd (IMPACT), which is provided as Appendix J.

General biodiversity impacts associated with project-related traffic are discussed in Section 6.2. Specific biodiversity impacts associated with the proposed upgrade of the Lachlan Valley Way/Paytens Bridge Road intersection are assessed in Appendix G and discussed below. Noise impacts due to traffic are discussed in Section 6.8.

6.7.1 Level of assessment

As the potential traffic impacts of the project, particularly during construction, are one of the key project issues requiring assessment and management, as identified by the SEARs, a ***detailed assessment*** of traffic impacts was undertaken.

6.7.2 Methodology

In accordance with the requirements of the SEARs, the TIA evaluated the condition of the existing road network and then assessed the impacts of the project by considering the proposed vehicle access routes, site access points (including required road works), vehicular movements and sighting requirements. Specifically, the following aspects were considered:

- site location and local and regional context
- existing road network
- vehicle access routes, including the anticipated access routes for:
  - delivery of solar farm components from Sydney to the site

  - delivery of construction materials such as aggregate and gravel, and water deliveries
  - project workers
- site access points
- vehicle turning lane requirements
- sight distance requirements and assessed intersection sight distances
- traffic generation during construction, operation and decommissioning
- impacts on the local roads.

Specific consultation has also been undertaken with council. This has included discussion of potential traffic and transport impacts, including the suitability of site access routes during construction. The need for road maintenance contributions to council for the upkeep and repair of local access roads, in particular Paytens Bridge Road, has been considered along with the requirements for traffic control measures in relation to site access.

Consultation with council was also undertaken as part of the traffic impact assessment. Council provided traffic numbers on Paytens Bridge Road to IMPACT for use in the TIA and assisted with photographs of Paytens Bridge Road showing the alignment and sightlines at the proposed site access points.

6.7.3 Existing conditions

The existing road network in the vicinity of the project site is shown on Figure 1.2.

Two roads are located within 500 m of the project site (see Figure 1.2). These are:

- Payten's Bridge Road (Photo 6.7), which is a paved local road running east-west between project site lots 9 and 441 to the north and Lot 442 to the south (described further below)
- Pineleigh Road, which is a north-south unpaved local road off Paytens Bridge Road. This road forms the western boundary of Lot 9, although, as the development is only on the eastern part of Lot 9, the road does not bound the project site and is approximately 1.3 km west of the site.

Access to both the northern and southern sections of site during construction and operation will be directly from Paytens Bridge Road, with Edify's proposed site entry points shown on Figure 1.3.

Paytens Bridge Road is a local road which is generally aligned in a north-south direction along most of its length (although traversing east-west across the project site) and extends between New Grenfell Road to the south and Casuarina Drive to the north (see Figure 1.2). Paytens Bridge Road in the vicinity of the site is generally straight, and flat, and the trees along the verge of the road are setback at least 5 m to 7 m from the carriageway on both ends of the verge.

In the vicinity of the site, Paytens Bridge Road has been constructed with a central seal approximately 5.0 m wide with sealed/unsealed gravel shoulders measuring approximately 1 m on each side. A speed limit of 100 km/h applies to this section of the road.

Data provided by Council indicates that, on average, Payten Bridge Road carries in the order of 340 vehicles per day in the vicinity of the project site.

Peak period traffic generally represents approximately 10% of the total daily movements or 34 peak movements in this instance.

Photo 6.7 Paytens Bridge Road as is passes through the project site, looking east

The intersection of Lachlan Valley Way / Paytens Bridge Road is expected to provide direct access for construction vehicles travelling to and from the subject site. Trees and vegetation within this area are setback from the through lanes. Furthermore, the road alignment is generally flat and straight.

6.7.4 Impact assessment

SITE TRANSPORATION ROUTES

Major components

It is anticipated that most of the components (including the solar panels and the BESS units and substation infrastructure) will be procured from Sydney or imported via international logistics (sea freight) through Botany Bay.

Due to the existing rail infrastructure and proximity of the project to a major regional rail network, it is anticipated that the solar module / substation components may be transported by rail and delivered to the Mountain Industries rail siding laydown yard at Forbes. Once unloaded, the materials will be transferred to trucks and transported to the site. Should rail transport be adopted as a mean of transporting components to the site, such as via the Stockinbingal-Parkes railway line, then the implications of this for the rail network will be further assessed in consultation with TfNSW.

The proposed road haulage route to and from the project site from the Forbes rail siding is:

- Forbes – Lachlan Valley Way – Paytens Bridge Road – Peninsula SF

An alternative but non-preferred route from the Forbes railway siding is:

- Forbes – Lachlan Valley Way – New Grenfell Road – Paytens Bridge Road – Peninsula SF

This alternative via New Grenfell Road is non-preferred as it makes less use of Lachlan Valley Way, relying on the use of local roads for greater distances, and involves an extra intersection.

Should rail to Forbes be unviable, an alternative route is road haulage to site from Port Botany as follows:

- Port Botany – General Holmes Drive (M1) - M5 East (M5) – Westlink M7 (M7) - Western Motorway (M4) – Great Western Highway (A32) – Mid Western Highway (A41) – Grenfell Road (B64) – Lachlan Valley Way – Paytens Bridge Road – project site

Should the above route be used to transport components to the site, then the implications of this for the road network will be further assessed in consultation with TfNSW.

Other components

It is anticipated that other components (including construction materials and water) will be sourced locally from Forbes and access to the site will be via Paytens Bridge Road from the east.

No Crown roads are expected to be used for the project.

INTERSECTION SIGHT DISTANCES

An assessment of the sight distances available from the project site access points has been undertaken by IMPACT.

Austroads Guide to Road Design - Part 4A: Unsignalised Intersections (Austroads 2017) describes the sight distance requirements for unsignalised intersections, including:

- approach sight distance
- safe intersection sight distance (SISD)
- minimum gap sight distance.

The guide recommends that the SISD is the minimum distance that should be provided on a major road (such as Paytens Bridge Road) at any intersection.

For heavy vehicles, based on an operating 85th percentile speed of 100 km/h, a calculated minimum SISD of 317 m is required.

Sight distances to the east and west at the proposed entry points on Paytens Bridge Road to both the northern and southern sections of the site comfortably exceed the minimum SISD requirement of 317 m, with the assessed sight distances exceeding 350 m in both directions (subject to pre-construction confirmation that vegetation is not impeding site distances).

Sight distances along Lachlan Valley Way at the intersection with Paytens Bridge Road are expected to comfortably exceed the minimum requirement as trees and vegetation are setback and the road alignment is generally flat and straight.

Prior to construction, an on-site assessment should be undertaken to confirm that there is no vegetation impeding on the integrity of the available SISD's (minor trimming could be undertaken if required). Furthermore, supplementary 'trucks crossing' signs could also be used to provide advanced warning for vehicles travelling along Paytens Bridge Road if desired.

TURNING LANE ASSESSMENT

The intersections along the preferred and non-preferred routes to the project site from the Forbes rail siding have been assessed for their suitability for use by project-related traffic, including by swept path analyses.

Preferred route (Lachlan Valley Way – Paytens Bridge Road)

Lachlan Valley Way / Paytens Bridge Road intersection

No formal turning infrastructure is currently available at the Lachlan Valley Way / Paytens Bridge Road intersection. Based on the existing traffic and anticipated construction traffic volumes along Lachlan Valley Way, a Basic Right Turn (BAR) is expected to be required for the intersection to cater for an increase in right-turning movements for vehicles travelling from Forbes to the project site. As vehicles will only be turning right in to Paytens Bridge Road from Lachlan Valley Way, no left turning infrastructure is considered necessary.

A desktop biodiversity assessment has been undertaken to determine the likely ecological constraints of the potential works as well as any likely significant biodiversity impacts that may need to be further addressed (see Appendix G). The assessment conservatively assumed that both a BAR and Basic Left-Turn (BAL) will be required and was based on a maximum potential disturbance footprint.

The desktop assessment concluded that the proposal is unlikely to have a significant impact on biodiversity, including on threatened species. Separate assessments of significance were undertaken under the differing impact significance criteria of the NSW BC Act and the Commonwealth EPBC Act, concluding that the proposal would not have a significant impact on threatened species. However, opportunities to avoid and minimise impacts will be considered in finalising the proposal design.

The cadastral boundaries of the intersection are mis-aligned and indicate that the intersection upgrade may encroach on a property owned by Telstra on the northwest corner of the intersection (Lot 112 DP704736). Whilst it is almost certainly the case that the upgrade works will not extend beyond the existing road reserve, and that the apparent impact on the Telstra site is a product of incorrect cadastral alignment, the Telstra Network Integrity Team has been consulted about the potential intersection upgrade. The Telstra Network Integrity Team confirmed that their Lot appears to be outside the area of disturbance.

TfNSW has been informed of the proposed intersection upgrade but has indicated that they will wait until the EIS referral process before providing a formal response to the upgrade.

Paytens Bridge Road site access

The TIA assessed the site access points as triggering a need for a BAL and BAR treatments. However, IMPACT considers that as existing traffic volumes are relatively low and that the site access has adequate sightlines, the road width / road shoulder can be used for passing vehicles without the need for BAL and BAR treatments. The use of the road width/shoulder for passing would only be necessary during the construction stages when heavy vehicles are accessing the site.

Prior to construction, an on-site assessment will be undertaken to confirm that there is no vegetation impeding the integrity of the available SISDs. Minor trimming of vegetation will be undertaken if required. Furthermore, supplementary 'trucks crossing' signs will be used to provide advanced warning for vehicles travelling along Paytens Bridge Road.

Non-preferred routes

Lachlan Valley Way – New Grenfell Road – Paytens Bridge Road

The alternative, non-preferred route to site from Forbes (via New Grenfell Road) would also be expected to require an upgrade of the intersection of Lachlan Valley Way and New Grenfell Road in the form of a BAR treatment. An assessment of the potential biodiversity and other impacts associated with such an upgrade would be undertaken if adoption of the alternative route was required. No upgrade is required for the New Grenfell Road Paytens Bridge Road intersection.

Road haulage from port

If the rail option was not viable and road haulage was required from port to site, then a BAL should be provided at Lachlan Valley Way / Paytens Bridge Road to cater for an increase in left-turning movements off Lachlan Valley Way due to project-related traffic. The potential disturbance associated with this intersection upgrade has already been included in the desktop biodiversity assessment (see Appendix G).

OSOM VEHICLE DELIVERIES

A number of over-mass (OM) movements will be required to deliver the substation components to site. The OM deliveries will be geometrically similar to a standard semi-trailer, but with additional axle loading due to the mass of the component being delivered. No over-size (OS) deliveries are expected.

The OM vehicles are expected to be geometrically consistent with other component deliveries and are therefore expected to be able to fit within the road footprint required for a 19 m semi. Should any vehicles exceed this size, prior approval will be sought from relevant authorities.

Approval for all OM or OS vehicle deliveries will also be required from the National Heavy Vehicle Registry (NHVR) prior to their delivery.

CONSTRUCTION

Traffic generation

Access to the site during construction and operation will be from Paytens Bridge Road, with both the northern and southern sections accessed from the east.

Total and peak vehicle movements have been estimated based on the 16-month construction phase and are shown in Table 6.17 (as total daily movements, i.e. in and out of the site). A peak demand of 46 daily traffic movements (i.e. 23 movements to site and 23 movements from site) is expected (during the site set up construction stage) where this will include:

- transport of construction workers
- OM vehicles used for the delivery of large substation components
- other heavy vehicles for the delivery of solar farm components and construction materials such as aggregate and water.

It is assumed that most workers will travel to and from the site in busses, noting that up to five buses (at a capacity of 50 passengers per bus) will be expected during the peak construction period (one-way traffic) to facilitate the anticipated construction workforce of 250 people.

Potential impacts

Transport impacts as a result of the project will be largely limited to the construction phase and may result from factors including intersection upgrades (as described above) haulage of materials and components, movements of workers to and from the site, and movement of trucks, vehicles and construction machinery within the site.

The following aspects have been identified as being potentially impacted by the proposed development:

- traffic efficiency for non-project traffic using public roads, including:
  - minor extensions of trip times caused by movements of project-related vehicles along the major transport routes
  - delays as a result of temporary road closures (although it should be noted that no road closures are currently planned during construction or decommissioning of the project)
- safety, particularly increased collision risks with other vehicles, cyclists, pedestrians, stock and wildlife (see Section 6.2.4)
- amenity impacts associated with dust (where traffic is on unsealed roads) and noise adversely affecting nearby residents.

Traffic-related dust and noise impacts are discussed in Section 6.5 and Section 6.8, respectively.

Traffic impact on road network

The proposed development is projected to generate up to 23 additional one-way movements (or 46 two-way movements) during the peak construction activities (occurring during the 'Site Setup' and 'General' activities). From Lachlan Valley Way, this traffic will likely be accommodated entirely along Paytens Bridge Road.

This volume of traffic is expected to have no material impact on the operation of Paytens Bridge Road, which is classified as a local road, designed to cater for at least 3,000 daily vehicle movements and up to 300 movements during the peak periods.

Table 6.17 Estimated peak traffic – construction (total daily movements)

Stage	Duration	Staff	Heavy vehicles (total)	Heavy vehicles (per day)	Light vehicles (per day)	Bus (per day)	Over-dimensional movements[1]	Anticipated daily peak construction traffic[2]
General	16 months	30	4,812	12	10	2	0	24
Site mobilisation	2 months	60	80	2	10	4	0	16
Site setup (plus 1 month overlap with mobilisation)	5.5 months	150	3,842	30	10	6	0	46
Solar panel and battery structures	2.5 months	250	1,012	16	10	10	0	38
Substation works	6 months	60	490	4	10	4	6	24

[1]Six OM movements in total across two days during substation works

[2]Trips assume a 6-day working week/average of 25 working days per month during construction

The TIA noted that Paytens Bridge Road has historically carried up to 340 vehicle movements on a daily basis. Accordingly, during the construction stages of the project, Paytens Bridge Road can be expected to carry up to 410 daily vehicle movements (an increase of 20%). IMPACT considers that this additional traffic could be comfortably accommodated by Paytens Bridge Road, with no material impact on the operation or safety of this road.

It is noted that the additional traffic generated from the proposed solar farm will largely consist of heavy vehicle movements. Accordingly, the additional traffic is likely to affect the road pavement condition over the duration of the construction period.

Prior to construction, Edify will liaise further with Council/Transport for NSW (TfNSW) concerning potential requirements for maintenance and repair work along the relevant sections of these roads during construction.

All proximate Crown Roads will be undisturbed and unused by any contractors or activities associated with the project's execution.

OPERATION

Traffic generation

During the operational phase of the solar farm, minimal traffic movements will be generated with negligible impacts upon traffic on the local road network. The proposed turn treatments / warrants are considered applicable only during the construction stage of the project, with movements generated by the operation of the solar farm not significant enough to warrant any change to existing intersection design.

Operational traffic will be generated from the following sources:

- Daily routine maintenance will be carried out by an average of five people (full time equivalent). It is assumed that the daily traffic generation will not exceed two vehicle movements per day to the local road network, with all other movements being internal to the site.
- Occasional, non-routine maintenance will occur when project components such as solar panels or tracker systems need to be replaced. This is expected to occur only occasionally and will have no discernible impact on the external road network.
- Visitors to the site such as delivery drivers and couriers.

Traffic impact on road network

Compared with traffic during project construction and background traffic levels along Paytens Bridge Road, traffic during project operation will have negligible impact on the road network.

DECOMMISSIONING

It is envisaged that decommissioning will involve the removal of all infrastructure associated with the project and rehabilitation of the site. It is anticipated that traffic generated during decommissioning and associated impacts will be similar to that during the construction phase, although over a shorter timeframe, with similar impacts.

6.7.5 Management and mitigation

PRE-CONSTRUCTION

The potential requirement for a BAR at the intersection of Lachlan Valley Way and Paytens Bridge Road will be confirmed in discussions with TfNSW.

An assessment will be undertaken as part of the NHVR application process to confirm the temporary traffic management measures (such as escort vehicles and pilot cars) that will be required for deliveries to site by OM vehicles.

Edify's obligations in relation to road maintenance and repair work along the site access route will be agreed with Council and TfNSW.

A traffic management plan (TMP) will be developed prior to construction, in consultation with the Council, TfNSW and any other relevant stakeholders.

CONSTRUCTION

Traffic management plan

The TMP will be implemented during project construction and will include the following:

- project construction timeframe and work stages
- expected traffic volumes generated by the project for all work stages
- identification of all heavy vehicle and OM vehicle haulage routes for all work stages
- a mechanism to review identified haulage route road conditions prior to the commencement of works
- agreements (if deemed necessary in pre-construction discussions with Council and TfNSW) for Edify to assist with the maintenance of haulage route roads and road infrastructure, including local public roads used by site traffic, during construction works and to reinstate roads to at least pre-construction conditions
- any requirements for specific work stage construction TMPs
- any requirements for OM vehicle permits and related traffic management
- confirmation of the adequacy of available sight distances along Paytens Bridge Road from the site access and along Lachlan Valley Way at the intersection with Paytens Bridge Road (vegetation trimming will be undertaken if required).

Standard management measures

General requirements for traffic management, will include:

- ensuring (through contractual conditions) that all vehicles travelling to site are road-worthy
- reinforcing (through contractual conditions) that road rule and speed limits should be adhered to on the way to site and once on site
- erecting appropriate traffic management signage at site access points and within the site, in accordance with applicable standards

- design, construction and maintenance of site access points and the BAR at the intersection of Lachlan Valley Way and Paytens Bridge Road
- ensuring access roads within the site are properly engineered and maintained
- minimising traffic impacts on biodiversity, as outlined in Section 6.2
- minimising traffic-related dust generation, as outlined in Section 6.5
- minimising traffic-related noise impacts, as outlined in Section 6.8.

Unless the relevant roads authority agrees otherwise, construction of the site access points and the BAR at the intersection of Lachlan Valley Way and Paytens Bridge Road will comply with the *Austroads Guide to Road Design* (as amended by TfNSW supplements) and be carried out to the satisfaction of the relevant roads authority.

Management of biodiversity impacts associated with intersection upgrades

Management of biodiversity impacts associated with intersection upgrades will be managed by:

- identifying any opportunities to avoid and minimise biodiversity impacts during the design of intersection upgrades
- adapting and applying the biodiversity management and mitigation measures outlined in Section 6.2.6.

OPERATION

Standard traffic management measures will be implemented during project operation, as outlined above for construction.

DECOMMISSIONING

Traffic management measures will be implemented during decommissioning to mitigate potential impacts.

6.7.6 Conclusion

The traffic impact assessment has identified that Paytens Bridge Road in the vicinity of the project site may experience an increase in traffic volumes of up to 20% during the peak construction period. This additional traffic can be comfortably accommodated on Paytens Bridge Road with no material impact on the operation or safety of this road, although some road maintenance may be required.

No turn treatments are considered to be required at the site access points to accommodate construction traffic and no line of site issues were identified. A BAR treatment is proposed at the intersection of Lachlan Valley Way / Paytens Bridge Road.

Traffic impacts during operation will be negligible. Impacts during decommissioning are expected to be generally comparable to construction, although likely extending over a shorter period.

6.8 Noise and vibration

The project has the potential to result in noise impacts on nearby sensitive receivers as a result of noise-generating activities such as operation of vehicles, equipment and machinery, and the presence of staff. This section provides an assessment of the potential noise impacts as a result of this project. Further detail regarding the noise assessment is contained in a noise impact assessment report prepared by Resonate Consultants Pty Ltd (Resonate) and attached as Appendix K.

6.8.1 Level of assessment

The SEARs require an assessment of the construction noise impacts of the development in accordance with the *Interim Construction Noise Guideline (ICNG*) (DECC 2009), operational noise impacts in accordance with the *NSW Noise Policy for Industry* (NSW EPA 2017), cumulative noise impacts (considering other developments in the area), and a draft noise management plan (NMP) if the assessment shows construction noise is likely to exceed applicable criteria.

As the potential noise impacts of the project, particularly during construction, are likely to be one of the key project issues requiring management, a ***detailed assessment*** of noise impacts was undertaken. Cumulative impacts due to noise are considered in Section 6.14.

6.8.2 Existing conditions

BACKGROUND NOISE SOURCES

Background noise levels are expected to reflect the location of the site in a rural setting 27 km southeast of Forbes, the nearest major town. Sources of background noise include:

- traffic on Paytens Bridge Road which runs east-west between the northern and southern sections of the site and carries in the order of 340 vehicles per day in the project area (see Section 6.7)
- the operation of machinery and equipment such as harvesters, boom sprayers and tractors associated with the predominantly agricultural land use in the vicinity of the project site
- equipment operated at local residences such as generators or on-site water pumps
- insects, and wind through trees and vegetation
- operations at Pineleigh Quarry, located approximately 500 m west of the project site, which are anticipated to cause regular increases above other background noise levels.

NEAREST SENSITIVE RECEIVERS

Fourteen residential receivers (R1 to R14) have been identified within a 5 km radius of the project site (see Figure 1.4).

Two of the receivers (R3 and R5) are associated with the project:

- residence R5 is located 1.5 km east of the project site boundary and owned by one of the project landholders

- residence R3 is located 1.3 km southeast of the project site boundary and is owned by a member of the involved landholder (and who is part of the negotiations with Edify).
- Of the 12 non-associated residences within 5 km of the project site:
- three (R1, R2 and R4) are located within 2 km of the site
- nine (R6 to R14) are located between 2 km and 5 km of the project site.

The nearest non-associated receivers are residence R1 at 1065 Pineleigh Road, Mulyandry, which is located approximately 300 m west of the northern section of the site and residence R2 at 2140 Paytens Bridge Road, Paytens Bridge, 580 m northeast of the southern section of the site (see Figure 1.4). Pineleigh Quarry is on land owned by R1.

Residence R4 is not currently occupied but has recently been sold (see Section 5).

In accordance with NSW noise assessment guidance documents (as specified below), receivers that have the potential to be affected by project-related noise impacts have been termed noise-sensitive receivers (NSRs).

6.8.3 Methodology

CONSTRUCTION NOISE

Impacts from construction noise have been assessed in accordance with the ICNG (DECC 2009) which provides guidance on managing works to minimise noise (including airborne noise, ground-borne noise and blasting), with an emphasis on communication and cooperation with all involved in, or affected by, construction and noise.

Noise criteria

A rating background noise level (RBL) has been derived for noise assessment purposes. The RBL is the overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (NSW EPA 2017).

Background noise monitoring was not undertaken as part of this assessment, hence in accordance with the *Noise Policy for Industry* (NPI) (NSW EPA 2017), 30 dB(A) for evening and night periods, and 35 dB(A) for daytime periods, have been adopted as RBLs.

The construction hours for the project (see Section 3.7.1) are in accordance with the ICNG recommended standard hours for construction work, with no evening or night-time work. The ICNG specifies noise thresholds at NSRs for construction activities where standard hours are worked as presented in Table 6.18.

The 'noise affected' level represents the point above which the ICNG considers some community reaction to noise may occur. The 'high noise affected level' represents the point above which there may be strong community reaction to noise.

Noise sources

The construction activities have been assessed over the total construction period of 16 months during six typical construction scenarios.

Table 6.18 Project-specific construction noise management levels (NMLs)

Receiver type	Construction NML, $L_{eq,\ 15\ minute}$, dB(A)				High noise affected, $L_{eq,\ 15\ minute}$, dB(A)
	Standard hours	Out-of-hours			
	Day	Day	Evening	Night	
Residential	45	40	35	35	75
Industrial	75	75	75	75	-

Typical plant and equipment for each scenario have been developed based on Resonate's past project experience and are listed in Table 12 of Appendix K along with the period of use on site.

Noise calculation

Prediction of construction noise impacts from the project has been undertaken through the use of the SoundPLAN noise propagation modelling software (Version 8.2). The most significant factors in determining the level of noise received from construction activities are the receiver's distance from the project site, the presence of shielding, the potential for ground absorption and the heights of the noise sources.

Consistent with the requirements of the ICNG, construction noise impacts have been quantified by:

- predicting the realistic worst-case or conservative noise levels from the identified sources, taking into account the construction activities
- applying these noise levels to assessment locations representing the most noise-exposed dwellings

OPERATIONAL NOISE

Impacts from noise during operation have been assessed in accordance with the NPI (NSW EPA 2017). Assessment under the NPI has two components:

- The intrusiveness of an industrial noise source is generally considered acceptable if the L_{Aeq} noise level of the source, measured over a period of 15 minutes, does not exceed the background noise level by more than 5 dB(A). Intrusive noise levels are only applied to residential receivers. For other receiver types, only the amenity levels apply.
- To limit continual increases in noise levels from the use of the intrusiveness level alone, the ambient noise level within an area from all industrial sources should remain below the recommended amenity levels specified in the NPI for that particular land use.
- For this assessment, the area surrounding the project is considered to be 'rural'.

Noise criteria

Typically, the intrusiveness level will inform the project noise trigger level in areas with little industry (and/or ambient noise levels), whereas the amenity level will inform the project noise trigger level in areas with higher existing background noise levels (as per the NPI).

As for construction noise, in the absence of background noise monitoring the adopted RBL's are the minimum RBLs as per the NPI (i.e. 30 dB(A) for evening and night periods, and 35 dB(A) for daytime periods).

The intrusiveness criterion for residential noise receptors as described in the NPI is:

- $L_{Aeq,\ 15\ min} \leq$ RBL (dB(A) L_{A90}) + 5 dB(A)

The recommended amenity noise level (L_{Aeq}) for rural residential properties has been applied.

Project specific noise levels

The intrusiveness and amenity criteria that apply for day, evening and night periods are shown in Table 6.19. Under the NPI, the lower of the two (intrusiveness or amenity) is adopted as the project specific noise level (PSNL), shown in bold.

Table 6.19 NPI noise criteria (rural amenity area)

Receiver type	Period	Noise level – dB(A)			
		Recommended amenity noise level L_{eq}	Assumed background noise level	Project noise trigger level[5] $L_{eq(15minute)}$	
			RBL[1]	Intrusiveness	Amenity[2,3]
Residential	Daytime	50	35[4]	**40**	53
	Evening	45	30[4]	**35**	48
	Night-time	40	30[4]	**35**	43
Industrial	When in use	75	n/a	n/a	**73**

(1) RBL = Rating background noise level
(2) The recommended amenity noise level has been used as the project amenity noise level as there are no other industries present or likely to be introduced, except for Pineleigh Quarry, which is assumed to operate intermittently.
(3) The project amenity noise level has been converted to a 15-minute level by +3 dB(A)
(4) The minimum RBL as per the NPI has been adopted
(5) The lower of the two (shown in bold) has been adopted as the PSNL

Table 6.19 shows that the intrusiveness criteria are lower than the amenity criteria for day, evening and night periods. Therefore, the intrusiveness criteria have been adopted as the PSNL.

The NPI provides guidance on applying adjustments where the noise may be considered annoying (e.g. due to tonality, intermittency, irregularity or dominant low-frequency content).

For each aspect an adjustment of 5 dB(A) can be added to the predicted value, up to a total of 10 dB(A), to penalise the noise for its potential annoyance.

NOISE SOURCES

The key elements of the development will include:

- 17 power stations (102 inverters)
- 6,250 solar panel tracker motors
- transformer in substation.

The equipment is conservatively assumed to operate continuously 24 hours per day, 7 days a week. Sound power totals used in the noise calculations are shown in Table 6.20. L_w is the intrinsic noise output of a piece of plant or equipment and does not depend on distance or orientation of the machine.

Noise calculation

Noise impacts from project operation have been quantified by:

- during the evening and night-time periods, the panel tracker motors will not be operating and there will be no maintenance activities
- noise emissions from power stations and transformers are continuous and there are no peak noise levels for an instant or very short time period
- tracker motors and transformers can be tonal and a 5 dB(A) penalty is applied
- the operational noise is assessed against the sleep disturbance LA_{eq} criterion and not the LA_{max} criterion.

Table 6.20 Sound power levels for operational noise sources

Plant	Sound power (L_w) (dB(A))	Number of plant
Power station (number of inverters)	95	17 (102)
Solar panel tracker motor	78	6,250
Transformer in substation	100	1
Maintenance activities, includes trucks travelling along the access road within the site	103	-

To determine the acoustical impact of the project, a computer model incorporating all significant noise sources, the closest potentially affected residential properties, and the intervening terrain has been prepared.

The computer model was prepared using the SoundPLAN noise propagation modelling software (Version 8.2) Industrial Module which allows the use of various internationally recognised noise prediction algorithms. The CONCAWE algorithm, which is suitable for the

assessment of large industrial plants, was selected because it also enables meteorological influences to be assessed.

VIBRATION

The ICNG calls for the application of feasible and reasonable measures to mitigate construction noise and vibration. Impacts from vibration can be considered both in terms of effects on building occupants (human comfort) and the effects on building structure (building damage). Of these, the human comfort limits are the most stringent. Therefore, for occupied buildings, if compliance with human comfort limits is achieved, then compliance will also be achieved with the building damage objectives.

The TfNSW publication *Construction Noise and Vibration Guideline – August 2016* (RMS 2016) provides guidance for safe working distances for vibration-intensive activities. Vibration levels for typical construction activities have been published along with the safe working distances for cosmetic damage and human comfort. The recommended safe working distances for vibratory roller and jackhammer that may be used the construction of the project are shown in Table 15 of Appendix K.

NOISE FROM ROAD TRAFFIC

Noise from road traffic was assessed taking into consideration the NSW Road Noise Policy (RNP) (DECCW 2011), that describes noise assessment criteria for existing residences affected by land use development. The policy sets different noise limits dependent upon the road category and type of project and land use.

If road traffic noise during the project construction is within 2 dB(A) of current levels then the objectives of the RNP are met and no specific mitigation measures are required. Where the project road traffic noise levels exceed 2 dB(A) of current levels than consideration should be given to the actual noise levels associated with construction traffic and whether or not these levels comply with the RNP criteria as presented in Table 6.21.

Noise assessment of the project is undertaken using the TfNSW Excel-based tool *Road Traffic Noise Estimator* (RMS 2015).

Table 6.21 Road traffic noise assessment criteria

Road category	Type of project/land use	Assessment criteria[1] – dB(A)	
		Day 7 am to 10 pm	Night 10 pm to 7 am
Freeway/arterial/ sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq,15hr}$ 60 (external)	$L_{Aeq,9hr}$ 55 (external)
Local roads	Existing residences affected by additional	$L_{Aeq,1hr}$ 55 (external)	$L_{Aeq,1hr}$ 50 (external)

[1] The assessment criteria for external noise levels apply at 1 m from the facade of any affected residential receiver

6.8.4 Impact assessment

CONSTRUCTION NOISE

The predicted noise levels associated with each stage of construction works are presented in Appendix B of Appendix K.

The predicted maximum construction noise levels at the project site will be attenuated to a level that remains below 45 dB(A) at most NSRs, except receiver R1. The worst case predicted construction noise level is 46 dB(A) at receiver R1 during Stage 1 'Site preparation, clearing & demolition' activities, which exceeds the standard hours NML by 1 dB(A).

Predicted noise levels have been based on continuous operation of the noise sources identified for each construction stage. Predictions are therefore conservative and considered to represent the highest potential noise impacts. The predicted noise levels would typically be short-term, lasting for the duration of the construction period when works are conducted in the vicinity of each receiver.

The ICNG notes that work practices that minimise noise levels on site and provide for proper communication with the community are generally the most effective at managing noise. Accordingly, Edify will minimise construction noise through the adoption of appropriate work practices and effective communication with the community.

As construction noise levels at all NSRs are predicted to be substantially lower than the 'highly noise affected' level of 75 dB(A) (as defined by the ICNG) even before noise management measures are implemented, a strong community reaction to noise levels is unlikely.

OPERATIONAL NOISE

Pre-mitigation

The predicted operational noise levels for the day, evening and night-time periods assuming are presented in Appendix D of Appendix K and the operational noise contours are presented in Appendix E of Appendix K. Modelling initially assumed that the substation would be located on the western boundary of the project site, next to (south) of the 132 kV transmission line.

The highest predicted operational noise levels during neutral weather condition are:

- 35 dB(A) during the daytime period at receiver R1
- 32 dB(A) during the evening/night-time periods also at receiver R1.

The highest predicted operational noise levels during adverse weather conditions are:

- 40 dB(A) during the daytime period at receiver R1
- 39 dB(A) during the evening/night-time periods also at receiver R1.

The only receiver that has been predicted to exceed the evening/night-time criteria, assuming the western substation option is adopted, is R1 by 2 dB(A), and only during adverse weather conditions.

Post-mitigation

To mitigate the noise impacts on R1, the following mitigation measures were developed:

- the substation was moved to the eastern boundary of the project site, next to (south) of the 132 kV transmission line (see Figure 1.3)
- power stations (inverters) were located at least 840 m from receiver R1 and 1.1 km from receiver R2.

The modified site layout was remodelled and the predicted noise levels and contours are presented in Appendices F and G of Appendix K, respectively. With the adoption of the above mitigation measures, a marginal exceedance of 1 dB(A) is predicted at R1 and compliance is predicted at all other receivers (Figure 6.15). The exceedance at R1 is predicted to only occur during the evening/night period under adverse weather conditions.

The marginal exceedance of 1 dB(A) at R1 is considered acoustically insignificant as a 1 dB(A) change in sound level is typically not perceptible by the average human ear. Therefore, this predicted level is considered to achieve compliance with the criteria.

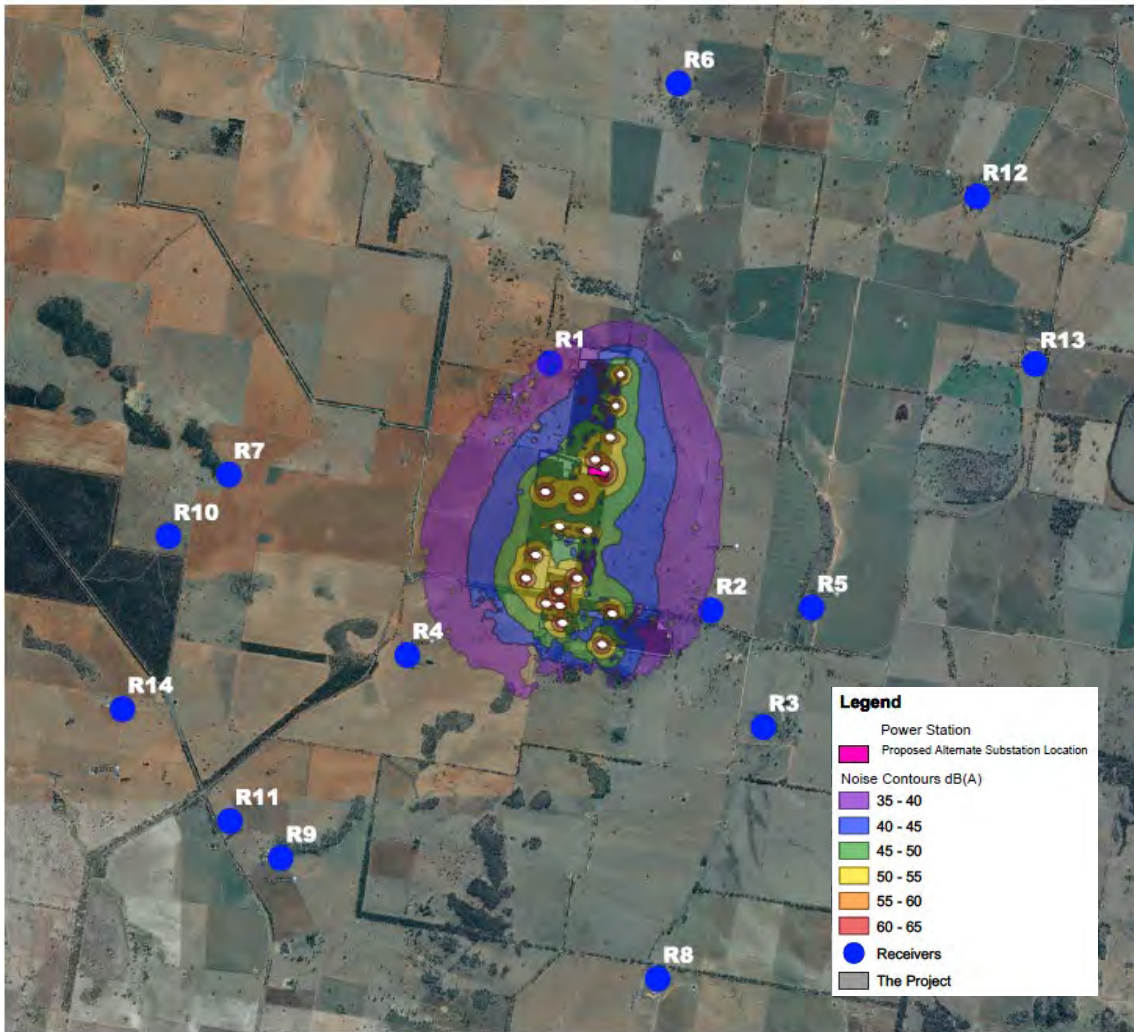


Figure 6.15 Predicted noise contours – evening/night-time operation, temperature inversion condition with noise control measures (from Resonate)

VIBRATION

Vibration issues are expected to be negligible during both construction and operation due to the significant distance (<300 m) between the site and the nearest sensitive receivers.

NOISE FROM ROAD TRAFFIC

The assessment shows that the proposed construction traffic along Paytens Bridge Road during the worst case 1-hour traffic flows and along Lachlan Valley Way during the 15-hour daytime period are not predicted to increase the existing traffic noise levels by more than 2 dB at the nearest residences.

The Peninsula SF is expected to be operated remotely with limited site visits, and the daily traffic numbers will generally not exceed two vehicle movements per day. However, some extra movements are possible on occasion. Road traffic noise associated with the project during operation is not predicted to increase the existing traffic noise levels by more than 2 dB at the nearest residences.

At these predicted noise levels, the objectives of the RNP are met during both construction and operation and no specific mitigation measures are required. Road traffic noise associated with the project during construction and operation is unlikely to have an adverse impact on surrounding receivers.

6.8.5 Management and mitigation

DESIGN

Noise management will be incorporated into project design as follows:

- the substation will be located on the eastern boundary of the project site (see Figure 1.3)
- power stations (inverters) will not be located within 840 m of receiver R1 and within 1.1 km of receiver R2
- standard noise attenuation measures such as setbacks, orientation, shielding or other treatments on plant and equipment will be implemented where practicable.

CONSTRUCTION

Noise impacts during construction will be managed by:

- applying all reasonable work practices to minimise noise levels, such as (where practicable), those outlined in Table 16 of Appendix K
- informing all potentially impacted residents about the nature of works to be carried out, expected noise levels and duration, and work practices applied to minimise noise, as well as contact details.

OPERATIONAL

Noise impacts during operation will be managed by:

- incorporating the project design features outlined above
- undertaking routine maintenance to keep noise-generating equipment in good order.

ROAD TRAFFIC

Management of construction-related traffic noise will include the following controls (based on TfNSW 2016):

- appropriate scheduling and routing of vehicle movements
- requiring drivers to comply with speed limits while driving to the project site and within the site
- requiring drivers to behave responsibly in regard to noise generation and to avoid of the use of engine compression brakes
- ensuring vehicles and equipment are not excessively noisy before allowing them to operate on site.

DECOMMISSIONING

Management and mitigation measures to be implemented as part of decommissioning will be similar to those implemented during construction.

6.8.6 Conclusion

Noise levels during construction (and decommissioning) are predicted to result in short-term exceedances of noise criteria by 1 dB(A) at one residence (R1) when works are conducted in the vicinity of the receiver.

Noise levels during operation, with the adoption of a modified site layout to mitigate impacts, is predicted to marginally exceed noise criteria at residence R1 by 1 dB(A).

Marginal exceedances of noise criteria by 1 dB(A)) are considered acoustically insignificant as they are typically not perceptible by the average human ear. Therefore, the predicted levels are considered to achieve effective compliance with the criteria.

Increases in traffic noise during construction, operation and decommissioning will be minor and do not require mitigation.

Vibration impacts during construction, operation and decommissioning are expected to be negligible.

6.9 Visual amenity

Renewable energy (solar farm) projects are often located in rural areas due to the need for sufficient land for the panels and other associated infrastructures. Due to their rural setting, such projects typically result in changes to landscape character and impacts on visual amenity.

Accordingly, a Visual Impact Assessment (VIA) of the Peninsula SF has been undertaken by Accent and is provided as Appendix L. The VIA delivers an objective statement of the probable impacts on the visual environment resulting from the construction of the proposed project. The report outlines the results from a site assessment, describing the present landscape character. It documents the assessment of visual impact resulting from the project and provides recommendations for impact mitigation measures.

6.9.1 Level of assessment

As the potential visual impacts of the project are one of the key project issues requiring assessment and management, as identified by the SEARs, a ***detailed assessment*** of visual impacts was undertaken.

6.9.2 Methodology

The visual impact assessment is based on a combination of professional qualitative judgement and commonly accepted industry criteria and guidelines, as follows:

- Landscape Institute and Institute of Environmental Management & Assessment *Guidelines for Landscape and Visual Impact Assessment* (LIIEMA 2013)
- Transport for NSW *Guideline for landscape character and visual impact assessment* (TfNSW 2020a)
- Transport for NSW *Beyond the Pavement 2020: Urban design approach and procedures for road and maritime infrastructure planning, design and construction* (TfNSW 2020b)
- DPE *Draft Large-Scale Solar Energy Guideline* (DPIE 2021f) (used to undertake preliminary visual assessment).

The assessment was undertaken using a combination of site inspection to gather visual data and information on existing landscape character, assessment and GIS analysis of aerial imagery and topographic data, preparation of viewshed analyses, compilation of photomontages to illustrate predicted impacts, consideration of community concerns regarding visual amenity, and consideration of mitigation measures (such as visual screening and landscaping) to mitigate impacts.

Visual impacts were evaluated by considering the sensitivity of the landscape character and the magnitude of the proposal using a risk matrix.

6.9.3 Existing conditions

LANDFORM AND VEGETATION

The images provided in Photos 6.8 to 6.13 illustrate the scenery typical of the existing landscape and proposed site from road and paddock vantage points.

The project site is a rural landscape characterised by a patchwork of extensive agricultural land and vast open spaces, predominantly focussed on cropping and grazing. The site is mapped as LSC Class 3, Class 4 and Class 5 land (see Section 6.5.3). Remnants of native vegetation remain on undulating rises within the project area (see Photos 6.5 and 6.8) and some regrowth occurs along roadsides and fence lines.

A small hard rock quarry (the Pineleigh Quarry) is located 500 m west of the northern section of the project site. A minor, disused quarry (Thomas Pit) is located immediately south of the project site (see Photo 6.1).

Photo 6.8 Quarry operated by Tastex Pty Ltd adjacent to R1 on their land

Photo 6.9 Wooded, undulating rise to the west of the site

Photo 6.10 Current 132 kV Forbes-Cowra transmission line running through the project site

Photo 6.11 Typical undulating rises, vegetation patches and farm infrastructure, southwest of site

Photo 6.12 Onsite vegetation to be retained on rise in the southwestern portion of Lot 441

Photo 6.13 Onsite view from the centre of Lot 441 looking south towards Paytens Bridge Road and the southern portion of the project site

SURROUNDING RESIDENCES

Five scattered residences (R1-R5) are located on rural properties within 2 km of the site. These residences are located between 320 m and 1.74 km from the development footprint. An additional nine residences (R6-R14) are located greater than 2 km, but within 5 km of the site. Figure 1.4 (see Section 1.1) shows the location of all the residences within 5 km of the project site. As residences R3 and R5 are associated with the project, they are not included in the visual impact assessment.

TOPOGRAPHY

Most of the project site is flat with low, undulating rises present towards the southern section of the site (south of Paytens Bridge Road) and a single low hill in the southern part of the northern section of the site (north of Paytens Bridge Road).

ADJACENT ROADS

Two roads are located within 500 m of the project site. Paytens Bridge Road, which is a paved local road running east-west between the northern and southern sections of the project site and Pineleigh Road which is an unpaved local road running north-south and located to the west of the project site.

EXISTING VEGETATION

Due to the long history of grazing and cropping activities native vegetation is largely absent from the project site. Remnant vegetation patches within the project site are generally associated with the presence of undulating rises and have been excluded from the disturbance footprint.

6.9.4 Impact assessment

VISUAL RECEIVERS

Based on the method proposed for preliminary visual assessment set out in Appendix B of the *Draft Large-Scale Solar Energy Guideline* (DPIE 2021f), The 12 non-associated residences within 5 km of the project site were plotted on the DPE Preliminary Assessment Tool, based on their distance from the project site boundary and considerations of relative height (Figure 6.16).

Three of the residences (R1, R2 and R4) plotted under the line and are therefore identified as potential visual receivers requiring detailed visual assessment. The project site is visible from the two nearest roads (Paytens Bridge Road and Pineleigh Road). These roads are therefore also classified as visual receivers, requiring a detailed visual assessment.

Viewshed analyses were undertaken to illustrate the visibility of the project site and proposed facilities from the three residences. By considering lines of sight from the surrounding topography, the analysis shows the ‘visual catchment’ of the project.

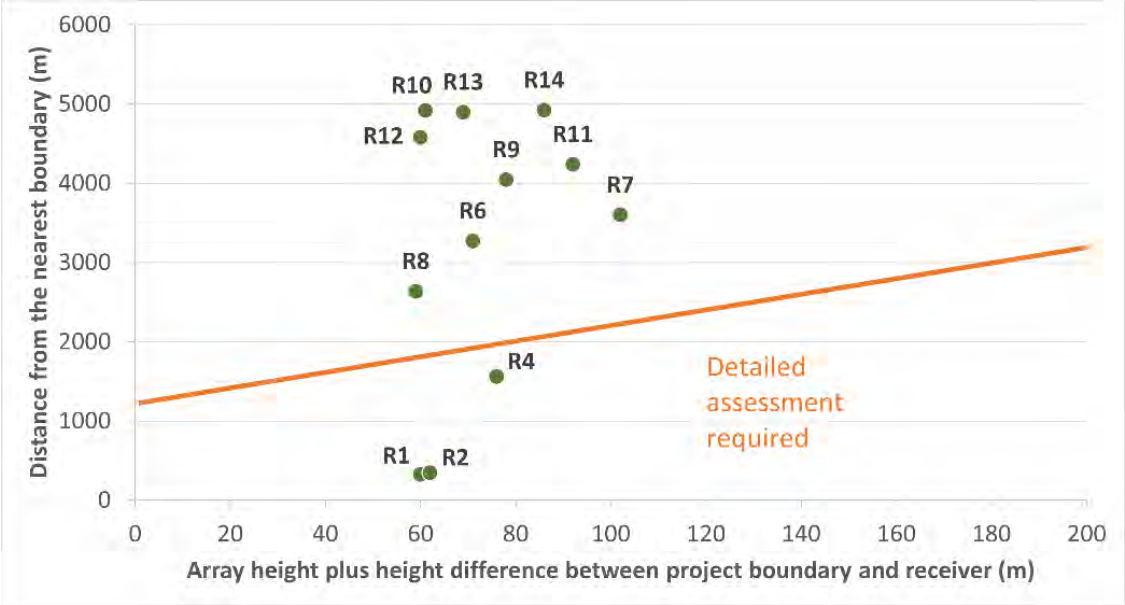


Figure 6.16 Preliminary visual assessment

Figure 6.17 shows the area surrounding the project site within which at least part of the project is visible (ignoring the potential screening effects of intervening vegetation or structures). Two images are shown on the figure:

- the first image shows the visual catchment of the solar arrays (assumed to be 4 m above the ground)
- the second image shows the visual catchment of the substation (based on the eastern substation option) which is assumed to be 10 m in height (the analysis excludes the less visually intrusive lightning rods that extend to 12 m).

The viewshed analysis confirmed that the solar arrays and the substation are potentially visible from residences R1, R2 and R4 (i.e. the view of the site is not fully obscured by topography). The viewshed analysis also identified residences R6, R7, R9, R11 and R13 as potential visual receivers, although based on the outcomes of the preliminary screening (see Figure 6.16), they are not considered sensitive receivers.

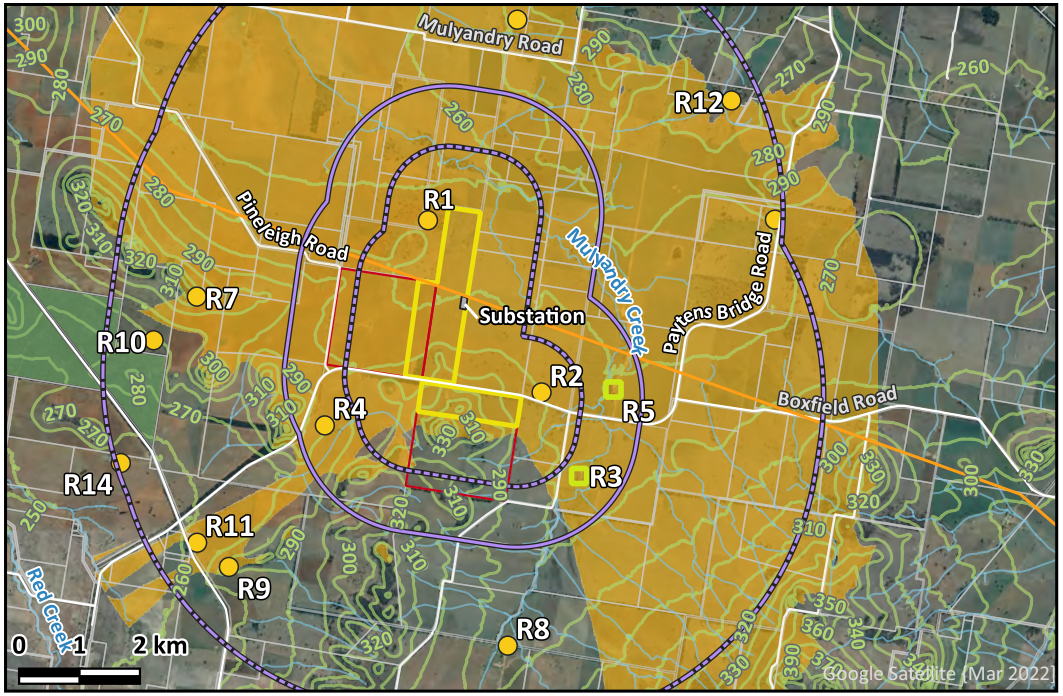
SENSITIVE RECEIVERS

Whether visual receivers are also sensitive receivers depends on their susceptibility to change in views and visual amenity, as well as the value attached to particular views.

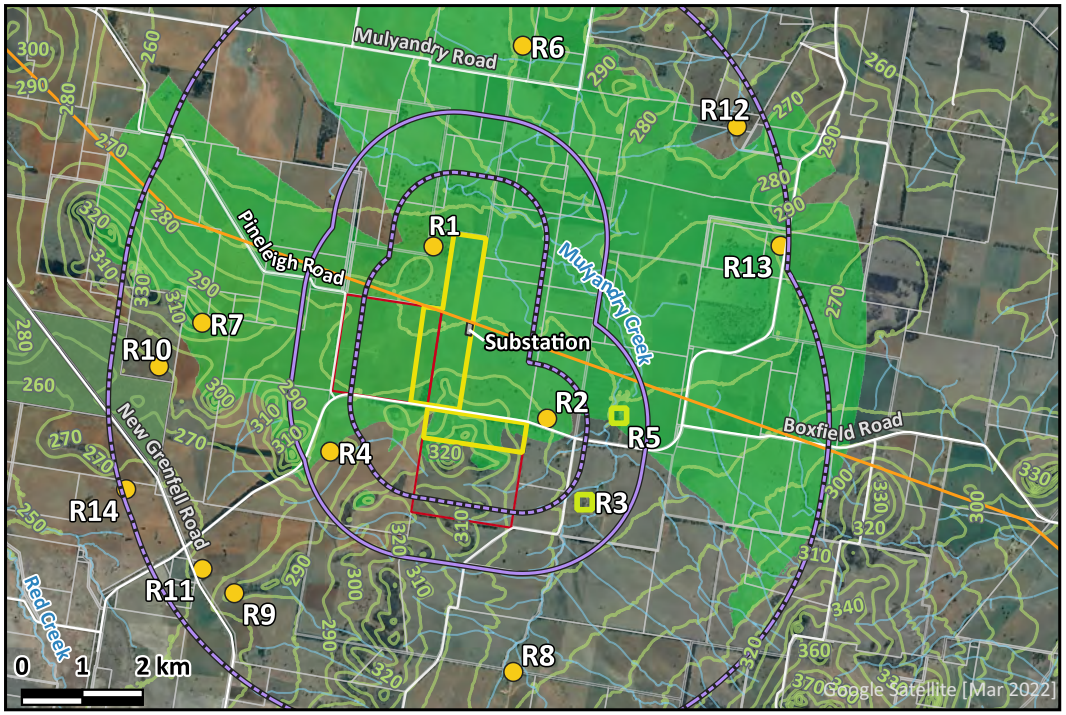
LIIEMA (2013) considers that visual receptors most susceptible to change include residents at home. The occupants of residences R1, R2 and R4 are therefore considered to be the sensitive receivers. The users of Paytens Bridge Road and Pineleigh are also considered sensitive receivers although, based on the LIIEMA guidance, they are less susceptible to visual change than people living at residences.

VIEWPOINTS

Viewpoints (VPs) are positions looking towards the project that consider views from receivers. Accent has selected six viewpoints for analysis as shown in Figure 6.18 and listed in Table 6.22.



Viewshed analysis, solar panel height 4 m



Viewshed analysis, substation height 10 m

AE1173.1 Peninsula SPS
Figure 6.17. Viewshed analysis
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Page size: A4

N

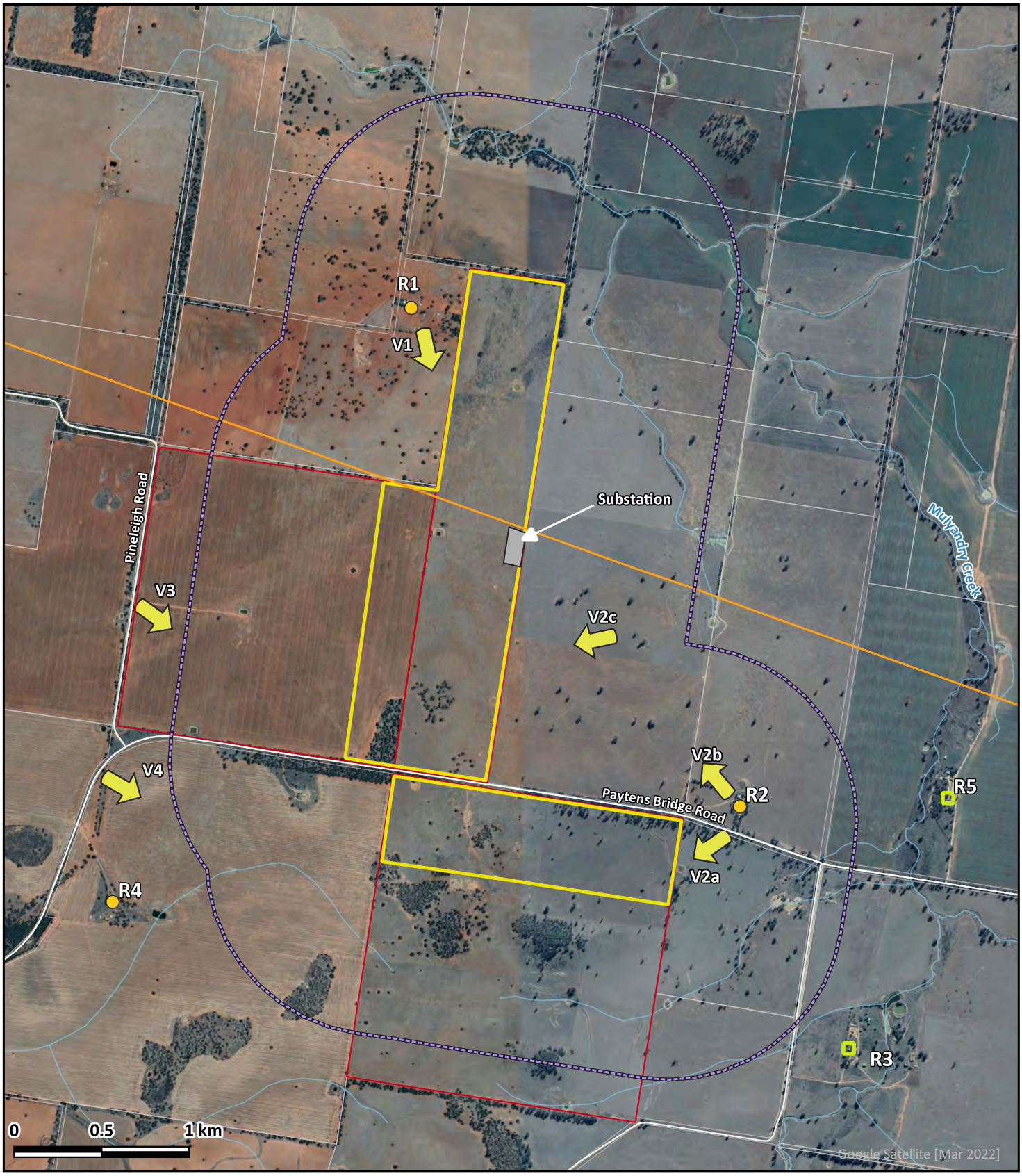
- Project site
- Lot boundary (project site)
- Substation
- Residence, non-associated
- Residence, associated
- Lot boundary
- 1 km radius from site
- 2 km radius from site
- 5 km radius from site

Area project site infrastructure is potentially visible based on structures of the following heights:

- Solar panels, 4 m tall
- Substation, 10 m tall
- Existing transmission line
- Watercourse - tributary
- Contour AHD (10 m interval)

Additional data: NSW RoadSegment, NSW Hydroline, NSW ElectricityTransmissionLine, NSW Six Contours_2m_AHD.

Note these viewshed analysis outcomes were created using a contour digital elevation model (DEM) (terrain only)



Project site
Lot boundary (project site)
Substation
Associated residence
Non-associated residence
Viewpoint and direction of view
Lot boundary
Existing transmission line
1 km radius from project site
Watercourse - tributary

N

AE1173.1 Peninsula SPS
Figure 6.18. Viewpoints and direction of view
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CRS: GDA 1994 MGA Zone 55
Page size: A4
Additional data: NSW RoadSegment, NSW Hydroline, NSW ElectricityTransmissionLine, NSW Six cadastral data

ACCENT ENVIRONMENTAL

Table 6.22 Selected viewpoints for analysis

Viewpoint	Description	Distance and direction from site
VP1	**Purpose**: view from surrounds of R1 residential compound ('Pineleigh') towards northern section **Location**: approximately 150 m southeast of R1 compound **Direction of view**: southeast **Subject of view**: solar arrays in northern section of project site	Approximately 800 m northwest of northern section solar arrays along central line of sight
VP2a	**Purpose**: view from surrounds of R2 residential compound towards southern section and view from Paytens Bridge Road **Location**: at southern end of R2 driveway, next to Paytens Bridge Road **Direction of view**: southwest **Subject of view**: solar arrays in southern section of project site	Approximately 500 m northeast of southern section solar arrays along central line of sight
VP2b	**Purpose**: view from surrounds of R2 residential compound towards northern section **Location**: approximately 30 m northwest of R2 residential compound **Direction of view**: northwest **Subject of view**: solar arrays and substation in northern section of project site	Approximately 1.9 km southeast of substation along central line of sight
VP2c	**Purpose**: represents typical view from adjacent paddock (R2 landholder) **Location**: paddock approximately 1.2 km northwest of R2 residential compound **Direction of view**: west-southwest **Subject of view**: solar arrays, substation and BESS (if centralised) in northern section of project site	Approximately 650 m east-northeast of solar arrays along central line of sight
VP3	**Purpose**: view from Pineleigh Road **Location**: Pineleigh Road approximately 850 m north of Paytens Bridge Road **Direction of view**: east-southeast **Subject of view**: solar arrays in northern section of project site	Approximately 1.3 km west-northwest of northern section solar arrays along central line of sight
VP4	**Purpose**: proxy for R4 and view from Paytens Bridge Road	Approximately 1.6 km west-northwest of southern section solar arrays along central line of sight

Viewpoint	Description	Distance and direction from site
	Location: Paytens Bridge Road, approximately 750 m north of R4 housing compound **Direction of view**: east-southeast **Subject of view**: solar arrays in southern section of project site (also partly looking towards northern section)	

Where viewpoint photos were not taken from within a housing compound, they were taken close to the compound as a proxy for the view from the compound.

Photomontages (Figures 6.19 to 6.30) have been prepared to simulate the visual impacts of the proposed development from the viewpoint locations shown in Figure 6.18. The photomontages for the viewpoints include the current views of the site and the simulated views of the site after the installation of solar panels and other infrastructure.

VIEWPOINT IMPACT ASSESSMENT

In assessing the visual impacts of the proposed development, the following have been considered:

- the potential sensitive receivers in the vicinity of the site
- the type of sensitive receiver
- distance and elevation of sensitive receiver in relation to site
- visibility of site from sensitive receiver
- profile of proposed infrastructure
- the type of materials proposed to be used in construction
- the nature, location and frequency of project-related traffic accessing the site
- lighting required during construction and operation.

Figure 6.19 Viewpoint 1: Current view of proposed Peninsula SF site looking southeast from 'Pineleigh'

Figure 6.20 Viewpoint 1: Simulated view of proposed Peninsula SF site looking southeast from 'Pineleigh'

Figure 6.21 Viewpoint 2a: Current view of proposed Peninsula SF project site looking southwest from Paytens Bridge Road

Figure 6.22 Viewpoint 2a: Simulated view of proposed Peninsula SF project site looking southwest from Paytens Bridge Road

Figure 6.23 Viewpoint 2b: Current view of proposed Peninsula SF project site looking northwest from adjacent to R2 compound

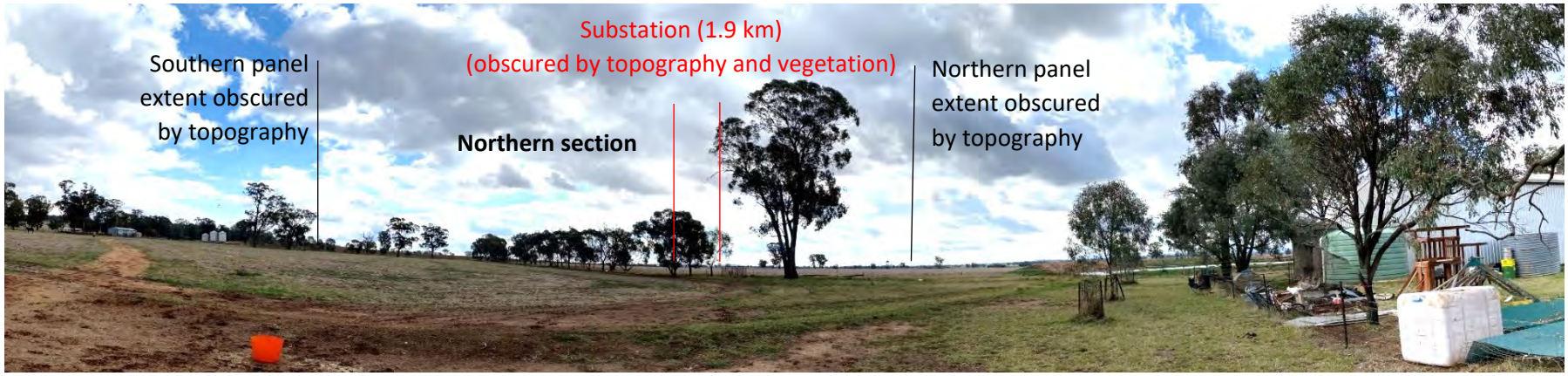


Figure 6.24 Viewpoint 2b: Simulated view of proposed Peninsula SF project site looking northwest from adjacent to R2 compound

Figure 6.25 Viewpoint 2c: Current view of proposed Peninsula SF project site looking west

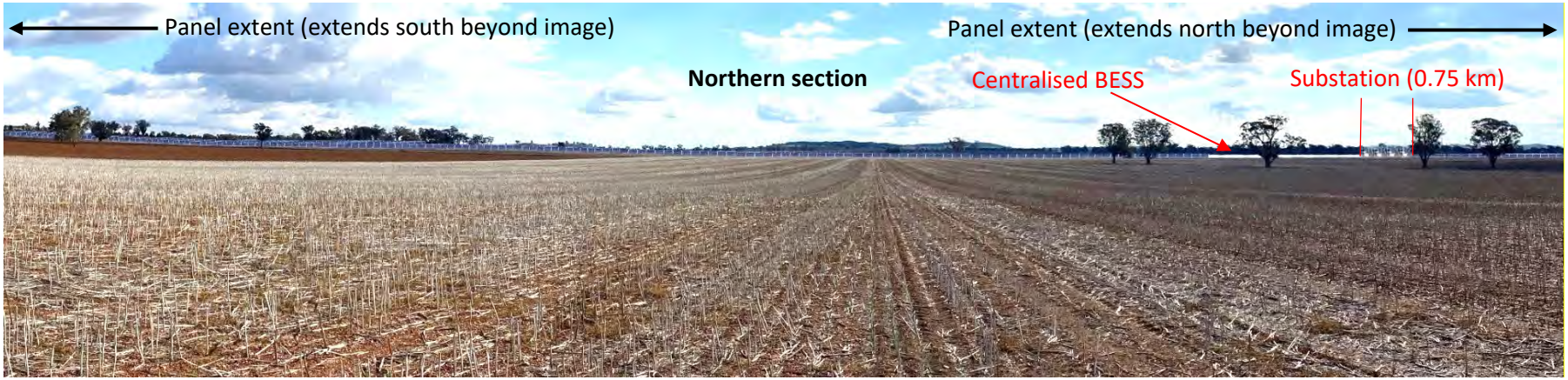


Figure 6.26 Viewpoint 2c: Simulated view of proposed Peninsula SF project site looking west

Figure 6.27 Viewpoint 3: Current view of proposed Peninsula SF project site looking east-southeast from Pineleigh Road

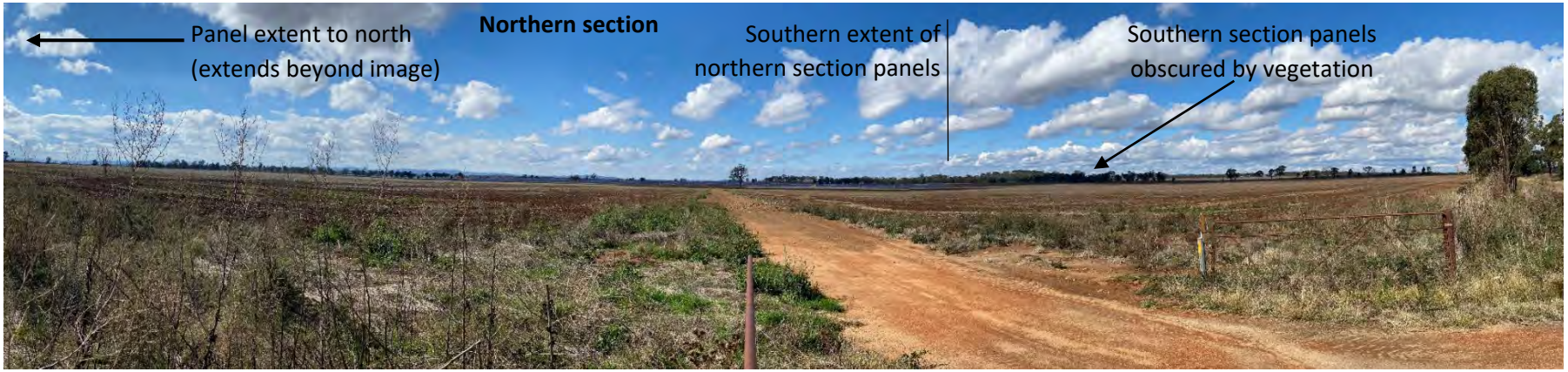


Figure 6.28 Viewpoint 3: Simulated view of proposed Peninsula SF project site looking east-southeast from Pineleigh Road

Figure 6.29 Viewpoint 4: Current view of proposed Peninsula SF project site looking southeast from Paytens Bridge Road

Figure 6.30 Viewpoint 4: Simulated view of proposed Peninsula SF project site looking southeast from Paytens Bridge Road

A summary of the pre-mitigation visual impact assessment for the six viewpoints is provided in Table 6.23.

Table 6.23 Viewpoint visual impact assessment summary

Viewpoint/ residence	Sensitivity	Magnitude	Impact rating (pre-mitigation)
Viewpoints			
VP1	Low	Moderate	Moderate-Low
VP2a	Low	Moderate	Moderate-Low
VP2b	Low	Negligible	Negligible
VP2c	Low	High	Moderate
VP3	Low	Moderate	Moderate-Low
VP4	Low	Negligible	Negligible

As the six viewpoints were located on rural land or local roads, the sensitivity of the impacts was identified as low. The viewpoint with the highest pre-mitigation visual impact rating was VP2c which had a moderate impact rating. Viewpoints VP1, VP2a and VP3 had moderate-low impact ratings. No specific mitigation measures such as visual screening zones are considered to be required for the six viewpoints.

Viewpoints VP1, VP2a, VP2b and VP4 provide views of the project from the land that surrounds residences R1, R2 and R4. From the actual residences themselves, the sensitivity to visual impact will be high, but the magnitude of impact reduced due to the trees and fences located around the houses:

- R1 is located within a compound which has a fence along most of its eastern border and trees and a wall along its southern border (Photo 6.14). Only the far northern end of the project site is likely to be visible from within the compound. This impact has been mitigated by excluding this northern area of the site from development. The excluded area is shown on Figure 1.3 as non-development zone number 1.
- R2 is surrounded by vegetation and R4 has vegetation between it and the project site. Due to the vegetation close to the houses, the presence of additional intervening vegetation and the presence of intervening topography, no specific mitigation measures such as visual screening zones are considered to be required for residences R2 and R4.

Although no specific mitigation measures are proposed based on the viewpoint analysis, other than the exclusion of the far northern section of the site from development, a range of general visual mitigation measures are outlined in Section 6.9.5.

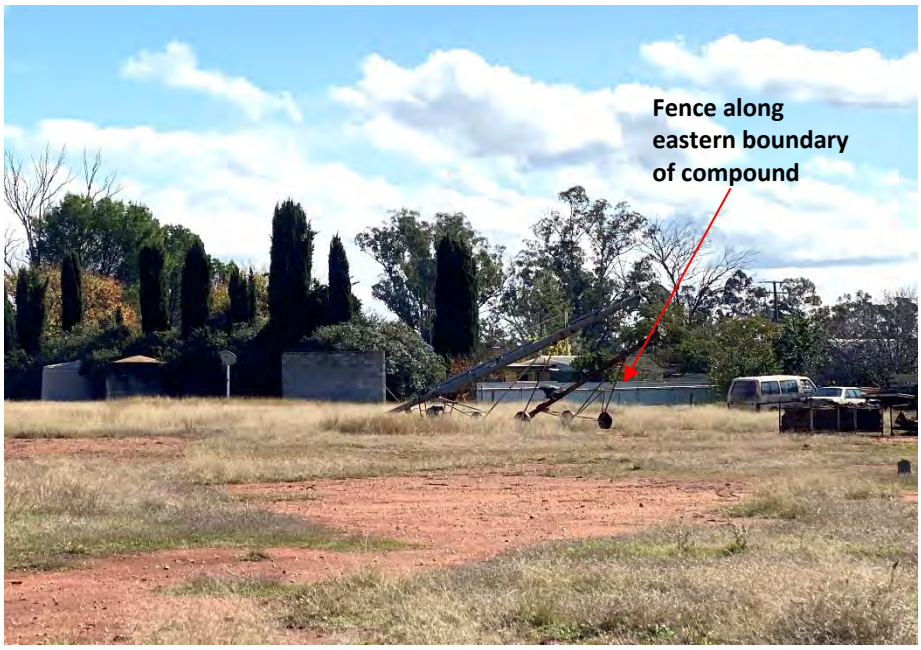


Photo 6.14 Residence R1, viewed from southeast

OTHER VISUAL CONSIDERATIONS

Night lighting

During operation, lighting will be provided for security reasons and for staff and contractors utilising the site facilities. External lighting would be restricted to the area where the maintenance shed, permanent site office, and switch yard are located. All external lighting around buildings will be faced downwards and inwards to minimise impacts to neighbouring properties.

Construction activities at the site would occur from 7 am to 6 pm Monday to Friday and from 8 am to 1 pm on Saturdays (i.e., during daylight hours). However, if lighting is required during construction, it will be directed into the construction areas and positioned to minimise the potential increase in light pollution for adjacent receptors.

The visual impacts of project night lighting on surrounding residences, scenic or significant vistas, air traffic and road corridors in the public domain, during construction, operations and decommissioning, are considered to be minor and readily manageable using standard management methods.

Decommissioning

It is envisaged that decommissioning will involve the removal of all infrastructure associated with the project and rehabilitation of the site (see Section 6.14). As the decommissioning phase of the project is likely to be of limited duration, it is not considered likely to result in an unacceptable level of visual impact. At the completion of rehabilitation, the project site will be returned to its existing rural landscape character.

Community and stakeholder consultation

Community and stakeholder consultation undertaken in relation to the EIS is outlined in Chapter 5. The decision to exclude the far northern end of the site from development to avoid

direct lines of site from the R1 residential compound was made in response to concerns over visual impacts expressed during consultation.

Edify is in active discussion with the nearest residences concerning visual impacts and their management Edify will continue undertaking community engagement throughout the development, operation and eventual decommissioning of the project, including during the EIS exhibition and review period.

6.9.5 Management and mitigation

To ensure that the visual impacts of the proposed project are acceptably minimised, the following management measures will be adopted.

Design phase measures

The following detailed design measures will be adopted to reduce the visual impact of the project:

- Exclude the far northern end of the site from development to avoid direct lines of site from the R1 residential compound.
- Apply urban design principles and objectives during detailed design phase.
- Investigate colour combinations for infrastructure items to aid visual obscurity.
- Ancillary structures: minimise reflective surfaces with a preferred use of muted colours.

Construction phase measures

The following measures will be implemented to minimise visual impacts during construction:

- Demarcation and exclusion fencing will be installed around trees and vegetation to be retained.
- Limiting disturbance and rehabilitating disturbed areas.
- Minimising light spill from the development into adjacent visually sensitive properties by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
- Temporary hoardings, barriers, traffic management and signage should be removed when no longer required.
- The site to be kept tidy and well maintained, including removal of all rubbish at regular intervals. There should be no storage of materials beyond the construction boundaries

Operation phase measures

The following measures will be taken to minimise visual impacts during the operation phase of the project:

- Restrict external lighting to the area where the maintenance shed, permanent site office, and switch yard are located.
- All external lighting around buildings to be faced downwards and inwards to minimise impacts to neighbouring properties.

Decommissioning phase measures

The following measures will be taken to minimise visual impacts during the decommissioning phase of the project:

- A rehabilitation and decommissioning strategy will be implemented to return the site to its pre-existing condition.

6.9.6 Conclusion

An assessment of the visual impacts of the project has found that the viewpoints requiring detailed assessment are three residences (R1, R2 and R4) and two roads (Paytens Bridge Road and Pineleigh Road). This visual impact assessment has qualitatively assessed the visual impact of the project site from major viewpoints and receivers, with the impacts ranging from moderate to negligible. Visual impacts on the three residences are assessed as negligible, once the impact mitigation proposed for R1 is taken into account.

The degree to which the change to the landscape will actually be perceived will depend on affected individual receptors' sensitivities, which cannot be finally predicted at this stage. These sensitivities are being considered as far as practicable via ongoing community consultation as part of the wider EIS and will be further considered during project planning and development.

6.10 Hazard

Safety-related hazards associated with renewable energy projects can present a significant risk to human health, life, biodiversity and infrastructure if not managed effectively. The potential hazards related to the construction, operation and decommissioning of the Peninsula SF project include the presence and use of hazardous materials (e.g. associated with lithium-ion batteries and hazardous chemicals) and the associated risks (e.g. impacts due to radiant heat, overpressure, toxic contaminant release, electromagnetic fields and bushfire).

A Preliminary Hazard Assessment (PHA) has been undertaken by Mendham Consultants and is attached as Appendix M.

6.10.1 Level of assessment

The SEARs require an assessment of hazards including:

> *"- a Preliminary Hazard Analysis (PHA) prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011);*
>
> *- an assessment of potential hazards and risks including but not limited to bushfires, electromagnetic fields for the proposed grid connection infrastructure against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields."*

Accordingly a **detailed assessment** of hazards associated with the project has been undertaken by way of the PHA.

6.10.2 Existing conditions

The PHA (Appendix M) is primarily concerned with the potential risks posed by the project to the safety of receivers (people) at the project site boundary. By considering the safety of receivers at the project site boundary, the PHA is also, by default, considering the safety of receivers that are further from the project. Such receivers include the users of Paytens Bridge Road between the northern and southern sections of the site and local landholders such as the occupants of the nearest residence, R1, located approximately 300 m west of the site (see Figure 1.4).

The project site is largely cleared of vegetation for agricultural purposes and is not considered to be bushfire-prone land, according to the NSW Rural Fire Service (NSW RFS) online tool (search undertaken 4 February 2021) (NSW RFS 2021).

The nearest NSW RFS fire station is located at Forbes, approximately 29.6 km northwest of the project site. Fire and Rescue NSW (FR NSW) also has a fire station in Forbes around 29.5 km to the northwest.

Transgrid is responsible for managing the fire risk associated with the existing 132 kV transmission line crossing the project site. The transmission line is also an existing source of electromagnetic fields within the site.

6.10.3 Methodology

PRELIMINARY HAZARD ASSESSMENT

The PHA follows the assessment process outlined in *Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis* (HiPAP 6) (DoP 2011a) and *Multi-Level Risk Assessment* (DoP 2011b). The PHA considers:

- the nature and quantities of hazardous materials (and hazardous articles i.e., batteries) stored and used in process (i.e. BESS units) on the site
- the type of plant and equipment in use
- the adequacy of proposed technical, operational, and organisational safeguards
- the surrounding land uses or likely future land uses
- the interactions of these factors.

The risk analysis and assessment process adopts a qualitative (Level 1) approach whereby a HAZID table is developed and, from this, credible risk scenarios are identified and analysed.

Where the initial level of risk does not exceed an estimated 'low' level and is considered to be managed to an extent that is low, as far as is reasonably practicable (AFARP), no further action is required.

Where the initial risk exceeds a level that is low AFARP, further analysis (e.g. radiant heat analysis, overpressure estimation,) is undertaken to recommend additional risk controls (mitigations) that achieve a residual risk level that is low AFARP.

As the Peninsula SF project is still in the conceptual design phase and technology suppliers have not yet been chosen, hazard mitigation has been based on calculating safe separation distances between hazardous site components (i.e. the BESS units) and the project boundary.

For each risk factor considered, the separation distances presented are therefore worst case, as they assume no mitigation measures such as the application of recognised standards and performance-based solutions have been adopted to reduce risk.

The separation distances were calculated to achieve compliance with the following criteria, in accordance with *HIPAP 4: Risk Criteria for Land Use Safety Planning* guidance (DoP 2011c):

- potential radiant heat exposure to a person located at the site boundary should not exceed 4.7 kw/m^2 to avoid risk of injury
- potential overpressure exposure to a person located at the site boundary should not exceed 7 kPa to avoid risk of injury and property damage

In addition, a required separation distance between individual BESS units was calculated such that radiant heat from a fire in one BESS unit should not result in a radiant heat exposure of greater than 12.6 kw/m^2 at another unit. Above this radiant heat criterion, in accordance with HIPAP guidance, structural failure could occur. Information from a recent Victorian fire that occurred during BESS commissioning has been used to estimate the effects of such fires in terms of radiant heat and the likelihood of fire spreading between BESS units (see Appendix M).

6.10.4 Preliminary Hazard Assessment

The PHA focusses primarily on hazards and risks associated with the operational phase of the Peninsula SF project as hazards and risks associated with project construction generally pose a low risk to human receivers beyond the project site boundary and are readily manageable by applying standard construction management practices. An exception is the hazard posed by project-related traffic, which is assessed in Section 6.7.

The assessment below is applicable to both BESS options currently under consideration by Edify, i.e.:

- decentralised BESS with DC coupled solar plus storage system design (Figure 6.31)
- centralised BESS with AC coupled solar plus storage system design.

INITIAL HAZARD AND RISK IDENTIFICATION

A summary of hazards and risks identified during the HAZID process is provided in Table 6.24. Initial risk levels were assessed in relation to the potential for credible off-site (i.e. beyond project site boundary) risks to be present to receivers as a result of project facilities and activities. Table 6.24 shows the initial (pre-control) risk level associated with the identified hazards and the residual risk level (post-control) for those risks requiring controls to reduce risk levels to low AFARP.

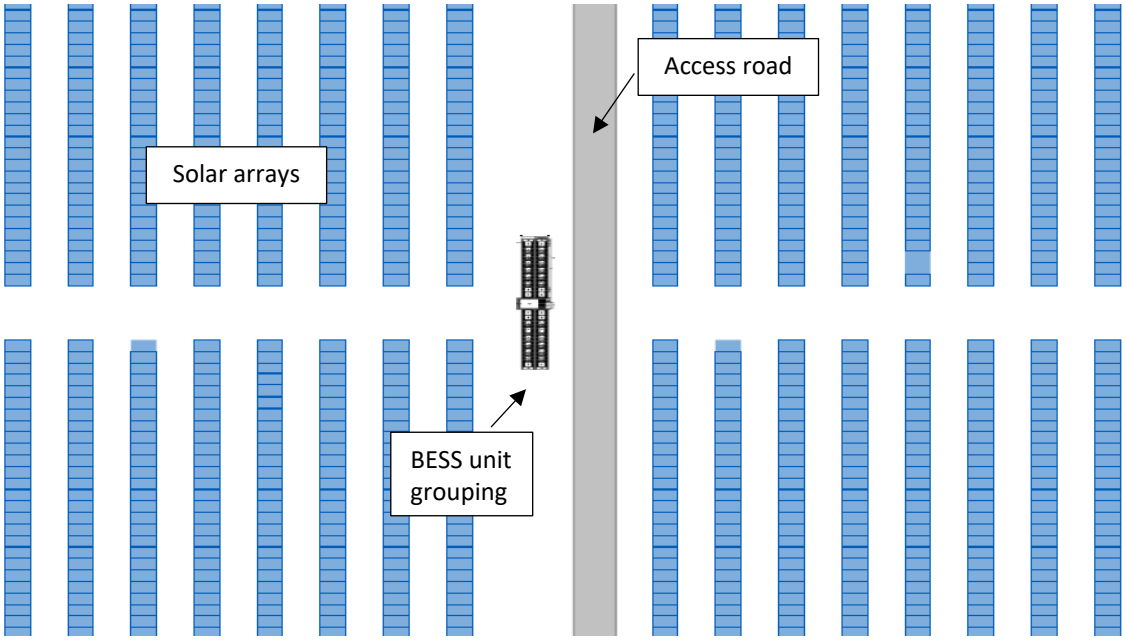


Figure 6.31 DC coupled configuration showing BESS unit grouping in decentralised BESS

Table 6.24 Identified hazards and risks

Hazard	Risk	Initial risk level	Additional controls recommended	Residual risk level
Flooding	Plant outage – no offsite risks	Low (AFARP)	Nil	NA
Bushfire	Radiant heat or ember attack causing damage to assets – no offsite risks	Low (AFARP)	Nil	NA
Electric shock	Injury to worker – no offsite risks	Low (AFARP)	Nil	NA
Extreme weather events	Damage to infrastructure from very strong wind – no offsite risks	Low (AFARP)	Nil	NA
Subsidence	Solar farm outage – no offsite risks	Low (AFARP)	Nil	NA
Subsidence	Plant outage and potential damage to assets – no offsite risks	Low (AFARP)	Nil	NA
Hazardous chemical loss of containment	Potential for environmental and safety impacts	Moderate	Yes	Low (AFARP)

Hazard	Risk	Initial risk level	Additional controls recommended	Residual risk level
Arson/theft	Arsonists start fire	Moderate	Yes	Low (AFARP)
Lightning	Lightning starts fire	Moderate	Yes	Low (AFARP)
Vehicular or access equipment impact during construction, commissioning, maintenance, or decommissioning	Impact starts fire	Moderate	Yes	Low (AFARP)
Manual handling incidents	Loss of containment (LoC) of battery contents	Low (AFARP)	Nil	NA
BESS or static inverter fire (localised)	Equipment failure starts fire	Moderate	Yes	Low (AFARP)
BESS or static inverter fire (beyond unit of origin)	Equipment failure starts fire	Moderate	Yes	Low (AFARP)
BESS explosion	Equipment failure causes overpressure	Moderate	Yes	Low (AFARP)
BESS toxic release	Equipment failure causes toxic gas/vapour release	Moderate	Yes	Low (AFARP)

NA = not applicable

FURTHER PHA ANALYSIS

Further analysis was undertaken of those hazards listed in Table 6.24 with initial risk levels that are not low AFARP and therefore require the application of risk controls. The outcomes of this analysis are summarised below under the following headings:

- Hazardous chemical loss of containment
- Radiant heat from BESS unit fire
- Overpressure from BESS explosion
- Toxic release from BESS fire

HAZARDOUS CHEMICALS

Minor storage volumes (i.e. in accordance with applicable Australian dangerous goods standards, including AS1940) of hazardous chemicals will be stored on site for maintenance, pest and weed control activities, and use in portable fire pumps used for bushfire

management. All chemicals will be stored in commercially available chemical storage cabinets. Chemicals will be stored allowing compliant separation from 'Protected Places' and required segregation for incompatible hazardous chemicals.

The hazardous chemicals (including hazardous articles) to be stored on site include:

- air conditioning refrigerant (difluoromethane, pentafluoroethane)
- transformer oil
- aerosols within the fire suppression system
- coolant.

Estimated quantities of dangerous goods transported to site and used and stored during operation are listed in Table 6.25 and Table 6.25, respectively, along with the applicable threshold quantities under Resilience and Hazards SEPP as described in DoP (2011d). As the quantities are below the threshold values no specific management measures are required, other than the standard measures for managing fuels and chemical outlined in Section 6.6.5.

RADIANT HEAT FROM BESS UNIT FIRE

Fire in a BESS unit presents a range of hazards both on-site and off-site, particularly in relation to exposure of individuals or groups to radiant heat, overpressure from explosions caused by flammable vapour deflagrations, and the release of toxic products of combustion, which have the propensity to migrate off site. Fire in a BESS unit could also cause damage to project infrastructure and adversely impact the health and safety of site personnel. Such a fire could potentially be initiated within the unit, initiated by a static inverter fire, or initiated by some external event such as arson, lightning or vehicular impact.

A separation distance of approximately 25 m between the BESS units (whether containerised or modular) and the site boundary has been determined to be required, in the absence of additional mitigation measures, so that a radiant heat flux of 4.7 kw/m^2 is not exceeded at the boundary (see Appendix M).

A separation distance of approximately 2.5 m between individual BESS units (whether containerised or modular) has been determined to be required, in the absence of additional mitigation measures, so that a radiant heat flux of 12.6 kw/m^2 is not exceeded, potentially leading to structural failure and fire spread (see Appendix M).

The 2.5 m separation distance has been determined based on the potential for radiant heat associated with fire on top of the BESS unit. Such distances are much greater than would be required for an internal BESS unit fire where heat is transferred horizontally through the wall of the unit. If the risk of external flames above the unit has been appropriately mitigated, a reduced separation distance of 15 cm is permitted, as per UL9540A fire test certification.

The number of BESS units allowed to be grouped such that they are at fire risk from adjacent units is at the discretion of the proponent in consultation with regulatory authorities.

The approximate 25 m and 2.5 m separation distances conservatively assume that no other risk mitigation measures are implemented (i.e. they are relying solely on distance to achieve the required risk mitigation). The current project site has sufficient area available to accommodate these conservative separation distances.

Table 6.25 Dangerous goods and Resilience and Hazards SEPP transport threshold

Hazardous material	Dangerous goods class	Resilience and Hazards SEPP transport threshold		Project transport requirements		Exceed SEPP
		Movements	Quantities	Movements	Quantities	
Fire suppression gas	2.2	Not applicable		If required, dependent on technology selection		Not applicable
Diesel fuel	C1	Not applicable		6 total[1]	<2.5 tonne[1]	Not applicable
Transformer oils	C1	Not applicable		1 total[1] 2/year[2]	<45 tonne[1] <5 tonne[2]	Not applicable
Herbicides	6.1 PGII	All	1 tonne	2/year[2]	<1 tonne[2]	Does not exceed SEPP threshold
Lithium-ion battery units	9	>1000/year cumulative >60/week	No limit	<1000/year cumulative <60/week	No limit	Does not exceed SEPP threshold

[1] during construction, [2] during operation

Table 6.26 Dangerous goods and Resilience and Hazards SEPP storage threshold

Hazardous material	Dangerous goods class	Resilience and Hazards SEPP storage threshold	Project storage	Exceedance
Fire suppression gas	2.2	Not applicable	If required, dependent on technology selection	Not applicable
Diesel fuel	C1	10 tonne	<8 tonne[1] Nil[2] Nil[3]	Does not exceed SEPP threshold
MV Transformer Oil	C1	Not applicable	<1 tonne[1] <1 tonne[2] Nil[3]	Not applicable
HV Transformer Oil	C1	Not applicable	<1 tonne[1] <1 tonne[2] Nil[3]	Not applicable
Herbicides	6.1 PGII	2.5 tonne	<2 tonne[2]	Does not exceed SEPP threshold
Lithium-ion battery units	9	Not applicable	up to 80 MW / 160 MWh	Not applicable

[1]during construction, [2]in use during operation, [3]surplus stored during operation

Should appropriate fire protection measures such as prescriptive or engineered solutions be implemented, then separation distances could be reduced. Such measures would typically be considered acceptable if supported by a fire test of appropriate scope and performed to appropriate standards and demonstrated to meet NSW requirements at the project site under HIPAP 6. Such standards include those specified by the UL, NFPA, IEEE, IEC or other recognised developers of international technical and safety standards.

In the event of fire, BESS units need to be readily accessible by emergency responders, requiring internal access to the BESS facility that is compliant with FR NSW and NSW RFS specifications.

OVERPRESSURE FROM BESS EXPLOSION

If containerised BESS units are to be installed, the recommended safe overpressure distance to the site boundary from the unit is approximately 25 m so that an overpressure of 7 kPa is not exceeded at the boundary, unless suitable risk mitigation measures are included in the design that allow the distance to be reduced. The overpressure separation distance is comparable to or marginally less than the radiant heat flux separation distance. Therefore, a minimum of approximately 25 m separation distance to the boundary should be observed in the absence of appropriate mitigation measures.

If externally accessed BESS units are to be installed, a separation distance for blast overpressure is not considered to be required as conditions leading to vapour cloud explosions (VCE) are not likely to occur outside the BESS unit due to the rapid dispersion in outside air of flammable vapour and gases.

A final decision on whether containerised or externally accessed BESS units will be adopted for the Peninsula SF will be made during the detailed design phase.

There are no examples of overpressure (explosions) from BESS units used in utility grid capacity installations in Australia, or from static inverter systems similarly deployed in such installations.

TOXIC RELEASE FROM BESS FIRE

The extent of toxic gas release is directly related to the products of combustion (PoC) and can increase if fire spread occurs between adjacent BESS units.

Harmful products of combustion (PoC) may eventuate from BESS failure. Typical PoC are listed in Table 6.27 (Xin Teng et al 2015).

The risk of off-site impacts associated with toxic gas release (as a result of BESS fire) is considered low in relation to the proposed project configuration and no specific management measures are proposed.

CONCLUSION

The separation distances presented above are worst case as they use distance alone, rather than separation in combination with other mitigation measures, to achieve low AFARP risk levels.

Table 6.27 Typical BESS LiPF electrolyte gas composition in relation to deflagration

Compound	Mass %
Ethylene	64.0%
Carbon monoxide	34.5%
Ethane	0.8%
Carbon dioxide	0.4%
Methane	0.3%

*LiPF = lithium hexafluorophosphate

As design progresses from conceptual to detailed, and technology selection is made, these separation distances will be able to be reduced substantially, if and as required, by adoption of appropriate mitigation measures. Future project hazard assessments will utilise the application of recognised standards and performance-based solutions to reduce separation distances to boundaries while achieving compliance with prescribed boundary conditions.

ASSESSMENT OF BESS AGAINST OTHER STANDARDS

BESSs are still a relatively new contributor to the Australian National Electricity Market's energy mix. In recent years there has been significant research and development of standards in relation to BESSs that will continue to evolve over time and provide improved guidance. A summary of a number of standards that are in place or under development and of relevance to BESS design is provided in Table 6.28.

Table 6.28 Assessment of BESS against other standards

Standard/code	Name	Discussion
NFPA 855	Standard for the Installation of Stationary Energy Storage Systems	This standard provides the minimum requirements for mitigating hazards associated with energy storage systems. The standard will be considered by Edify where relevant during the detailed design phase.
AS 5139	Electrical Installations – Safety of Battery Systems for use with Power Conversion Equipment	This standard describes general installation and safety requirements for BESSs. The standard will be considered by Edify where relevant during the detailed design phase.
IEC 62897	Safety Requirements for Secondary Lithium Cells and Batteries for Use in Industrial Applications	IEC 62897 provides general safety requirements for stationary ESSs for lithium batteries. The standard incorporates a number of requirements addressing potential hazards including electric shock or burn; spread of fire from equipment; excessive temperature; effects of fluids and fluid pressure; liberated gases; explosion and chemical hazards.

Standard/code	Name	Discussion
		As this standard is currently under development by IEC, it is unavailable for an assessment. The standard will be considered by Edify where relevant during the detailed design phase, assuming it becomes available.
UL 9540 / UL 9540A	Energy Storage System (EES) Requirements – Evolving to Meet Industry and Regulatory Needs/Test Method	UL 9540/ UL 9540A are standards that provide an overview of safety for energy storage systems. The PHA (Appendix M) considers that separation distances in the horizontal direction are a more important factor when considering unit separation.
FM Global DS 5-33	Electrical Energy Storage System 5-33	FM Global DS 5-33 is a data sheet that describes loss prevention recommendations for design, operation, protection, inspection, maintenance, and testing of ESSs that use lithium-ion batteries. This document will be considered by Edify where relevant during the detailed design phase.
FM Global	Development of Sprinkler Protection Guidance for Lithium Ion Based Energy Storage Systems	This standard provides guidance to the development of sprinkler protection for lithium-ion based ESSs. As the current project has not developed a sprinkler protection system, this standard is not currently relevant. This standard will be considered by Edify if it becomes relevant during the detailed design phase.
AS 2419	Fire Hydrant Installations – System Design, Installation and Commissioning	The AS 2419 standard describes the requirements for the design, installation and commissioning of a fire hydrant system to protect properties. This standard will be considered by Edify where relevant during the detailed design phase.

6.10.5 Electromagnetic fields

EMFs are a combination of electric and magnetic fields generated from electrically charged objects such as transmission lines. They are produced whenever electricity is used and are present wherever energy flows, and therefore humans are exposed to some level of EMF in their daily lives.

Voltage produces the electric fields and currents that produce the magnetic fields, therefore the stronger the voltage and current, the stronger the EMF will be. As described by the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), electric fields exist in any live wire, whether electricity is being consumed or not, however magnetic fields only exist when an appliance is operating (ARPANSA 2022a).

With distance from the source, the strength of EMFs reduces rapidly. However, although electric fields can be insulated from surrounding materials such as air, buildings and the earth, magnetic fields are not. The strength of magnetic fields, at a given location, is dependent on the number and kinds of sources and the distance from the sources (ARPANSA 2022a).

Naturally occurring EMFs are associated with thunderstorms, lightning and ionospheric currents (ARPANSA 2022b). The existing 132 kV transmission line crossing the project site would have EMFs associated with it.

This section considers the potential impacts of EMFs associated with the project, which includes those associated with the following project components:

- solar panels
- lithium-ion batteries
- inverters
- above-ground and underground DC cabling
- switchboard
- transformers.

CONTEXT

Transmission lines and other electrical devices and infrastructure in Australia operate at a frequency of 50 Hz and fall within the Extremely Low Frequency (ELF) range of 0-300 Hz (ARPANSA 2022a). Fields of different frequencies can interact with the human body in various ways. However, ELF EMFs have not been shown to have significant impacts on health (ARPANSA 2014).

ARPANSA advises that exposure to ELF EMF at high levels can affect nervous system functioning. Some population studies have reported a possible association between prolonged exposure to ELF magnetic fields (below exposure limits but above what is typically encountered) and childhood leukaemia, although scientific evidence of this is not strong (ARPANSA 2014). However, based largely on these population studies, the International Agency for Research on Cancer has classified EFL magnetic fields as possibly carcinogenic to humans (ARPANSA 2015).

ARPANSA states that:

> *"The scientific evidence does not establish that exposure to the electric and magnetic fields found around the home, the office or near powerlines causes health effects"* (ARPANSA 2016), and
>
> *"There is no established evidence that the exposure to magnetic fields from powerlines, substations, transformers or other electrical sources, regardless of the proximity, causes any health effects"* (ARPANSA 2022c).

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) establishes guidelines for limiting EMF exposure to humans, with the aim of preventing adverse impacts to health and wellbeing. The exposure limits outside the body, referred to as reference levels, were developed using worst-case assumptions so that basic restrictions (i.e. exposure limits related to adverse effects within the body) can be met (ICNIRP 2010).

ICNIRP reference levels for the general public and occupational exposure of electric fields in kV and magnetic fields in microtesla (µT) are shown in Table 6.29, along with the comparable levels for electric fields specified in IEEE Standard C95.6 *IEEE Standard for Safety levels with respect to Human Exposure to Electromagnetic Fields 0-3kHz* (IEEE 2002). As EMF measurements vary from different electrical/electronic equipment, the cumulative effects of EMF should be estimated to ensure compliance with exposure limits at the property boundary.

Table 6.29 Exposure reference levels for IEEE and ICNIRP

EMF Exposure	ICNIRP (2010)		IEEE (2002)	
Receiver	General public	Occupational	General public	Occupational
Electric field strength	5 kV/m	10 kV/m	5 kV/m 10 kV/m (within right of way)	10 kV/m 20 kV/m (within right of way)
Magnetic field strength	200 µT	1,000 µT	Not specified	Not specified

ELECTRIC FIELDS

The World Health Organization (WHO) states that strength of electric fields directly underneath powerlines can reach up to 10 kV/m but reduces significantly with distance – at 50 m to 100 m the fields are normally at levels that are found in areas away from high voltage power lines (WHO 2016). The electric field values at different distances from transmission lines is shown in Figure 6.32 (note that the units on the vertical axis are V/m whereas the ICNIRP reference levels are kV/m).

The typical electrical field strengths of household equipment, for comparison, is shown in Table 6.30 (sourced from WHO 2016).

Table 6.30 Typical electric field strengths of household appliances, measured at a distance of 30 cm

Appliance	Electric field strength (kv/m)	Electric field strength (V/m)
Stereo	0.18	180
Iron	0.12	120
Refrigerator	0.12	120
Mixer	0.1	100
Toaster	0.08	80
Hair dryer	0.08	80

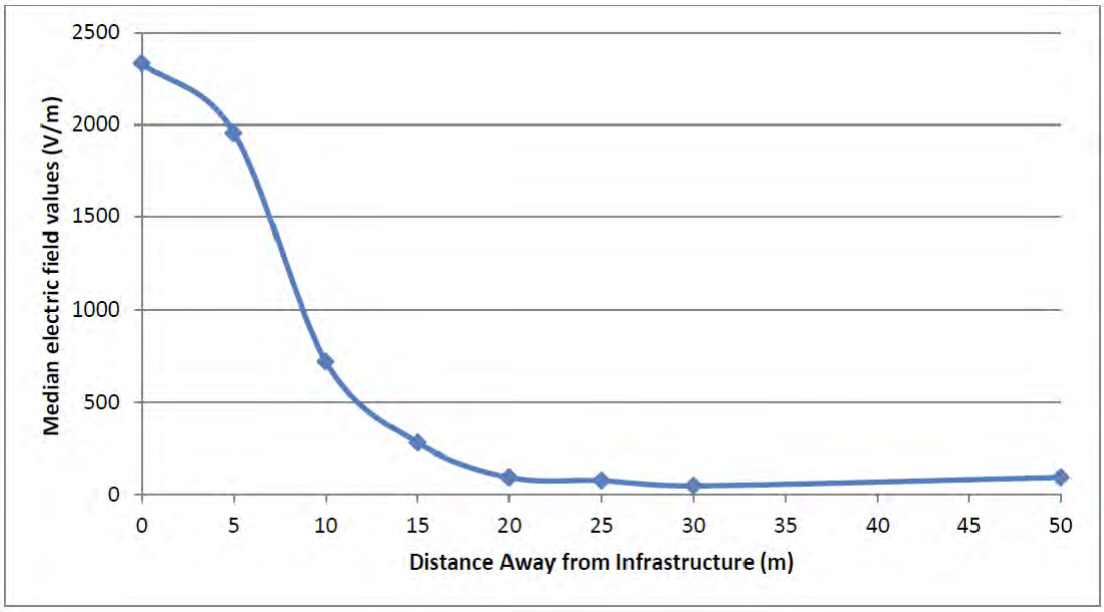


Figure 6.32 Median electric field values at different distances from transmission lines (sourced from ARPANSA 2014)

MAGNETIC FIELDS

The values of magnetic fields that are typical for powerlines and substations are listed in Table 6.31. The values are well below ICNIRP reference levels of 200 µT for the general public and 1000 µT for occupational exposure (see Table 6.29).

Typical values of magnetic fields from common household appliances measured at normal user distance are shown in Table 6.31. Typical values of magnetic fields near substations and powerlines are shown in Table 6.32 (ENA 2016). A comparison of the values in the two tables shows that, within a distance of several metres, magnetic fields from substations and powerlines are comparable to or less than those from household appliances.

Table 6.31 Typical values of magnetic fields measured at normal user distance (ARPANSA 2022a)

Appliance	Range of measurements (µT)
Electric stove	0.2-3
Personal computer	0.2-2
Electric blanket	0.5-3
Hair dryer	1-7
Toaster	0.2-1
Electric kettle	0.2-1

Table 6.32 Examples of magnetic fields levels near substations and powerlines

Source	Location of measurement	Range of measurements (µT)
Substation	0.25 m away	5.3
	3 m away	0.02
	5 m away	0.06
Transmission line	Directly underneath	1-20
	10 m away	0.05-1

Homes located more than 50 m from high voltage powerlines, including transmission lines, are not expected to have higher than typical levels of magnetic fields. Levels of magnetic fields measured five to ten metres from substations and transformers are generally indistinguishable from typical background levels that occur in a home (ARPANSA 2022c). The magnetic field values at different distances from transmission lines is shown in Figure 6.33.

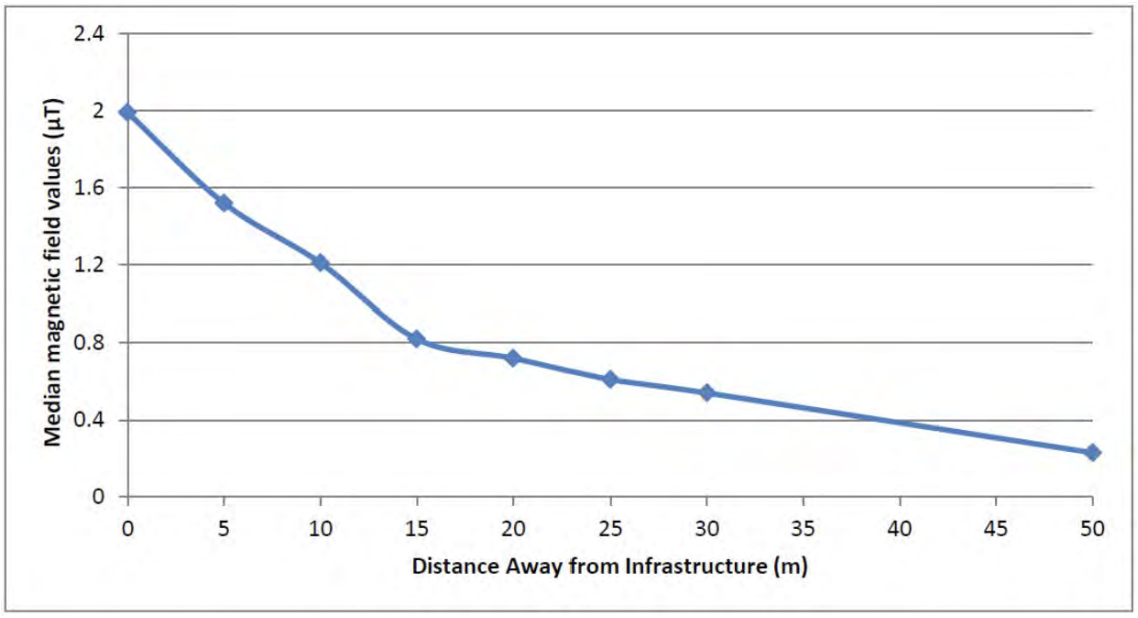


Figure 6.33 Median magnetic field values at different distances from transmission lines (sourced from ARPANSA 2014)

CONSTRUCTION AND DECOMMISSIONING

Exposure to ELFs depends on factors including proximity to electricity equipment and infrastructure and the number of electrical components comprising the infrastructure (ARPANSA 2014).

Exposure to EMFs during construction and decommissioning would be limited to staff working in and around the 132 kV transmission line traversing the site. However, this will be for a short duration and therefore the potential impacts of EMFs on the health of staff are expected to be insignificant.

Exposure of the public to EMFs during construction and decommissioning would be no greater than is currently the case, as the main sources of EMFs in the area are the existing transmission lines.

OPERATION

Project-related sources of exposure during operation would be limited to the existing 132 kV transmission line, and project components including the solar panels, lithium-ion batteries, inverters, cabling, switchboard and transformers. There may be minor increases in EMF in the 132 kV transmission line due to the increased current from the solar farm. However, the transmission line will still be operating within its design capacity and these minor increases are not expected to result in any significant increase in risk.

Exposure to EMFs from project components during operation would be limited to maintenance staff and on-site staff. Public access will be restricted by perimeter site fencing.

According to ENA (2016), electric fields are shielded by most objects with electric fields above underground cables (such as those proposed for the Peninsula SF project) accordingly being negligible. EMFs from the lithium-ion batteries in the BESS units and from the inverters will be partially shielded by the enclosures they will be housed in. Regardless of the extent of shielding, EMFs from all sources reduce significantly with distance, as illustrated in Figures 6.32 and 6.33.

Magnetic fields produced from the solar panels would be less than those of household appliances, and the risk of EMFs from the panels would be insignificant (Chang and Jennings 1994). On the assumption that the electromagnetic field generated by a BESS unit is less than the electromagnetic field generated by a substation (which typically includes electromagnetic field transformers), the associated BESS field level is conservatively considered to be equivalent to a substation field level.

The values shown in Table 6.32 indicate that magnetic fields associated with the BESS units (even if equal to those of a substation), along with the substation and the associated transmission lines, are expected to be well below the magnetic field strength exposure reference levels listed in Table 6.29 at the project site boundary, even when cumulative effects are taken into consideration. The two nearest receivers to the project site are residences R1 and R2, located approximately 300 m and 580 m, respectively, from the project boundary (see Figure 1.4).

The likely level of EMF exposure to the general public at the site boundary is expected to be insignificant based on the published guidance. No specific EMF management measures are proposed.

6.10.6 Bushfire risk

The PHA considered the risk that radiant heat from on-site fire posed to human receivers on the project site boundary. However, the spread of bushfire from the site to surrounding properties and vice versa is also a risk that requires detailed consideration and management.

Bushfires can present a significant risk to human health, life, biodiversity, and infrastructure both within the project site and in the surrounding landscape. Environmental hazards such as hot, dry climatic conditions and the presence of dense vegetation can increase the risk or

severity of a fire occurring. Activities such as the operation of construction machinery or the use of tools such as angle grinders can increase combustion or ignition risks. This section provides an assessment of the potential hazards associated with bushfires.

As the project is an SSD, a bush fire safety authority under section 100B of the Rural Fires Act is not required. However, Section 63 of the Act imposes a duty of care on land managers and landholders to:

> *…. take the notified steps (if any) and any other practicable steps to prevent the occurrence of bush fires on, and to minimise the danger of the spread of bush fires on or from, that land.*

Section 64 requires that during the bush fire danger period, land managers and landholders must:

> *(a) immediately on becoming aware of the fire and whether the occupier has lit or caused the fire to be lit or not, take all possible steps to extinguish the fire, and*
>
> *(b) if the occupier is unable without assistance to extinguish the fire and any practicable means of communication are available, inform or cause to be informed an appropriate officer of the existence and locality of the fire if it is practicable to do so without leaving the fire unattended.*

Although the project site is cleared of most mid-storey and overstorey vegetation, the existing pasture grasses and the excluded areas of remnant native vegetation could be susceptible to fire in hot, dry or windy conditions. The broader landscape surrounding the site is also largely cleared of native vegetation, reducing fire risk, although some patches of remnant vegetation are present on the undulating rises, along with treelines and vegetated road verges (see Section 6.5.3).

Fire risk needs to be considered during project construction, operation and decommissioning. Sources of ignition at the site during project construction (and decommissioning) could include:

- operation of machinery, including construction machinery, hot tools (angle grinders, welders etc.) and motor vehicles
- existing overhead transmission line
- nearby bushfires
- lightning strikes
- smoking and careless disposal of cigarette butts.

In addition to the above, sources of ignition during operation include:

- battery storage infrastructure (as discussed above in relation to the PHA)
- electrical faults in inverters, the substation and other components.

The risk of a bushfire may also be increased by the presence of combustible materials including chemicals and dangerous goods, although quantities stored and used on site during

construction and operation will be below Resilience and Hazards SEPP thresholds, as discussed above.

As the vegetation within the project site is grassland and will be maintained by mowing (and potentially grazing), it is unlikely the project will present a significant bushfire risk to the surrounding area. However, the project will need to adopt fire prevention and control measures in accordance with NSW RFS and FR NSW requirements (see Section 6.10.5), such that a fire initiated on site can be readily contained prior to extinguishment.

An important fire risk mitigation measure will be the provision of adequate access by emergency response vehicles to the BESS units (see Section 6.10.5). The project design includes a 10 m fire protection zone around the site. An all-weather perimeter road between 4 m and 6 m wide will be constructed within the fire protection zone. In addition, access to groupings of BESS units will be designed in accordance with NSW RFS and FR NSW requirements to enable access by emergency vehicles in the event of a BESS fire. Appropriately sized, dedicated water tanks will be installed on site for fire-fighting purposes.

A Fire Safety Study in accordance with FR NSW requirements and a Bushfire Assessment Report in accordance with NSW RFS requirements will be prepared prior to construction to further reduce fire risk. The Emergency Response Plan (ERP) for the site will detail requirements for bushfire preparation and response.

6.10.7 Mitigation and management

BESS UNIT HAZARDS

The following mitigation measures are proposed to manage the risk of radiant heat impacts and general fire risk associated with the operation of the BESS units:

- separating all BESS units from the site boundary by 25 m and BESS unit groupings from each other by 2.5 m unless prescriptive or engineered fire controls are incorporated into project design to allow separation distances to be reduced
- taking current and emerging standards for BESS design into account during the detailed design phase for the project
- restricting access to BESS units (and static inverters) to competent trained employees and supervising contractors
- constructing and maintaining site access roads and providing access to BESS unit groupings and other project components in accordance with NSW RFS and FR NSW requirements to enable access by emergency vehicles.

GENERAL BUSHFIRE RISKS

The following mitigation measures are proposed to manage bushfire risk at the Peninsula SF project:

- undertaking a Fire Safety Study prior to project construction in consultation with FR NSW and in accordance with the requirements of *Hazardous Industry Planning Advisory Paper No. 2 – Fire Safety Study Guidelines* (HIPAP 2) (DoP 2011e)

- preparing a Bushfire Assessment Report prior to project construction in accordance with the *Planning for Bush Fire Protection 2019* (NSW RFS 2019)
- preparing an ERP in consultation with FR NSW and NSW RSF requirements that specifically addresses:
  - foreseeable onsite and offsite fire events and other emergency incidents (e.g. fires involving BESS units, bushfires in the immediate vicinity or potential hazmat incidents)
  - risk control measures that will need to be implemented to safely mitigate potential risks to health and safety of firefighters and other first responders (including electrical hazards)
  - other risk control measures that may need to be implemented in a fire emergency due to any unique hazard specific to the site.
- detailing appropriate risk control measures in the ERP to mitigate potential risks to the health and safety of firefighters and other first responders, including:
  - appropriate personal protective clothing required to be worn
  - minimum level of respiratory protection required
  - decontamination procedures
  - minimum evacuation zone distances and site muster point
  - a safe method of shutting down and isolating the photovoltaic system.
  - emergency evacuation procedures.
- storing two copies of the ERP in a prominent 'Emergency Information Cabinet', to be located directly adjacent to the main entry point of the project site
- providing the NSW RFS and FR NSW fire stations at Forbes with copies of the Fire Safety Study, Bushfire Assessment Report and ERP, including plans of the project site
- implementing and maintaining a 10 m fire protection zone around the perimeter of the project site
- providing on-site water tanks, sized and located in discussion with FR NSW
- undertaking daily monitoring of the Fire Danger Rating for the area, during the Fire Danger Period
- maintaining vegetated areas of the project site to keep grasses low and avoid the build-up of vegetative litter
- designing and maintaining electrical components in accordance with relevant Australian Standards to minimise the risk of ignition
- designing buildings in accordance with relevant NSW RFS standards
- storage of hazardous and flammable chemicals in accordance with applicable Australian hazardous materials and dangerous goods standards, including AS1940
- informing project staff and contractors of fire risks and evacuation procedures.

6.10.8 Conclusion

The PHA (Appendix M) has determined conservative separation distances of BESS units to the project site boundary and separation distances between BESS groupings to achieve compliance with HIPAP 6 (DoP 2011a) and specifically with HIPAP 4 criteria (DoP 2011c). As design progresses from conceptual to detailed, and technology selection is made, these separation distances will be able to be reduced substantially, if and as required, by adoption of appropriate mitigation measures.

Based on the outcomes of the PHA, taking into account the adoption of suitable separation distances, the project is not expected to pose an unacceptable risk to the community in relation to radiant heat, overpressure or toxic gas release.

The likely level of EMF exposure to the general public at the site boundary is expected to be insignificant. In addition, provided that the project adopts fire prevention and control measures in accordance with FR NSW and NSW RFS requirements, the risks of the project initiating a bushfire or being affected by an external bushfire are considered very low.

6.11 Social and economic

Socio-economic impacts on local communities, both positive and negative, have the potential to occur as a result of major developments. As required by the SEARs, this section provides an assessment of the social and economic impacts of the project, including a summary of the existing socio-economic profile of the surrounding area, the wider Forbes Shire LGA and towns within approximately a 100 km radius from the project site.

6.11.1 Level of assessment

The social and economic impacts of the project can be understood sufficiently for the purposes of planning and mitigation so that detailed assessment, survey or modelling are not required. Accordingly, a ***standard assessment*** of impacts has been undertaken based on review of literature.

6.11.2 Methodology

The SEARs state that an assessment of the social and economic impacts is required in accordance with *Social Impact Assessment Guideline* (DPIE 2021g) (application subject to transitional arrangements). The assessment is to include the benefits of the project for the region and the State as a whole, including consideration of any increase in demand for community infrastructure services, assessment of impact on agricultural resources and agricultural production on the site and region.

The approach to assessing the social impacts associated with the Peninsula SF project involved the following:

- reviewing strategic local (community), regional and state-level planning documents to appreciate social objectives and expectations
- summarising the views and values of the receiving community obtained from the consultation process

- assessment of the timing and scale of the project to predict socially related impacts
- describing mitigation measures
- assessing residual impacts once mitigation measures are considered.

The social impact assessment has focussed particularly on the potential effects of the project on the main towns within an approximately 100 km radius from the project site as, based on likely commute times:

- this area is considered to include the main catchment of people already living in the area who may seek employment at the project
- the main towns within this area are the locations people moving to the area for project employment are likely choose for their accommodation.

6.11.3 Existing conditions

FORBES LGA

Paytens Bridge is a small New South Wales Rural Location within the Forbes LGA. It is located approximately 40 km southeast of Forbes and has a recorded population of 104 residents (Landchecker 2021).

The Forbes Shire LGA covers an area of 471,012.8 km² and had an estimated population of 9,920 in 2020 (Australian Bureau of Statistics (ABS) 2020), of which 5,006 were males and 4,914 were females. The estimated working age population (aged 14-64 years) consisted of 5,680 people (57.4% of the population) within the LGA. A breakdown of five-year progressive age brackets is provided in Figure 6.34 for comparison.

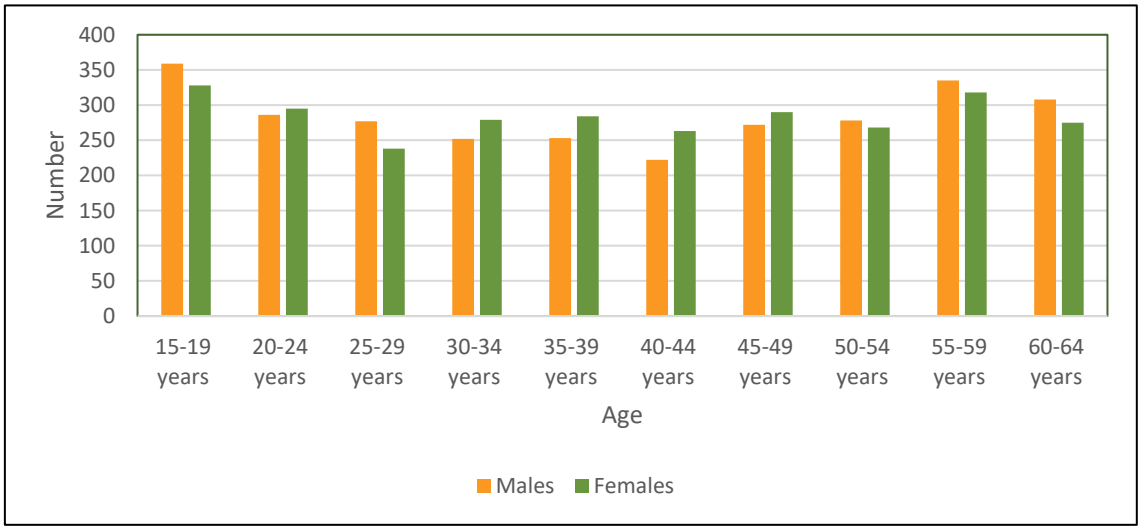


Figure 6.34 Working age population (aged 14-64 years) distribution in the Forbes LGA (ABS 2020a)

Forbes Shire is predominantly rural, with several townships which include residential, industrial and commercial areas. Much of the rural area is used for farming, including sheep and cattle grazing, dairy farming, orcharding and viticulture. Major features of the Shire include the Lachlan River, Lake Forbes, Lake Cowal, Jemalong Weir, Gum Swamp Bird Hide

(Wildlife Sanctuary), Eugowra Nature Reserve, the Forbes Central Business District (CBD), McFeeters Motor Museum, Forbes Historical Society Museum, TAFE NSW Western Institute (Forbes College), Forbes Hospital, Ben Hall's Grave and various wineries (VisitNSW 2021).

The main town centre and majority of the population within the LGA resides in Forbes, with the remainder residing in smaller towns including Bedgerebong, Garema, Wirrinya, Corinella and Ootha (FSC 2021b). The LGA's main land use is rural and consists predominantly of farmland. A detailed breakdown of jobs among the 5,778 employed persons within the Forbes LGA according to ABS 2018 data is shown in Figure 6.35 (ABS 2018). Agriculture, forestry and fishing (717), health care and social assistance (676) and retail trade (632) are the main employers in the LGA. According to ABS 2016 data (ABS 2020), unemployment for the LGA in 2016 was 5.4%.

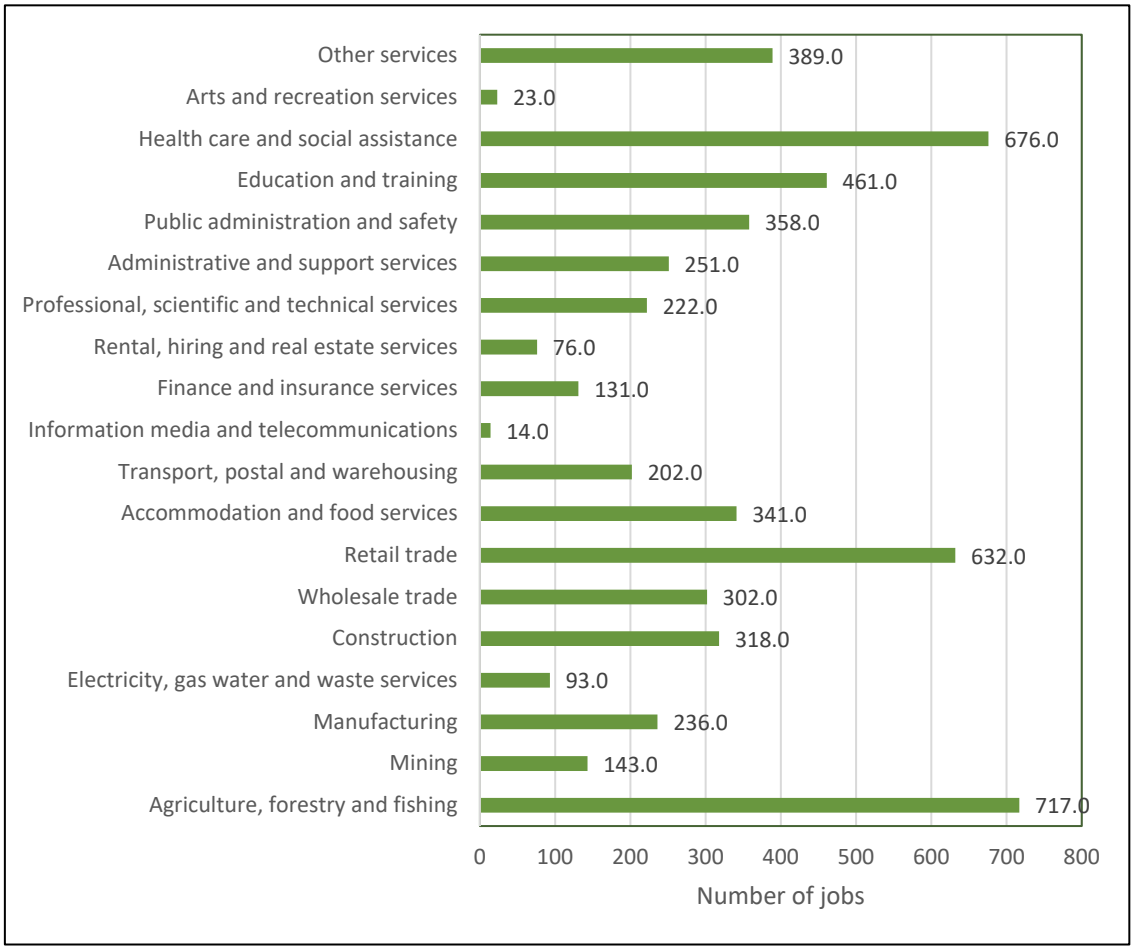


Figure 6.35 Number of employee jobs in the Forbes LGA (ABS 2020).

The Forbes Shire LGA forms part of the Central West Region, which is rich in natural resources with agriculture, mining and tourism significant drivers of jobs and opportunities. Increasingly, health and education have taken on a significant role in the region's economy (FSC 2021c). The agriculture and mining industry output is underpinned by abundant natural resources within rich soil and mineral deposits. Additionally, varied topography and climatic conditions across the region provide various opportunities ranging from forestry, cool climate produce, dairy, sheep and beef livestock, as well as a variety of irrigation and broad acre crops (Central

West 2021). Forbes Shire is regarded as one of the richest primary producing areas in New South Wales, with an annual economic output of $1.316 billion (Remplan 2021).

A number of educational facilities are located within the LGA, including four primary schools, two high schools and the TAFE NSW Forbes campus which offers a wide variety of practical courses ranging from carpentry and joinery, to primary industry and natural resource management options, as well as aged care, business, computing, hairdressing, retail and welding programs (FSC 2021d).

According to ABS 2016 data (ABS 2016a), the highest level of educational attainment of people aged 15 years and over is Year 10 (17.8%), followed by Certificate level III (15.8%) and Year 9 or below (14.3%) (Figure 6.36).

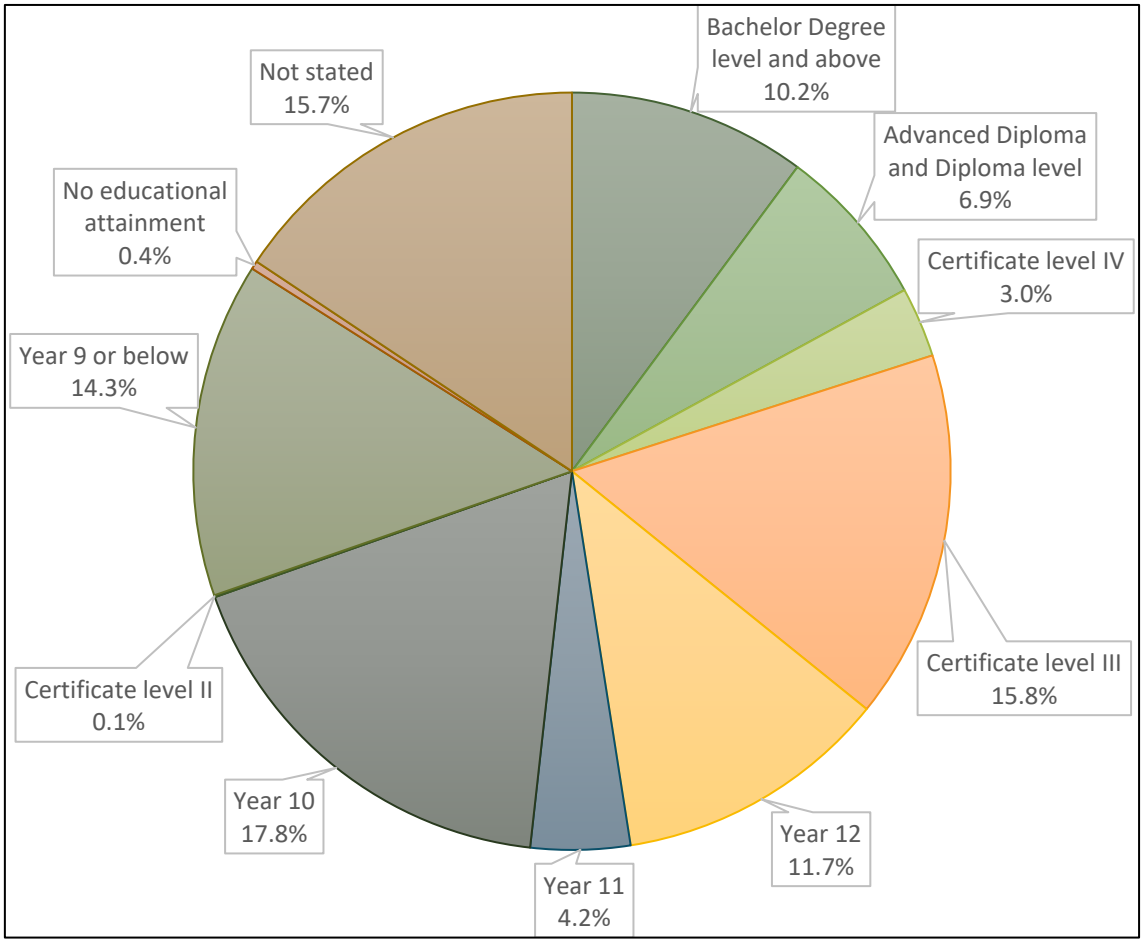


Figure 6.36 Forbes LGA – Level of highest educational achievement - Persons aged 15 years and over (ABS 2016a)

The LGA also provides health and wellbeing support to the community, including providing services in aged and disability care, family and youth services, and sporting and recreation facilities (FSC 2021c).

An aerodrome is located 8 km from Forbes and is currently operated by Forbes Shire Council (FSC 2021e). However, the aerodrome services private aircraft. Fees for using this facility include charges for holding an aeroplane at the airport. The nearest commercial airport that is

regularly serviced by flights to/from Sydney is Parkes Airport, approximately 90 km north of the project site. Bus and train services are available from Forbes to Sydney (TfNSW 2021a).

LOCAL GOVERNMENT AREAS AND MAJOR TOWNS WITHIN 100 KM RADIUS OF PROJECT SITE

Towns and respective LGAs within approximately a 100 km radius of the project site include Parkes (Parkes Shire LGA), Cowra (Cowra Shire LGA), Canowindra (Cabonne Shire LGA), Young (Hilltops LGA), Orange (City of Orange LGA), West Wyalong (Bland Shire LGA) and Grenfell (Weddin LGA). The latest population data for these towns and others within approximately 100 km of the project site and populations over 2000 are listed in Table 6.33 and shown on Figure 6.37.

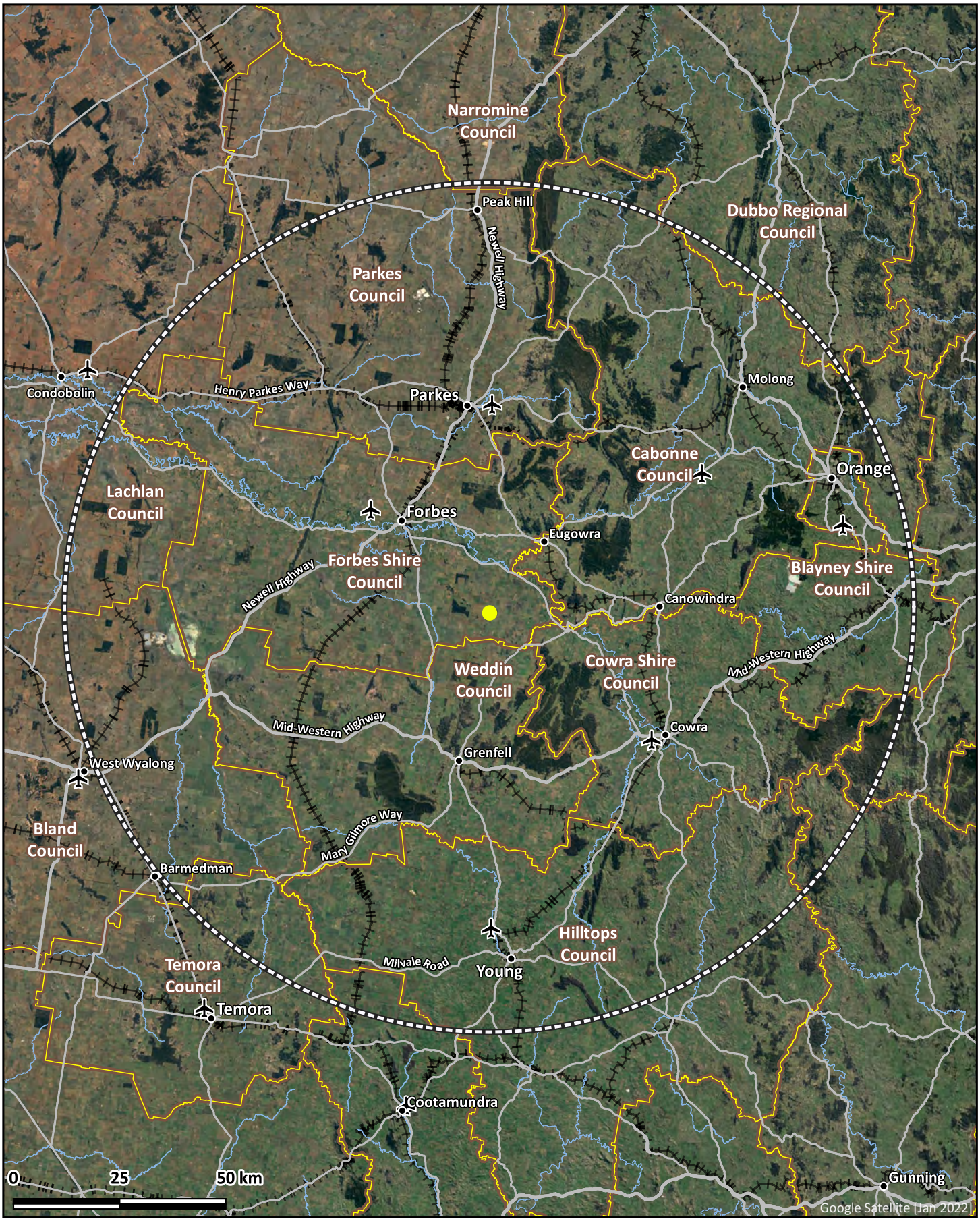
Table 6.33 Populations for towns within approximately 100 km of the project site

Town	Population (ABS 2016a-i)	Distance from site by road (approximate)
Forbes	8,432	36 km
Grenfell	2,573	40 km
Canowindra	2,258	51 km
Cowra	9,863	60 km
Parkes	11,224	69 km
Young	10,295	91 km
Orange	38,097	108 km
West Wyalong	4,141	125 km

Figure 6.34 shows that the highest estimated resident population of males and females within the Forbes LGA are aged between 15 to 19 years old. The highest estimated resident population of males within the Parkes and Cabonne LGAs are also aged between 15 and 19 years. In contrast, for the Cowra LGA, the highest estimated proportion of males is between the ages of 55 to 59 years old. In the Parkes, Cowra and Cabonne LGAs, the highest estimated resident population of females ranges between the ages of 45 to 64 years old (see Figure 1.1 in Appendix O).

Figure 6.35 shows that the number of employee jobs in the construction sector is 318 which comprise approximately 5.5% of the 5,778 employed persons within the Forbes LGA. In the Parkes, Cowra and Cabonne LGAs, employed persons in construction comprise between 3.9% and 6.2% of the population (see Figure B in Appendix O).

Figure 6.38 shows that labourers comprise approximately 12.9% of employed persons within the Forbes LGA. Machinery operators and drivers, and technicians and trades workers comprise approximately 8.2% and 13.9% of employed persons, respectively.



Project site
LGA boundary
Major road
100 km radius from project site
Railway
Airport
Main watercourse
Town

N

AE1173.1 Peninsula SPS
Figure 6.37. LGAs and major towns within 100 km radius of the project site
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Additional data: NSW RoadSegment, NSW_LGA_POLYGON, NSW_FOI_Transport_Facilities_Airport, NSW Transport Theme - Railway

ACCENT ENVIRONMENTAL

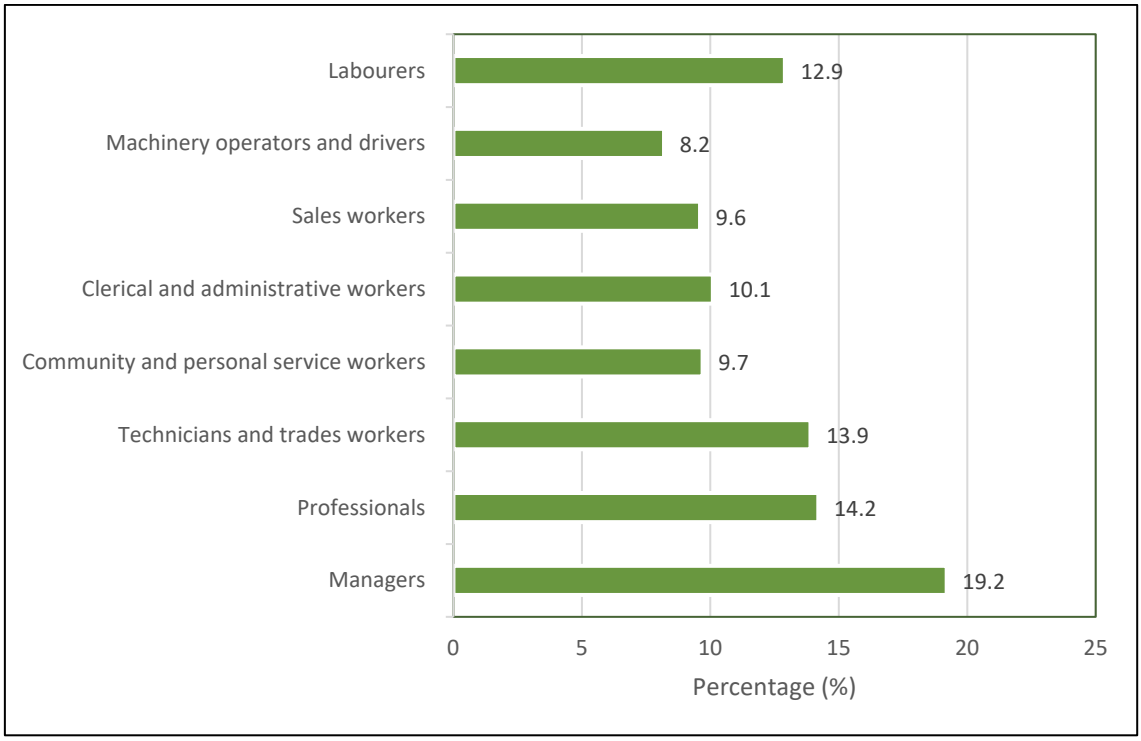


Figure 6.38 Forbes LGA – Occupation of employed persons (ABS 2016a)

In the Parkes, Cowra and Cabonne LGAs, labourers comprise between 10.4% and 15.5% of employed persons, machinery operators and drivers comprise between 6.6% and 10.3% of employed persons, and technicians and trades workers comprise between 13.4% and 14.8% of employed persons (see Figure C in Appendix O).

Figure 6.36 shows that 17.1% of people aged 15 years and over have obtained either a diploma level qualification or a bachelor's degree or above. Education levels in the Cabonne LGA, Parkes and Cowra LGAs are generally comparable to Forbes. However, the Cabonne LGA has a higher proportion (22.9%) of people with either a diploma level qualification (8.6%) or a bachelor's degree and above (14.3%) (see Figure D in Appendix O).

The largest town within the approximately 100 km radius of the project site is Orange, located 108 km to the northeast with a population in 2016 of 38,097. As Orange is a major regional center and likely to be an important supplier of services and potentially labour to the project during construction, a socio-economic snapshot of the City of Orange LGA is provided in Table 6.34 (ABS 2016f).

6.11.4 Impact assessment

PROJECT COMPATIBILITY WITH STRATEGIC PLANS

The compatibility of the project with relevant strategic plans is assessed below. The compatibility with key planning documents was outlined in Section 2.2.

Table 6.34 Social and economic snapshot of the City of Orange LGA

Category	Subcategory	Data
Overall population	-	38,097
Population breakdown	Male	48.4%
	Female	51.6%
	Aboriginal and/or Torres Strait Islander	6.5%
Age	0 to 14 years	21.3%
	More than 65 years	16.7%
	Median age	37 years
Most common occupation	Professionals	21%
	Technicians and trades workers	4.7%
	Clerical and administrative workers	13%
	Community and personal service workers	11.8%
	Labourers	10.8%.
Major industries of employment	Hospitals (except psychiatric hospitals)	6.2%
	Gold ore mining	4.2%
	State government administration	3.4%
	Other social assistance services	3.1%
	Supermarket and grocery stores	2.5%.
Major industry	-	Construction, rental, hiring and real estate services
Rent	Median rent per week	$270

Source: Orange (ABS 2016f)

Community Strategic Plan 2027

The *Forbes Community Strategic Plan 2018 – 2028* (FSC 2018), which was developed by the Council, outlines the future vision and aspirations of the community to assist with long-term planning, prioritisation and decision making within the Forbes Shire community. The plan was developed through extensive engagement and collaboration with the Forbes Shire community and is based on six 'key directions', including community and culture; local economy; natural environment; rural and urban landuse; infrastructure and services; and government and representation.

The project is compatible with these strategies, and in particular with the following:

- Local Economy strategy
  - **LE2** Foster and support the sourcing of local skilled and unskilled labour by public and private sector employers. Compatibility with this strategy is demonstrated by Edify's commitment to sourcing labour and services from the local region.
  - **LE6** Ensure that public and private sector entities and business work co-operatively to strengthen and expand the Shire's economic base. Compatibility with this strategy is demonstrated by Edify's commitment to community and stakeholder liaison in relation to the local economic opportunities generated by the project. The consultation session held in November 2021 specifically targeted community groups in areas including business and agriculture (see Section 5.4.3).
  - **LE7** Promote the Shire as an ideal location for investment and the establishment of innovative, sustainable businesses and light industry. Compatibility with this strategy is demonstrated by the nature of the project.
  - **LE10** *Foster an ethic in community spending to first "try local" when purchasing goods and services*. Compatibility with this strategy is demonstrated by Edify's commitment to prioritising the sourcing of products, services and labour from the local region.
- Natural Environment strategy
  - **NE7** Identify and develop appropriate sustainable energy supply options, such as wind and solar power generation. Compatibility with this strategy is evident by the very nature of the proposed project.

The development of the Peninsula SF is consistent the broad tenure of the Forbes Community Strategic Plan's strategic goals, and in particular with strategies LE2, LE6, LE7, LE10 and NE7.

Central West and Orana Regional Plan 2036

The *Central West and Orana Regional Plan 2036* (CWORP36) provides a 20-year blueprint for the region, setting out the NSW Government's vision for the region's future growth and prosperity, providing certainty and direction for the next 20 years (DPE 2017). This plan sets out four strategic goals for the region, namely, *The most diverse regional economy in NSW* (Goal 1); *A stronger, healthier environment and diverse heritage* (Goal 2); *Quality freight, transport and infrastructure networks* (Goal 3); and *Dynamic, vibrant and healthy communities* (Goal 4). The project is compatible with these goals, and in particular with the following:

- The most diverse regional economy in NSW
  - **Direction 9:** *Increase renewable energy generation.* Compatibility with this goal is evident by the very nature of the proposed project.
- Dynamic, vibrant and healthy communities
  - **Direction 22:** *Manage growth and change in regional cities and strategic and local centres.* As this goal is the growth of regional cities and strategic centres which will encourage future investment, increase housing choices, and diversify industry

and create new job opportunities, the development of the Peninsula SF is compatible with this goal.

The development of the Peninsula SF is consistent with CWORP36's strategic goals more broadly, and in particular, with strategies Direction 9 and Direction 22.

A 20-Year Economic Vision for Regional NSW

The 20-Year Economic Vision for Regional NSW report was developed by the NSW Government in 2018 (NSW Government 2018c). The report brings together long-term and existing strategies including the Future Transport Strategy 2056, NSW State Infrastructure Strategy and regional plans.

A key objective of the document is to:

> "*Accelerate economic growth in key sectors such as agribusiness, tertiary education and health care, taking full advantage of trade and tourism opportunities with Asia to ensure regional NSW continues to play a critical role in the Australian economy."*

The compatibility of the project with the 20-Year Economic Vision document directly relates to one of the 50 new priorities to drive long-term stimulus impact being major investment in REZs such as the nearby Central-West Orana REZ.

The 20-Year Economic Vision document recognises renewable energy as an industry that is driving the economic future of NSW, and that development of regional energy zones would capitalise on the state's energy resources and further attract renewable energy project development.

The project will contribute to this vision by assisting with the economic growth of regional NSW and further encouraging renewable energy project development through its successful operation.

LOCAL COMMUNITY ATTITUDES

As outlined in Chapter 5, feedback on the project has been limited mostly due to the November 2021 flood emergency event in the region curtailing the scheduled community consultation activities. However, the community has been generally supportive.

Although not raised to date, it is likely based on experience from other projects that interest will be expressed during further consultation in issues such as:

- traffic and transport impacts
- noise impacts
- visual impacts
- battery-related hazards
- local benefits, such as employment and commercial opportunities.

These issues have been covered by the EIS (see Sections 6.7, 6.8, 6.9, 6.10 and this chapter, respectively) which will form a suitable basis for further community engagement.

CONSTRUCTION AND DECOMMISSIONING IMPACTS

The project is expected to have a generally positive impact on the local and wider economy during construction (and decommissioning), with adverse impacts being minimal given the temporary (16 months) nature of the construction phase and the implementation of the management and mitigation measures listed in the other sections of Chapter 6. The key potential social and economic impacts (both positive and negative) that are expected to result from construction of the project include:

- increase in local employment, as the project will create direct employment for up to 250 staff and contractors during construction, with most of these drawn from the local area
- creation of approximately five permanent full-time equivalent positions during operation
- increase in local and regional economic activity due to preferentially sourcing project-related materials and services from local providers
- increase in local workforce skills from the training and experience gained working on the project
- stimulation of the local economy through demand for accommodation, hospitality and retail services from additional workers from outside the area
- short-term pressure on local services including accommodation, health services and schools has the potential to increase due to the relocation of construction workers into the area.

Local economic stimulus

Construction of the project will provide immediate social and economic benefits to the local community due to the need of the Engineering, Procurement and Construction (EPC) contractor to establish a workforce with the capabilities required for the different phases of the project, starting with site preparation. Opportunities will exist for a range of personnel, such as:

- managers
- engineers
- technicians
- tradespeople
- machinery operators
- drivers
- labourers
- administrative personnel
- human resources personnel
- consultants.

In particular, large numbers of technicians, tradespeople, machinery operators, drivers and labourers will be required during construction. Edify's policy, to be passed down to the EPC contractor, will be for the project workforce to be preferentially sourced from the local region where the requisite skills and experience exist. As outlined in Section 6.11.3, the Forbes LGA and surrounding LGAs already have strong construction sector experience, and a significant proportion of the workforce is currently working in relevant occupations (e.g. see Figure 6.38).

Some components of project construction are likely to be subcontracted by the EPC contractor to local suppliers, including activities such as:

- earthmoving activities and trenching
- construction of access roads and parking
- electrical services
- construction of management hub area (operation and maintenance building/control building)
- erection of perimeter stock-proof fence and entry gates
- water supply and sanitation
- revegetation, landscaping and weed control.

Edify's policy will also be for local services to be preferentially sourced from the local region.

Indirect, multiplier effects will also flow into local towns and communities from increases in local business activity during construction and, to some extent, operation. When salaries are earned and spent locally, the money can in turn be re-spent locally, raising the overall level of economic activity, paying more salaries, and building the local tax base. For example the 9.6% of people employed as salespeople in the Forbes LGA and the 9.7% employed as community and personal service workers (see Figure 6.38), will likely benefit from a local increase in both population and customers with disposable income during the 16-month construction period.

The project will accordingly increase local employment opportunities and help drive growth in the area, while helping NSW to sustainably meet its energy needs.

Pressure on local services

Pressure on local services has the potential to increase over the construction period due to the relocation of construction workers into the area. Short-term pressure on accommodation, local services such as health facilities, and local traffic, especially if construction of other major proposed developments or events in the region overlap with construction of the Peninsula SF project (see Section 6.13).

In addition to Forbes (population 8,432), accommodation options and services are available in other regional centres within acceptable commuting times of the project site (see Table 6.33). The nearest centres include Grenfell (40 km by road from the site, population 2,573, Cowra (60 km by road from the site, population 9,863 and Canowindra (51 km by road from the site, population 2,258). It is therefore likely that the majority of the workforce can be locally sourced and that major migration into the area can be avoided, reducing risk of pressure on existing accommodation and services.

While the majority of the workforce is likely to be locally sourced, a number of short-term accommodation options are available within the Forbes Shire LGA (and neighbouring LGAs) including hotels, motels, motor inns and caravan parks, indicating that additional construction worker force could be practically accommodated in the town/region. The partial filling of existing accommodation vacancies will be a positive benefit for owners of those businesses and properties.

Impacts during decommissioning are expected to be similar to those outlined above for construction. In addition, local reuse or recycling of infrastructure may provide community and economic benefit.

OPERATION IMPACTS

The key potential social and economic impacts that may result from operation of the project include:

- small (but long-term) increase in local employment as the project will directly employ five full-time equivalent staff to manage the site during operation.
- temporary loss of agricultural land, as outlined in Section 6.5.
- change in visual character of the project site and the rural landscape as outlined in Section 6.9
- potential creation of a local tourist attraction.

6.11.5 Management and mitigation

The following management and mitigation measures will be implemented to minimise the adverse social and economic impacts of the project and maximise project benefits to the community and other stakeholders:

- The Community and Stakeholder Engagement Plan (see Section 5.2) will be progressively implemented and updated by Edify. The plan provides procedures for:
  - informing stakeholders of potential impacts
  - providing project-related updates
  - registering and responding to complaints and feedback.
- Ongoing engagement with the Forbes Shire Council will be undertaken to discuss and resolve any concerns during construction and operation.
- Ongoing engagement with the local business community will be undertaken to discuss and maximise local opportunities for project support.
- An accommodation and employment strategy (AES) will be prepared prior to project construction in consultation with the Forbes Shire Council to:
  - reduce the potential for adverse impacts on local accommodation availability, services or events due to the construction workforce
  - maximise local employment and commercial opportunities.

- Edify is committed to developing an AES, which will:
  - facilitate the accommodation and the workforce associated with the development
  - investigate options for prioritising the employment of local workers for the construction and operation of the development, where feasible
  - include a program to monitor and review the effectiveness of the strategy over the life of the development.
- Local employees, contractors, manufacturing facilities, materials and services will be preferentially engaged during construction and operation, where qualification and experience criteria are met.
- The project website will be maintained during construction and operation and include provision for the community and other stakeholders to submit comment and feedback.
- A stakeholder feedback, complaints and suggestions register will be maintained during construction and operation, including actions responsibilities and timeframes for feedback response.

6.11.6 Conclusion

The social and economic impacts of the project are expected to be positive at a state level in relation to the project's contribution towards the transition to renewable energy, and the level of investment in the State. At a local and regional level, positive impacts will include jobs and commercial opportunities, primarily during construction but to some degree continuing during project operation. These positive impacts will be maximised by the preferential engagement of local workers and service providers. The local region appears well-equipped to provide the needs of the project.

The potential adverse social impacts of the project include impacts during construction on the availability of local accommodation and services, although it is anticipated that most of the workforce will be sourced locally. With the adoption of proposed management and mitigation measures the residual, adverse impacts of the project on accommodation and services are expected to be minor.

6.12 Waste management

The construction, operation and decommissioning of the Peninsula SF project will generate a range of waste streams that will require management. For many of these waste streams (e.g. metals and concrete), mature end markets exist allowing them to be recycled and minimising disposal to landfill. However, the rapid growth of renewable energy projects in recent years had led to the generation of wastes such as solar panels, wind turbine blades and lithium-ion batteries for which re-use and recycling options and markets are currently limited in Australia's domestic. Re-use and recycling of solar and battery modules is a technically and commercially viable and available solution in international markets, which will be considered in conjunction with the evolving recycling capabilities within Australia.

6.12.1 Level of assessment

A ***standard assessment*** of waste management has been undertaken based on review of literature and professional knowledge.

6.12.2 Existing conditions

Resources consumed and potential wastes generated by the project are outlined below.

CONSTRUCTION

The key resources, materials and products to be used for the project during construction will include:

- concrete to provide foundations for the solar panel trackers, BESS units, inverter enclosures and substation
- metal components, including for the solar array piles and framework, for housing the BESS units and inverters, for construction of the substation, and for site buildings
- silica and other minerals as contained in the solar panels
- lithium as contained in lithium-ion batteries
- components of cabling and junction boxes
- electrical conduit materials
- timber for building fit-out
- aggregate for uses such as road base
- steel fencing materials
- steel mounts and bolts
- plastic and masonry products for slabs and footings
- sand for burying cables
- water for cleaning, dust suppression, sanitary facilities and fire preparedness
- fuel, lubricants and oils for motor vehicles, machinery and electrical equipment.

Wastes as a result of construction will include:

- excess building and construction materials, such as offcuts, scrap metals and cabling
- packaging materials such as cardboard, plastic, polystyrene foam, metal strapping and timber pallets
- green waste from vegetation clearance
- bio-wastes from sanitary facilities.

OPERATION

Resource use associated with project operation is likely to be limited to maintenance activities (e.g. replacement of some components), the presence of on-site personnel (e.g. use of office-related products including stationary) and the use of machinery and motor vehicles.

Relatively small quantities of water will be consumed by the project during construction, operation and decommissioning. It is anticipated that 500 kL of water will be used during

operation each year for cleaning, maintenance, and staff amenities. During operation, water use will be offset by the collection of rainwater from building roofs and storage in onsite water storage tanks (e.g. 2 x 35 kL tanks). It is expected that the water used for cleaning and sanitary facilities will also be minimal and sourced from the onsite storage tanks, or delivered to site by a water truck and local contractor as required.

Waste may include replaced components (metals, electrical conduits etc.), green waste from vegetation clearance, bio-waste from on-site sewerage systems, minor waste chemicals or oils, and packaging materials such as cardboard, plastic and timber pallets.

There may also be a need to intermittently replace some solar panels and/or lithium-ion batteries during operation, due to reasons such as hail damage or isolated faults.

DECOMMISSIONING

Above-ground infrastructure and all buried infrastructure up to one metre below the surface of the land will be removed during decommissioning. Edify notes that no infrastructure is anticipated to be buried below 1.0m. The project components listed above under 'Construction' will therefore become waste components during decommissioning.

Resources consumed during decommissioning are likely to include fuels and lubricants used for machinery and vehicles that are used to remove the infrastructure. Water use would be similar to that used in construction.

6.12.3 Methodology

To identify requirements for waste management, NSW waste management legislation, guidelines and policy have been considered.

LEGISLATION, GUIDELINES AND POLICIES

The *Protection of the Environment and Operations Act 2001* (POEO Act) is the overarching waste management legislation in NSW. The Act sets out waste classifications, licensing requirements and other regulatory controls that would be applicable to wastes transported from the solar farm.

The POEO Act provides a framework for waste management in NSW. Under the Act, a licence is required to carry out certain scheduled waste activities and it is an offence to:

- wilfully or negligently dispose of waste likely to cause harm to the environment
- litter.

Schedule 1 of the POEO Act sets out the waste classification which provides the basis for the NSW Waste Classification Guidelines (NSW EPA 2014a).

The Protection of the Environment Operations (Waste) Regulation 2005 (POEO Regulation) prescribes management requirements for certain wastes and provides thresholds for environment protection licences. The regulations also outline the waste levy system, including NSW EPA's requirements for records, surveys and reports.

The POEO Act and POEO Regulation assist in meeting the objectives of the *Waste Avoidance and Resource Recovery Act 2001* (WARR Act). The WARR Act promotes waste avoidance and

resource recovery to reduce waste generation, in accordance with principles of ecologically sustainable development, and describes resource management hierarchy principles.

To ensure resources are used efficiently and adverse impacts to the environment as a result of waste generation are minimised, this chapter considers the following guidelines and strategies:

- EPA's Waste Avoidance and Resource Recovery Strategy 2014-2021 (WARR Strategy) (NSW EPA 2014b)
- EPA's Waste Classification Guidelines (NSW EPA 2014a)
- EPA's Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities 2012 (NSW EPA 2012).

WASTE CLASSIFICATION

The *Waste Classification Guidelines* provide detail on how wastes should be assessed and classified, and management options for their disposal. The guidelines classify waste as follows:

- special waste (e.g. asbestos and tyres)
- liquid waste (e.g. fuels, oils and pesticides)
- hazardous waste (e.g. lead-acid or nickel-cadmium batteries and lead paint)
- restricted solid waste (currently no wastes have been pre-classified by the EPA as 'restricted solid waste')
- general solid waste (putrescible) (e.g. general litter, food waste, green waste, sanitary waste and animal waste)
- general solid waste (non-putrescible) (e.g. building and demolition waste, synthetic fibre waste and wood waste).

Most of the waste resulting from construction would be classified under the POEO Act as 'general solid waste (non-putrescible)'. Other wastes such as bio-wastes would be classed as 'general solid waste (putrescibles)'.

Lithium-ion batteries have not been pre-classified by EPA under the *Waste Classification Guidelines*. However, they are classified as a Dangerous Good under the *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG Code) (National Transport Commision (NTC) 2020) and under the *Consumer Guide to Responsible Recycling of Battery Storage Systems* (Australian Battery Recycling Initiative (ABRI) 2019). The EPA recommends the ABRI be contacted regarding recycling of lithium-ion batteries (NSW EPA 2012).

WASTE MANAGEMENT HIERARCHY

The WARR Act describes the waste management hierarchy (Figure 6.39) which is to govern waste management (NSW EPA 2021a).

A description of the waste management hierarchy is as follows:

- **Avoid and reduce waste**: reduce the quantity of waste being generated.
- **Reuse waste**: reuse a product more than once in its original form for the same or similar use, avoiding the need for reprocessing.

- **Recycle waste**: process waste into a similar non-waste product. This consumes less energy than the production of the non-waste product from raw materials.
- **Recover energy**: convert non-recyclable waste to energy such as heat, electricity or fuel.
- **Treat waste**: use chemical, biological or mechanical processes (e.g. composting) to stabilise wastes, reducing their health and environmental impacts.
- **Disposal of waste**: dispose of waste at appropriately licensed facilities or as required by relevant legislation, regulations of codes of practice.

Figure 6.39 Waste management hierarchy

6.12.4 Impact assessment

CONSTRUCTION AND DECOMMISSIONING

Most of the waste resulting from construction will be building and demolition waste, classified under the POEO Act as 'general solid waste (non-putrescible)'. Many of these wastes, including infrastructure components such as steel or electrical components and concrete, are highly recyclable or reusable and are not expected to require disposal during either construction or decommissioning.

Recycle and reuse (including sale) of the following materials are expected to be possible during decommissioning of the site:

- solar panels
- lithium-ion batteries
- metal components
- electrical conduits
- concrete from project foundations

- timber from buildings
- equipment including DC boxes and junction boxes.

Where a material cannot be recycled or reused, it will be disposed of in accordance with the *Waste Classification Guidelines* (NSW EPA 2014a) (or updated version) to appropriately licensed facilities (see 'waste disposal options' below).

Temporary toilets will be available throughout the construction and decommissioning periods for use by contractors. The toilets will be pumped out by a local, licenced waste contractor.

Edify is committed to recycling the solar panels and the lithium-ion batteries when they have reached the end of their life. Edify also recognises that the recycling technologies and guidelines regarding waste, and in particular solar panels and lithium-ion batteries, are evolving rapidly and commits to investigating appropriate contemporary solutions.

Edify notes that ABRI offers guidance on battery recycling in *Consumer Guide to Responsible Recycling of Battery Storage Systems* (ABRI 2019).

At decommissioning, ABRI (or equivalent) will be consulted in regard to the recycling of lithium-ion batteries, as recommended by the EPA (NSW EPA 2012). Edify notes that the Australian Government is in the process of setting up a Product Stewardship Scheme for Photovoltaic Systems (Department of Agriculture, Water and Energy (DAWE)) and has called for partners to develop and implement an industry-led product stewardship scheme for PV systems (DAWE undated). Edify will consider this scheme (or comparable future schemes) when decommissioning the solar arrays.

It is likely that more mature markets and options for solar panel and lithium-ion battery recycling will exist by the time the majority of panel and battery waste is generated at the end of project life.

OPERATION

During operation, replacement of some components may occur as part of maintenance activities. These wastes are expected to largely comprise steel or electrical components and will be readily recyclable.

Some replacement of the solar panels and/or lithium-ion batteries may be required. The guidance provide above under 'construction and decommissioning' will be considered.

Other wastes generated by the project such as general solid waste (putrescibles) (e.g. food, animal carcasses and green waste from vegetation clearance) and liquid waste (fuel) will be minimal and will be managed in accordance with the *Waste Classification Guidelines*.

Materials that cannot be reused or recycled will be disposed of at an appropriately licensed facility or as required by relevant legislation, regulations of codes of practice.

Sewage generated during operation will be connected to an individual waste tank that is removed and replaced regularly by a licensed operator.

WASTE DISPOSAL OPTIONS

The Forbes Shire Council operates three rural landfill sites and one waste management facility, comprising:

- Daroobalgie Waste Management Facility at Lot 1 Calarie-Daroobalgie Rd, Calarie
- Bedgerabong Landfill, at Darcys Lane, Bedgerabong
- Garema Landfill, at Pinnacle Road, Garema
- Ootha Landfill, at Ootha Road, Ootha (however, access to this landfill is controlled and provided to residents only).

The Daroobalgie Waste Management Facility accepts most types of waste including commercial and industrial, construction and demolition waste. However, the capacity of the Daroobalgie Waste Management Facility is limited, and this will need to be considered when planning for waste disposal.

6.12.5 Management and mitigation

A Waste Management Plan (WMP) will be prepared prior to issue of Construction Certificate in consultation with Forbes Shire Council. The WMP apply to project construction and operation and will detail at a minimum:

- measures to minimise waste, including opportunities to avoid, reuse, recycle, recover, or treat waste
- expected waste outputs in detail, including quantity and classification of expected wastes
- measures to separate waste into appropriate categories on site to allow appropriate disposal
- disposal methods, including which waste facilities they will be transferred to and expected costs and approvals required (noting that the Daroobalgie Waste Management Facility has only limited capacity)
- details of contractor for collection and disposal of waste.

Procedures for waste management during decommissioning (including opportunities for re-use and recycling) will be outlined in a rehabilitation and decommissioning strategy, as outlined in Section 6.14.5.

6.12.6 Conclusion

The project will generate a range of wastes during construction, operation and decommissioning which will be managed as far as practicable in accordance with the waste hierarchy and applicable legislation and guidelines. Many of the wastes generated are expected to be suitable for reuse or recycling. Edify is committed to recycling the solar panels and the lithium-ion batteries used in the project, where recycling opportunities exist, when they have reached the end of their life. Accordingly, no significant environmental impacts are anticipated in relation to waste management and disposal.

6.13 Cumulative impact

As outlined in the *Cumulative Impact Assessment Guidelines for State Significant Projects* (CIA Guidelines) (DPIE 2021h):

> *Cumulative impacts are a result of incremental, sustained and combined effects of human action and natural variations over time and can be both positive and negative. They can be caused by the compounding effects of a single project or multiple projects in an area, and by the accumulation of effects from past, current and future activities as they arise.*

The Peninsula SF project, in combination with other developments in the area, has the potential to cause cumulative impacts.

6.13.1 Level of assessment

A ***standard assessment*** of cumulative impacts has been undertaken based on review of literature and professional knowledge.

6.13.2 Methodology

The CIA was conducted in a manner broadly consistent with a project-level, issue-specific assessment, as outlined in the CIA Guidelines (DPIE 2021h). It therefore "*considers the impacts of the project together with the impacts of other relevant future projects on specific issues within an identified area*".

As set out in the SEARs, the CIA is required to consider cumulative impacts on the specific issues of traffic, land use and noise. The area identified for consideration of these specific issues is:

- site access routes for cumulative traffic impacts
- the land surrounding the project site for cumulative land use impacts
- nearest sensitive receivers and site access routes for cumulative noise impacts.

These areas are considered to represent the likely geographical extent of potential cumulative impacts associated with each issue.

The CIA also considers the potential for cumulative social and economic issues. The area identified for consideration of social and economic impacts is primarily Forbes and other towns within commuting distance of the Peninsula SF project (within approximately a 100 km, as outlined in Section 6.11). Cumulative economic (and to a lesser extent social) impacts also have a State-wide dimension.

The CIA involved a systematic, qualitative assessment as follows:

- identifying other current and reasonably foreseeable projects in the region with the potential for cumulative impacts with the Peninsula SF project
- considering the nature, location and timing of current and reasonably foreseeable projects in the region

- assessing the degree to which cumulative impacts may result in impacts or approach thresholds for environmental or asset protection (e.g. noise criteria, road capacity)
- assessing the potential for project impacts to act cumulatively with other environmental disturbances (e.g. existing energy transmission infrastructure)
- considering ways to manage cumulative impacts if they occur.

6.13.3 Existing conditions

To enable a CIA to be undertaken, current and proposed developments in the region in addition to the Peninsula SF project were identified.

OTHER ENERGY-RELATED SSDs

As outlined in Section 2.4, there are currently eight developed, approved or proposed energy-related SSDs in the Forbes and adjacent LGAs listed on the DPE Major Projects website, in addition to the Peninsula SF (see Table 2.1 and see Figure 2.3). The eight projects are described as follows:

- The 100 MW Daroobalgie Solar Farm has recently completed Public Exhibition for the EIS, which was submitted to NSW DPE in March 2022. The proposal is located 25 km north-northwest of the Peninsula SF. In addition to solar PV infrastructure, the proposal includes battery storage and grid connection.
- The 150 MW Parkes Power Station is a gas-fired power station that was granted development consent in 2008. The project is located approximately 50 km northwest of the Peninsula SF.
- The 160 MW Quorn Park Solar Farm was granted development consent in July 2020 and is located approximately 50 km northwest of the Peninsula SF. In addition to solar PV infrastructure, the proposal includes battery storage and grid connection.
- The 66 MW Parkes Solar Farm has been developed by Neoen and started producing electricity in 2018. The project is located 50 km northwest of the Peninsula SF.
- The 83.7 MW Goonumbla Solar Farm has been developed by FRV. The project comprises approximately 270,000 solar modules and started operating in August 2020. The project is located 50 km northwest of the Peninsula SF.
- The 50 MW Jemalong Solar Farm was originally developed by Vast Solar Pty Ltd and since sold to Genex Power. The project comprises solar PV and grid connection infrastructure, operating since December 2020. The project is located 55 km west-northwest of the Peninsula SF.
- The 48.5 MW Manildra Solar Farm has been developed by New Energy Solar and started producing electricity in 2018. It is located 60 km northeast of the Peninsula SF.
- The 144.4 MW Flyers Creek Wind Farm owned by Iberdrola Australia was granted approval in 2019 and is currently being constructed. The project comprises 38 wind turbines and a grid connection and is located approximately 70 km east of the Peninsula SF.

ENERGY TRANSMISSION INFRASTRUCTURE

The Forbes-Cowra 132 kV Transmission Line (operated by Transgrid) crosses the project site.

TRANSPORT INFRASTRUCTURE

The NSW Government has invested $500 million into upgrading the Newell Highway, which is the major highway in the region and is located approximately 28 km northwest of the project site (see Figure 6.37) (TfNSW 2021b). The highway connects the State's Victorian and Queensland borders and connects numerous towns, including West Wyalong, Forbes and Parkes, and is regarded as the regional economic backbone for freight and livestock transporters, tourism operators, caravanners and holiday makers, emergency services, media and business owners.

The *Newell Highway Corridor Strategy* (TfNSW 2015) sets out how the NSW Government will manage road transport along the Newell Highway in the long-term and will be delivered over a 20-year timeframe. Within the strategy, Forbes is part of 'the Zone 2 – Marsden to Coonabarabran' component.

Nearer to the project site, the NSW Government is providing $250,000 to investigate options for replacing Paytens Bridge with a new concrete bridge. The bridge is located over the Lachlan River on Paytens Bridge Road, 11 km southwest of Eugowra (TfNSW 2021c) and approximately 9 km northeast of the site.

MINERALS/MINING

As outlined in Section 6.5.3 (see Figure 6.9):

- search of DPE's MinView tool identified no mining licences on the project site
- MinView identified six exploration licences within 20 km of the site
- Tastex has an existing mining lease (ML1773) for the Pineleigh Quarry, approximately 500 m west of the site, and has applied for another mining lease (neither of which overlap with the site)
- Tastex has applied for an exploration licence over their quarry and this application (ELA 5983) slightly overlaps with the site
- Another small quarry, Thomas Pit is located just south of the project site and is not currently operating.

There are no other minerals, petroleum or coal exploration titles or applications over the site.

Details of the Pineleigh Quarry and Thomas Pit, other than those presented in Section 6.5.3, are not available. However, neither site is considered to be of anything other than of local significance.

OTHER NON-ENERGY-RELATED SSDs

As outlined in Section 2.4, there are currently two developed, approved or proposed non-energy-related SSDs listed on the DPE Major Projects website in the Forbes LGA and neighbouring LGAs. They are:

- SSD-13855453 – Grenfell Poultry Breeder Farm, located approximately 25 km south of the site (proposed)
- SSD-6107-MOD-2 – Parkes Hospital Redevelopment, located approximately 45 km northwest of site (developed).

6.13.4 Assessment of cumulative risk

POTENTIAL FOR CUMULATIVE INTERACTION WITH OTHER PROJECTS

The potential for cumulative impacts to occur between projects depends on their relative locations and the timing of their development. If two projects are being developed concurrently and there is an overlap between their areas of direct and/or indirect impact (for a specific issue, such as transportation or noise), then the potential for cumulative impacts exists.

Geographic location

The Peninsula SF is located in a relatively isolated location, with Paytens Bridge Road a low volume local road (see Section 6.7). As a result, significant cumulative impacts are only likely to result from project developments located close enough to the project to share the same local access roads, or to generate localised cumulative noise or land impacts. Developments that are further away will have little interaction with the project, except for the sharing of access routes – largely highways and main roads that are designed to accommodate high volumes of heavy and other vehicles – and the potential for cumulative social and economic impacts.

As Forbes is a reasonably large regional centre (population of 8,432 in 2016), it provides an option for projects listed in Section 6.13.3 to provide labour, services and equipment, although it will be in competition with other towns in the region including, the larger Orange (population of 38,097 in 2016). Accordingly, cumulative impacts on traffic or associated noise may result where projects share, in part, the same access routes out of Forbes to their respective sites. This may be the case for the Jemalong and Daroobalgie Solar Farms. However, as both of these projects are located in different directions from Forbes than the Peninsula SF, access routes would quickly diverge.

The Grenfell Poultry Breeder Farm project is located south of the Peninsula SF project and likely to be accessed from Grenfell (further to the south). Traffic to the farm from Forbes would share the Lachlan Valley Way with Peninsula SF traffic for approximately 5 km.

The other projects listed in Section 6.13.3 are likely be accessed from other major towns (i.e. Parkes and Orange) and are considered unlikely to present significant potential for access route conflicts.

The Pineleigh and Thomas Pit quarries are located close to the project site and therefore have some potential for cumulative impacts based on their geographical proximity.

Project timing

Uncertainties exist regarding the timing of the projects listed in Section 6.13.3 in relation to the Peninsula SF project. The greatest potential for cumulative impacts is the concurrent construction of the energy-related SSDs (due to their large scale), and the Peninsula SF project. However, given the uncertainties of project approval, financing, grid connection agreements

and market conditions, the timing associated with energy-related SSDs is particularly uncertain.

TRAFFIC IMPACTS

For energy-related SSDs, traffic during construction is considerably higher than during operation (when traffic is typically minimal in relation to background traffic volumes). Increased traffic volumes during construction of the Peninsula SF project are predicted to be comfortably accommodated with no material impact on the roads (see Section 6.7). It is also highly unlikely that the design capacity of a major highway such as the Newell Highway, Great Western Highway or the Mid-Western Highway will be exceeded even if multiple projects proceed concurrently. However, increased traffic, particularly heavy vehicle traffic, could affect other road users such as by causing safety issues, increased travel times and decreased road amenity. Construction of the Peninsula SF project is anticipated to take around 16 months, so this will be the highest-risk period for traffic-related cumulative impacts.

The increase of traffic on Paytens Bridge Road as a result of the Peninsula SF project during construction could generate potential cumulative impacts with traffic generated from local events, activities, and co-occurring developments. However, Paytens Bridge Road is highly unlikely to be used by any of the projects listed in Section 6.13.3, except for the Pineleigh and Thomas Pit quarries. The two quarries are existing projects and the traffic generated by them has by implication already been accounted for in the existing traffic numbers used in the traffic impact assessment in Section 6.7, which found that traffic impacts would not be significant.

If project components are brought to site from Sydney during construction, the heavy vehicle traffic is likely to use the Great Western Highway. As this is the major road that accesses Central-West NSW, most other major projects in the region are likely to use this route during construction. However, as a major highway, the road is designed to carry high volumes of heavy and other vehicles and no access route conflicts are anticipated.

Road haulage vehicles to the project site are unlikely to transit through Forbes, but will likely access the site from the east, via the Mid-Western Highway from Bathurst and then via Lachlan Valley Way from Cowra. Projects east of the project site, such as the Flyers Creek Wind Farm project, may therefore potentially share site access routes with the Peninsula SF project. Any such overlapping routes are likely to be along main roads or highways roads with minimal risk of access route conflicts.

During project construction, there is also the potential for many of the workforce to be based in Forbes, the nearest major town. The potential for Forbes-based employees and contractors travelling to site during construction to cause road-use conflicts with traffic from other developments is considered minimal. For the Jemalong and Daroobalgie Solar Farms, any sharing of routes from Forbes would likely be confined to a short stretch (<1 km) of the Newel Highway through the township. For the Grenfell Poultry Breeder Farm project, traffic from Forbes would only share the Lachlan Valley Way route with Peninsula SF traffic for approximately 5 km before diverging. The other projects listed in Section 6.13.3 are likely be accessed from other major towns (i.e. Parkes and Orange) and are considered unlikely to present significant access route conflicts.

The risk of cumulative traffic impacts during operation is negligible due to the low number of fulltime equivalent jobs (five) generated by the project, although traffic could temporarily increase during maintenance activities.

The risk of cumulative traffic impacts during decommissioning will be similar to construction and will depend on the timing of decommissioning of the project and the nature of other regional developments at the time. However, infrastructure removal (rather than construction) will result in a shorter duration of works and therefore a reduced potential for cumulative impact.

Cumulative traffic impacts will need to be managed if practicable, in consultation with Council and/or other project proponents, should such impacts be likely to occur during project construction (or decommissioning).

LAND USE IMPACTS

There are no land impacts associated with the Peninsula SF project that are regionally significant (see Section 6.4) and therefore no potential for regional-level cumulative impacts associated with the projects listed in Section 6.13.3.

Cumulative land use impacts are only likely to occur on a local scale where the loss of land associated with the project contributes to a local impact (such as the loss of vegetation of significance, cultural heritage high value agricultural land).

Land clearance during construction of the Peninsula SF project has the potential to result in cumulative impacts on native vegetation and species habitat in conjunction with other land clearance activities occurring in the area. However, disturbance of high value native vegetation associated with the project will be minimal (see Section 6.2). No significant loss of Aboriginal cultural values and archaeological sites or historic heritage sites within the local area is expected to be associated with the Peninsula SF (see Sections 6.3 and 6.4) so there will be no potential for associated cumulative impacts. More than half the site is mapped as either LSC Class 5 (moderate to low) or Class 4 (moderate) capability land, although 46.0% of the site is Class 3 (high) (see Section 6.5). Class 3 land is regionally common along the Lachlan River valley to the north of the site.

The risk of cumulative land use impacts is considered negligible, as the project will only result in a temporary loss of 235 ha of land, that is locally common in nature, during the period of project operations. This temporary loss will be minimised if, as is likely, the site accommodates a co-use agricultural activity (sheep grazing) during operations.

NOISE IMPACTS

Cumulative noise impacts during construction may result from increases in traffic along Paytens Bridge Road and Lachlan Valley Way associated with the Peninsula SF project in combination with other operating projects in the area. However, as outlined above under ‘traffic impacts’, there is minimal risk of access route conflicts and therefore minimal risk of associated cumulative traffic noise increases.

As discussed above, with the exceptions of the two nearby quarries, none of the projects listed in Section 6.13.3 are close enough to the Peninsula SF project to directly generate cumulative noise impacts.

The main potential for cumulative noise impacts is associated with the operation of the two quarries in conjunction with project activities. Both quarries are small and operate only intermittently (see Section 6.5.3). Noise emissions from these sites, when operating, are assumed to be similar to noise emissions from the proposed Peninsula SF project during site preparation works, when excavation and other earth-moving activities will take place. The operation of the quarries is unlikely to contribute significantly to cumulative noise impacts during either the construction, operation or decommissioning of the Peninsula SF.

SOCIAL AND ECONOMIC IMPACTS

Cumulative social and economic impacts (both positive and negative) could occur where the construction of the Peninsula SF project coincides with construction timeframes for other project developments in the region, in particular the large SSD projects or road construction works described in Section 6.13.3. Potential impacts include:

- Short-term pressure on accommodation and local government services (such as health facilities) in local towns due to an influx of construction workers. As Forbes is a medium-sized regional town, it has greater capacity to accommodate construction workers moving into the area than a small town. In addition, it is expected that a significant proportion of the construction workforce for local projects will be sourced from within Forbes and other towns in the area such as Parkes and Cowra, reducing the requirement for external workers. The large regional town of Orange is also within approximately an hour's drive from the site and may also be a source of workers and be capable of accommodating workers for other major projects in the region.
- The diversion of a section of the local workforce to the construction of major projects in the region, such as the Peninsula SF project, could result in labour shortages within local towns, such as Forbes, Parkes and Cowra. However, this would have the positive effect of reducing local unemployment rates.
- Increases in local commercial activities and retail sales due to an influx of construction workers, along with money generated within the local economy due to the employment of local workers and procurement of local services.

Adverse cumulative social or economic impacts, such as pressure on accommodation or services, will need to be managed in consultation with council and/or other project proponents should such impacts occur during the construction (or decommissioning) of the Peninsula SF.

Once construction has been completed, new developments will result in less pronounced but generally positive cumulative socio-economic impacts. Smaller workforces during operations and longer employment timeframes will be more readily accommodated by the community.

The benefits of renewable energy generation and storage in the local (and at a State level), as outlined in Section 2.1, will be further enhanced by having a number of solar and wind farms co-located within the region.

6.13.5 Management and mitigation

Implementation of the management and mitigation measures for each of the forementioned environmental aspects are addressed the relevant sections of this chapter (Chapter 6). It is expected that these measures, if implemented effectively, will minimise the risk of most cumulative impacts during the construction and decommissioning phases of the project.

However, the timing and location of other developments in the region will be monitored by Edify and, if a risk of adverse cumulative impacts during project construction (or decommissioning) is identified, discussions will be held with council and/or other project proponents to consider ways of minimising such impacts (such as cooperation to jointly manage the issue).

The operation of the solar farm will require a workforce of around five full-time equivalent staff. The size of this number is such that no cumulative impact management and mitigation measures are proposed for the operational phase of the project.

6.13.6 Conclusion

The Peninsula SF is located in a relatively isolated location and significant cumulative impacts are therefore only likely to result from project developments located close enough to the project to share the same local access roads, or to generate localised cumulative noise or land impacts. Developments that are further away will have little direct interaction with the project and the main risk is the potential for cumulative social and economic impacts such as the availability of local accommodation and services.

Cumulative impacts are difficult to predict and quantify due to the uncertain timeframes of other potential developments. However, any such impacts associated with the Peninsula SF project will be restricted to the 16-month construction period (and are expected to be manageable in consultation with council), as the potential for cumulative impacts during operations will be negligible.

6.14 Environmental framework

Edify proposes to manage the environmental risks associated with the proposed Peninsula SF by implementing a suite of project-specific management and mitigation measures as detailed in the previous sections of Chapter 6. A statement of commitments is provided in Appendix B.

The project will be constructed and operated in accordance with an EMS to be prepared prior to construction. The EMS will be an umbrella document that describes the framework for environmental management. The strategy will be supported by a series of sub-plans detailing the management of key environmental aspects, such as traffic management, biodiversity management and heritage management.

It is anticipated that the EMS will include sections addressing the following key areas:

- purpose and scope
- statutory requirements
- EMS structure, approval and review
- environmental management framework

- organisational structure, roles and responsibilities
- monitoring, auditing, reporting and review
- community and stakeholder engagement.

The EMS (and sub-plans) will be formally developed during the post-approvals process in consultation with relevant government agencies. The EMS will be a living document that is updated as necessary to incorporate key construction or operational changes.

7 Project justification and evaluation

Consent for a renewable energy project such as the Peninsula SF on rural land can only be provided once the suitability of the site to accommodate the proposed development has been established, having regard to its potential environmental impacts, permissibility, strategic context and existing site constraints. This section provides a justification and evaluation for the project, considering the project's economic, environmental and social impacts as well as the principles of ecologically sustainable development.

7.1 Site selection and project design

Edify has factored environmental considerations into all stages of project development, including the initial selection of the project site and the configuration of project components within the project site.

The region in which the project is located, the Central West region of NSW, has been selected primarily due to its proximity to one of NSW's REZs – the Central-West Orana REZ. Within this region the location of the project site has been constrained by the need to be as close as possible to an existing transmission line with capacity to accept electricity from the solar farm.

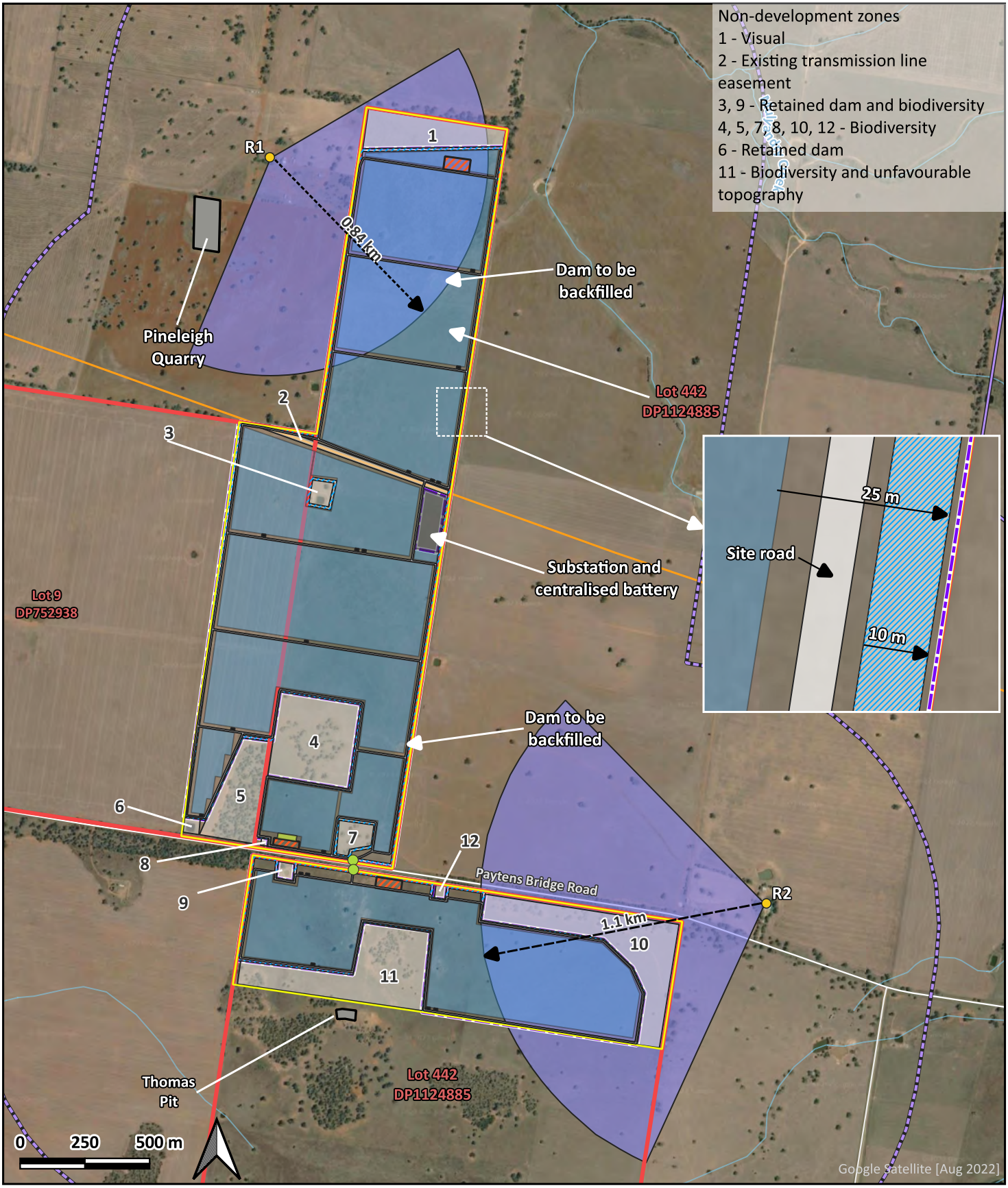
Operating within these constraints, Edify has looked for a site that not only meets construction and operational requirements (such as suitable topography and accessibility by major transport routes) but has low environmental values and limited potential for adverse community impact. The project site meets these selection criteria. In addition, land use conflicts with existing surrounding land uses are minimal (see Section 6.5.5) and agricultural land use is expected to be able to be restored at the end of project life.

A site layout and constraints plan is provided in Figure 7.1 and Figure 7.2, showing the environmental and other constraints which have been accommodated in the siting and design of project facilities (and which will continue to be accounted for during the detailed design process).

As Edify is considering the option of a decentralised BESS configuration where smaller BESS groupings would be distributed around the site, Edify has a degree of flexibility in siting these groupings within the project footprint.

Accordingly, during the EIS study period, potential BESS unit locations were evaluated to establish minimum allowable distances from nearest sensitive receivers, primarily to minimise noise impacts from inverters. No inverters will be located within 0. 84 km of R1 or 1.1 km of R2, as shown on Figure 7.1. These locational constraints will be key inputs to the detailed design phase, should the decentralised BESS configuration be chosen.

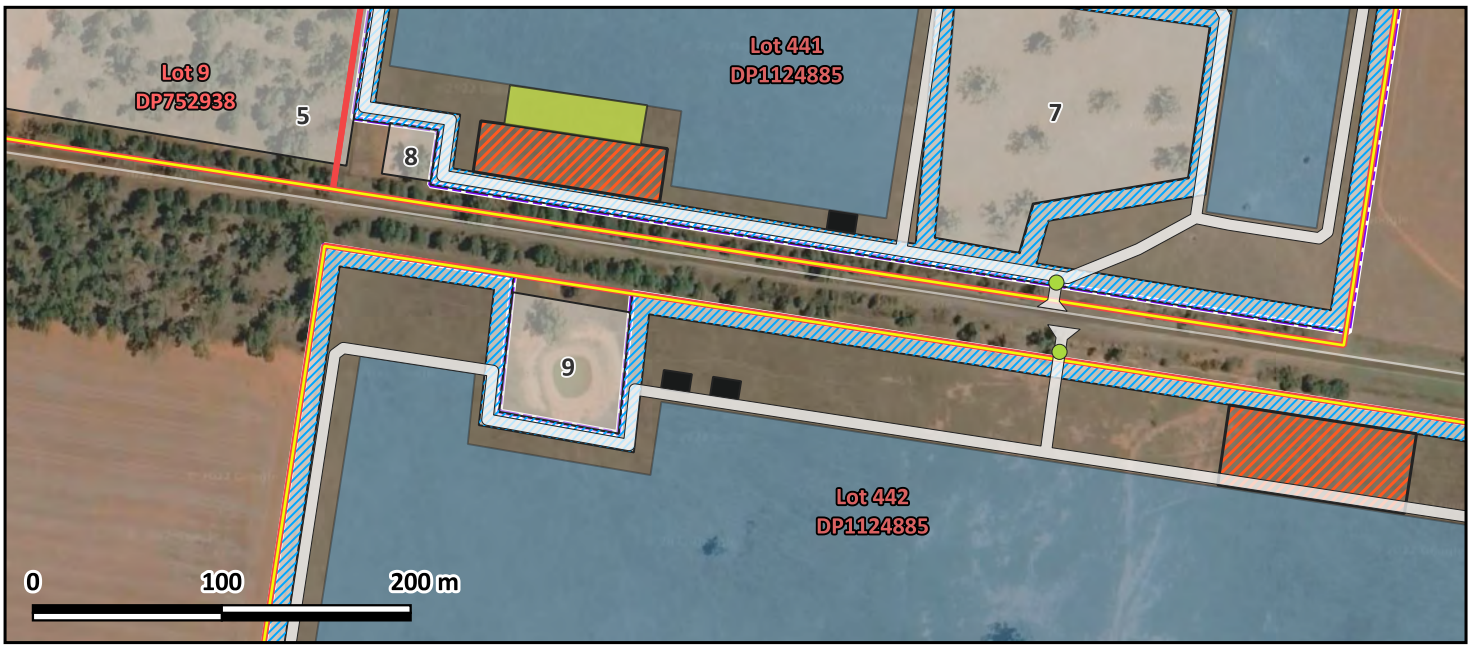
Furthermore, Edify also had some flexibility when choosing the location for the substation (and the centralised BESS option should this be chosen). During the EIS study period, western and eastern locations proximal to the existing 132 kV transmission line were evaluated in relation to noise, potential flood risk, visual impacts and other factors. The eastern substation option has been adopted as the proposed location as it enables noise criteria to be met at the nearest sensitive receivers without the need for mitigation.



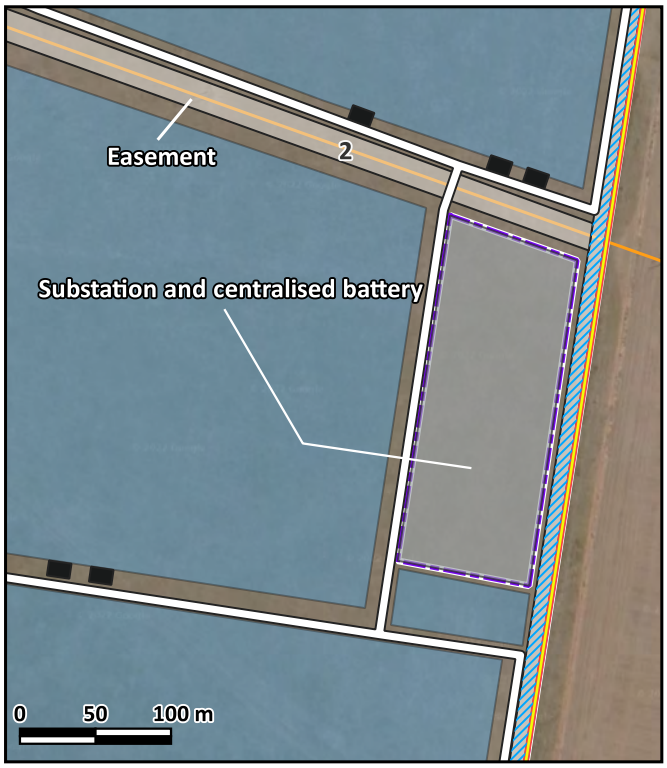
- Project site
- Lot boundary
- Non-development zone
- Asset protection zone
- BESS Enclosure and Power Conversion Unit
- Laydown area
- Operations and maintenance building
- Indicative solar panel extent
- Substation and centralised battery
- Site road
- Access point
- Site security fence
- Non-associated residence
- Existing transmission line
- Quarry
- 1 km radius from project site
- Watercourse - tributary

AE1173.1 Peninsula SF
Figure 7.1. Site layout and constraints map
Created: 18/08/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4
Additional data: NSW RoadSegment, NSW Hydroline, NSW ElectricityTransmissionLine, NSW bl_titlePolygon, MinView Min_occ_all_construction, NSW Six cadastral data

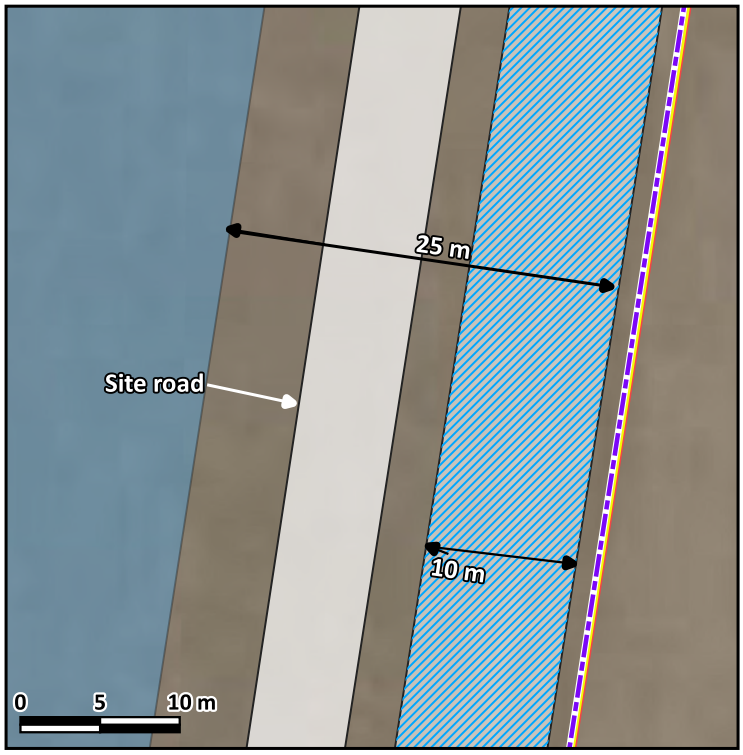
ACCENT ENVIRONMENTAL



Northern and southern site entry detail



Substation and centralised battery detail



Site perimeter detail

- Project site
- Lot boundary
- Non-development zone
- Asset protection zone
- BESS Enclosure and Power Conversion Unit
- Laydown area
- Operations and maintenance building
- Indicative solar panel extent
- Substation and centralised battery
- Site road
- Access point
- Site security fence
- Existing transmission line
- Watercourse - tributary

N

Non-development zones:
2 - Existing transmission line easement
5, 7, 8 - Biodiversity
9 - Retained dam and biodiversity

AE1173.1 Peninsula SF
Figure 7.2. Proposed site layout - detail
Created: 18/08/2022
CRS: GDA 1994 MGA Zone 55
Page size: A4
Basemap: Google Satellite [Aug 2022]
Additional data: NSW RoadSegment, NSW ElectricityTransmissionLine

ACCENT ENVIRONMENTAL

Edify also recognised that the location of some of the solar infrastructure at the northernmost portion of the site could visually impact on the nearest residence, R1, and impact on a vegetation community and threatened species. Accordingly, after assessing the visual impact and meeting with the landholder, Edify decided not to develop a section of Lot 441 to minimise visual impacts on that sensitive receiver; and following the biodiversity surveys to minimise impacts on native vegetation by excluding development along part of the eastern fenceline at the northern end of Lot 441.

Additional areas within the project site were excluded from development, primarily to avoid impacts on areas of biodiversity value such as the remnant vegetation patches identified in the BDAR (see Section 6.2. In total twelve non-development zones have been designated within the project site, as shown in Figure 7.1. No project infrastructure will be located within these zones, other than perimeter fencing.

Based on the PHA, in the absence of hazard mitigation measures, the site configuration also currently assumes a minimum separation distance of 25 m between BESS units and the site boundary. The project design also assumes that a 10 m-wide asset protection zone (APZ) will be required around the project infrastructure. Other than a perimeter road, no infrastructure will be located within the APZ.

The selection of BESS technology during the detailed design phase will provide a further opportunity to reduce environmental risk. The controls and safeguards that the BESS units are equipped with, or that are added by Edify, will be an important design consideration. Such measures are likely to include ventilation systems and fire prevention or control features and are expected to enable the 25 m separation distance between BESS units and the site boundary to be reduced.

Various site access route options were evaluated. Rail was considered a safer and more efficient option than long distance haulage for transporting project components into the region (to a rail siding at Forbes) during construction. Road haulage to site from Forbes via Lachlan Valley Way and Paytens Bridge Road is the preferred option as it minimises the use of local roads and involves fewer intersections.

7.2 Consistency with strategic context

7.2.1 Ecologically sustainable development

ESD CONTEXT AND PRINCIPLES

Ecologically Sustainable Development (ESD) is the integration of environmental, social and economic considerations in policy development and decision-making processes. In 1991, the Australian Government defined ESD as:

> "*using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased*".

In 1992, the Australian Government endorsed *The National Strategy for Ecologically Sustainable Development* (1992). The strategy aims to provide governments with a framework for policy development and decision-making in Australia using ESD principles, particularly in

relation to industry sectors that rely on utilisation of natural resources (ESDSC 1992). Australia's national goal of ESD is (Ecologically Sustainable Development Steering Committee (ESDSC) 1992):

> "*Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends."*

Schedule 2, Section 7, subclause 1f of the *Environmental Planning and Assessment Regulation 2000* requires the EIS to include justifications for the development, with regard to biophysical, economic and social considerations, including the principles of ESD set out in subclause 4.

Subclause 4 lists the four principles of ESD as follows:

> *"a)* ***the precautionary principle****, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by:*
>
> > *i. careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
> >
> > *ii. an assessment of the risk-weighted consequences of various options,*
>
> *b)* ***inter-generational equity****, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,*
>
> *c)* ***conservation of biological diversity and ecological integrity****, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration,*
>
> *d)* ***improved valuation, pricing and incentive mechanisms****, namely, that environmental factors should be included in the valuation of assets and services, such as:*
>
> > *i. polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*
> >
> > *ii. the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*
> >
> > *iii. environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms, that enable those"*

The project is consistent with these principles as outlined below.

PRECAUTIONARY PRINCIPLE

The precautionary principle has been adopted by undertaking technical assessments of various project options to ensure serious or irreversible damage to the environment is avoided. The resultant project design has resulted in a project that is expected to have minimal impact on the environment. The management and mitigation measures proposed in this EIS have been

prepared by environmental specialists and as required by the precautionary principle, are conservative where uncertainty exists over the extent of potential impact. For example:

- Where threatened species surveys have been unable to be conducted within optimal seasonal timeframes, the BDAR has assumed that they are present on site (see Section 6.2).
- Although only one site of Aboriginal cultural heritage significance was identified within the project site, an unanticipated finds protocol will be implemented during project construction (see Section 6.3).
- In the absence of background noise monitoring, the noise assessment has made conservative assumptions about background noise levels (see Section 6.8).
- Uncertainty over BESS technology selection and risk mitigation controls has resulted in conservative separation distances being proposed in the PHA (see Section 6.10).

The project is therefore consistent with the precautionary principle.

INTER-GENERATIONAL EQUITY

The project is consistent with the principle of inter-generational equity. The project will assist in the transitioning to renewables by addressing intermittent renewable supply and in doing so helping to reduce climate change impacts, which will contribute to positive environmental and social outcomes for future generations. With the project's battery energy storage system able to provide stability to the grid, additional renewable energy projects will be able to access the grid, enhancing the capacity of future generations to generate energy. Once the site is decommissioned, it can be returned to primary production. Additionally, during the operational life of the project, it is likely the site will accommodate a co-use agricultural activity (sheep grazing) allowing for ongoing primary production for both current and future generations.

CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY

The project site is located on agricultural land that has been largely cleared of native vegetation. A BDAR has been prepared by a qualified specialist to identify existing ecological values of the site and potential project-related impacts. This assessment identified one threatened species, which although not found on the project site, was conservatively assumed to be present. Overall, the development assessment found that the project will have no significant impact on biodiversity or ecological integrity. Unavoidable impacts will be managed appropriately (see Section 6.2.6).

CARBON DIOXIDE EMISSION REDUCTION

Carbon dioxide (CO_2) is a significant contributor to greenhouse gas emissions and the power generated by the project is predicted to contribute 226,320 tonnes of saved CO_2 emissions per annum.

IMPROVED VALUATION, PRICING AND INCENTIVE MECHANISMS

This principle places a monetary value on the environment to reduce future exploitation. The energy generation plus battery energy storage system will be capable of producing enough energy to support more than 60,000 households at peak hours, or when there is an absence of

generation. This project collects and stores electricity from a renewable source (solar panels) that utilises a natural environmental resource, the sun's energy, to produce electricity.

The removal of native vegetation on the project site will require an offset in accordance with the NSW Biodiversity Offsets Policy for Major Projects, which will fund biological conservation activities. Offsetting is a means of placing monetary value on the environment to provide incentive for improved biodiversity outcomes.

The polluter pays principle will also apply to waste generated by the project that is required to be disposed of at registered landfill, by the payment of landfill levies.

7.2.2 Transition to renewables

The project demonstrates consistency with government strategic objectives in relation to the transition from fossil fuel-based energy generation to renewable energy, which was initially driven primarily by climate change response and the need to reduce GHG emissions but is also now market driven due to the decreasing costs of renewable energy (see Section 2.2).

The contribution of 80 MW solar energy generation capacity to the grid is significant, as is the addition of 80 MW/160 MWh storage capacity. It is primarily through the addition of multiple, utility-scale renewable energy projects that the existing reliance on electricity from GHG-intensive, large-scale coal-fired power stations can be overcome.

As the grid connects more renewables generation such as wind and solar, concerns about the effect of intermittent renewable generation on power system security need to be addressed. A review of the reliability and security in the National Electricity Market (NEM) was undertaken following the South Australia black-out which led to the National Energy Guarantee (NEG) being developed by the Energy Security Board. One aspect of the NEG focused on a reliability guarantee to ensure energy is always available. Whilst the NEG itself has stalled as a legislative mechanism, the overarching goals of Energy Security Board endure as they continue to implement market reforms based on a recognition that dispatchable generation, whether as 'firming' and 'peaking' services, will form a core part of the energy policy at the federal level (AEMO 2020).

Specifically, the proposed BESS incorporated into the solar farm will provide reliability and security to the NEM by storing energy for dispatching when it is most required (i.e. when the demand is high). As Network Service Providers face challenges in managing load flows to maintain network stability, combined energy generation and energy storage becomes vital as it provides flexibility that renewable generation alone does not.

The Peninsula SF project therefore supports strategic objectives at three levels of government (see Section 2.2):

- At a federal level, the project supports:
  - the Australian government's recent commitment to achieve net zero GHG emissions by 2050 (DISER 2021)
  - the RET scheme which has mandated the use of energy from renewable resources and will continue to require high-energy users to meet their obligations under the policy until 2030 (CEC 2018).

- At a state level, the project supports the NSW government's commitments to deliver:
  - a 35% cut in emissions by 2030 under its Net Zero Plan Stage 1: 2020-2030 (DPIE 2020b)
  - 12 GW of network capacity within the five declared REZs, including replacing retiring generators (such as the Liddell coal-fired power station). The Peninsula SF is located in close proximity to the Central-West Orana REZ.
- At a council level, the project is consistent with the Forbes Shire Council's:
  - *Forbes DCP 2013* which seeks to encourage site responsive development, reflecting the opportunities and constraints and preserving or enhancing its special qualities, whilst ensuring development is consistent and compatible with the established streetscape and character (FSC 2014).
  - *Community Strategic Plan 2018-2028* which places a strong emphasis on promoting renewable energy (FSC 2018).

7.2.3 Consistency with land use planning requirements

The project is consistent with land use planning requirements at both a state and council level:

- The Transport and Infrastructure SEPP allows for the development, with consent, of electricity generating works in a prescribed rural zone (see Section 4.3).
- The project is consistent with the aims of the Forbes Shire LEP 2013, particularly in relation to promoting ecologically sustainable urban and rural development (see Section 2.2).

Although the project site is in a prescribed rural zone and requires consent, the use of the site for electricity generation and storage is consistent with the current presence on the project site of the 132 kV transmission line. It is anticipated that the site can be rehabilitated back to agricultural use at the end of project life, meaning that the change in land use is temporary. Also it is important to note that during the operational life of the project, it is likely the site will accommodate a co-use agricultural activity (sheep grazing) which is consistent with activities allowable in a rural zone.

7.2.4 Consistency with regional plans

The project is consistent with the objectives of the Central West and Orana Regional Plan 2036, in particular the development of a strong and dynamic regional economy and strong infrastructure networks for a connected future and the growth of the region as the renewable energy hub of NSW (see Section 2.2).

The project is also consistent with the 20-Year Economic Vision for Regional NSW (NSW Government 2018c) which recognises renewable energy as an industry that is driving the economic future of NSW, and that development of regional energy zones would capitalise on the state's energy resources and further attract renewable energy project development (see Section 6.11.4).

7.3 Compliance with statutory requirements

Through appropriate design and site selection and the adoption of the management and mitigation measures set out in Chapter 6 and compiled in Appendix B, the project is able to demonstrate compliance with statutory requirements.

The permissibility of the project has been described in Section 4.3 and other statutory requirements are considered to be achievable, as outlined in Sections 4.4 to 4.6, Chapter 6 and Appendix C.

The project is consistent with the following applicable SEPPs and the Forbes LEP and DCP:

- *State Environmental Planning Policy (Planning Systems) 2021*: The project has been classified as an SSD under this SEPP. This EIS has been prepared in accordance with the SEARs to enable the assessment of the project consistent with the requirements of the SEPP.
- *State Environmental Planning Policy (Transport and Infrastructure) 2021*: The permissibility of the project relies on consent to allow electricity generating works on land zoned as RU1 Primary Production. Such a change in land use is prohibited under the Forbes LEP 2013 but permissible under the Transport and Infrastructure SEPP (see Section 4.3).
- *State Environment Planning Policy (Resilience and Hazards) 2021*: The classification of the project in relation to hazardous and offensive development has been considered in the PHA (see Section 6.10) and appropriate management and mitigation measures have been proposed. Feasible alternatives to the project have been considered in Section 2.6. Consideration of the potential for site contamination has been undertaken to meet the requirements of Chapter 4.6(1) of Resilience and Hazards SEPP (see Section 6.5).
- *State Environmental Planning Policy (Primary Production) 2021*: The significance of the agricultural land within the project site has been assessed and considered.
- *Forbes LEP and Forbes DCP.* The EIS has considered the requirements of the Forbes LEP 2013 and Forbes DCP 2013 (see Section 2.2).

The project is considered to satisfy the pre-conditions for consent set out in Table 4.2. This document fulfils the requirement for an EIS to be prepared for an SSD under Section 4.12 of the EP&A Act and a BDAR has been prepared in accordance with Part 7.9 of the *Biodiversity Conservation Act 2016.* Consideration of the potential for site contamination has been undertaken consistent with Resilience and Hazards SEPP.

7.4 Community considerations

The community consultation undertaken by Edify has focussed primarily on potentially affected landholders within 1 km of the project. Feedback on the project has been limited (primarily due to the November 2021 flood emergency event in the region curtailing the scheduled community consultation activities) but broadly supportive. The resident at R1 has

indicated to Edify they are not supportive, although Edify has modified the design of the project to limit its impact on R1 (see Section 5.3).

Based on experience from other projects, it is anticipated that interest will emerge concerning issues such as visual and noise impacts, traffic and transport impacts, battery-related hazards, and employment and commercial opportunities. Edify will work with the community to address such issues (see Section 6.11.5).

The project is consistent with a number of community outcomes as described in the *Forbes Community Strategic Plan 2018 – 2028* (FSC 2018), including the promotion of sustainable businesses, identifying and developing appropriate sustainable energy supply options, living to protect and support environment, heritage and resources (see Section 6.11.4).

7.5 Scale and nature of impacts

The land being disturbed is not regionally or locally unique and is surrounded by comparable land in terms of topography, hydrology, soils, vegetation and land use. At the end of the project life, it is expected that rehabilitation will enable the return of the land to its current agricultural use. The project therefore involves the temporary loss of 290 ha of agricultural land within a broad and consistent landscape. This temporary loss will be minimised if, as is likely, the site accommodates a co-use agricultural activity (sheep grazing) during operations.

The subject land does not contain land identified on the Biodiversity Values Map (BV Map). The nearest land mapped on the BV Map is located along Mulyandry Creek (approximately 580 m to the north at its nearest point to the site area).

The project site has been subjected to extensive historical clearing, and non-development zones have been designated by Edify within the project site to exclude most of the remaining native vegetation from project-related disturbance. Consequently, biodiversity impacts have been substantially reduced through careful site selection and design. Vegetation to be disturbed consists primarily of isolated paddock trees, derived grassland and non-native vegetation.

Due to the largely cleared nature of the project site and the approach being successfully implemented by Edify to avoid, minimise and mitigate disturbance (including proposed offsetting), impacts on biodiversity as a result of the project are expected to be relatively minor compared with many comparably sized projects.

The project will have an impact to Aboriginal cultural heritage values as one Aboriginal site was recorded. This artefact was identified to have high social or cultural value but low archaeological/scientific and aesthetic value and nil historical value. The artefact will be retrieved following project approval and moved to a location where it will not be impacted by the project. The project is not expected to result in any significant impacts on historic heritage. One item of historic heritage identified during the assessment was assessed as having no historic heritage significance under the current Heritage NSW guidelines and the Burra Charter.

Impacts on soils, land use and agriculture are expected to be minor, largely confined to the disturbance areas of the project site, and largely reversible, provided that the proposed land management measures, including erosion controls, are effective. The LSC of more than half the

project site is not high, being rated as Class 5 (moderate to low) or Class 4 (moderate), although 46.0% is Class 3 (high). The nearest BSAL is located approximately 70 km southeast of the site.

Changes to site hydrology will be minor and reversible, although runoff controls will be required to minimise erosion risk. No impacts on groundwater are anticipated and risks to water quality are expected to be readily manageable. Modelling indicates that the project site will have no impact on flooding, as the footprint is located on the floodplain where velocity is low. Water use during construction and operation will be minor, with water supplied from off site.

Paytens Bridge Road in the vicinity of the project site may experience an increase in traffic volumes of up to 20% during the peak construction period. This additional traffic can be comfortably accommodated on Paytens Bridge Road without any material impact on the operation or safety of this road, although some road maintenance may be required. No turn treatments are considered to be required at the site access points to accommodate construction traffic and no line of site issues were identified. A BAR treatment is proposed at the intersection of Lachlan Valley Way / Paytens Bridge Road.

Noise levels during construction are predicted to comply with noise criteria. Increases in traffic noise will be minor and not require mitigation. Noise during operation is predicted to comply with noise criteria provided that the eastern substation option is adopted and inverters are located greater than the specified minimum distances from receivers. Vibration impacts during construction and operation are expected to be negligible.

The project facilities are expected to be visible from the surrounds of three nearby sensitive receivers (residences R1, R2 and R4). However, visual impacts from within the residential compounds are expected to be negligible, provided that development is excluded, as proposed, from the northernmost area of the site (non-development zone 1). Visual impacts from local roads will be moderate to low and no mitigation proposed.

The PHA has shown that risks to the public associated with the operation of the solar farm (including the BESS units), such as the potential for fire, can be effectively managed by establishing appropriate separation distances between the battery enclosures and the site boundary.

It is expected that bushfire risk can be effectively managed by implementing appropriate fire prevention and control measures in consultation with FR NSW and the NSW RFS.

The project will generate a range of wastes, many of which are expected to be suitable for reuse or recycling. Edify is committed to recycling the solar panels and the lithium-ion batteries used in the project when they have reached their end-of-life.

The social and economic impacts of the project are expected to be positive at a state level in relation to the transition to renewable energy, and the level of investment. At a local and regional level, positive impacts will include jobs and commercial opportunities (particularly during construction), and the multiplier effect that is the additional economic benefit accrued to the area from money being spent in the local economy. Potential adverse social impacts include reduced availability of local accommodation and services during construction due to a proportion of the workforce moving into the Forbes region from other locations.

Cumulative impacts on aspects such as land use, noise and traffic are difficult to predict and quantify due to the uncertain timeframes of other potential developments in the region. However such impacts will be restricted to the short-term, construction period given that the potential for cumulative impacts during operations will be negligible.

7.6 Compliance monitoring

Once the project is approved, compliance with the conditions of consent relevant to environmental management will be monitored by a compliance monitoring and reporting program, consistent with the requirements of *Compliance Reporting Post Approval Requirements* (DPIE 2018) (or equivalent document if updated), as outlined below.

A compliance monitoring and reporting schedule will be prepared describing the required frequency of compliance monitoring and reporting (e.g. pre-construction, construction, pre-operation, operation, decommissioning).

A compliance table will be prepared that:

- identifies the requirements in all conditions of consent that must be complied with during each phase of the development, including those of relevance to environmental management
- describes the compliance monitoring methodology that must be used to assess compliance with each compliance requirement
- describes the type of data or evidence that is to be collected to assess whether compliance has been achieved.

Edify, or its Agent/s, will develop an EMS and associated sub-plans, which will outline how those conditions in the compliance table that are relevant to environmental management will be implemented. A program of internal and external environmental compliance audits will be implemented to review conformance with the compliance table and the EMS.

Compliance reports will be submitted to DPE in accordance with the agreed monitoring and reporting schedule.

7.7 Uncertainties

There are a number of uncertainties in relation to the project with potential environmental implications.

The decision whether to proceed with a centralised or decentralised BESS option has implications for environmental aspects such as noise management, visual impacts, and hazard and risk management. The EIS has taken both options into consideration, with the impact assessment and proposed management measures assuming the highest level of potential impact presented by the two options in relation to each environmental aspect. However, the decision will have implications for the development of detailed environmental management plans and mitigation measures during the pre-construction phase.

The selection of BESS technology has not yet been made, along with the associated application of recognised standards and performance-based solutions to minimise fire and other risks.

Once determined, and subject to the outcomes of the project's detailed design and Construction Environment Management Plan., these separation distances will be able to be reduced substantially. This uncertainty will be resolved during the procurement process and detailed design phase and implications for compliance with project consent will be discussed with DPE.

The requirements for fire prevention, protection and access by emergency services vehicles may also have implications for the project configuration. This will be discussed with FR NSW and NSW RFS during the detailed design phase. Proposed changes to project configuration with implications for compliance with project consent will be discussed with DPE.

The BDAR and associated offset calculations currently assume that the threatened Large-eared Pied Bat is present on site. However, the results of survey analysis are pending and could determine that the bat is unlikely to be present on site. This could result in a request by Edify to re-do and resubmit the BAM calculations to reduce offset requirements.

7.8 Project benefits

The benefits of the Peninsula SF project are expected to include:

- providing renewable generating capacity to the electricity grid
- providing reliability and security to the electricity grid
- providing firming capacity in the transition to renewable energy from fossil fuel generation
- employment opportunities, mainly during construction, including engagement of local contractors and materials and service providers
- increasing the capacity and experience of local workforce, contractors and service providers
- direct local investment via a Community Benefit Fund
- local business stimulus.

7.9 Assessment summary

A summary of the assessment studies for the EIS is provided in Table 7.1. The summary sets out, for each matter assessed:

- the level of assessment (detailed or standard) – see definitions in Section 6.1.2
- whether a consideration of cumulative impacts in relation to the matter is included in the CIA
- the nature of stakeholder engagement (i.e. whether specific engagement in relation to the matter has been undertaken, or whether the matter has been covered as part of general EIS engagement
- key government plans, policies and guidelines that has been considered
- cross-refence to the section of this EIS report where the matter has been discussed.

Table 7.1 Assessment summary table

Matter	Level of assessment	CIA	Engagement	Relevant government plans, policies and guidelines	EIS report reference
Biodiversity	Detailed	No	General	• *Atlas of Groundwater Dependent Ecosystems* (BOM 2021c) • *Biodiversity Assessment Method* (DPIE 2020e) and related BAM guidance documents and BAM Calculator • *Biogeographic Regionalisation of Australia* (IBRA) (Thackway and Cresswell 1995) • *NSW Biodiversity Offsets Scheme (BOS)* (NSW Office of Environment & Heritage 2017) • *Matters of National Environmental Significance, Significant impact guidelines 1.1,* Environment Protection and Biodiversity Conservation Act 1999 (DoE 2013)	Section 6.2
Heritage – Aboriginal and historic cultural heritage	Detailed	No	Specific	• *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010, Part 6 National Parks and Wildlife Act 1974* (DECCW 2010b) • *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW, Part 6 National Parks and Wildlife Act 1974* (OEH 2011) • *Historical Archaeology Code of Practice* (Heritage Council 2006)	Section 6.3 and Section 6.4
Land use and capability	Standard	Yes	General	• Safeguarding our Agricultural Land portal (DPIE 2021c) • *Land Use Conflict Risk Assessment Guide* (DPI 2011)	Section 6.5

Matter	Level of assessment	CIA	Engagement	Relevant government plans, policies and guidelines	EIS report reference
				• *The land and soil capability assessment scheme: second approximation – A general rural land evaluation system for NSW* (OEH 2012) • *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom 2004)	
Watercourses and hydrology (including flood risk)	Standard (Detailed for flood risk)	No	General	• *Atlas of Groundwater Dependent Ecosystems* (BOM 2021b) • *National Code of Practice NOHSC:2017(2001)* (NOHSC 2001) • *Managing Urban Stormwater: Soils and Construction Volume 1* (Landcom 2004)	Section 6.6
Traffic and transport	Detailed	Yes	Specific	• *AustRoads Guide to Road Design* (AustRoads 2017)	Section 6.7
Noise	Detailed	No	General	• *Interim Construction Noise Guideline* (DECC 2009) • *Noise Policy for Industry* (NSW EPA 2017) • *Construction Noise and Vibration Guideline – August 2016* (RMS 2016)	Section 6.8
Visual amenity	Detailed	No	Specific	• *Guideline for landscape character and visual impact assessment* (TfNSW 2020a) • *Beyond the Pavement 2020: Urban design approach and procedures for road and maritime infrastructure planning, design and construction* (TfNSW 2020b) • *Draft Large-Scale Solar Energy Guideline* (Appendix A) (DPIE 2021f)	Section 6.9

Matter	Level of assessment	CIA	Engagement	Relevant government plans, policies and guidelines	EIS report reference
Hazards	Detailed	No	General	• *Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis* (DoP 2011a) • *Assessment Guideline – Multi-Level Risk Assessment* (DoP 2011b) • *Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning guidance* (DoP 2011c) • *Hazardous Industry Planning Advisory Paper No 4 – Risk Criteria for Land Use Safety Planning guidance* (DoP 2011d) • *Non-Ionizing Radiation Protection Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields* (ICNIRP 1998) • *Planning for Bush Fire Protection 2019 - A guide for councils, planners, fire authorities and developers* (NSW RFS 2019)	Section 6.10
Social and economic	Standard	Yes	Specific	• *Social Impact Assessment Guidelines for State Significant Projects* (DPIE 2021g)	Section 6.11
Waste management	Standard	No	General	• *Waste Classification Guidelines*. Part 1: Classifying Waste (NSW EPA 2014a) • *Waste Avoidance and Resource Recovery Strategy 2014-2021* (NSW EPA 2014b) • *Better Practice Guidelines for Waste Management and Recycling in Commercial and Industrial Facilities* (NSW EPA 2012)	Section 6.12

Matter	Level of assessment	CIA	Engagement	Relevant government plans, policies and guidelines	EIS report reference
				• *Australian Code for the Transport of Dangerous Goods by Road and Rail* (ADG Code) (NTC 2020) • *Consumer Guide to Responsible Recycling of Battery Storage Systems* (ABRI 2019)	
Cumulative impact assessment	Standard	-	General	• *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPIE 2021h)	As relevant, above

7.10 Conclusion

The project is expected to be a relatively low impact development compared with many renewable energy SSDs due to:

- the project's location in an area that has been heavily disturbed by agricultural and grazing activities
- the relatively low value of more than half the agricultural land within the project site (LSC classes 4 and 5), although 46.0% is mapped as LSC Class 3
- the small number of potentially affected sensitive receivers
- the exclusion of key areas of biodiversity value from the development footprint
- the location of the project adjacent to existing electrical infrastructure
- the project's distance from areas of high environmental sensitivity.

The operation of the solar farm will require very little handling of hazardous materials and will generate very little hazardous pollution or waste, other than the eventual removal of the solar panels and lithium-ion batteries at the end of their operational life, which are likely to return precious and high value materials for re-use or repurposing.

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Appendix A:
SEARs and agency inputs

Table A1 Secretary's Environmental Assessment Requirements

Secretary's Environmental Assessment Requirements	Section in EIS
General Requirements	
The environmental impact statement (EIS) must comply with the requirements of Schedule 2 of the Environmental Planning and Assessment Regulation 2000 (the Regulation).	Whole EIS document
In particular, the EIS must include:	
• a stand-alone executive summary	See separate Project Summary document
• A full description of the development, including: – details of construction, operation and decommissioning – site plan showing all infrastructure and facilities (including any infrastructure that would be required for the development, but the subject of a separate approvals process) – detailed constraints map identifying the key environmental and other land use constraints that have informed the final design of the development.	Section 3: Project description
• a strategic justification of the development focusing on site selection and the suitability of the proposed site with respect to potential land use conflicts with existing and future surrounding land uses (including other proposed or approved solar farms such as Quorn Park Solar Farm, Daroobalgie Solar Farm, wind farms, rural residential development and subdivision potential).	Section 6.5: Land, Section 7: Project justification and evaluation
• an assessment of the likely impacts of the development on the environment, focusing on the specific issues identified below, including: – a description of the existing environment likely to be affected by the development – an assessment of the likely impacts of all stages of the development, (which is commensurate with the level of impact), including any cumulative impacts of the site	Section 2.3: Key features of the site, Section 6: Assessment and mitigation of impacts

Secretary's Environmental Assessment Requirements	Section in EIS
and existing, approved or proposed developments in the region and impacts on the site and any road upgrades, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice	Section 6.13: Cumulative impacts
– a description of the measures that would be implemented to avoid, mitigate and/or offset the impacts of the development (including draft management plans for specific issues as identified below); and	Section 6: Assessment and mitigation of impacts
– a description of the measures that would be implemented to monitor and report on the environmental performance of the development.	Section 6: Assessment and mitigation of impacts
• a consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments in the EIS; and the reasons why the development should be approved having regard to:	Section 6.14: Environmental framework, Appendix N: Statement of Commitments
– relevant matters for consideration under the Environmental **Planning and Assessment Act** 1979, including the objects of the Act and how the principles of ecologically sustainable development have been incorporated in the design, construction and ongoing operations of the development	Section 7.2: Consistency with strategic context
– the suitability of the site with respect to potential land use conflicts with existing and future surrounding land uses; and	Section 6.5: Land
– feasible alternatives to the development (and its key components), including the consequences of not carrying out the development.	Section 2.6: Alternatives considered
• **a detailed consideration of the capability of the project to contribute to the security and reliability of the electricity system in the National Electricity Market, having regard to local system conditions and the Department's guidance on the matter; and**	Section 7.2: Consistency with strategic context
• a detailed evaluation of the merits of the project as a whole.	At front of EIS
The EIS must also be accompanied by a report from a suitably qualified person, providing:	Appendix A

Secretary's Environmental Assessment Requirements	Section in EIS
• a detailed calculation of the capital investment value (CIV) (as defined in clause 3 of the Regulation) of the proposal, including details of all assumptions and components from which the CIV calculation is derived; and • certification that the information provided is accurate at the date of preparation. The development application must be accompanied by the consent in writing of the owner/s of the land (as required in clause 49(1)(b) of the Regulation).	Submitted with the development application
Specific issues	
The EIS must address the following specific issues:	Section 6: Assessment and mitigation of impacts
Biodiversity – including: • an assessment of the biodiversity values and the likely biodiversity impacts of the project in accordance with Section 7.9 of the ***Biodiversity Conservation Act 2016 (NSW)***, the Biodiversity Assessment Method (BAM) and documented in a Biodiversity Development Assessment Report (BDAR), unless BCS and DPIE determine the proposed development is not likely to have any significant impacts on biodiversity **values** • the BDAR must document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM • if an offset is required, details of the measures proposed to address the offset obligation; and • an assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the ***Fisheries Management Act 1994***, and a description of the measures to minimise and rehabilitate impacts**.**	Section 6.2: Biodiversity
Heritage – including: • including an assessment of the likely Aboriginal and historic heritage (cultural and archaeological) impacts of the development and consultation with the local Aboriginal community in accordance with the ***Aboriginal Cultural Heritage Consultation Requirements for Proponents*****.**	Section 6.3: Aboriginal cultural heritage and Section 6.4: Historic heritage

Secretary's Environmental Assessment Requirements	Section in EIS
Land – including: • an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including: – a consideration of agricultural land, flood prone land, Crown lands (including Crown Roads), mining, quarries, mineral or petroleum rights (including current and prospective exploration licences) – a soil survey to determine the soil characteristics and consider the potential for erosion to occur – a cumulative impact assessment of nearby developments. • an assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including: – consideration of the zoning provisions applying to the land, including subdivision – completion of a Land Use Conflict Risk Assessment in accordance with the Department of Industry's Land Use Conflict Risk Assessment Guide; and – assessment of impact on agricultural resources and agricultural production on the site and region.	Section 4.3: Permissibility, Section 6.5: Land Section 6.5: Land Section 6.13: Cumulative impacts Section 6.5: Soils and land use
Visual - including a detailed assessment of the likely visual impacts (including any glare, reflectivity and night lighting) of all components of the project (including arrays, transmission lines, substations and any other ancillary infrastructure) on surrounding residences and key locations, scenic or significant vistas, air traffic and road corridors in the public domain and provide details of measures to mitigate and/or manage potential impacts (including a draft landscaping plan for on-site perimeter planting, with evidence it has been developed in consultation with affected landowners)	Section 6.9: Visual amenity

Secretary's Environmental Assessment Requirements	Section in EIS
Noise - including an assessment of the construction noise impacts of the development in accordance with the ***Interim Construction Noise Guideline*** (ICNG), operational noise impacts in accordance with the ***NSW Noise Policy for Industry*** (2017), cumulative noise impacts (considering other developments in the area), and a draft noise management plan if the assessment shows construction noise is likely to exceed applicable criteria;	Section 6.8: Noise and vibration, Section 6.13: Cumulative impacts
Transport – including: • an assessment of the peak and average traffic generation, including over-dimensional vehicles and construction worker transportation • an assessment of the likely transport impacts to the site access route (including, but not limited to, Paytens Bridge Road, New Grenfell Road, Lachlan Valley Way, Hume Highway, the Newell Highway and the Stockinbingal-Parkes railway line), site access point(s), any Crown land, particularly in relation to the capacity and condition of the roads, road safety and intersection performance • a cumulative impact assessment of traffic from nearby developments; and • provide details of measures to mitigate and / or manage potential impacts including a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road and rail authorities (if required).	Section 6.7: Traffic and transport Section 6.13: Cumulative impacts
Water – including: • an assessment of the likely impacts of the development (including flooding) on surface water and groundwater resources and other watercourses traversing or surrounding the site (including Mulyandry Creek), drainage channels, wetlands, riparian land, farm dams, groundwater dependent ecosystems and acid sulfate soils, related infrastructure, adjacent licensed water users and basic landholder rights, and measures proposed to monitor, reduce and mitigate these impacts	Section 6.6: Water

Secretary's Environmental Assessment Requirements	Section in EIS
• details of water requirements and supply arrangements for construction and operation; and • a description of the erosion and sediment control measures that would be implemented to mitigate any impacts under Managing Urban Stormwater: Soils & Construction (Landcom 2004)**.**	
Hazards - including: • **a Preliminary Hazard Analysis (PHA) must be prepared by the *Hazardous Industry Planning Advisory Paper*** *No. 6 – Guideline for Hazard Analysis* **(DoP 2011) and *Multi-Level Risk Assessment* (DoP 2011); and** • an assessment of potential hazards and risks including but not limited to bushfires, spontaneous ignition, electromagnetic fields or the proposed grid connection infrastructure against the ***International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields*****.**	Section 6.10: Hazards
Socio-Economic – including an assessment of the likely impacts on the local community, any demands on Council infrastructure and a consideration of the construction workforce accommodation	Section 6.11: Socio-economic
Waste – identify, quantify and classify the likely waste stream to be generated during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste.	Section 6.12: Waste management
Plans and Documents	
The EIS must include all relevant plans, architectural drawings, diagrams and relevant documentation required under Schedule 1 of the Regulation. Provide these as part of the EIS rather than as separate documents.	Whole EIS document

Secretary's Environmental Assessment Requirements	Section in EIS
In addition, the EIS must include high-quality files of maps and figures of the subject site and proposal.	
Legislation, Policies & Guidelines	
The assessment of the key issues listed above must consider relevant guidelines, policies, and plans as identified.	Whole EIS document
Consultation	
During the preparation of the EIS, you should consult with relevant local, State or Commonwealth Government authorities, infrastructure and service providers, community groups, affected landowners and any exploration licence and/or mineral title holders In particular, you must undertake detailed consultation with affected landowners surrounding the development and Forbes Shire Council The EIS must describe the consultation process and the issues raised and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, a short explanation should be provided.	Section 5: Community engagement and Appendix D: Community and stakeholder engagement
References	
The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. A list of some of the legislation, policies and guidelines that may be relevant to the assessment of the project can be found at: • https://www.planningportal.nsw.gov.au/major-projects/assessment/policies-and-guidelines; and • http://www.environment.gov.au/epbc/publications#assessments	Whole EIS document
Further consultation after 2 years	

Secretary's Environmental Assessment Requirements	Section in EIS
If you do not lodge a Development Application and EIS for the development within 2 years of the issue date of these SEARs, you must consult further with the Planning Secretary in relation to the preparation of the EIS.	EIS document supports development application within the timeframe

Table A2 Agency advice

Agency	Key issue raised	Section in EIS
Department of Planning, Industry and Environment-Water and the Natural Resources Access Regulator	• A description of the watercourses located within the vicinity of the development, including Strahler Stream Order as mapped by Spatial Services NS, and appropriate riparian setbacks in accordance with the Guidelines for riparian corridors on waterfront land. (http://www.water.nsw.gov.au/__data/assets/pdf_file/0004/547222/licensing_approvals_controlled_activities_riparian_corridors.pdf). • Details of water supply requirements and arrangements for the life of the project (both construction and operation) • An assessment of the likely impacts (including flooding) on surface water and groundwater resources* and measures proposed to monitor, reduce and mitigate these impacts • A description of erosion and sediment control measures to mitigate any impacts in accordance with Managing Urban Stormwater: Soils & Construction (Landcom 2004) • The proponent documents and addresses any sedimentation issues, through the development of an Erosion and Sediment Control Plan, in consultation with DPIE Water • Consideration of any relevant legislation, policies and guidelines, including the NSW Aquifer Interference Policy (2012), the Guidelines for Controlled Activities on Waterfront Land (2018) and the relevant Water Sharing Plans (available at https://www.industry.nsw.gov.au/water).	Section 6.6: Water
Department of Planning, Industry and Environment	The Biodiversity, Conservation and Science Directorate (BCS) recommends the EIS needs to appropriately address the following:	

Agency	Key issue raised	Section in EIS
	1. Biodiversity and offsetting 2. Water and soils 3. Flooding	
	Biodiversity • Biodiversity impacts related to the proposed development will be assessed by Section 7.9 of the Biodiversity Conservation Act 2016, the Biodiversity Assessment Method, and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the *Biodiversity Conservation Act 2016* (s6.12), *Biodiversity Conservation Regulation 2017* (s6.8), and BAM unless the Department determine that the proposed development is not likely to have any significant impacts on biodiversity values • The BDAR must document the application of the avoid, minimise, and offset framework, including assessing all direct, indirect, uncertain and prescribed impacts in accordance with the BAM • The BDAR must include details of the measures proposed to address the offset obligation as follows: – the total number and classes of biodiversity credits required to be retired for the development/project – the number and classes of like-for-like biodiversity credits proposed to be retired – the number and classes of biodiversity credits proposed to be retired by the variation rules – any proposal to fund a biodiversity conservation action – any proposal to conduct ecological rehabilitation (if a mining project)	Section 6.2: Biodiversity and Appendix F: BDAR

Agency	Key issue raised	Section in EIS
	– any proposal to make a payment to the Biodiversity Conservation Fund. • If seeking approval to use the various rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits • The BDAR must be submitted with all spatial data associated with the survey and assessment as per Appendix 11 of the BAM • The BDAR must be prepared by a person accredited in accordance with the Accreditation Scheme for the Application of the Biodiversity Assessment Method Order 2017 under s6.10 of the Biodiversity Conservation Act 2016.	
	Water and Soils • The EIS must map the following features relevant to water and soils including: – acid sulphate soils (Class 1, 2, 3 or 4 on the Acid Sulfate Soil Planning Map) – rivers, streams, wetlands, estuaries (as described in s4.2 of the BAM – wetlands as described in s4.2 of the BAM – groundwater – groundwater dependent ecosystems – proposed intake and discharge locations. • The EIS must describe background conditions for any water resource likely to be affected by the development, including: – existing surface and groundwater – hydrology, including volume, frequency and quality of discharges at proposed intake and discharge locations	Section 6.6: Water Section 6.5: Land

Agency	Key issue raised	Section in EIS
	– Water Quality Objectives (as endorsed by the NSW Government) including groundwater as appropriate that represent the community's uses and values for the receiving waters – indicators and trigger values/criteria for the environmental values identified at (c) in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and/or local objectives, criteria or targets endorsed by the NSW Government – *Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions*. • The EIS must assess the impacts of the development on water quality, including: – The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the development protects the Water Quality Objectives where they are currently being achieved and contributes towards the achievement of the Water Quality Objectives over time where they are now not being fulfilled. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction – Identification of proposed monitoring of water quality. • The EIS must assess the impact of the development on hydrology, including: – water balance including quantity, quality and source – effects to downstream rivers, wetlands, estuaries, marine waters and floodplain areas – effects to downstream water-dependent fauna and flora including groundwater-dependent ecosystems	

Agency	Key issue raised	Section in EIS
	– impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches) – changes to environmental water availability, both regulated/licensed and unregulated/rules-based sources of such water – mitigating effects of proposed stormwater and wastewater management during and after construction on hydrological attributes such as volumes, flow rates, management methods and re-use options – identification of proposed monitoring of hydrological attributes.	
	Flooding • The EIS must map the following features relevant to flooding as described in the Floodplain Development Manual 2005, including: – flood prone land – flood planning area, the area below the flood planning level – hydraulic categorisation (floodways and flood storage areas) – flood hazard. • The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 5% Annual Exceedance Probability (AEP), 1% AEP, flood levels and the probable maximum flood, or an equivalent extreme event • The EIS must model the effect of the proposed development (including fill) on the flood behaviour under the following scenarios: – current flood behaviour for a range of design events as identified in 14 above. This includes the 0.5% and 0.2% AEP year flood events as	Section 6.6: Water and Appendix i: Flood impact

Agency	Key issue raised	Section in EIS
	proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change. • Modelling in the EIS must consider and document: – existing council flood studies in the area and examine consistency to the flood behaviour documented in these studies – the impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood, or an equivalent extreme flood – impacts of the development on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazard categories and hydraulic categories – relevant provisions of the *NSW Floodplain Development Manual 2005*. • The EIS must assess the impacts on the proposed development on flood behaviour, including: – whether there will be detrimental increases in the potential flood affectation of other properties, assets and infrastructure – consistency with Council floodplain risk management plans – consistency with any Rural Floodplain Management Plans – compatibility with the flood hazard of the land – compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land – whether there will be an adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site	

Agency	Key issue raised	Section in EIS
	– whether there will be a direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses – any impacts the development may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the NSW SES and Council – whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the NSW SES and Council – emergency management, evacuation and access, and contingency measures for the development considering the full range of flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of the Council and the NSW SES – any impacts the development may have on the social and economic costs to the community as a consequence of flooding.	
Transport for NSW	Suitable qualified person/s prepare traffic impact assessment (TIA) according to the *Austroads Guide to Traffic Management Part 12*, Roads and Maritime's Supplements to Austroads and the RTA Guide to Traffic Generating Developments. The TIA is to address the following: • Road transport volumes and vehicle types broken down into: o Hours and days of construction. o Schedule for phasing/staging of the project. o Heavy vehicle traffic (heavy rigid and articulated vehicles including over dimensional vehicles and construction worker transportation) • The origin, destination and routes for:	Section 6.7: Traffic and transport Appendix J: Traffic impact Appendix N: Statement of Commitments

Agency	Key issue raised	Section in EIS
	o Employee and contractor light traffic. o Heavy vehicle traffic. (Heavy rigid and articulated vehicles) o Over size and over mass traffic. (including over dimensional vehicles) • Travel/ haulage routes inclusive of the materials, volumes to be transported along each route including haulage volumes and materials to be transported by rail via the Stockinbingal-Parkes railway line. • The impact of traffic generation on the public road network and measures employed to ensure traffic efficiency and road safety during construction, operation and decommissioning of the project including, but not limited to, Paytens Bridge Road, New Grenfell Road, Lachlan Valley Way, Hume Highway and the Newell Highway), site access point(s), any Crown land, particularly in relation to the capacity and condition of the roads, road safety, intersection performance including the safety of vulnerable road users. • The need for improvements to the road network, and the improvements proposed such as road widening and intersection treatments, to cater for and to mitigate the impact of project-related traffic including a schedule of all required road upgrades (including resulting from heavy vehicle and over mass / over dimensional traffic haulage routes), road maintenance contributions, and any other traffic control measures, developed in consultation with the relevant road and rail authorities (if required). • Provide details of the use of rail transport for moving construction materials and equipment, the number of train paths (or rail wagons) required on a typical construction day and assess the potential impact on these activities on the proposed intermodal precinct (staging areas and sidings) and the road routes that serve them. • It is noted haulage routes will include the Newell Highway (HW17) and The Lachlan Valley Way (MR56), both State classified roads. Consideration will	

Agency	Key issue raised	Section in EIS
	need to be given to the traffic volumes and potential implications at these intersections with the local road network. • Local climate conditions that may affect road safety for vehicles used during construction, operation and decommissioning of the project (e.g. fog, flooding, wet and dry weather, etc.) • Haulage times/scheduling should consider the cumulative impacts of any surrounding development • The total traffic impact of existing and proposed development on the road network with consideration inclusive of: – existing background traffic – project-related traffic throughout each stage including construction, operation and decommissioning – projected cumulative traffic volumes and the potential impact between each stage of the project. • The volume and distribution of traffic generated by the proposed development, inclusive of: – ratio of project light vehicles to heavy vehicles – peak times for existing traffic – peak times for project-related traffic – transportation hours. • Impact of project related traffic with any rail interfaces • The layout of the internal road network, parking facilities and infrastructure within the project boundary • Impacts of road traffic noise and dust generated along the primary haulage route/s	

Agency	Key issue raised	Section in EIS
	• Consideration for the preparation of a Traffic Management Plan that incorporates the matters identified within the attached appendix • Consideration for the preparation of a Driver Code of Conduct for all project employees, including but not be limited to: – a map of the primary haulage routes highlighting critical locations – safety initiatives for haulage through residential areas and/or avoidance during school zone hours or local school bus pick up / drop off locations times – consideration of the use of shuttle buses to transport employees to and from site – an induction process for vehicle operators and regular toolbox meetings – a complaint resolution and disciplinary procedure – any community consultation measures for peak haulage periods – local climatic conditions that may impact road safety of employees – throughout all project phases (e.g. fog, wet and significant dry, dusty weather).	
Forbes Shire Council	**Workers Accommodation** The applicant is to provide details in the EIS of proposed worker accommodation. Council notes that there are currently several large-scale developments in and around the Forbes Shire which have led to a severe rental shortage. The applicant is to provide sound solutions for the accommodation of workers, which may include: • Evidence of prior booking of accommodation within the area during expected construction period	Section 6.11: Social and Economic Section 6.13: Cumulative Appendix N: Statement of Commitments

Agency	Key issue raised	Section in EIS
	• Commitment to ensure a large portion of employees are local residents (Council recommends at least 50% plus 10% of the workforce being trainees/apprentices) • Share of accommodation in surrounding towns (in consultation with relevant Councils). Development should be considerate of other major projects within or near the shire to ensure cumulative impacts of the developments do not further hinder the availability of rental accommodation. **Traffic and Transport** The EIS should include the following details surrounding traffic and transport: • The origin, number, size, frequency and destination of vehicles accessing/exiting the site • Details of routes taken by workers and heavy vehicles respectively • Loads, weights and lengths of haulage and construction related vehicles and the number of movements of such vehicles • Existing background traffic, peak hour volumes and types and their interaction with projected development related traffic • The management and coordination of construction and staff vehicle movements to the site and measures to limit disruption to other motorists: – Council has a strong preference to the use of shuttle buses for staff to minimize impact and will recommend that this be a condition of consent unless sound demonstration of an alternative is provided • Scheduling of haulage vehicle movements to minimize convoy length or platoons	Section 6.7: Traffic and Transport

Agency	Key issue raised	Section in EIS
	• Details of intersection improvement works in accordance with *Austroads Guide to Road Design* • Local climate conditions that may affect road safety for vehicles during construction, operation and decommissioning of the project (e.g. flooding) Should there be any infrastructure proposed to be in Councils road reserve a license from Council will be required. **Waste Management Plan** As part of the EIS, Council requests that the applicant provide details surrounding expected waste outputs and disposal methods. A further waste management plan should be created prior to issue of Construction Certificate in consultation with Forbes Shire Council that details, at a minimum: • Measures to minimize waste, including any possible recycling inputs • Measures to separate waste into appropriate categories on site to allow appropriate disposal • Expected waste outputs in detail, including quantity and classification of expected wastes • Disposal methods, including which waste facilities they will be transferred to and expected costs and approvals required • Details of contractor for collection and disposal of waste Please note that the only landfill in Forbes Shire Council area that is licensed to accept commercial waste is the Daroobalgie Waste Management Facility. Daroobalgie Waste Management Facility capacity is limited and the Waste Management Plan should detail quantities to ensure that it can be accommodated.	Section 6.12: Waste

Agency	Key issue raised	Section in EIS
	Remediation Details surrounding expected level of remediation should be provided in the EIS. Council expects that the land should be remediated to an appropriate level for rural-residential use in accordance with the objectives for the zone (RU1 Primary Production)	Section 6.14: Decommissioning
NSW Department of Regional NSW – Mining, Exploration and Geoscience (MEG)	MEG requests the proponent be required to check for new mineral and energy titles that may be granted (at a later date) in the vicinity of the subject site (including areas proposed for electricity transmission infrastructure and transmission lines) during project planning to ensure that other stakeholders (such as title holders) with interest in the area are aware of the solar farm project. We also request to be consulted on the location of any biodiversity offset areas (both on and off site) or any supplementary biodiversity measures to ensure there is no consequent reduction in access to prospective land for mineral exploration, or potential for sterilisation of mineral or extractive resources.	Section 6.5: Land
TransGrid	TransGrid requests that the proponent: • Include details of how they would connect to TransGrid's 330kV Substation Include details of how they would connect to the network (Transmission Line 998) • Include the connection to Line 998 in their development footprint, including new transmission line (overhead or underground), substation, BESS and access roads, and provide TransGrid with shapefiles, where required) • Undertake any necessary environmental assessments (Ecology, Heritage, Visual, EMF, Noise etc.) and obtain the required approval(s) for this connection • Ensure appropriate setbacks and APZ (as appropriated) from TransGrid's transmission line 998 are included in the proposed EIS • Ensure appropriate setbacks from TransGrid's Tamworth 330kV Substation, APZs and all associated transmission lines are included in the proposed EIS.	Whole EIS document

Agency	Key issue raised	Section in EIS
Heritage NSW	• The EIS must identify and describe the Aboriginal cultural heritage values that exist across the whole area that will be affected by the development and document these in an Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation. The identification of cultural heritage values must be conducted in accordance with the *Code of Practice for Archaeological Investigation in NSW* (DECCW 2010) and be guided by the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011) • Consultation with Aboriginal people must be undertaken and documented in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW 2010). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR • Impacts on Aboriginal cultural heritage values are to be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to Heritage NSW • The assessment of Aboriginal cultural heritage values must include a surface survey undertaken by a qualified archaeologist. The surface survey results inform the need for targeted test excavation to assess better the integrity, extent, distribution, nature, and overall significance of the archaeological record. The results of surface surveys and test excavations are to be documented in the ACHAR • The ACHAR must outline procedures to be followed if Aboriginal objects are found at any stage of the project's life to formulate appropriate measures to manage unforeseen impacts	Section 6.3: Aboriginal cultural heritage Section 6.4: Historic heritage

Agency	Key issue raised	Section in EIS
	• The ACHAR must outline procedures to be followed in the event Aboriginal burials, or skeletal material is uncovered during construction to formulate appropriate measures to manage the impacts to this material.	
NSW Department of Primary Industries (NSW DPI) Agriculture	**Site Suitability** • Include a Land Use Conflict Risk Assessment (LUCRA) to identify potential land use conflict with sensitive receptors including surrounding agricultural land uses. The LUCRA is to address separation distances and management practices to minimise odour, dust and noise impacts. A LUCRA is described in the DPI Land Use Conflict Risk Assessment Guide • Include a map to scale showing the above operational and infrastructure details including separation distances from sensitive receptors including agricultural land uses. **Consideration of impacts on agricultural resources and land** Characteristics of Agricultural Land • Describe the soil, slope, land capability, agricultural productivity, land characteristics and the history of agricultural land uses on the proposed development site • Describe the current and historical agricultural land uses on surrounding land in the locality including the land capability and agricultural productivity of the surrounding land. Impacts on Agricultural Land, Resources and Land Uses • Detail the potential impacts from the proposed development on agricultural land and agricultural land uses on the site and in the locality • Detail the location and areas of land to be temporarily removed from agricultural use, and those areas which are to be returned to agricultural use on completion of the development	Section 6.5: Land

Agency	Key issue raised	Section in EIS
	• Consider possible cumulative impacts on surrounding agricultural enterprises and landholders • Assess impacts on agricultural support services, processing and value adding industries. Measures to mitigate impacts on Agricultural land • Demonstrate that all significant impacts on current and potential agricultural developments and resources can be reasonably avoided or adequately mitigated • Detail the expected life span of the proposed development • Detail the proposed strategies to manage impacts on agricultural aerial spraying in the area • Detail considerations for potential land sharing with agriculture. **Suitable and secure water supply** • Detail the estimated water demand and water availability and the source of water and any sanitisation methods proposed • Outline any impacts to water use for agriculture and measures to mitigate against these impacts. **Biosecurity** • Include a biosecurity (pests, weeds and disease) risk assessment outlining the likely plant, animal and community risks. The relevant weed or pest animals for a region are addressed in the regional plans or strategies issued by NSW Local Lands Services	Section 6.6: Water Section 6.2: Biodiversity

Agency	Key issue raised	Section in EIS
	• Include details of how the proposal will deal with identified biosecurity risks as well as contingency plans for any failures. Include monitoring and mitigation measures for weed and pest management.	
	Traffic movements • Detail the volume and route of traffic movements for the proposed development and how potential impacts on surrounding agricultural land uses are proposed to be mitigated (e.g. noise, dust, volume of traffic). This should include consideration of Travelling Stock Reserves (TSR) and the movement of livestock or farm vehicles along / across the affected roads.	Section 6.7: Traffic and Transport
	Land stewardship • Describe the final proposed land use and land form once the life of the proposed development has ceased and rehabilitation has been completed • Detail the proposed rehabilitation and decommissioning/closure measures to achieve this land use including the expected timeline for the rehabilitation program. It is expected that the rehabilitation measures will include, but not be limited to removal of all above and below ground infrastructure and will be in accordance with State Environmental Planning Policy No 55 - Remediation of Land • Outline the monitoring and mitigation measures to be adopted for rehabilitation remedial actions • Provide details of any proposed earthworks including proposed, an assessment of the overall footprint where the natural contours of the land will be modified, the total amount of material involved, how any stockpiled material will be managed and outline of how this material will or will not be used for rehabilitation purposes	Section 6.14: Decommissioning

Agency	Key issue raised	Section in EIS
	• Provide a complete soil survey, undertaken prior to works commencing, as a benchmark for rehabilitation • Detail the cropping history or capability for cropping of the land and how the proposed rehabilitation works will enable this land to be used for cropping in the future. This detail is expected to require that for land with a cropping history or soil capability of category 1 to 3 in accordance with The land and soil capability assessment scheme: second approximation (OEH), cables/pipes are to be buried at a depth of greater than 500mm below the finished surface level to allow agricultural activities to continue over the top, particularly for non-decommissioning cables/pipes once restoration is complete • Where the land contains sodic soils detail the proposed management practices which should ensure than any trenching through sodic soils during construction is to include soil amendment with Gypsum at a minimum rate of 10t/ha (actual rates to be determined following soil testing (Clay content, ECEC and EC)).	
	Community Consultation • Consult with the owners / managers of affected and adjoining neighbours and agricultural operations in a timely and appropriate manner about; the proposal, the likely impacts and suitable mitigation measures or compensation	Section 5: Community Consultation
	Emergency Management • The proposal is to detail contingency plans to enable the operation to deal with emergency situations. The proposal is to detail Emergency Management procedures and responsibilities for responding to bushfire threats and possible mass mortality events which might result from extreme climatic conditions, routine or emergency animal disease outbreaks.	Appendix N: Statement of Commitments

Agency	Key issue raised	Section in EIS
Unnamed	**Hazards and Risks** • The EIS must include a preliminary hazard analysis (PHA) for the battery energy storage system (BESS) prepared in accordance with the Department's Hazardous Industry Planning Advisory Paper No. 6, 'Hazard Analysis' (HIPAP 6) and MultiLevel Risk Assessment (MLRA). • The PHA must also identify and confirm all risk sources of gas explosion to or from the development and assess these risks accordingly. • Guidance for BESS-related PHAs • In preparing the PHA, we expect the Applicant to consider recent developments in research and standards for BESS, ensuring that fire risks from these BESS have been appropriately considered in designing the SSD. Of particular note (not exhaustive) are: – NFPA 855 – AS 5139 – EC 62897 – UL 9540 – UL 9540A – FM Global – DS 5-33; and – FM Global's Development of Sprinkler Protection Guidance for Lithium Ion Based Energy Storage Systems. s. • Where certain aspects of the scope or requirements from the above publications may not align exactly, reasonable best practice should be considered in the designing the BESS while taking into account the principles from these publications. As such, the PHA should be prepared by a suitable specialist, ensuring appropriate technical judgement is taken in view of the above publications or reasonable best practice. Of particular importance is	Section 6.10: Hazards Appendix M: PHA

Agency	Key issue raised	Section in EIS
	verification that the proposed BESS capacity would be able to fit within the land area designated for the BESS while taking into account separation distances between: – BESS sub-units (racks, modules, enclosures, etc.) ensuring that a fire from a sub-unit do not propagate to neighbouring sub-units; and – the overall BESS and other on-site or off-site receptors, ensuring fire safety.	

Appendix B:
Statement of commitments

Appendix B – Statement of commitments

Phase	Mitigation measure
Biodiversity (EIS section 6.2)	
Design	***Project design***
	• exclude and avoid some of the identified PCT areas and established vegetation, where feasible/practicable.
	• design and site project facilities and infrastructure outside the designated non-development zones within the project site.
	• select site access points that minimise the need to remove native vegetation.
Pre-construction	***Offsetting***
	• offsets for ecosystem credits and species credits will be in place prior to the commencement of construction.
Construction	***Clearing and prevention of over-clearing***
	• all personnel will be inducted and will be informed that disturbance of any stand of native vegetation outside the development footprint, or otherwise unauthorised disturbance, could have legislative consequences if done without approval. Evidence of all personnel receiving an induction will be kept on file (signed induction sheets).
	• before start of work, the extent of permitted vegetation clearing and areas to be retained as native vegetation will be clearly identified. Fencing or bunting will be installed to demarcate 'no go zones' where vegetation is to be retained.
	• a pre-clearing process and unexpected threatened species finds procedure will be implemented. Any fauna found during the disturbance will be allowed (or assisted) to relocate into adjoining habitat.
	• a suitably qualified ecologist will be employed to conduct pre-clearance surveys at least 24 hours prior to vegetation removal. The ecologist will identify and mark any potential habitat trees that may be impacted by the proposed vegetation removal works.
	• a suitably qualified ecologist will be present for the removal of all identified habitat trees to ensure fauna can be relocated safely.
	• vegetation will be removed in such a way as to avoid unnecessary damage to surrounding vegetation.

Phase	Mitigation measure
Construction	• where possible, vegetation to be removed will be mulched or placed on-site and re-used to stabilise disturbed areas. If hollows are found, these will be placed in appropriate areas within the non-development project lands to be retained to provide potential fauna habitat.
	Damage to native vegetation outside of impact zone
	• Soil stockpiles will be located according to the following hierarchical criteria:
	– at least 40 m away from the nearest waterway
	– in areas of low ecological conservation significance (i.e. previously disturbed land)
	– on relatively level ground.
	Disturbance to fallen timber, dead wood, bush rock and anthropogenic habitat
	• where practicable, bush rock encountered on site that requires removal will be relocated to the edge of the disturbance area to enhance habitat. In particular, exfoliating rock will be relocated and repositioned such that the exfoliating pieces continue to provide habitat for fauna such as reptiles and bats.
	• if fauna is detected, work will be stopped immediately and either the area will be left undisturbed until the individuals have dispersed, or suitably qualified personnel will be engaged to facilitate removal of the fauna.
	• any human structure will be thoroughly searched for evidence of habitation by animals prior to removal. If evidence is detected, a relevant qualified person will be contacted to arrange the relocation of species occupying the structure.
	• a suitably qualified ecologist will be present for the removal of all identified potential fauna habitat to ensure fauna can be relocated safely.
	Threatened species management
	• a suitably qualified ecologist/fauna spotter catcher will search habitat and animal breeding places for fauna prior to clearing to relocate or mark habitat as 'do not disturb'. A suitably qualified ecologist/fauna spotter catcher will also be present during clearing to inspect tree hollows following felling.

Phase	Mitigation measure
Construction	• no new areas will be cleared without further assessment, as threatened flora species may occur in any unassessed impact area.
	• if the impact footprint changes from the current extent assessed in the study, re-assessment of the potential impact of the activity will be needed to ensure impacts to threatened species are not inadvertently caused, given that suitable habitat for threatened species occurs elsewhere on the property.
	Other construction-phase measures
	• adopting measures to control weeds, plant pest and diseases, and pest animals, as outlined in Section 6.5.6.
	• implementing dust management measures, as outlined in Section 6.5.6.
	• implementing a soil and water management plan for the project, as outlined in Section 6.5.6, to protect downgradient aquatic habitat.
	• implementing appropriate procedures for safely storing, using and disposing fuel and chemicals, as outlined in Section 6.6.5, to protect downstream aquatic habitat.
	• ensuring that speed limits are adhered to by project-related vehicles, as outlined in Section 6.7.5, to reduce risks to fauna.
	• adopting noise control measures, as outlined in Section 6.8.5, to minimise disturbance of fauna.
	• using low illumination lighting and minimising lightspill, as outlined in Section 6.9.5, to minimise disturbance of fauna or attract predatory pest species to the site.
Operation	***Operation-phase measures***
	• locating soil stockpiles (e.g. associated with any maintenance earthworks) as required in Table 6.3.
	• avoiding stockpiling of materials and equipment, and parking of vehicles within the dripline (extent of foliage cover) of any tree.
	• avoiding the clearance of any new areas or any modification to project footprint until a threatened species assessment has been undertaken.
	• adopting measures to control weeds, plant pest and diseases, and pest animals, as outlined in Section 6.5.6.

Phase	Mitigation measure
Operation	• implementing a soil and water management plan for the project, as outlined in Section 6.5.6, to protect downgradient aquatic habitat.
	• implementing appropriate procedures for safely storing, using and disposing fuel and chemicals, as outlined in Section 6.6.5, to protect downstream aquatic habitat.
	• ensuring that speed limits are adhered to by project-related vehicles, as outlined in Section 6.7.5, to reduce risks to fauna.
	• adopting noise control measures, as outlined in Section 6.8.5, to minimise disturbance of fauna.
	• using low illumination lighting and minimising lightspill, as outlined in Section 6.9.5, so as not to disturb fauna or attract predatory pest species to the site.
	• managing bushfire risk, as outlined in Section 6.10.7.
Decommissioning	***Use of measures outlined in the Construction phase***
	• measures to minimise impacts during the decommissioning phase of the project will be similar to those implemented during construction. Decommissioning will largely focus on reinstatement of the project site to its original (pre-construction) condition and land capability. Consideration will be given to enhancing biodiversity values to the extent that they did not conflict with proposed final land use.
Aboriginal cultural heritage (EIS section 6.3)	
Pre-construction	***Retrieval and moving identified artifact Peninsula IF-1***
	• identified artifact Peninsula IF-1 will be retrieved and moved to a location where it will not be impacted.
In all phases	***Ground disturbance***
	• if activities are to occur beyond the assessed area, then further Aboriginal cultural heritage assessment will be required.
	• develop and implement an unanticipated finds procedure.

Phase	Mitigation measure
In all phases	***Discovery of suspected Aboriginal objects***
	• should any suspected Aboriginal objects be noted during project construction or operation, all work will stop, and the unanticipated finds procedure will be followed.
Historic heritage (EIS section 6.4)	
In all phases	***Ground disturbance***
	• if activities are to occur beyond the assessed area, then further archaeological assessment may be required.
	• develop and implement an unanticipated finds procedure.
	Discovery of suspected historic heritage objects
	• should any items suspected of having historic heritage significance be uncovered, all work will stop, and the unanticipated finds protocol will be followed.
Land (EIS section 6.5)	
Design	***Design of infrastructure***
	• internal access roads and other project infrastructure and facilities will be designed with adequate run-off controls to prevent erosion from concentrated flows.
Construction	***Erosion and sediment control***
	• potential erosion and sedimentation impacts as a result of construction will be managed in accordance with a soil and water management plan (SWMP) for the project.
	• the SWMP will be developed in accordance with the requirements of:
	– *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition* (Landcom 2004).
	• the SWMP will include the following measures to reduce potential impacts on soils, land capability and agricultural land from erosion and sedimentation:

Phase	Mitigation measure
Construction	– constructing and/or installing temporary and long-term erosion and sediment control structures (including a sediment basin if required by Landcom (2004) based on hydrological calculations and soil types), with subsequent regular inspection, particularly following rainfall events
	– lining drains with geotextile or plastic, where required to reduce erosion
	– maintaining a register of erosion and sediment control activities, including records of inspection and maintenance
	– minimising areas of disturbance and rehabilitating disturbed areas as soon as possible with appropriate plant species
	– separating topsoil and subsoil and ensuring that soils are reinstated in the correct order
	– filling trenches progressively after placement of underground cabling.
	Dust management
	• dust issues will be managed by:
	– adopting standard dust control measures for construction sites, such as outlined in Section 6.3.10 'Control of Wind Erosion' in Landcom (2004), i.e. wetting down the internal access roads and other exposed surfaces, particularly during dry and windy conditions.
	Weed, pathogen and pest control
	• the following measures will be implemented to minimise impacts on soils, land capability and agricultural land from the introduction and/or spread of weeds, pathogens and pest species:
	– implementing biosecurity controls and procedures for project components imported to Australia in accordance with requirements under the *Biosecurity Act 2015*
	– developing a weed and pest management plan (WPMP) prior to construction. The WPMP will include
	– identifying the types and prevalence of environmental weeds on the project site, including weeds of national significance (WONS)
	– outlining methods for controlling weeds (e.g. herbicides, physical removal, grazing)

Phase	Mitigation measure
Construction	– implementing a vehicle hygiene protocol when entering and leaving the site to ensure vehicles and earthmoving machinery are free of debris, sediment and weeds
	– ensuring any fill brought to site is weed and pathogen free.
	Existing site contamination
	• the risk of disturbing existing site contamination during earthworks will be managed by implementing a procedure to identify areas of suspected contamination encountered during construction and to assess such areas in accordance with EPA requirements.
Operation	***Plan review and update***
	• the SWMP will be updated for operation and include the following measures to reduce potential impacts on soils, land capability and agricultural land from erosion and sedimentation:
	– undertaking regular inspection of drains and erosion and sediment control structures
	– maintaining vegetation cover across the project site to minimise soil exposure and reduce erosion potential (including inspecting and maintaining revegetated areas until stable and self-sustaining).
	• the WPMP will be updated for operation and will include measures for the ongoing monitoring and control of weeds, pathogens and pest species.
Decommissioning	***Use of measures outlined in the Construction phase***
	• management and mitigation measures to be implemented as part of decommissioning will be similar to those implemented during construction. Decommissioning will largely focus on reinstatement of the project site to its original (pre-construction) condition and land capability.
Water (EIS section 6.6)	
Design	***Design of infrastructure***
	• to the extent practical, project design will minimise the use of concrete slabs and maximise the permeability of areas occupied by project facilities to promote infiltration and minimise runoff.

Phase	Mitigation measure
Construction	***Management is in accordance with an SWMP***
	• potential impacts on hydrology as a result of construction will be managed in accordance with an SWMP, as outlined above, developed in accordance with the requirements of Landcom (2004) and ARC (2016).
	Erosion and sediment control
	• in addition, the following management and mitigation measures will be implemented during construction to limit the impacts of the project on hydrology and water resources:
	– implementing erosion and sediment control measures during construction as outlined above, including minimising areas of disturbance and rehabilitating disturbed areas as soon as possible
	– installing effective stormwater management and control measures during construction, in accordance with the SWMP, with a focus on protecting downstream waterways flowing north into Mulyandry Creek
	– locating temporary stockpiles away from flow paths and locating, shaping and revegetating long-term stockpiles to minimise hydrological disruption
	– infilling farm dams on the project site with a gentle batter that is consistent with the local ground slope and directs runoff into the natural drainage path next to the dam
	– re-profiling (if required) and revegetating disturbed areas not occupied by project facilities (such as the temporary laydown area) to match pre-existing topography
	– undertaking visual inspections during soil levelling and trenching. If these inspections indicate acid sulphate soils may be present, additional actions such as monitoring of pH after rainfall may be considered to confirm that acid sulphate soils are not present
	– developing and implementing procedures for the testing and management of construction wastewater if disposal is required
	– storing fuels and chemicals in accordance with the *National Code of Practice NOHSC:2017(2001)* (NOHSC 2001) and other relevant standards
	– storing fuel and chemicals in an impervious bunded area at least 50 m away from water bodies and drainage lines

Phase	Mitigation measure
Construction	– refuelling plant and machinery will be undertaken a minimum of 50 m away from water bodies and drainage lines, where practicable in designated bunded refuelling areas, with spill kits available at all times during the refuelling process
	– implementing a spill response plan (to be prepared as part of the EMS) which will include containment and remediation procedures, placement of spill kits and SDSs, and training requirements for staff
	– disposing of all hazardous chemicals and waste off-site in accordance with relevant NSW government regulations and guidelines
	– daily inspection of all machinery and plant to ensure no leakage of fuels, lubricants or other liquids.
Operation	***Hydrology and water resources impact control measures***
	• the following management and mitigation measures will be implemented during operation to limit the impacts of the project on hydrology and water resources:
	– maintaining vegetation cover under all solar panel arrays to maximise water infiltration
	– storing fuels and chemicals in accordance with the *National Code of Practice NOHSC:2017(2001)* (NOHSC 2001) and other relevant standards
	– undertaking regular inspection of equipment and facilities to identify spills or leaks
	– implementing a spill response plan (based on that used for construction)
	– ensuring the ERP for the project includes procedures to be followed in the event of flooding within the project site or surrounding area, including information on safe evacuation routes
	– installing and maintaining effective stormwater management and control measures during operation, in accordance with the erosion and sediment control plans for the site.

Phase	Mitigation measure
Decommissioning	***Use of measures outlined in the Construction phase***
	• management and mitigation measures to be implemented as part of decommissioning will be similar to those implemented during construction. Decommissioning will seek to re-establish pre-existing slopes (where modified by the project) and drainage.
Traffic and transport (EIS section 6.7)	
Pre-construction	***Development of a Traffic Management Plan (TMP)***
	• a TMP will be developed prior to construction, in consultation with the Council, TfNSW and any other relevant stakeholders.
Construction	***Management in accordance with TMP***
	• the TMP will include the following:
	– confirmation of the project construction timeframe and work stages
	– confirmation of expected traffic volumes generated by the project for all work stages
	– identification of all heavy vehicle and over-mass (OM) vehicle haulage routes for all work stages
	– a mechanism to review identified haulage route road conditions prior to the commencement of works
	– any additional relevant mechanisms for over-dimensional vehicle permits and traffic management requirements
	– mechanisms/agreements (if deemed necessary) to maintain haulage route roads and road infrastructure, including local public roads used by site traffic, during construction works and to reinstate roads to at least pre-construction conditions
	– any requirements for specific work stage construction TMPs
	– identification of relevant mechanisms for OM vehicle permits and traffic management requirements
	– confirmation of the adequacy of available sight distances along Paytens Bridge Road from the site access and along Lachlan Valley Way at the intersection with Paytens Bridge Road (vegetation trimming will be undertaken if required)

Phase	Mitigation measure
Construction	– unless the relevant roads authority agrees otherwise, construction of the site access points and the BAR at the intersection of Lachlan Valley Way and Paytens Bridge Road will comply with the *Austroads Guide to Road Design* (as amended by TfNSW supplements), and carried out to the satisfaction of the relevant roads authority.
	Implementation of standard traffic management measures
	• standard traffic management measures will be implemented during project operation, such as ensuring vehicle road-worthiness, enforcing speed limits, erecting signage, proper design of site access points, and providing access roads within site are adequately engineered and maintained.
Operation	***Implementation of standard traffic management measures***
	• standard traffic management measures will be implemented during project operation, such as ensuring vehicle road-worthiness, enforcing speed limits, erecting signage, proper design of site access points, and providing access roads within site are adequately engineered and maintained.
Decommissioning	***Implementation of traffic management measures***
	• traffic management measures will be implemented during decommissioning to mitigate potential impacts.
Noise and vibration (EIS section 6.8)	
Design	***Design of infrastructure***
	• the substation will be located on the eastern boundary of the project site
	• power stations (inverters) will not be located within 840 m of receiver R1 and within 1.1 km of receiver R2
	• standard noise attenuation measures such as setbacks, orientation, shielding or other treatments on plant and equipment will be implemented where practicable.
Construction	***Construction noise***
	• applying all reasonable work practices to minimise noise levels, such as (where practicable), those outlined in Table 16 of Appendix K

Phase	Mitigation measure
Construction	• inform potentially impacted residents of the nature of works to be carried out, expected noise levels and duration, and work practices applied to minimise noise, as well as company contact details.
	Construction traffic noise
	• management of construction-related traffic noise should as a minimum include the following controls:
	– appropriate scheduling and routing of vehicle movements
	– requiring drivers to comply with speed limits while driving to the project site and within the site
	– requiring drivers to behave responsibly in regard to noise generation and to avoid of the use of engine compression brakes
	– ensuring vehicles are adequately equipped with noise controls before allowing them to access the site.
Operation	***Operation noise***
	• management of operation-related noise will be managed by:
	– incorporating the project design features outlined above
	– undertaking routine maintenance to keep noise-generating equipment in good order.
Decommissioning	***Use of measures outlined in the Construction phase***
	• management and mitigation measures to be implemented as part of decommissioning will be similar to those implemented during construction.
Visual amenity (EIS section 6.9)	
Design	***Design phase measures***
	• exclude the far northern end of the site from development to avoid direct lines of site from the R1 residential compound.
	• apply urban design principles and objectives during detailed design phase.
	• investigate colour combinations for infrastructure items to aid visual obscurity.

Phase	Mitigation measure
	• ancillary structures: minimise reflective surfaces with a preferred use of muted colours.
Construction	***Construction phase measures***
	• demarcation and exclusion fencing will be installed around trees and vegetation to be retained.
	• limiting disturbance and rehabilitating disturbed areas.
Construction	• minimising light spill from the development into adjacent visually sensitive properties by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
	• temporary hoardings, barriers, traffic management and signage should be removed when no longer required.
	• the site to be kept tidy and well maintained, including removal of all rubbish at regular intervals. There should be no storage of materials beyond the construction boundaries.
Operation	***Operation phase measures***
	• restrict external lighting to the area where the maintenance shed, permanent site office, and switch yard are located.
	• all external lighting around buildings to be faced downwards and inwards to minimise impacts to neighbouring properties.
Decommissioning	***Decommissioning Management Plan***
	• a rehabilitation and decommissioning strategy will be implemented to return the site to its pre-existing condition.
Hazards (EIS section 6.10)	
Design	***Design phase measures***
	• radiant heat impact and general fire risk management measures will include:
	– separating all BESS units from the site boundary by 25 m and BESS unit groupings from each other by 2.5 m unless prescriptive or engineered fire controls are incorporated into project design to allow separation distances to be reduced
	– constructing and maintaining site access roads and providing access to BESS unit groupings and other project components in accordance with NSW RFS and F&R NSW requirements to enable access by emergency vehicles.

Phase	Mitigation measure
	• current and emerging standards for BESS design will be taken into account during the detailed design phase for the project.
Pre-construction	***Document preparation***
	• a Bush Fire Assessment Report will be prepared:
	– in accordance with the *Planning for Bush Fire Protection 2019.*
Pre-construction	• a comprehensive fire safety study will be prepared:
	– in consultation with FR NSW and in accordance with the requirements of *Hazardous Industry Planning Advisory Paper No.2 – Fire Safety Study Guidelines*
	– and will consider the operational capability of local fire agencies and the need for the facility to achieve an adequate level of on-site fire and life safety independence.
	• an emergency response plan (ERP) will be prepared in consultation with FR NSW and NSW RFS. It will address:
	– foreseeable onsite and offsite fire events and other emergency incidents (e.g. fires involving BESS units, bushfires in the immediate vicinity or potential hazmat incidents)
	– risk control measures that will need to be implemented to safely mitigate potential risks to the health and safety of firefighters and other first responders (including electrical hazards)
	– other risk control measures that may need to be implemented in a fire emergency due to any unique hazard specific to the site.
	• the ERP will detail appropriate risk control measures to mitigate potential risks to the health and safety of firefighters and other first responders, including:
	– appropriate personal protective clothing required to be worn
	– minimum level of respiratory protection required
	– decontamination procedures
	– minimum evacuation zone distances and site muster point

Phase	Mitigation measure
	– a safe method of shutting down and isolating the photovoltaic system
	– emergency evacuation procedures.
All phases	***BESS unit hazards***
	• radiant heat impact and general fire risk management measures will include:
All phases	– restricting access to BESS units (and static inverters) to competent trained employees and supervising contractors
	– constructing and maintaining site access roads and providing access to BESS unit groupings and other project components in accordance with NSW RFS and F&R NSW requirements to enable access by emergency vehicles.
	General bushfire risks
	• Bushfire risk management measures will include:
	– storing two copies of the ERP in a prominent 'Emergency Information Cabinet', to be located directly adjacent to the main entry point of the project site
	– providing the NSW RFS and FR NSW fire stations at Forbes with copies of the Fire Safety Study, Bushfire Assessment Report and ERP, including plans of the project site
	– implementing and maintaining a 10 m fire protection zone around the perimeter of the project site
	– providing on-site water tanks - to be sized and located in discussion with FRNSW
	– daily monitoring of the Fire Danger Rating for the area during the Fire Danger Period
	– maintaining vegetated areas of the project site to keep grasses low and avoid the build-up of vegetative litter
	– designing and maintaining electrical components by relevant Australian Standards to minimise the risk of ignition
	– designing buildings in accordance with relevant NSW RFS standards
	– appropriately storing hazardous and flammable chemicals
	– informing project staff and contractors of fire risks and evacuation procedures.

Phase	Mitigation measure
Socio-economic (EIS section 6.11)	
All phases	The following management and mitigation measures will be implemented to minimise the adverse social and economic impacts of the project and maximise project benefits to the community and other stakeholders:
All phases	• the Community and Stakeholder Engagement Plan (see Section 5.2) will be progressively implemented and updated by Edify. The plan provides procedures for:
	– informing stakeholders of potential impacts
	– providing project-related updates
	– registering and responding to complaints and feedback.
	• ongoing engagement with the Forbes Shire Council will be undertaken to discuss and resolve any concerns during construction and operation.
	• ongoing engagement with the local business community will be undertaken to discuss and maximise local opportunities for project support.
	• an accommodation and employment strategy (AES) will be prepared prior to project construction in consultation with the Forbes Shire Council to:
	– reduce the potential for adverse impacts on local accommodation availability, services or events due to the construction workforce
	– maximise local employment and commercial opportunities.
	• Edify is committed to developing an AES, which will:
	– facilitate the accommodation and the workforce associated with the development
	– investigate options for prioritising the employment of local workers for the construction and operation of the development, where feasible
	– include a program to monitor and review the effectiveness of the strategy over the life of the development.

Phase	Mitigation measure
	• local employees, contractors, manufacturing facilities, materials and services will be preferentially engaged during construction and operation, where qualification and experience criteria are met.
	• the project website will be maintained during construction and operation and include provision for the community and other stakeholders to submit comment and feedback.
	• a stakeholder feedback, complaints and suggestions register will be maintained during construction and operation, including actions responsibilities and timeframes for feedback response.
Waste management and resource use (EIS section 6.12)	
All phases	***Development of a Waste Management Plan (WMP)***
	• a WMP will be prepared to meet the waste management classification and hierarchy outlined in Section 6.12.2.
	Management in accordance with WMP
	• the WMP will include the following:
	– measures to minimise waste, including opportunities to avoid, reuse, recycle, recover, or treat waste
	– expected waste outputs in detail, including quantity and classification of expected wastes
	– measures to separate waste into appropriate categories on site to allow appropriate disposal
	– disposal methods, including which waste facilities they will be transferred to and expected costs and approvals required (noting that the Daroobalgie Waste Management Facility has only limited capacity)
	– details of contractor for collection and disposal of waste.
Cumulative impacts (EIS section 6.13)	
Construction	The timing and location of other developments in the region will be monitored by Edify and, if a risk of adverse cumulative impacts during project construction (or decommissioning) is identified, discussions will be held with council and/or other project proponents to consider ways of minimising such impacts (such as cooperation to jointly manage the issue).

Appendix C:
Legislation, regulations and planning instruments

Appendix C: Key legislation, regulations and planning instruments

Statutory reference	Relevance to project
Commonwealth legislation	
Environment Protection and Biodiversity Conservation Act 1999	The EPBC Act protected matters search identified four threatened ecological communities (TECs), 24 threatened species, 11 listed migratory species and 18 listed marine species with the potential to occur in the 10 km search area. Of these, 10 threatened and seven migratory species possibly occur, based on habitat available on the subject land (see EIS Section 6.2). No Matters of National Environmental Significance have been identified as being potentially affected by the proposed project (see EIS Section 6.2). The project will not involve actions that affect Commonwealth land or that are carried out by Commonwealth agencies. Accordingly, a referral of the project under the *Environment Protection and Biodiversity Conservation Act 1999* will not be required.
Native Title Act 1993	A National Native Title Claims Search conducted on 11 May 2021 found that no Native Title Claims cover the study area (see EIS Section 6.3). Accordingly, the *Native Title Act 1993* is not relevant to the project.
State legislation and regulations	
Environmental Planning and Assessment Act 1979	The consent authority for a State Significant Development (SSD) is determined under Part 4, Division 4.2 Section 4.5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Consent for an SSD is granted under Part 4, Division 4.7, Section 4.38 of the EP&A Act. As an SSD, the project requires the development of this EIS under Part 4 'Development Assessment' of the EP&A Act.
Environmental Planning and Assessment Regulation 2000	The EP&A Regulation sets out the requirements for the preparation of an EIS.
Roads Act 1993	Under Section 138 of the *Roads Act 1993*, consent from the relevant roads authority (council or Transport for NSW (TfNSW) will be required for any road upgrade works. Under Part 4, Division 4.7, Section 4.2 of the EP&A Act, consent for any required road upgrades cannot be refused if it is necessary for carrying out the SSD and is to be substantially consistent with the SSD consent.
Biodiversity Conservation Act 2016	Preparation of a biodiversity development assessment report (BDAR) is required as requested by the Secretary's Environmental Assessment Requirements (SEARs) and in accordance with the requirements of the *Biodiversity Conservation Act 2016.*
Biodiversity Conservation Regulation 2017	The Biodiversity Conservation Regulation 2017 outlines the framework for addressing impacts on biodiversity from development and clearing, as set out in the BDAR.
Fisheries Management Act 1994	The BDAR for the project did not identify any habitat for threatened aquatic species on the project site. However, Mulyandry Creek

Statutory reference	Relevance to project
	downstream of the project has been mapped as Key Fish Habitat (KFH) by the Department of Primary Industries – Fisheries and identified as Protected Riparian Land (PRL) by DPIE (see Section 6.2 of the EIS).
Biosecurity Act 2015	The *Biosecurity Act 2015* provides a statutory framework for the management of biosecurity risks from diseases, pests (plant and animal) and contaminants, such as potentially may be introduced and/or spread due to the project.
National Parks and Wildlife Act 1974	An Aboriginal Cultural Heritage Assessment Report (ACHAR) was required by the SEARs and was prepared to meet requirements under the *National Parks and Wildlife Act 1974*.
Heritage Act 1977	An historic heritage assessment was required by the SEARs and was prepared to meet requirements under the *Heritage Act 1977*.
Water Management Act 2000	Under section 4.41 of the EP&A Act, authorisations under section 91 the *Water Management Act 2000* that are not required for an SSD include: 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) of the *Water Management Act 2000*. The project is not expected to require an aquifer interference approval under the *Water Management Act 2000*, as only limited and shallow excavation is proposed. Accordingly, approvals under the *Water Management Act 2000* are not expected to be required.
Crown Lands Management Act 2016	Crown Land is not present within the project site and no Crown Land permits will be required for the project.
Protection of the Environment Operations Act 1997	Under section 48 of the POEO Act, premises-based scheduled activities, as defined in Schedule 1, require an Environmental Protection Licence (EPL). Under Clause 17 of Schedule 1, electricity generation is a scheduled activity requiring an EPL. However, solar power is not included in this definition and therefore the project is not a scheduled activity under the POEO Act and an EPL is not required.
Rural Fires Act 1997	As the project is an SSD, a bush fire safety authority under section 100B of the *Rural Fires Act* is not required. However, the management of fire risk at the project will be considered with reference to the requirements of the *Rural Fires Act*.
Local Land Services Act 2013	Local Land Services will be a stakeholder in the project, and is expected to be consulted, particularly in relation to biosecurity and the management of weeds. However, the *Local Land Services Act 2013* is not directly relevant to the development approval.
Mining Act 1992	There are no existing mineral exploration licences that cover the development site. Accordingly, consideration of the provisions of the *Mining Act* 1992 will not be required as part of the development approval.

Statutory reference	Relevance to project
Environmental planning instruments	
State Environmental Planning Policy (Planning Systems) 2021	The State Environmental Planning Policy (SEPP) (Planning Systems) 2021 determines that the project is classified as an SSD.
State Environmental Planning Policy (Transport and Infrastructure) 2021	The SEPP (Transport and Infrastructure) 2021 allows for the development of solar farm projects with consent even on land prescribed for primary production.
State Environmental Planning Policy (Resilience and Hazards) 2021	The Resilience and Hazards SEPP consolidates and repeals the provisions of the following 3 SEPPs: 1. SEPP (Coastal Management) 2018 (Coastal Management SEPP) 2. SEPP 33 – Hazardous and Offensive Development (SEPP 33) 3. SEPP 55 – Remediation of Land (SEPP 55) incorporates in accordance with SEPP No. 33 – Hazardous and Offensive Development
	The SEARs require an assessment of hazards to be undertaken. This assessment includes: • a Preliminary Hazard Assessment to be undertaken in accordance with the guidance documents *Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis* and *Multi-Level Risk Assessment*. An appraisal of the risks of the storage of hazardous chemicals at the site has been done in accordance with *Hazardous and Offensive Development Application Guidelines Applying SEPP 33*
	Under the Resilience and Hazards SEPP the consent authority must be satisfied that the land is suitable – or will be suitable after remediation of contamination – for the purpose for which the development is proposed to be carried out.
State Environmental Planning Policy (Primary Production) 2021	The objects of Part 2.2 of the SEPP Primary Production are to identify State significant agricultural land, to provide for the carrying out of development on that land, and to provide for the protection of agricultural land. State significant agricultural land is not currently defined by the SEPP.
State Environmental Planning Policy – Koala Habitat Protection 2020 and 2021 (Koala SEPP 2020 and Koala SEPP 2021)	Koala SEPP 2021 was released on 17 March 2021 and aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. As an interim measure, it is designed to operate alongside Koala SEPP 2020. Forbes LGA is listed in Schedule 1 – Local Government Areas of Koala SEPP 2021 and therefore is subject to the requirements of the SEPP. However, as the project site is in zone RU1 (Primary Production), it continues (as an interim measure) to fall within the remit of Koala SEPP 2020.
Forbes Shire Local Environmental Plan (LEP) 2013	Under Part 4, Division 4.3, Section 4.15 of the EP&A Act, in determining a development application, a consent authority is to take into consideration the provisions of any environmental planning instrument that applies to the land to which the development application relates.

Statutory reference	Relevance to project
Development control plans	
Forbes Shire Development Control Plan 2013	Under Part 4, Division 4.3, Section 4.15 of the EP&A Act, in determining a development application, a consent authority is to take into consideration the provisions of any development control plan that applies to the land to which the development application relates. The consistency of the project with the Forbes Shire DCP 2013 is considered in Section 2.2 of the EIS.
Regional strategies	
Central West and Orana Regional Plan 2036	Direction 1.1 of the Ministerial Direction 1.5 – Rural Lands requires that planning proposals must be consistent with a Regional Plan released by the Minister for Planning.

Appendix D: Community and stakeholder engagement materials

strategic development group

Peninsula Solar Farm
Payten's Bridge, Forbes Shire Council, NSW

Consultation Report

April 2022

FORWARD THINKING PROJECTS. THRIVING COMMUNITIES.

EXECUTIVE SUMMARY

This report summarises community and stakeholder engagement undertaken in relation to a proposal by Edify Energy Pty Ltd, to develop a solar farm at Payten's Bridge, 27 km south-east of Forbes, NSW in the Forbes Shire Council area.

Consultation targeted community stakeholders in the Forbes, in particular neighbours of the solar farm site as well as local residents, community groups and organisations.

Engagement has primarily been undertaken through individual discussions with residents and community group representatives through a range of in person and online options. Engagement by the community was affected by the severe flooding that was experienced in the Forbes Shire Council area in November 2021. This flooding coincided with a number of planned engagement activities at this exact time, which was postponed to early 2022 and completed in March 2022.

Feedback has been constructive, and provided a variety of ideas for further consideration as planning for the solar farm continues. Some key observations from the consultations include: a general acceptance in the community of the kind of solar energy development being proposed; some concerns about impact on the neighbours of the solar power station site; and ongoing community interest in engagement with the project in implementation for the benefit of the local community.

Engagement has been undertaken by staff of Edfiy Energy and independent engagement specialists from Strategic Development Group, a firm based in Yass in regional NSW.

This report has been prepared by Michael Pilbrow and Kate Lord from Strategic Development Group
strategicdevelopment.com.au

PURPOSE OF THIS REPORT

This report outlines the community engagement undertaken at the initiative of Edify Energy, the proponent for the Peninsula Solar Farm, to contribute to the Environmental Impact Statement (EIS) for the proposal. taking account of the:

- Planning Secretary's Environmental Assessment Requirements (SEARS)
- DPIE "State significant guidelines for preparing an EIS"
- DPIE Undertaking Engagement Guidelines for State Significant Projects

APPROACH

Engagement with the community has been undertaken directly by the proponent, Edify Energy, and by a team of independent community engagement specialists from Strategic Development Group. Strategic Development Group is a member of the International Association for Public Participation (IAP2) and uses IAP2's international best practice principles for community participation, as reflected in the five levels of the IAP2's spectrum of public participation (see figure below). Engagement around the Peninsula Solar Farm is at the 'Consult' and 'Involve' points on this spectrum, reflecting the nature of the project and its location.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION 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 TO THE PUBLIC	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.

International Association for Public Participation (IAP2) Spectrum - used with permission

Working at the 'Consult' and 'Involve' levels, a combination of face to face and online consultation opportunities was considered appropriate in order to:

- capture views of the general community on the project, answer questions and provide opportunity for suggestions
- include targeted consultations with key stakeholders.

Project information was also provided on the Peninsula Solar Power Station website in support of the engagement process https://edifyenergy.com/project/peninsula-solar-power-station/. The website includes an up-to-date overview of the project, refers interested parties to the NSW Government Planning Portal for links to the power station's planning documents, allows registration for regular email updates, and provides a link to a Frequently Asked Questions (FAQ) booklet.

STAKEHOLDER IDENTIFICATION

The stakeholders identified for engagement fall into in three main categories – neighbours, community groups and members, and government (local/state/federal). The following stakeholders for engagement were identified and approached as part of the consultation process:

Neighbours

- Neighbours of the project site

Community groups and members:

- Rural Fire Service (RFS)
- Forbes Business Chamber
- Wiradjuri Condobolin Corporation
- Forbes Wiradjuri Dreaming Centre
- REDI.E
- Bimbadeen Aboriginal Training College
- Forbes Aboriginal Community Working Party
- Lachlan "Galari" Reconciliation Group – which covers Forbes and Parkes
- Condobolin & Cowra Aboriginal Land Council
- Intract Indigenous Contractors
- Traditional Family Group (TFG)
- Central West Lachlan Landcare
- Forbes Wiradjuri Men's Shed & Forbes Men's Shed
- Programmed Skilled Workforce
- Rotary Club of Forbes
- Forbes District Lions Club
- Forbes View Club
- Forbes College for Seniors
- Forbes Country Women's Association (CWA) and Evening Branch
- Forbes Generocity Church
- St Laurence O'Toole Church
- Forbes Baptist Church
- St. John's Anglican Church
- Wirinya Progress and Sports Association
- Forbes Rugby League & Union Club

Government:

- Forbes Shire Council
- DPIE
- Fire and Rescue, Forbes
- Forbes TAFE NSW
- NSW State Member Hon. Phil Donato MP
- Federal MP for Riverina Hon. Michael McCormack

COMMUNITY CONSULTATION

The process of engagement to date has involved three main cohorts:

1. **Neighbours:** direct contact has been initiated with neighbours of the project site offering opportunities to discuss the proposal, and its potential impacts and opportunities.
2. **Community:** consultation opportunities have been offered to the community living in the Forbes Shire Council LGA, structured to enable community members to:
    - hear directly from Edify about the project, including aspirations, key features, work undertaken to date and future process/timing
    - ask questions, raise concerns and suggest ideas
3. **Government:** Government/elected representatives have been made an offer of a briefing on the project.

1. Engagement with neighbours

Engagements with the neighbours in proximity to the site have been undertaken by Edify since late 2020 using various methods, including phone calls, email and text messages. All neighbours have been given equal opportunity to meet or be involved in the Project and all have been given information to enter discussions or join in group discussions with Edify Energy.

The residences of the identified neighbours within 5 km of the project site are shown on the table below outlines the engagement undertaken with neighbours to date.

Receiver # [1]	Comments
R1 (330m to project boundary, closest neighbour to the west)	Engagement began with initial contact in November 2020. Proponent met with landholder in December 2020 at their residence. Edify has shared ongoing emails, calls and text messages with the landholder since engagement began. Advance copies of key reports have been shared. The most recent engagement was on 13 December 2021, when the neighbour was provided with the FAQ document and an opportunity to complete and submit a survey in relation to the project.
R2, R12, R6 (550m to project boundary, neighbour to the east)	Proponent began engagement proceedings in January 2021 and met with the family's advocate; their son, in May 2021. This meeting was a shared 1 hour discussion on the boundary lines. The proponent shared with this neighbour advance copies of the key reports. The Proponent has shared multiple phone calls and emails and the most recent was on the 13th December 2021 when they

[1] the Receivers number is to align with the Noise report and numbering convention used by the acoustic engineer.

	were provided with the FAQ document and opportunity to enter a survey. On 24 March 2022, the neighbour attended the drop-in sessions at Forbes Town Hall.
R3	The landholders are relations to the involved landholder family and are supportive of the project. Therefore, all engagements have been via the involved landholder.
R4 (no dwelling)	Edify has made multiple attempts at engaging with this landholder in various methods (calls, voicemails, text) over several months, from July to December 2021, without success. Edify sent postal mail to the residence in January 2022. This included an overview of Edify, an introduction to the project, links to the Scoping Report (NSW Major Projects webpage), contact details for the project team and the FAQ document.
R5	R5 is an involved landholder, all engagements have been via the associated landholder
R7 (4km), R10 (4.3km)	Edify has made attempts to engage with the landholder without success and has been advised of the recent sale of the property by another project landholder (off-market sale, September 2021). Edify is attempting to obtain the contact details of the new landholder/s, with Edify sending postal mail to the residence in January 2022. This included an overview of Edify, an introduction to the project, links to the Scoping Report (NSW Major Projects webpage), contact details for the project team and the FAQ document.
R8 (>4km)	This landholder is also being represented by the family representative of R2, R6 and R12. Engagement has been undertaken with this individual as stated above for R2, R6 and R12. However, the impact of the project on this receiver is considered likely to be low due to the distance of the residence from the project.
R9, R11 (>4km)	Edify has contacted the R9/R11 landholder despite the likely low impact of the project due to its distance from the residence. The landholder has and will be kept up to date to all future developments on the project due to the opportunity for construction for their earth moving business. They have previously been involved in Jemalong Solar Farm and road construction and expressed interest in participating in civil road works associated with the project.
R13 (5km east of project)	Edify has been unable to contact this receiver as they do not have any contact details. However, the impact of the project on this receiver is considered likely to be low due to the distance of the residence from the project.

	Edify sent postal mail to the residence in January 2022. This included an overview of Edify, an introduction to the project, links to the Scoping Report (NSW Major Projects webpage), contact details for the project team and the FAQ document.
R14 (>>6km)	Edify has contacted this landholder despite the distance of the residence from the project. The landholder has expressed support of renewables and has and will be kept up to date with project information, so they are able to be involved and/or help with the project.

The Proponent, Edify Energy, have made several attempts of various methods to contact R1 (the adjacent neighbour to the west) to follow up on email correspondence sent throughout the past 12 months about the project and involvement in upcoming engagements to no avail. Despite these attempts to engage, Edify/the Proponent has made changes to the footprint of the site to avoid any view of the infrastructure for the northern side of the property boundary and with other factors, such as sheds, fencing and existing screening, all views of any infrastructure will be blocked.

In addition to the changes made to the footprint of the project site, the Proponent has also provided to R1 and R2 (the other adjacent neighbour to the site) advanced copies of the key reports such as the noise report.

2. Engagement with Community Groups and members

Engagement opportunities offered to the community included:

- Online and face to face consultation sessions
- Phone/email discussion
- Online survey
- Engagement through the Edify website

Late 2021 consultations

A number of online and face to face consultation sessions with community stakeholders were planned and advertised by Edify for November 2021. Due to the large-scale flooding in the township of Forbes and the surrounding area at the time of the sessions, most of the planned engagement had to be postponed until early 2022, including:

- Two drop-in information session in Forbes
- A number of online consultation sessions

However, an online session was held on Thursday 18 November 2021 from 12:00pm to 1:30pm (1.5 hours). The consultation session targeted community groups in the areas of business, agriculture, community service, religion, arts, education and health and all community members were welcomed to this session, however due to the disastrous flooding in the Forbes around and surrounds at the time, the attendance was lower than expected and desired.

This session advertisement was:

- advertised in the Forbes Advocate newspaper, published on 4th and 11th November (half-page advertisements)
- direct contacts via phone and email

Those who were able to attend were representatives from the following organisations:

- Condobolin Local Aboriginal Land Council (CLALC)
- Forbes TAFE
- McMahons/Intract Indigenous Contractors
- Energy Corporation NSW Government and
- A Representative for the Federal Member of the Riverina, MP Michael McCormack.

Online survey

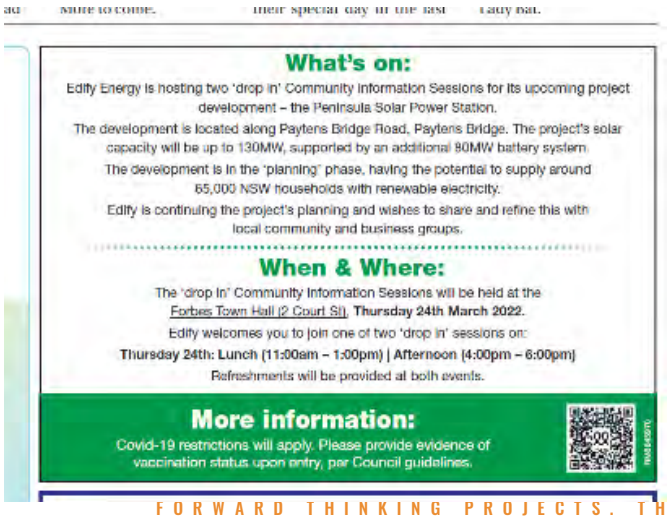
Due to the postponement of the face-to-face sessions and the other proposed online sessions, a short survey was also offered to stakeholders as an alternative method of engagement. As of April 2022, there has been a small number of responses to the survey, which will continue post-EIS submission.

The survey asked the following questions:

- *Have you previously engaged with the Edify team regarding this project?*
- *Do you represent a Community Group or an Organisation? If so – please provide details*
- *Do you have any questions or comments around the Environmntal impact of this project. For example: Visual Montage, Ecology, Sustainability.*
- *Do you have any questions or comments around the Technical Planning factors? For example: Solar Energy, Battery, Flood, Fire, Traffic Management.*
- *Do you have any questions or comments around how to get involved? For example: Employment Opportunities and the Community.*
- *Would you like to register to receive updates on this project via email?*

Early 2022 consultations – drop-in sessions

The drop-in sessions were rescheduled for 24 March 2022 in Forbes, and advertised in the Forbes Advocate newspaper (see below), published on 10 and 17 March. Two drop-in sessions were held in the Forbes Town Hall and attracted 12 attendees from the local community.



What's on:

Edify Energy is hosting two 'drop in' Community Information Sessions for its upcoming project development – the Peninsula Solar Power Station.

The development is located along Paytens Bridge Road, Paytens Bridge. The project's solar capacity will be up to 130MW, supported by an additional 80MW battery system.

The development is in the 'planning' phase, having the potential to supply around 65,000 NSW households with renewable electricity.

Edify is continuing the project's planning and wishes to share and refine this with local community and business groups.

When & Where:

The 'drop in' Community Information Sessions will be held at the Forbes Town Hall (2 Court St), **Thursday 24th March 2022.**

Edify welcomes you to join one of two 'drop in' sessions on:

Thursday 24th: Lunch (11:00am – 1:00pm) | Afternoon (4:00pm – 6:00pm)

Refreshments will be provided at both events.

More information:

Covid-19 restrictions will apply. Please provide evidence of vaccination status upon entry, per Council guidelines.

Advertisement in Forbes Advocate on 10 March and 17 March

Across the 2 sessions held on the 24th March, there were 12 attendees to the drop in sessions at the Town Hall in Forbes, who had the opportunity visit three stations focused on different aspects - technical; environmental; and opportunities to engage and ask questions of Edify Energy staff and to share their views with the engagement team from Strategic Development Group.

Community members engaging at the drop-in sessions

3. Engagement with Government

With respect to elected representatives, the Federal Member for Riverina, the Hon Michael McCormack, was represented at the 18 November 2021 online consultation session and the 24 March 2022 drop-in session, and a video call was held in December 2021 with the State Member for Orange, MP Philip Donato. A letter of support for the project has been received from the Hon Michael McCormack.

COMMUNITY AND STAKEHOLDER FEEDBACK

The independent engagement team greatly appreciated the active and constructive way in which community members engaged, asked questions and shared their views through the consultation process.

Key issues raise through feedback are summarised and grouped below.

Impact on neighbours:

- Footprint and visual representation of the project
- Management of weeds on the solar power station site
- Management of fire and related insurances
- Timing of construction phase, including transport movements on local roads

Broader community considerations

- Environmental sustainability
- Approach to cultural heritage assessment

Industry/educational engagement

- Business opportunities for local companies
- Procurement approach for construction works (including indigenous procurement policy compliance)
- Ongoing industry/education engagement, including with TAFE

Council-related matters

- Voluntary Planning Agreement with Forbes Shire Council
- Proximity to two other council areas, Cowra Shire Council and Cabonne Shire Council

Ongoing community engagement

- Further engagement with the community during planning phase, avoiding harvest season
- Ongoing engagement with the community once operational

Overall observations from the feedback include: a general acceptance in the community of the kind of solar energy development being proposed; some concerns about impact on the part of the neighbours; and ongoing community interest in engagement with the project in implementation for the benefit of the local community.

USE OF COMMUNITY FEEDBACK

Comments and feedback provided by community members will be essential in informing Edify's approach to the detailed planning of the Peninsula Solar Farm.

Edify's FAQ booklet (file:///C:/Users/User/Downloads/Peninsula-SPS-FAQ-Final-20211213.pdf) has been updated as a result of the consultation process, to provide relevant information in relation to comments and questions raised by community members. Progressively updating the document allows community members to see Edify's responses to matters raised by themselves and by others.

Edify has already responded to a number of the specific issues raised during consultation and will continue to respond to issues as they emerge during the remaining project approvals and development phases. Edify has made changes to the footprint of the site to avoid any view of the infrastructure for the northern side of the property boundary and with other factors, such as sheds, fencing and existing screening, all views of any infrastructure will be blocked. For example, the occupants of the 'Pineleigh' residence (R1) have raised concerns about the visual impact of the proposed solar farm. Due to those concerns, Edify has modified the proposed design by excluding an area of approximately 7 ha at the northern end of Lot 441 so that the line-of-site to the northernmost part of the solar array is screened by existing sheds and vegetation on the landholder's land.

Edify has also provided advanced copies of the key reports such as the noise impact assessment to the nearest landholders in response to concerns.

PROPOSED FURTHER CONSULTATION

Stakeholder engagement – both structured and informal - will continue to be carried out across the remaining phases of the project including:

- EIS exhibition and approval phase
- Following key project development milestones
- Project development phase
- Construction and operation phases.
- At other times as interest levels dictate
- As otherwise recommended by DPIE

Future engagement will directly address the issues identified during the engagement undertaken to date as well as any issues yet to emerge.

Lines of communication between Edify and stakeholders will remain open through the project website and Edify's proactive engagement activities, such as face-to-face meetings with landholders and provision of project information and regular updates to the website which provides both updated information and an avenue for contributing to the engagement.

#	Grouping	Contact Person	Email	Phone number	Notes
	Indigenous Group				
1	**Wiradjuri Condobolin Corporation**		reception@wiradjuricc.com	(02) 6895 4664	Contacted - includes a Wiradjuri Study Centre. Future Employment seminar and opportunities. PD emailed 3/11/21 PD called 10/11/21, however no answer. PD called 18/11/21 and invited to attend lunchtime event. Group could not attend and will try to attend next drop-in session when rescheduled. CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
2	**Forbes Wiradjuri Dreaming Centre (WDC)**	Aileen Allen	aileenallen52@hotmail.com	0413 834 239	PD emailed 4/11/21 PD called 10/11/21 and left voice message CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
3	**REDI.E - Dubbo + other centres**	Allan Lamb - Chairperson	info@redie.org.au	1800 035 721	Future Employment Opportunities - for those seeking work and those searching for employees PD emailed 4/11/21 PD phoned 10/11/21 and spoke with Deborah, who has encouraged Allen and the Directors of the company to attend event on 15th Nov. CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
4	**Aboriginal Community Working Party - Forbes**	David Acheson - Chairman	facwp2014@gmail.com https://www.facebook.com/groups/facwp	N/A	PD emailed 4/11/21 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
5	**Lachlan "Galari" Reconciliation Group - Forbes & Parkes**		lachlanreconciliation@gmail.com	N/A	PD emailed 4/11/21 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
6	**Condobolin NSW Aboriginal Land Council - 99km from Forbes**	Louise Davis CEO	Louise.Davis@condobolinlalc.com.au	02 6895 4418 0456808481	Closest proximity to Forbes - no Land Council in Forbes PD emailed 4/11/21 PD called 10/11/21 and spoke with Louise. Louise has other commitments 15th Nov, but will try to attend online session. In addition, Louise will introduce me to colleagues who may be able to attend. CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
7	**Cowra NSW Aboriginal Land Council - 90km from Forbes**	N/A	cowralalc@gmail.com	02 6342 3259 0400 398 557	Closest proximity to Forbes - no Land Council in Forbes PD emailed 4/11/21 PD called 10/11/21 however phone number on website is not connected, same as mobile. CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
8	**Intract Australia**	Jay Dayarathna	jay.dayarathna@intract.com.au	0447 775 330	Indigenous employment agency PD called and emailed Jay 3/11/21

#	Grouping	Contact Person	Email	Phone number	Notes
	Indigenous Group				
9	**Traditional Family Group (TFG)**	Janeece Thompson	janeece@tfgco.com.au	0437 772 547	Indigenous employment agency PD called and emailed Janeece 3/11/21 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
	Agency				
10	**Fire and Rescue Forbes, NSW**	Brian Clarke - Captain	www.fire.nsw.gov.au	02 6851 1843 Southern Highlands Zone Office (02) 4824 7200	Phone and email contact made by Patrick 2/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
11	**RFS**	Superintendent Ken Neville District Manager	midlachlan.team@rfs.nsw.gov.au	02 6851 1541	Phone and email contact made by Patrick 2/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
12	**Forbes Business Chamber**	Marg Duggan - President	forbes.businesschambernsw@gmail.com	0407 380 936	Phone and email contact made by Patrick 2/11/2021 PD called 10/11/21 and left a voice message. I have called various times, however the phone is engaged. PD also sent follow up email 10/11/21. CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
13	**Forbes CWA**	Suzanne Maree Robinson - Secretary	sue.robinson579@gmail.com	0428 883 810	PD emailed 4/11/2021 PD shared call 9/11 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
14	**Forbes CWA Evening Branch**	Shirley Redfern - Secretary	shirley.redfern@tafensw.edu.au	0428 122 040	PD emailed 4/11/2021 PD called 9/11/2021 and spoke with Shirley. CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
15	**Fobres TAFE NSW**	Melissa Dukes	melissa.dukes2@tafensw.edu.au	02 6853 9100	PD emailed 9/11/21 PD called 10/11/2021 and spoke with Melissa. She confirmed her attendance for 15th Nov.
	Churches				
15	**Forbes Generocity Church**	Andrew & Michelle Hunt	forbes@generocitychurch.com	1300 240 831	PD emailed 5/11/2021 PD called 10/11/21 and left a voice mail CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
16	**St Laurence O'Toole**	Margaret Green - Parish Secretary	parish.forbes@wf.catholic.org.au	(02) 6852 2213	PD emailed 5/11/2021 PD called 10/11/21 and spoke with secretary. Unclear if they will attend next Monday. CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
17	**Forbes Baptist Church**	Murray Brown (Secretary)	info@forbesbaptist.org	N/A	PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
18	**St. Johns Anglican Church**	Roger & Sally Phelps	angfbs@westserv.net.au	(Office) 02 6851 1544	PD emailed 5/11/2021 PD called 10/11/2021 and left a voice message. CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
	Sports				

#	Grouping	Contact Person	Email	Phone number	Notes
	Indigenous Group				
19	**Wirinya Progress and Sports Association Inc**	Monica Langfield - President	wirrinyaprogress@gmail.com		PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
20	**Forbes Rugby League Club**	Greg Grogan - President	andrews407@bigpond.com	0457 478 745	PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
21	**Forbes Rugby Union Club**	Rhys Woods	forbesrugby@hotmail.com	0420 577 229	PD emailed 5/11/2021 PD shared voice message 9/11 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
	Business/Other Community Groups				
22	**Central West Lachlan Landcare**	Marg Applebee - Co-ordinator	cwllpo@hotmail.com	02 6862 4914 0418 611 053	PD emailed 4/11/2021 PD shared voice message 9/11 and 10/11 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
23	**Forbes College for Seniors**	Evelyn Mahlo - President	president@forbesnew.u3anet.org.au	0428 537 216	PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
24	**Forbes District Lions Club**	Richard Eggleston - President	lionsclubs@hotmail.com.au	N/A	PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
25	**Forbes Wiradjuri Men's Shed**	Norm Haley	haleytransport@bigpond.com.au	0428 638 665	PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
26	**Forbes Men's Shed**	Peter White	forbesmensshed@hotmail.com	0477 639 640	PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
27	**Rotary Club of Forbes**	Chris Finkel	hfpitt@yahoo.com.au	N/A	PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
28	**Forbes View Club**	Secretary - Helen	rhurley01@bigpond.com	0419 688 353	PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
29	**Programmed Skilled Workforce**	Shawn Craig - National Account Mar	shawn.craig@programmed.com.au	0417 628 387	PD emailed 5/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
	Government Agencies				
30	**Forbes Shire Council**	Eliza Noakes, Mathew Teala	Eliza.Noakes@forbes.nsw.gov.au mathew.teale@forbes.nsw.gov.au		PD emailed 4/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
31	**NSW State Member**	Hon. Phil Donato MP	rebecca.hawkins@parliament.nsw.gov.au		Cassie emailed 4/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.
32	**Federal MP**	Hon. Michael McCormack	Eliza.Buckland@aph.gov.au Michael.McCormack.MP@aph.gov.au		PD emailed 4/11/2021 CD emailed 14/11/21 advising cancellation due to flooding, and invited to attend online session 18/11.

#	Grouping	Contact Person	Email	Phone number	Notes
	Indigenous Group				
33	**Transport for NSW**	Alexandra Power (A/Team Lead, Development Services) Howard Orr (Team Leader, Development Services)	Alexandra Power Howard Orr	6861 1449 0417 125 741	IMPACT phoned 8/032022 Ms Power's colleague took the call and passed details onto her. No direct response from Ms Power IMPACT emailed 3/03/2022 and phoned 8/032022 to discuss the project. No direct response from Mr Orr.
34	**Forbes Shire Council**	Timothy Welsh (Works Officer / Urban Services Supervisor)			IMPACT spoke with FSC 29/04/2021, 30/04/2021 and 4/05/2021 to discuss Traffic counts on Paytens Bridge Road and photographs of Paytens Bridge Road showing the alignment and sightlines

Edify

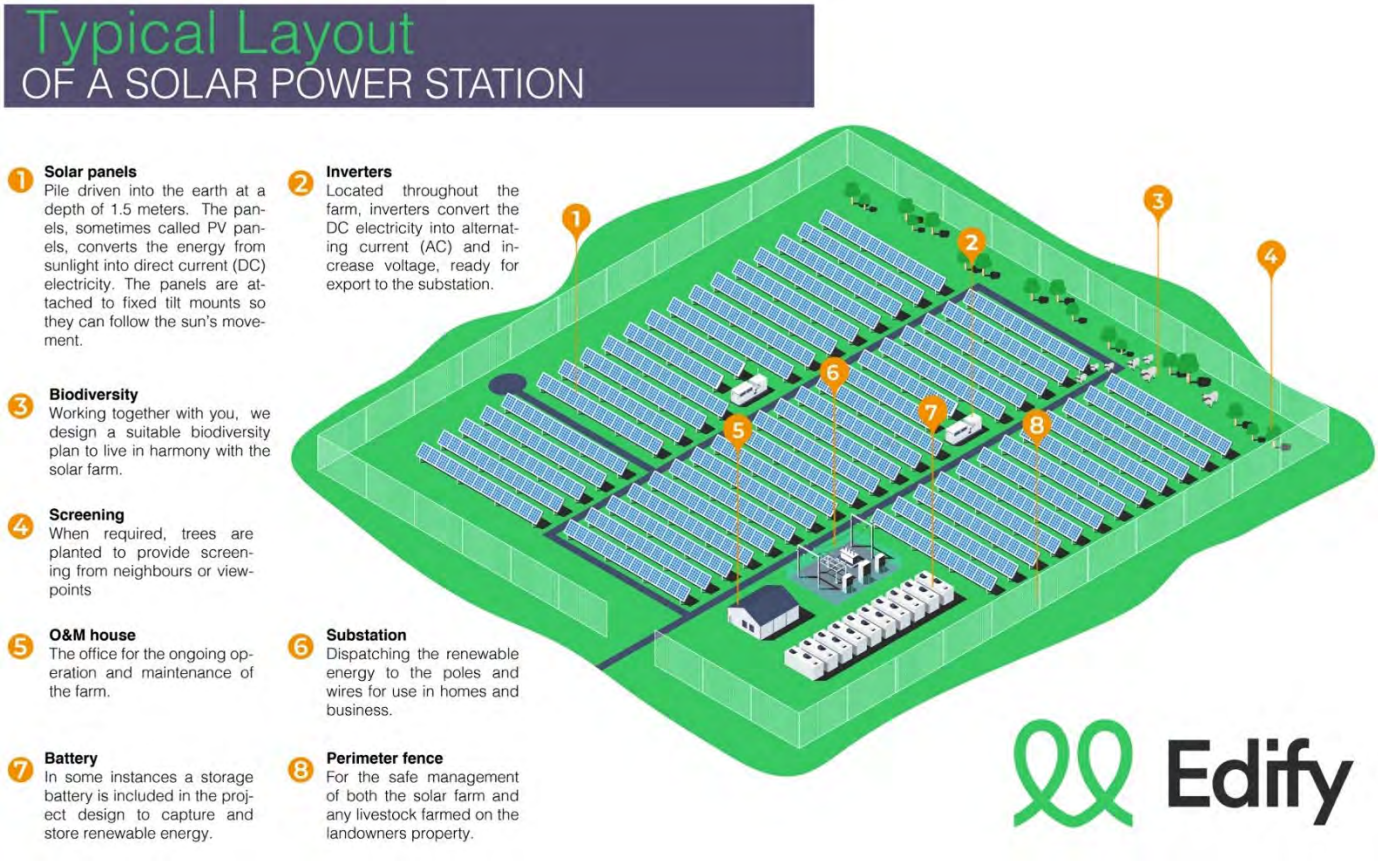
Peninsula Solar Power Station
Frequently Asked Questions

Frequently Asked Questions

How does solar generation work?

When sunlight photons shine on a solar panel they 'knock' electrons free on an electrical circuit (semi-conductor) and produce electricity. This electricity is initially generated as Direct Current (DC). Inverters then regulate the accumulation of electricity from a cluster or string of solar panels and converts this to Alternating Current (AC), delivering this AC power through the substation to the transmission network.

In regards to the solar panels, the angle of incidence of the light ray on the panel is of high importance in the amount of energy that can be extracted from it. This is why installing tracking systems helps increase the energy generation.



What type of infrastructure makes up a Solar Power Station?

Edify's projects incorporate a similar solar module to that used in residential solar photovoltaic installations. The main difference however is that utility-scale solar modules are often mounted on systems that track the sun through the sky. Edify has broad experience in financing, constructing and operating solar and battery projects. This proven track record is reflected in the suppliers and components that we procure for the project. The Peninsula Solar Power Station will utilise premium Tier 1 quality solar modules and battery technology, provided by leading manufacturers. This is selected through a competitive process for each project. All components come with long term warranty periods and performance guarantees, which is important as Edify act as Asset Managers throughout the multi-decade life of the Solar Power Station.

What's the difference between a 'solar farm' and a 'solar power station'?

Edify has vast experience in the integration or large-scale batteries into the Australian electricity network, owning and operating Australia's first solar plus battery project – Gannawarra Solar Power Station – which is located in regional Victoria.

'Solar farms' typically refer to large solar projects that do not include a battery system. Instead, solar farms only include the solar modules (and tracking systems) needed to produce electricity. Solar farms are an important contributor to Australia's energy mix, however they are solely depending on sunlight conditions and cannot generate electricity on-demand, nor after the sun goes down.

'Solar Power Stations' refer to hybrid projects that integrate solar and battery systems into the one project. By adding a large-scale battery, this enables the generator to dispatch electricity on-demand and can remove price spikes by creating a more stable market with reduced costs for consumers. The battery component supports the variability of solar generation by smoothing output. The battery component also interfaces with the transmission network via a digital inverter, which enables the project to support the grid's frequency, in the event of a contingency or disruption to the network.

The Solar Power Station's inverters have a response time within 200 - 300 milliseconds, which is incredibly fast *and accurate* when compared to traditional power plants. By integrating both solar and battery facilities into one project, this design achieves a balanced power and frequency and allows the operator to control exactly when energy is sent into the grid, to ensure sufficient generation is available when it's most needed. Finally, the battery can also provide an alternative solution than simply building more poles and wires. Transmission network augmentation can be deferred as this project has the ability to support New South Wales' network congestion (which have been notable in 2021). Batteries and other 'non-network solutions' can create savings for the network owners, government and most importantly – household consumers.

How long does it take to build a solar power station?

The construction timeframe depends on the project size and the number of workers deployed on site. For a 100 MW power plant, an 8 to 12-month timeframe is typical, with a peak construction period of 2 to 3 months. A larger project like Peninsula will take around 14 to 18 months to construct with a peak construction period of 3 to 4 months.

What is the life cycle of a solar power station?

A solar power station will typically operate for between 25 and 30 years. Tier 1 solar panels that will be procured for the project generally come with a 25-year manufacturer's warranty. Depending on the local environment, they can generate electricity for 30 years or more with only about 0.5% efficiency loss each year. It is anticipated that the Peninsula Solar Power Station will operate for between 25 to 30 years.

How long will the batteries last?

The battery's lifespan is dictated by the usage and frequency of cycles (charge / discharge). Edify will procure the batteries from Tier 1 supplier, who are able to provide a performance guarantee that will warrant the performance of the battery cells for 10-20 years. Edify's battery procurement contracts include an agreed 'degradation rate', which provides certainty over the long-term performance of the battery cells and cycling frequency.

In addition, the ambient and operational temperature of the battery system is a key factor that has impacts upon the overall life of the battery cell. This is why the battery system is housed within a climate-controlled enclosure, which includes multiple HVAC units to regulate the operating temperature of the system, ensuring the battery cells stay within the optimal temperature envelope to preserve the cell's longevity.

What is the maximum height of a solar panel when mounted on a tracking system?

The maximum height of the solar panel occurs when the tracking system is tilted at sunrise and sunset. This height is approximately 4m tall. Generally speaking solar panels have a dimension of 1m x 2m. Rows of solar panels are usually 30, 60 or 90 meters long. And rows of panels are separated by 5 to 7 meters. However, this varies from project to project.

Will the solar panels generate glare?

All tier 1 solar modules are coated with an Anti-Reflective material, which is why solar systems are common place across most major airports in Australia.

Improved manufacturing techniques on Tier 1 panels include anti-reflective (AR) coatings on solar panels to increase the amount of energy converted by the panels from sunlight. In addition, by minimising reflective losses from (or trapping more light within) solar panels, their performance can be increased while costs are lowered.

Fresnel's equation predicts that roughly 4% of the sunlight is reflected off the panel at normal incidence (i.e. when the sun's rays make an angle of 90°). Because every photon makes a difference in the efficiency electricity generation, significant investment has been made in AR coatings. AR coating can reduce the normal incidence reflectance to less than 1%.

The AR coating performance directly translates to increased power and energy output – designed to achieve greater than 99% transmittance. This coating is applied as a spray process integrated into the panel manufacturing process. Because of these innovations, solar panel installations are now commonly found in airports around the world where any issue of glare would be highly scrutinised. For example, the Brisbane Airport represents the largest solar installation at any Australian airport, consisting of 22,000 solar modules that span an area twice the size of the Melbourne Cricket Ground. The Adelaide airport also has 5,000 solar panels with a capacity of 1.28 MW on the roof of the terminal and carpark. From a regional perspective, the Mildura airport has 400 panels with a capacity of 100 kW on the roof of the terminal. Finally, the upcoming Western Sydney Airport is also considering significant solar investments to help contribute towards electricity demands and lower greenhouse gas emissions. All of these installations have been undertaken by stakeholders that are highly cognisant of risks, such as glare and other safety related concerns.

Where is the site and what route will large vehicles utilise?

The solar power station is proposed to have a capacity of 130MW and will be split between two sites that are separated by Paytens Bridge Road. Access to the sites will be provided via Paytens Bridge Road, which connects to Lachlan Valley Way, Forbes and the inland rail network, which is expected to support the project's logistics requirements. A vehicle crossing will be established across Paytens Bridge Road to provide traffic movements between the north and southern sites. A detailed Traffic Impact Assessment and Management Plan has been undertaken by Edify in the Environmental Impact Statement (Development Application).

Economy

Do solar power stations benefit the Australian/local economy?

Each project benefits the local community by creating employment, utilising local services and by increasing the long-term assets and investments that generate opportunities for decades to come. At Edify's Darlington Point Solar and Battery project, approximately 350 people were employed locally during the construction phase and five are employed locally in full-time positions during operations, as well as ongoing indirect employment (e.g. ground, fencing and building maintenance, engineering, Control Centre for 24hr monitoring, project management, vegetation control, calibration services, cleaning services, etc.).

Edify's Local Participation Plan provides opportunities for local contractors to submit tenders and local jobseekers to seek employment by hosting a series of 'Contractor Information Sessions' in the local area and online, prior to any construction commencing. In addition, Edify establishes a community fund with the local Council for each solar power station, which is designed to support community group projects. Media reports also indicate that some drought-stricken farmers are turning to renewable energy contracts as a way of earning additional income and future-proofing their enterprises against increasingly unpredictable climates.

How much do renewables cost compared with other energy sources?

Renewable energy projects are now the cheapest sources of new energy generation in Australia. Solar energy projects produce energy at less than $50 per megawatt hour. The costs of other sources of generation are:

» Existing coal: approximately $40 per megawatt hour

» New coal: approximately $130 per megawatt hour

» Combined gas-cycle generation: approximately $75 per megawatt hour

Edify also pays for any electrical transmission upgrades that are necessary to connect and operate the project in the electricity grid. This includes construction and maintenance costs for the life of the project.

Do solar power stations result in a decrease in electricity prices?

Solar energy forms just one part of the Australian Energy Market Operator's (AEMO) move towards a sustainable energy system. Solar power stations add to the supply side of the electricity supply / demand equation, which puts downward pressure on all electricity bills.

Does Edify require government subsidies to build its projects?

Edify does not require government subsidies to finance its projects. We finance our projects through a combination of our own equity and long-term bank loans. In addition, Edify also enters into agreements with governments or businesses that are seeking to purchase the renewable energy that is produced by our projects.

Which regulatory agency is responsible for assessing the project's Development Application?

The main regulator for the Peninsula Solar Power Station is the New South Wales Department of Planning, Infrastructure and Environment (NSW DPIE). All Edify projects meet strict State and Federal Government

regulations and are assessed under these regulations. We work closely with governments to ensure we meet all legal requirements and exceed these requirements wherever possible.

Once the Environmental Impact Statement (Development Application) is lodged by Edify, this 'Major Project's Portal' will allow members from the public to view the Development Application and associated reports (search: https://www.planningportal.nsw.gov.au/major-projects/project/41241; SSD #14757962).

Should I expect the value of my near-by property to decrease due to the project's development?

Some neighbours have questioned what impacts a development of renewable (primarily wind) projects will have on the value of their neighbouring property. Edify it cognisant that for most households, their home is their primary asset, which in turn means that any factor which may affect its value is significant and important to understand. Accordingly, Edify takes concerns regarding property values very seriously.

After delivering eight projects throughout Australia, including the largest solar and battery project in New South Wales, Edify is not aware of, and has not been presented with, any reliable, impartial research or evidence which establishes a correlation between declining real estate values and proximity to renewable infrastructure.

The most recent and relevant study carried out in Australia was commissioned by the NSW Office of Environment and Heritage and published by planning consultancy Urbis in July 2016[1]. This report comprised an analysis of available sales data and a 'literature review' of Australian and international studies. An example of the literature review includes a 2009 report prepared for the NSW Valuer General's office. Its conclusions are most easily understood when divided into 'agricultural' and 'lifestyle' land. The report recognises that property values are influenced by a range of factors and it is therefore difficult to determine if solar power stations (or other similar infrastructure) can cause land values on neighbouring agriculture properties to increase or decrease.

In summary, it is not expected that the Peninsula Solar power station would affect productivity of neighbouring agricultural properties.

What are the insurance implications for my nearby property or the broader community?

Edify will have its own insurance policy in place to provide coverage in the unlikely event that solar power station equipment is damaged (i.e. fire, flood, etc). A Bush Fire Management Plan will include procedures to deal with a fire on site, which is why the project's design requires water to be kept on site for that specific purpose.

The Environmental Management Strategy will include obligations that prevent the spread of fire across the site (such as grass cutting and a buffer / asset protection zone). Edify understands the concern of adjoining landowners regarding potential damage to a Edify facility, however the important elements for consideration are:

» For an adjoining landowner to have any liability for fires that have spread from their property to the solar power station, it has to be demonstrated that the landowner was negligent in causing damage.

» The occurrence of a fire from a weather event (e.g. a lightning strike) that migrates from the landowner property to Edify property would not necessarily create a legal liability for the landowner, likewise if there was

[1] https://epuron.com.au/documents/444/review_of_the_impact_of_wind_farms_on_property_values_urbis_2016_07_21.pdf

a heavy rainfall event and water drained from an adjoining property to Edify facility this again is not necessarily a negligent act of the landowner.

In summary, Edify has its own insurance and would seek to make claim on that first in the event of fire damage to the solar power station. Notwithstanding, Edify recommends that farmers on nearby properties take all necessary precautions to prevent the ignition and spreading of fires, and seek advice from their insurance providers on individual insurance policy matters.

Health & Culture

Are there any health risks associated with solar power stations?

Solar panels are deployed on almost 30% of Australian homes and have been deployed for the past 10 to 15 years on people's homes in the world. The Peninsula Solar Power Station would use the same type of technology, with the exception that the project operates at a higher voltage and scale. High voltage infrastructure is an inherently risky undertaking, due to the complexity of operating national electricity networks. However these risks are contained within the project boundary, where the project's staff are trained to perform and operate tasks in this work environment.

Is there any risk of chemical leaks from the solar PV modules?

Because PV panel materials are enclosed, and do not mix with water or vaporize into the air, there is little, if any, risk of chemical releases to the environment during normal use. The most common type of PV panel is made of tempered glass. They pass hail tests, and are regularly installed in Arctic and Antarctic conditions.

Can solar power stations' noise affect local residents?

The project has undertaken a noise assessment for the Environmental Impact Statement (Development Application), prepared by a 3rd party acoustic engineering expert. This indicates that the Solar Power Stations emits a noise level which is similar to typical residential and industrial levels during daytime hours. These results can be seen via the NSW Major Projects Portal.

Will the project reduce air quality?

Monitoring of dust levels during construction is a basic requirement of each project. Dust generating activities are assessed during windy conditions and are stopped and rescheduled where adequate control of dust generation cannot be achieved. Visual observation of machinery is undertaken during site inspections in addition to daily pre-start checks which ensure all machinery has appropriate emission control devices, is in good working order and is maintained correctly. Trucks that spray water to suppress dust will be utilised when required – mostly likely on a daily basis – which will reduce the impact of dust from the various truck deliveries throughout the construction phase.

Is cultural heritage taken into consideration?

Edify and the Wiradjuri People have conducted a detailed Cultural & Heritage survey, which complies with all legislation, including laws regarding the protection of cultural heritage. A cultural heritage assessment forms part of the critical studies, as does consultation with local Indigenous groups to ensure cultural heritage is protected. This collaboration between Edify and the local indigenous groups will remain an ongoing commitment throughout the lifecycle of the project.

Environment

Do solar power stations impact on flora and fauna?

Edify engages specialist consultants to undertake detailed flora and fauna surveys to determine the ecological attributes of the land. On all of our projects, we aim to minimise the impact on flora and fauna by designing projects to be constructed outside areas of high conservation significance and adopting control measures during the construction process.

Edify has selected the Peninsula Solar Power Station, in part due to the lack of vegetation that is present on the development area today. Pre-existing patches of vegetation are retained, while other mitigation measures include preparing management plans, identifying 'no-go zones' within the project site and conducting pre-clearance surveys. Edify also consults with government departments of environment and biodiversity throughout the development, construction and operational stages of projects, as well as local non-government organisations.

Do solar power stations affect farm/domestic animals?

Edify built and operates the Gannawarra solar and battery project in Victoria. This project is now host to around 500 merino sheep. This experience has proven that the sheep take a couple of days to get used to the site, and then are very comfortable with the solar and battery infrastructure. The sheep commonly use the shade from the solar arrays during summer to escape the harsh temperature and conditions.

How do you stop the solar facilities from impacting our landscape?

We acknowledge that solar facilities do impact the visual amenity of its near area, but will work with communities to ensure our solar power stations have the least possible detrimental impact on visual amenity. Edify encourage individuals and groups that have questions about visual impact and remedies to engage with us early. Overall, we consider that the immediate and long-term benefits which solar power stations bring to communities offset any loss of visual amenity.

How does Edify manage solar panels after they are decommissioned and no longer in use?

Solar panels are manufactured using few components; predominantly aluminium, glass and silicon, and over 90-95% of a panel's weight can be recycled. These materials can be separated and captured, for reuse in the manufacture of other products. Edify is committed to Project Custodian responsibilities and will implement such recycling practices with a local company, such as Reclaim PV Recycling or Tindo Solar. Based in Adelaide, Reclaim PV and Tindo Solar offer a solar waste management / resource recovery solution. This includes logistics and recycling of PV modules, inverters and batteries.

Will the batteries end up in landfill once their capacity is diminished?

Lithium-ion batteries and PV modules forming the critical asset components. Therefore, Edify recognises that a total cost of ownership strategy must encompass a robust end-of-life management process to ensure the project is a genuine sustainable investment.

Edify works with key equipment supply partners and newly emerging E-waste recycling parties, who share our 'Project Custodian' commitments. These end-of-life commitments represents a commercially viable incentive that strengthens the company's commitment to sustainability, local industry and circular economy procurement strategies.

Edify stipulates in the supply contract that the original battery manufacturer will be required to implement or support Edify with a recovery and recycling scheme. Within this recovery process, an assessment of the

battery's capacity and health will determine if the manufacturer disposes it, recycles the valuable metals, or prepares the battery cell for reuse in a '2nd-life application'.

Innovations are emerging in the battery value stream that extend the useful life of the battery cells beyond the original Project's use case. At the end of the initial 10-15 year expected lifespan, these battery cells will still possess useful capacity that can be used in '2nd-life applications' that require less-frequent battery cycling (charge/ discharge). An example of an alternative use case is in 'standby back-up' power systems that require less cycling and capacity than Edify's primary use case via the Project. This is exemplified by the ARENA project at the Netherland's national soccer stadium[2]. This project utilises recycled Nissan Leaf car battery cells and repurposes the lithium-ion batteries from previous applications to match them with an second alternative use case – such as the stadium's back-up power system.

How is any potential fire risk managed?

The design of the Peninsula Solar Power Station incorporates a cleared vegetation zone around the edges of the solar power stations to prevent fire propagation. This is complemented by a strict vegetation management plan.

The Battery system is monitored on a constant basis, utilising metering and power plant controllers that automatically assess, control and diagnose the 'health' of individual battery modules.

The project will incorporate a Battery Management System (BMS) for control and safety, ensuring that in the event the temperature rises in the battery cabinet (e.g. due to HVAC failure), the battery module and individually fused cells will trip when facing high temperatures and automatically shut down the module or entire battery system. This is possible due to the dedicated power electronics and system architecture that isolate the batteries from the common DC bus.

This key safety aspect will be designed by Edify and / or the Designated Construction Contractor, and must be agreed by the local Fire Authorities (NSW Rural Fire Service, or Fire and Rescue NSW) prior to construction commencing. The initial report that the project presents to the NSW Fire Authorities has been undertaken by a fire and risk specialise engineer. This report (Preliminary Hazard Assessment) is the first of a multi-stage process that we assist Edify and the regulators to refine the project's design and fire mitigation features.

[2] https://insideevs.com/news/356320/nissan-leaf-batteries-power-soccer-stadiums/

The Hon. Michael McCormack MP

Federal Member for Riverina

THE NATIONALS for Regional Australia

Ms Claire Driessen
Senior Development Manager
Edify
Level 1, 33-35 Palmer Street
SOUTH TOWNSVILLE QLD 4810

via email: claire.driessen@edifyenergy.com

Dear Ms Driessen

I write to thank you and your team for the informative briefing you provided my office in relation to the Peninsula Solar Power Station being established just outside of Forbes.

My office has appraised me of both the challenges and opportunities Edify has identified and I am also pleased to learn of the positive reception the solar farm project has received following initial public consultation processes.

I am pleased to offer my support for this project and look forward to working with Edify as it progresses. Do let me know if my office or I can be of assistance in providing local advice or enabling connections with local stakeholders and the community.

Yours sincerely

Michael McCormack MP
Federal Member for Riverina
mm.amc.wga

25 / 1 / 2022

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Appendix E:
Aboriginal Cultural Heritage Assessment Report
- see separate report

Appendix F:
Biodiversity Development Assessment Report
- see separate report

Appendix G: Biodiversity Assessment of Intersection Upgrade - see separate report

Appendix H:
Land Use Conflict Risk Assessment
- see separate report

Appendix I:
Flood Impact Assessment
- see separate report

Appendix J:
Traffic Impact Assessment
- see separate report

Appendix K:
Noise Impact Assessment
- see separate report

Appendix L:
Visual Impact Assessment
- see separate report

Appendix M: Preliminary Hazard Assessment - see separate report

Appendix N:
Historic Heritage Assessment Report
- see separate report

Appendix O:
Socio-economic data

Figure A Estimated male and female resident population by age in 2020.

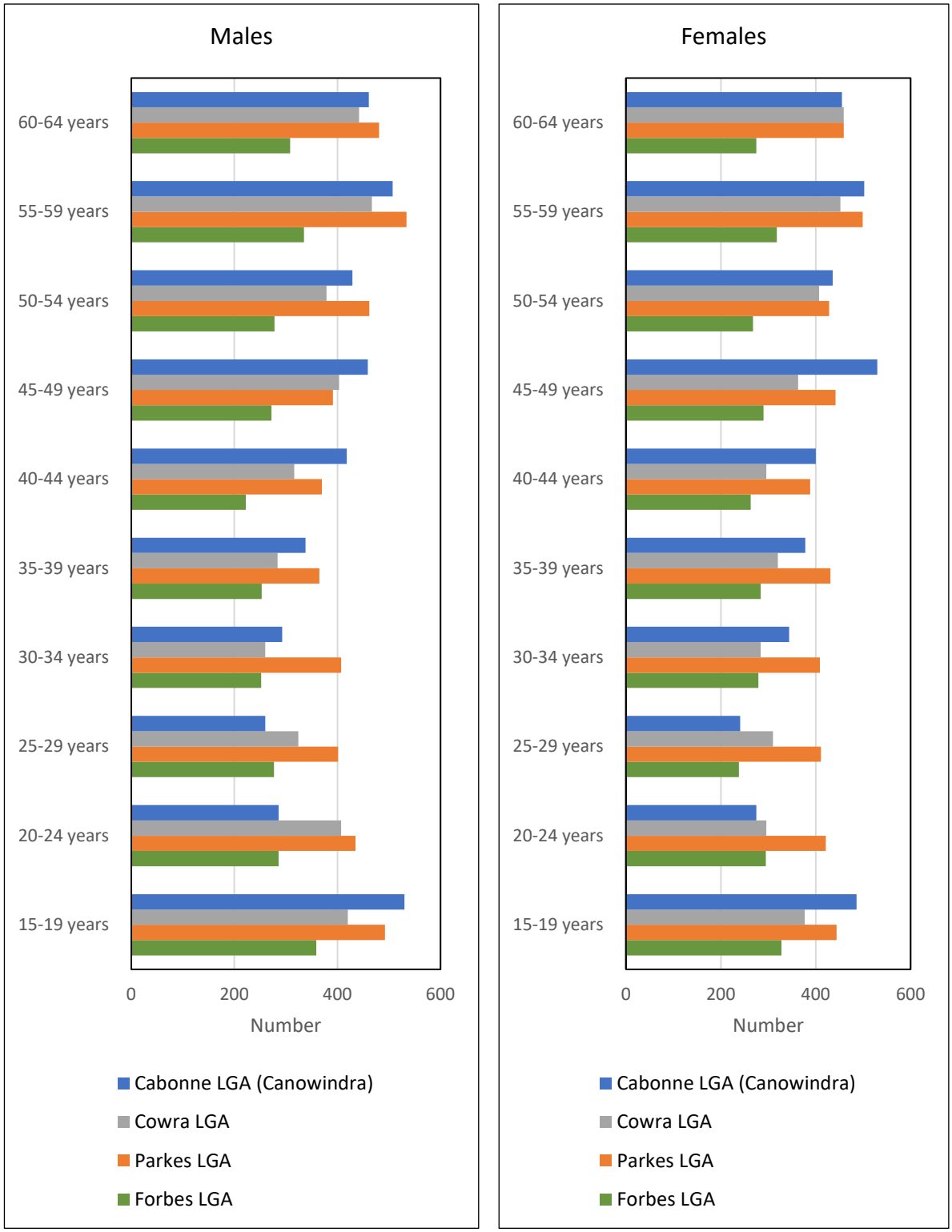


Figure B *Number of employee jobs in their respective sectors in 2018.*

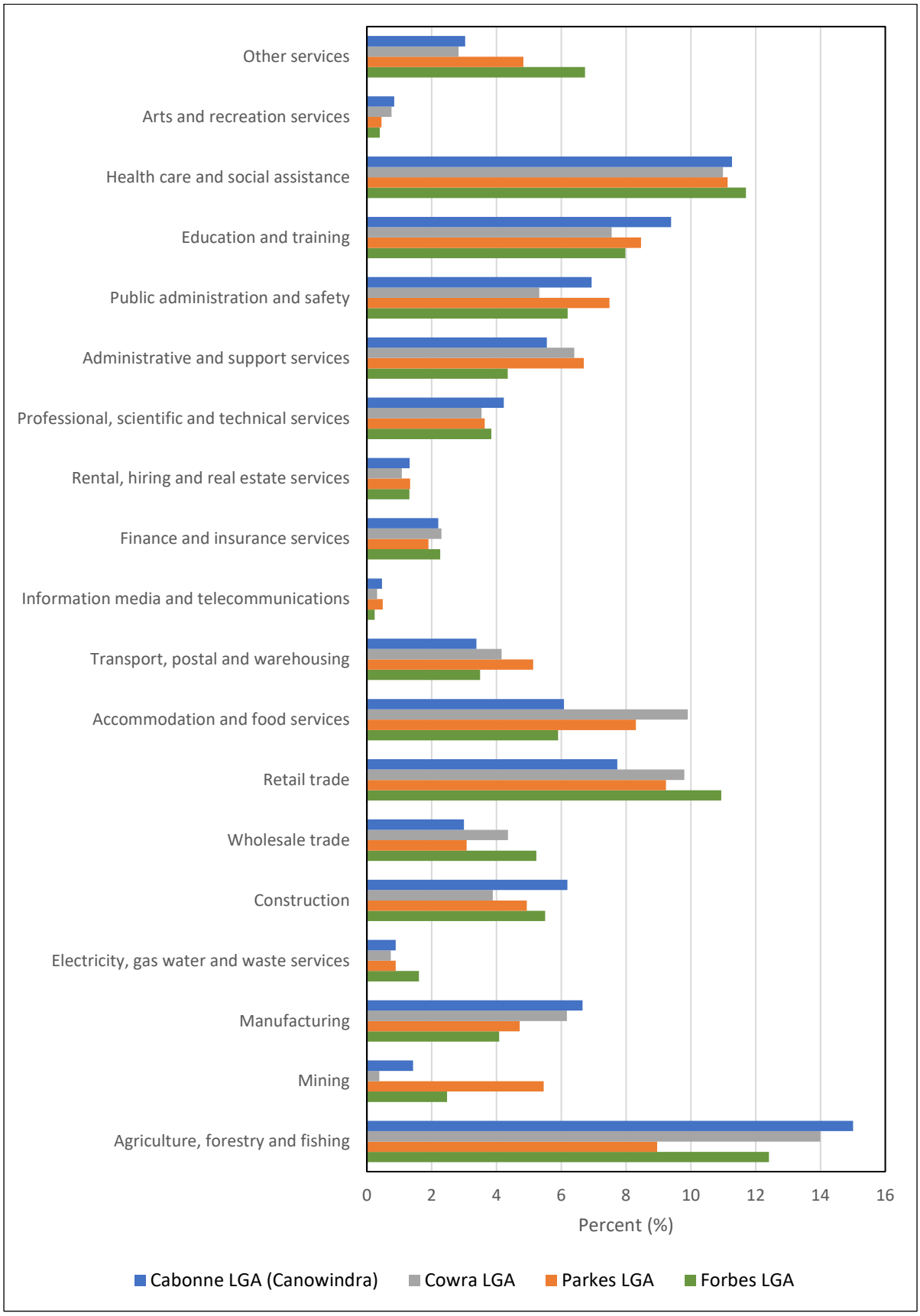


Figure C *Occupation of employed persons in 2016.*

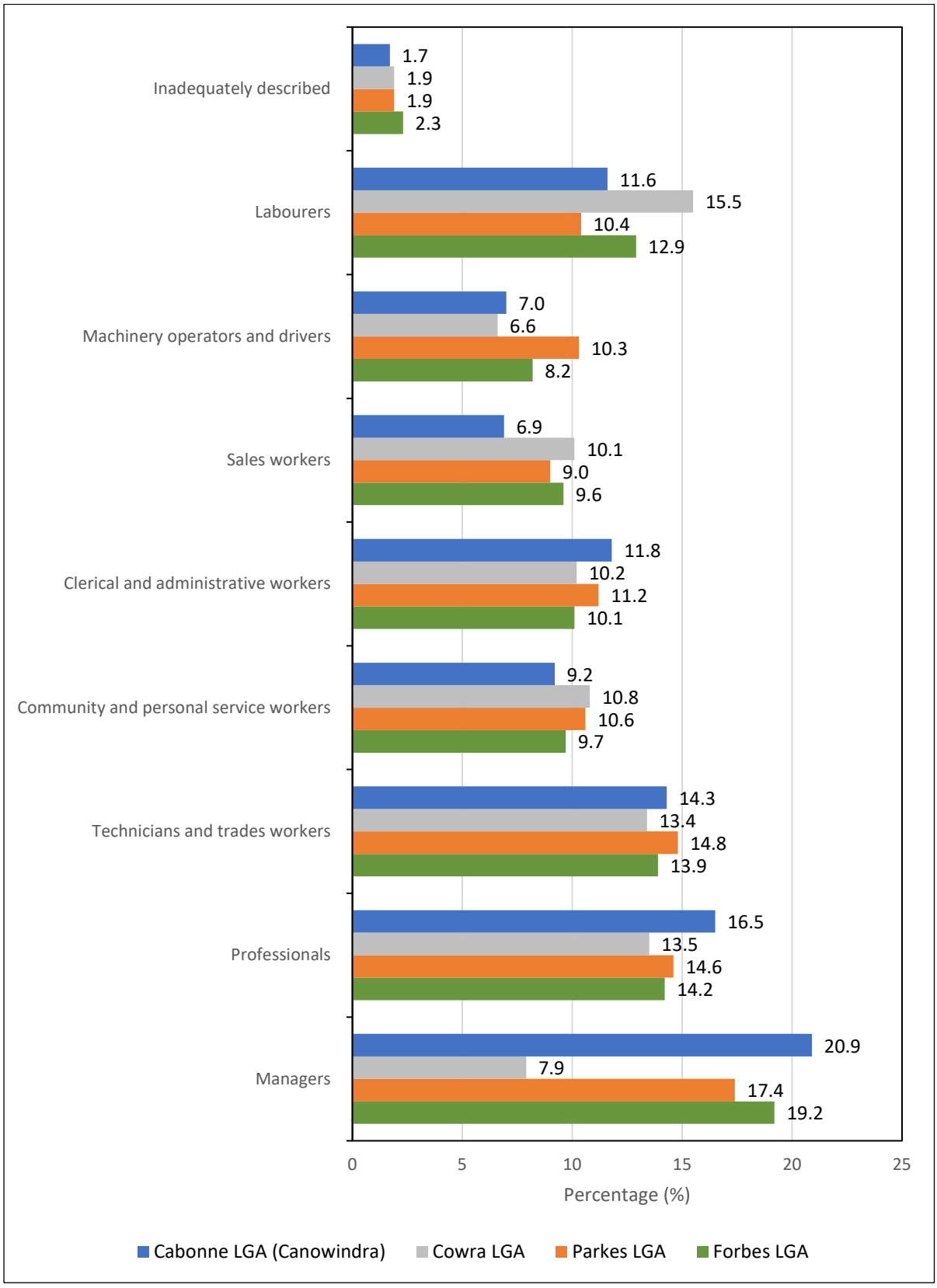
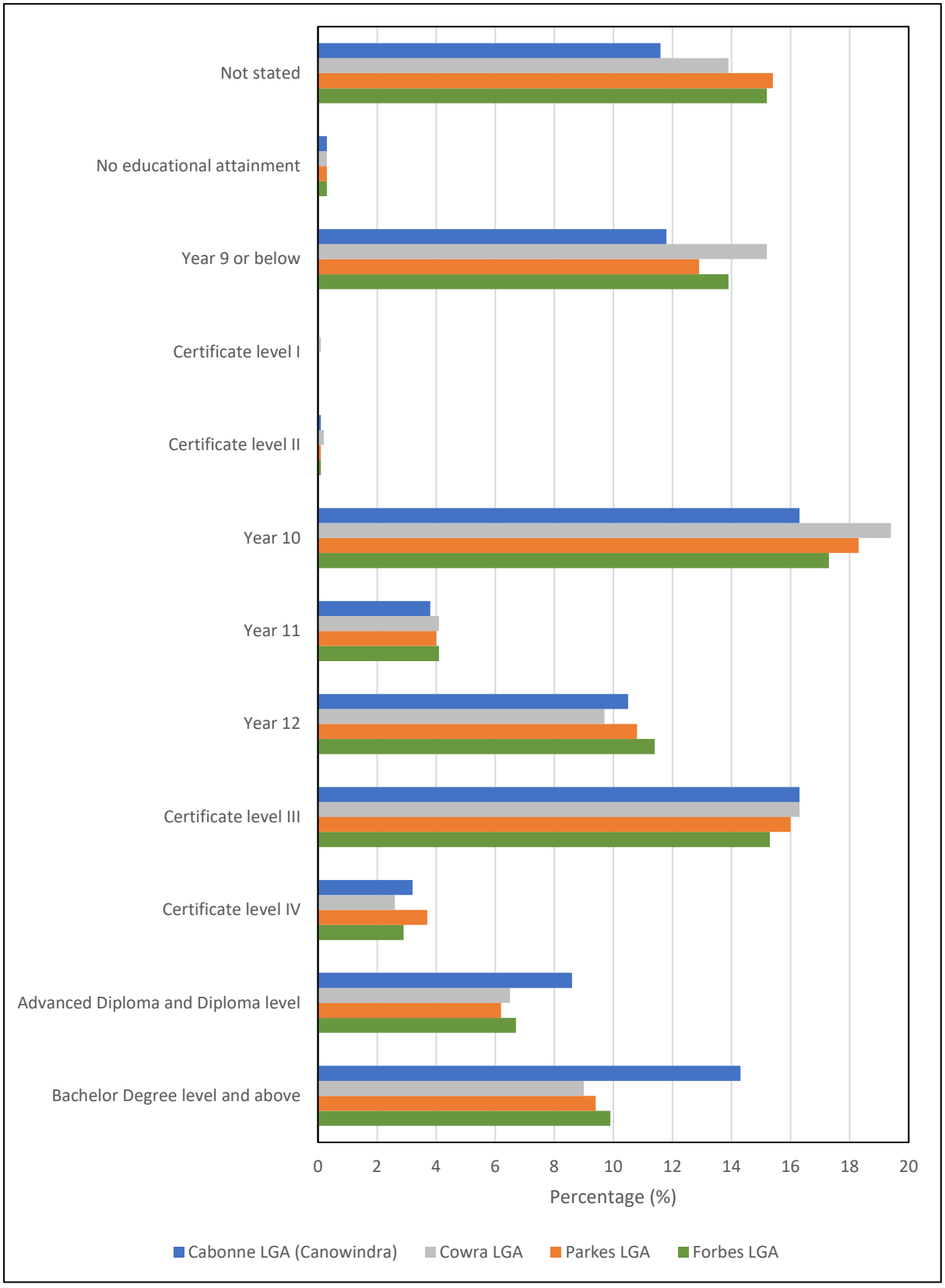


Figure D Level of highest educational achievement for persons aged 15 years and over in 2016.



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ABS (2016b). Parkes (A). Australian Bureau of Statistic 2016 Census Quickstats. Accessed 13th December 2021 at https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/LGA16200?opendocument

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ABS (2020c). Region summary: Cowra (A). Australian Bureau of Statistics. Accessed 13th December 2021 at https://dbr.abs.gov.au/region.html?lyr=lga&rgn=12350

ABS (2020d). Region summary: Cabonne (A). Australian Bureau of Statistics. Accessed 13th December 2021 at https://dbr.abs.gov.au/region.html?lyr=lga&rgn=11400