



Scoping report

CURRAWARRA SOLAR FARM



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ABBREVIATIONS AND ACRONYMS

ABS	Australian Bureau of Statistics
AHIMS	Aboriginal Heritage Information Management System
CCP	Community Consultation Plan
CEMP	Construction Environmental Management Plan
Cwth	Commonwealth
DPE	Department of Planning and Environment (NSW)
EEC	Endangered Ecological Community (listed under NSW TSC Act)
EIS	Environmental Impact Statement
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999</i> (Cwth)
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i> (NSW)
ha	hectares
Heritage Act	<i>Heritage Act 1977</i> (NSW)
ISEPP	<i>State Environmental Planning Policy (Infrastructure) 2007</i> (NSW)
km	kilometres
kV	kilovolt
LEP	Local Environment Plan
LGA	Local Government Area
m	metres
MNES	Matters of National Environmental Significance under the EPBC Act (c.f.)
MW	megawatts
NPW Act	<i>National Parks and Wildlife Act 1974</i> (NSW)
NSW	New South Wales
NV Act	<i>Native Vegetation Act 2003</i> (NSW)
OEH	(NSW) Office of Environment and Heritage, formerly Department of Environment, Climate Change and Water
RES	RES Australia Pty Ltd (proponent)
RET	Renewable Energy Target
RMS	Roads and Maritime Services
SEARs	Secretary's Environmental Assessment Requirements (issued by DPE)
SEPP	State Environmental Planning Policy (NSW)
SSD	State Significant Development, defined in the ISEPP
TEC	Threatened Ecological Community (listed under Commonwealth EPBC Act)
TSC Act	<i>Threatened Species Conservation Act 1995</i> (NSW)

1 INTRODUCTION

1.1 PROPOSAL OVERVIEW

RES Australia Pty Ltd proposes to develop a large scale solar farm at Currawarra, north-east of Deniliquin in the Riverina region of New South Wales. The solar farm would occupy around 750 hectares of rural land currently used for cropping. The proposal infrastructure includes solar arrays, a substation and an energy storage facility.

1.2 THIS REPORT

Scoping is a key stage in the environmental impact assessment process. It identifies the main issues and information requirements for the assessment, considering the values of the site, the nature and extent of potential impacts, planning and regulatory requirements and the results of early consultations. This allows the assessment to efficiently focus on the most important issues.

This Scoping Report:

- describes the proposal and the site
- identifies statutory approval requirements
- identifies key potential environmental issues associated with the proposal.

The report has been prepared to support a request to the Department of Planning and Environment (DPE) for the Secretary's Environmental Assessment Requirements (SEARs). The SEARs would guide the preparation of an Environmental Impact Statement (EIS) for the proposal under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.3 RES AUSTRALIA PTY LTD

RES was established in the UK in the early 1980s and has grown to become the world's largest independent renewable energy company (RES 2017). The company has deployed over 12GW of utility scale wind, solar and battery energy storage projects around the world. The company has operations in Europe, the Americas, Turkey and Australia. RES Australia Pty Ltd has been developing renewable energy projects in Australia since 2004 and is based at Chatswood, Sydney. Recent projects in Australia include the Taralga Wind Farm in NSW, and the Ararat and Murra Warra Wind Farms in Victoria.

2 SITE DESCRIPTION

2.1 LOCATION

The Currawarra solar farm proposal site is located at Blighty approximately 26 kilometres north-east of Deniliquin, north of the Riverina Highway (B58). The property fronts Russells Road, Mayrung Road and Sunny Pines Road. The site is within the Edward River Council Local Government Area. The location is shown on Figure 2-1.

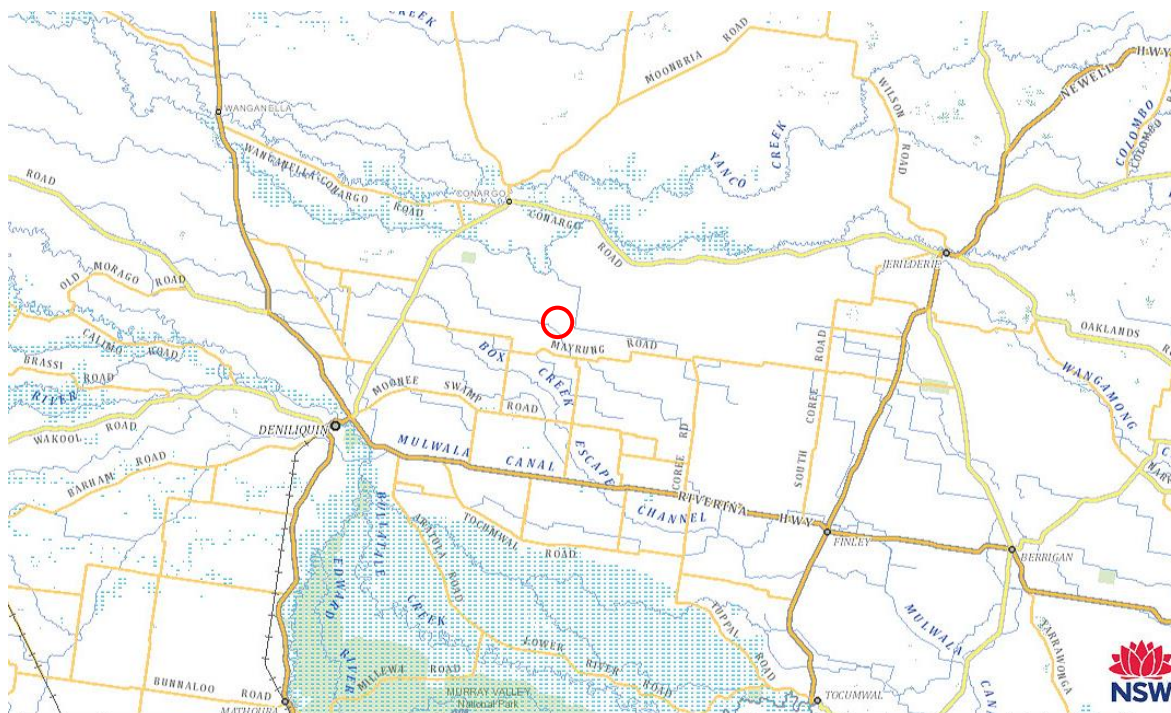


Figure 2-1 Location of the proposal site (Six Maps)

2.2 THE SITE

The Currawarra solar farm proposal would be located on a 750 hectare property comprising Lot 109 DP756305, Lot 110 DP756305, Lot 106 DP756305, Lot 105 DP756305, Lot 28 DP756344, Lot 30 DP756344 and Lot 40 DP756344 Mayrung.

The site is agricultural land used primarily for irrigated cropping. A residence is in the south of the property (accessed from Russells Road and Mayrung Road) and a second residence is in the north west of the property (accessed from Russells Road). Russells Road connects with Marshalls Road, which intersects the Riverina Highway around 14 kilometres to the south of the site.

The site comprises several large paddocks which have been levelled and largely cleared for cropping. Crops include wheat, barley and canola. Remnant native vegetation appears to be present at the site in the form of paddock trees with cleared or exotic groundcover, and a disturbed woodland remnant with patchy native understorey.

The Blighty, Blighty No. 14 and Blighty No. 17 irrigation channels managed by Murray Irrigation run through the property. Privately owned internal irrigation channels have been constructed within the property to distribute water to paddocks. A large storage dam has been constructed in the north of the property. Surface hydrology, landform and soils have been heavily modified by the paddock development and irrigation works. Much of the property has been laser-levelled for irrigated cropping.

A 132kV powerline runs along the southern and eastern boundary of Currawarra. The residence is connected to the grid via a 22kV powerline. The environmental features of the site are shown on Figure 3-1. Photographs of the site are provided in Appendix A.

2.3 THE LOCALITY

Edward River Council was formed following the merger of Conargo Shire and Deniliquin Councils in 2016. The proposal site is in the former Conargo Local Government Area (LGA), which has a population of 1,540 people (ABS 2013a). The Edward River Council area has a population of 8,972; covering an area of 8,881 square kilometres (NSW Government 2017). The main town and rural centre is Deniliquin with a population of 7,494.

The main local industry for employment in the Conargo district is agriculture; sheep, beef cattle, grain farming and dairy cattle (56 % in 2011) (ABS 2013). The LGA is renowned for sheep breeding studs and cereal crops such as white rice and canola and its distinctive natural environment (CSC 2016). The regional Council defines the communities' environmental values as water, agriculture, wide open plains, and big skies (ERC 2016a).

Community facilities and services in the locality include a Rural Fire Service shed at Blighty, recreation reserves at Blighty and Conargo, halls at Blighty, Mayrung and Conargo Community and local schools including Conargo Primary School, Blighty Primary School and Mayrung Primary School (Australian Schools Directory 2017).

Mayrung is a rural locality approximately 4 kilometres east of Lindifferon and 35 kilometres north-east of Deniliquin. The proposed solar farm is approximately 3.5 kilometres west of Mayrung. The locality of Mayrung is accessed via Moonee Swamp Road, Mayrung Road and Conargo Road and residences are dispersed over large rural properties. The Australian Bureau of Statistics (ABS) has 2011 statistics for Lindifferon (state suburb) which incorporates the locality of Mayrung. The population of Lindifferon (state suburb) in the 2011 Census was 244 people with a median age of 33 (ABS 2013b). 93.5% of the population were born in Australia; 1.6% in the Czech Republic, 1.2% were born in Germany, Italy and Netherlands respectively (ABS 2013b).

The main occupations were Managers at 63.7% (the Australian average was 12.9%), followed by Labourers at 13.7%, Professionals at 8.2%, Clerical and Administrative Workers 6.2% and Technicians, Community and Personal Service Workers and Sales Workers each at 2.1% (ABS 2013b). The median weekly personal income in 2011 was \$456; slightly lower than the Australia average of \$577 per week and the unemployment rate was 2% compared to the Australian average of 5.6% (ABS 2013b).

The site is in the Riverina Bioregion of NSW, which experiences a dry semi-arid climate with hot summers and cool winters (OEH 2016). Currawarra is in the Murray Fans Catchment Management Authority (CMA) subregion which is centred around the Murray and Edward-Kolety river systems (OEH 2016). This area is characterised by meandering channels, floodplains, overflow lakes and swamps with extensive river red gum forests and low floodplains; Yellow Box and Black Box with saltbush on the high floodplains and White Cypress pines on deep sand (Morgan and Terrey 1992).

3 THE PROPOSAL

3.1 SITE SELECTION

The Currawarra site has been selected for the following reasons:

- excellent solar exposure

- excellent access to local and major roads
- excellent access to the grid transmission network
- a low number of non-involved neighbouring dwellings
- likely low level of environmental impact – the site has been largely cleared and heavily disturbed by cultivation and cropping.

The use of the site would be based on a lease agreement between RES and the landowner.

3.2 PROPOSED WORKS

3.2.1 Proposed infrastructure

The proposal involves the construction of a ground-mounted photovoltaic solar array which will generate up to 195MW of renewable energy. The solar farm will connect directly into the existing TransGrid 132kV network, which runs along the southern and eastern boundaries. The development site would be approximately 750 hectares in area.

The solar farm arrangement is flexible and adaptable and would be designed to avoid impacts where feasible and minimise and mitigate environmental impacts if avoidance is not possible. The design would consider the results of this scoping report, consultation with relevant stakeholders and the EIS to be prepared. The EIS will detail how these studies have been used to produce the final proposal design.

The proposal will consist of the following components:

- around 667,000 solar panels mounted on either a fixed or single axis tracking system

Due to the proposal site being bisected by a Murray Irrigation Channel (refer to Figure 3-1) up to four access points to the site may be required. These include:

- One from Mayrung Road. This road will provide access to the southern area of the proposal site. This road provides access to one involved residence in the south of the proposal site.
- Two from Russells Road. This road will provide access to the north western area of the proposal site and the smaller area in the centre of the site. This road provides access to one involved residence in the north west of the proposal site.
- One from Sunny Pines Road. This road will provide access to the north eastern area of the proposal site. This road provides access to one residence (non-involved) to the east of the proposal site.
- access tracks
- operations and maintenance building with associated car parking
- an electrical substation
- overhead and underground electrical cable reticulation
- energy storage facility
- security fencing and CCTV
- native vegetation planting to provide visual screening for specific receivers, if required.

The proposal includes an energy storage facility of approximately 88MW/44MWh rated capacity which will be provided by banks of lithium-ion batteries. These will be housed in either a purpose-built building or within 12 metre shipping containers located in a secure compound adjacent to the collector yard.

The proposal will potentially require the subdivision of the property.

3.2.2 Construction, operation and decommissioning

The Currawarra solar farm is expected to operate for around 30 years. The construction phase of the proposal is expected to take eighteen months. After the initial operating period, the solar farm would either be decommissioned, removing all above ground infrastructure and returning the site to its existing land capability, or upgraded with new PV equipment.

3.2.3 Capital investment

The Currawarra solar farm proposal would have an estimated capital investment of \$294 million. A quantity surveyor's report would be prepared during the EIS process as part of the proposal which would confirm the capital investment cost.

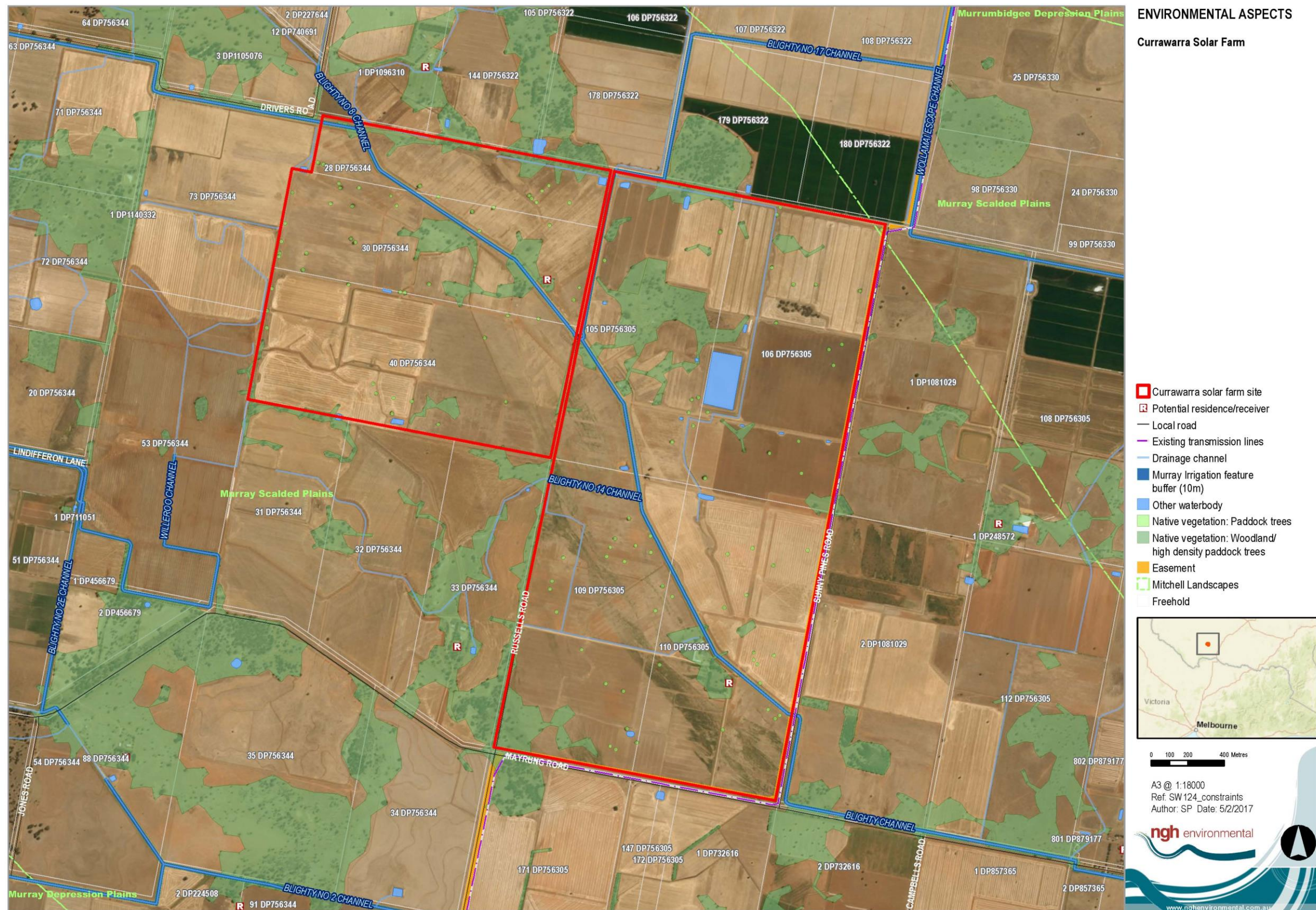


Figure 3-1 Proposed Currawarra solar farm site – environmental aspects

4 JUSTIFICATION AND ALTERNATIVES

4.1 STRATEGIC JUSTIFICATION

4.1.1 Technical feasibility

The proposal would employ proven and mature solar technology. The solar resource at the site is highly suited to efficient, high-output generation.

The site is flat and predominantly clear, making it an ideal location for a utility scale solar project.

The Transgrid network passes along the southern and eastern boundaries of the property, allowing connection to the transmission network and the substation to be sited on the property. This connection method means there are no off-site grid works.

Preliminary electrical system studies show there is sufficient capacity on the 132kV Transgrid system to accept electrical generation onto the network from the Currawarra project. The studies also show the level of generation is commensurate with demand in the Riverina area, leading to low electrical losses.

4.1.2 Climate change

Electricity generation is the largest individual contributor of greenhouse gas emissions in Australia (Department of Environment 2016). The solar farm proposal would generate around 466,339 MWh per year, which represents the power consumption of approximately 78,800 homes (assuming an average household consumption of 5,920kWh pa). Generation figures may change subject to final site design and technology selection.

The proposal would save approximately 155,627 tonnes of carbon dioxide per year, assuming generation would otherwise be made by brown coal with a carbon factor of 0.33372 tonnes per MWh (Department of the Environment National Inventory Report).

The Currawarra solar farm would contribute to the New South Wales Renewable Energy Action Plan (NSW Government 2013), which supports the national target of 20% renewable energy by 2020. The proposal will also further the three goals of the Action Plan:

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

The NSW 2021: A plan to Make NSW Number One (NSW Government 2011) has the following goal:

- *Contribute to the national renewable energy target ... by promoting energy security through a more diverse energy mix, reducing coal dependence, increasing energy efficiency and moving to lower emission energy sources.*

The proposal would also contribute to the Commonwealth Government's objective to achieve an additional 33GW of electricity from renewable sources by 2020 under the Renewable Energy Target or RET.

The COP21, also known as the 2015 Paris Climate Conference, achieved a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C, chiefly by reducing

greenhouse gas emissions. The Currawarra solar farm would form part of the Australian effort to help meet this target.

4.1.3 Electricity supply

AEMO (2016) forecasts that grid-supplied electricity consumption will remain flat for the next 20 years, despite projected 30% growth in population. Although not required to meet projected electricity demand, the proposal would benefit the network by shifting electricity production closer to local consumption, and regulating inputs to the grid using an Energy Storage Facility.

The Energy Storage Facility would be capable of storing energy for release when the use or cost is beneficial. The facility would be approximately 88MW/44MWh rated capacity, provided by banks of lithium-ion batteries. The facility would provide network services including ‘energy smoothing’ and frequency control integration and improved reliability as well as energy arbitrage. ‘Energy arbitrage’ is the price mechanism allowing energy to be stored during periods of low demand and then discharged during periods of high demand.

4.1.4 Socio-economic benefits

Employment

The proposal will generate around 200 direct jobs during construction and around 130 indirect supply chain jobs. In addition, it will employ approximately 3-4 full time staff during the operation and maintenance phase (expected to be 25-30 years).

The employment benefits extend through the local supply chains to fuel supply, vehicle servicing, uniform suppliers, hotels/motels, B&B’s, cafés, pubs, catering and cleaning companies, tradespersons, tool and equipment suppliers and many other businesses. In 2012, 24,000 Australians were employed in the renewable energy sector and the industry is set to generate an additional new 18,400 jobs by 2020 (CEC 2015).

Electricity prices

According to Deloitte, Australian households will pay \$510 million more for power in 2020 without renewable growth through the RET and up to \$1.4 billion more per year beyond 2020. Renewables increase competition in the wholesale energy market – and as in any market, less competition means higher prices.

4.2 ALTERNATIVES TO THE PROPOSAL

4.2.1 Alternative sites

RES has reviewed the solar generation potential of many areas in NSW using a GIS (Geographic Information System) model. The site was selected because it provides the optimal combination of:

- Low environmental constraints (predominantly cleared cropping land)
- Level terrain for cost effective construction
- High quality solar resource
- Low density population and limited neighbouring properties

- Suitable planning context
- Low flood risk
- Road access
- On-site access to the transmission network
- High levels of available capacity on the grid transmission system.

The site is of a scale that allows for flexibility in the design, allowing RES to avoid ecological and other constraints which may be identified during the EIS process. The factors that determine the final design area will be detailed in the EIS.

4.2.2 Alternative technologies

Photovoltaic solar technology was chosen because it is cost-effective, low profile, durable and flexible regarding layout and siting. It is a proven and mature technology which is readily available for broad scale deployment at the site.

5 PLANNING CONTEXT

5.1 NSW LEGISLATION

5.1.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and its associated regulations and instruments set the framework for development assessment in NSW. The Currawarra solar farm proposal would be assessed under Part 4 of the EP&A Act.

State Environmental Planning Policy (State and Regional Development) 2011

Clause 20 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011* defines 'State significant development' as including:

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 has a:

- (a) capital investment value of more than \$30 million, or
- (b) capital investment value of more than \$10 million and is located in an environmentally sensitive area of State significance.'

The Currawarra solar farm would have an estimated capital investment cost greater than \$30 million. The proposal is therefore classified as 'State significant development' under Part 4 of the EP&A Act.

State Significant Developments (SSD) are major projects which require approval from the Minister for Planning and Environment. While the Minister for Planning and Environment is the consent authority for SSD, the Minister may delegate the consent authority function to the Planning Assessment Commission (PAC), the Secretary or to any other public authority.

An Environment Impact Statement (EIS) is prepared in accordance with environmental assessment requirements issued by the Secretary of the Department of Planning and Environment (SEARs). In

determining the SEARs, the Secretary must consult with relevant public authorities and would have regard to the need to assess key issues raised by those public authorities. A scoping study is required to be submitted with the request for the SEARs.

State Environmental Planning Policy (Infrastructure) 2007

Clause 34(7) of *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) provides that development for the purpose of a solar energy system may be carried out by any person with consent on any land (except land in a prescribed residential zone). The Currawarra proposal is located within a rural zone and is permissible with consent under the ISEPP.

5.1.2 Roads Act 1993

The *Roads Act 1993* (Roads Act) provides for the classification of roads and for the declaration of the Roads and Maritime Services (RMS) and other public authorities as roads authorities for both classified and unclassified roads. It also regulates the carrying out of various activities in, on and over public roads. The need for upgrade works on local roads would be considered as part of the traffic assessment conducted for the proposal. If required, approval from the roads authority (RMS and/or Council) would be sought under section 138 of the Roads Act. Edward River Council, and RMS if required, would be consulted during the design and preparation of the EIS.

5.1.3 Native Vegetation Act 2003

The *Native Vegetation Act 2003* regulates the clearing of native vegetation. Clearing is defined as cutting down, felling, thinning, logging, removing, killing, destroying, poisoning, ringbarking, uprooting or burning native vegetation including native grasses and herbage. Under Section 89J of the EP&A Act, an authorisation referred to in section 12 of the *Native Vegetation Act 2003* to clear native vegetation would not be required for a State Significant Development.

A Property Vegetation Plan made under the Act applies to Currawarra and has been registered on the title of the property. The PVP authorises the clearing of identified paddock trees, and establishes a 4.42 hectare Grey Box Woodland offset site on the northern boundary of the property. The offset site is to be protected and managed for conservation in perpetuity. This area would be excluded from the solar farm design.

The PVP also requires the landholder to manage soils in the paddock tree clearing areas, including retention of groundcover (in the context of annual cropping) and minimising wind erosion risk using water applications.

The potential impacts to native vegetation are discussed in section 7.2.1 of this report.

5.1.4 Threatened Species Conservation Act 1996

The *Threatened Species Conservation Act 1995* (TSC Act) provides for the conservation of threatened species, populations and ecological communities of animals and plants. The TSC Act sets out several specific objects relating to the conservation of biological diversity and the promotion of ecologically sustainable development. Under Section 79B(2A) of the EP&A Act, concurrence under Section 79B including concurrence under the TSC Act would not be required for a State Significant Development. The potential impacts to threatened species, populations and ecological communities listed under the Act are discussed in section 7.2.1 of this report.

5.1.5 National Parks and Wildlife Act 1974

Under the *National Parks and Wildlife Act 1974*, the Director-General of the National Parks and Wildlife Service is responsible for the care, control and management of all national parks, historic sites, nature reserves, Aboriginal areas and state game reserves. The Director-General is also responsible under this legislation for the protection and care of native fauna and flora, and Aboriginal places and objects throughout NSW. Under Section 89J of the EP&A Act, an Aboriginal Heritage Impact Permit under Section 90 of the *National Parks and Wildlife Act 1974* would not be required for a State Significant Development. The potential impacts to Aboriginal heritage and native fauna and flora are discussed in section 7 of this report.

5.1.6 Heritage Act 1977

This Act aims to conserve heritage values. The Act defines 'environmental heritage' as those places, buildings, works, relics, moveable objects and precincts listed in the Local or State Heritage Significance. A property is a heritage item if it is listed in the heritage schedule of the local Council's Local Environmental Plan or listed on the State Heritage Register, a register of places and items of particular importance to the people of NSW. Under Section 89J of the EP&A Act, an approval under Part 4 or a permit under Section 139 of the *Heritage Act 1977* would not be required for a State Significant Development. The proposal is unlikely to directly or indirectly affect any items of heritage significance (refer section 7).

5.1.7 Crown Lands Act 1989

The objects of this Act are to ensure that Crown land is managed for the benefit of the people of New South Wales and in particular to provide for:

- (a) a proper assessment of Crown land,
- (b) the management of Crown land having regard to the principles of Crown land management contained in this Act,
- (c) the proper development and conservation of Crown land having regard to those principles,
- (d) the regulation of the conditions under which Crown land is permitted to be occupied, used, sold, leased, licensed or otherwise dealt with,
- (e) the reservation or dedication of Crown land for public purposes and the management and use of the reserved or dedicated land, and
- (f) the collection, recording and dissemination of information in relation to Crown land.

For the purposes of this Act, the principles of Crown land management are that:

- (a) environmental protection principles be observed in relation to the management and administration of Crown land,
- (b) the natural resources of Crown land (including water, soil, flora, fauna and scenic quality) be conserved wherever possible,
- (c) public use and enjoyment of appropriate Crown land be encouraged,
- (d) where appropriate, multiple use of Crown land be encouraged,
- (e) where appropriate, Crown land should be used and managed in such a way that both the land and its resources are sustained in perpetuity, and

- (f) Crown land be occupied, used, sold, leased, licensed or otherwise dealt with in the best interests of the State consistent with the above principles.

Under Part 3 of the Act, the Minister for Lands must be satisfied that the land has been assessed prior to any allocation action, i.e. reservation, dedication, sale, lease, licence or permit. The purpose of a land assessment is to ensure decisions made in relation to Crown land are in accordance with the principles of Crown land management by (amongst other matters) including an assessment of the capabilities of Crown land and the identification of suitable land uses.

Preliminary data obtained from NSW Land and Property Information does not indicate Crown land to be present within the solar farm site. This would be further investigated in the EIS and the Department of Primary Industries (Lands) would be consulted during the assessment process.

5.2 LOCAL GOVERNMENT

5.2.1 Conargo Local Environmental Plan 2013

Edward River Council was formed by the merger of Deniliquin Council and Conargo Shire Council in May 2016. The proposal is in the former Conargo Shire Council Local Government Area and is subject to the Conargo Local Environmental Plan 2013.

The aims of the LEP are:

- (a) to encourage sustainable economic growth and development in Conargo,
- (b) to provide for a range of development opportunities that contribute to the social, economic and environmental resources of the area and support the long-term and economic viability of the local community,
- (c) to protect, enhance and conserve agricultural land through the proper management, development and conservation of natural and human-made resources,
- (d) to promote the efficient and equitable provision of public services, infrastructure and amenities,
- (e) to conserve, protect and enhance the environmental and cultural heritage of Conargo,
- (f) to identify, protect, conserve and enhance the natural assets of Conargo.

The proposed solar farm site is located on land zoned RU1 - Primary Production under the Conargo LEP. Electrical generation is not listed among developments which are permitted with consent for the zone. However, the ISEPP takes precedence over the LEP and permits solar developments with consent in the RU1 zone.

The LEP has additional provisions to avoid and minimise impacts to wetlands which are identified on a Wetlands Map prepared under the LEP. The map identifies a wetland in the north of the Currawarra property, although this area corresponds to a large rectangular storage dam.

The LEP also lists historic heritage items recorded in the LGA – the proposals would not affect any of these items (refer section 7.3).

RU1 Primary Production

The LEP states that the consent authority must have regard to the objectives for development in a zone when determining a development application. The objectives of the RU1 zone 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.
- allow for the development of processing and service industries relating to primary production.
- encourage tourist and visitor accommodation that does not have an adverse impact on agricultural activities.
- allow for the development of non-agricultural land uses that are compatible with the character of the zone.
- permit small-scale rural tourism uses associated with primary production and environmental conservation that have minimal impact on primary production and the scenic amenity of the area.
- provide opportunities for employment-generating development that adds value to local agricultural production and integrates with tourism.

Subdivision

A lease of land creates a subdivision under *s.7A Conveyancing Act 1919* (formerly *s.327AA Local Government Act 1919* now repealed) when the total of the original term of the lease, together with any option of renewal, is more than five years.

When the lease affects the whole of a lot in a current plan - the body of the lease will simply identify the area to be leased by reference to the lot and deposited plan number. A new plan is not required.

When the lease affects part of a lot or lots in a current plan - it will be necessary to provide a plan to define the land in the lease and the residue of any lot in a current plan affected by the leased area.

Should the proposed land subdivision result in lot sizes that are less than the minimum lot size (as shown on the LEP Lot Size Map relating to that land) then approval via the Department of Planning and Environment, may be necessary. This may apply to this proposal as the minimum lot size map shows a 40 hectare minimum for the subject land and subdivision of the land below the minimum lot size may be required.

In this regard, consultation between RES and Edward River Council is ongoing to determine whether the provisions contained within the Local Environmental Plan would permit the land subdivision to occur.

Furthermore, land subdivision that affects land containing a dwelling will be subject to the provisions of the State Environmental Planning Policy (Rural Lands) 2008 and the matters that must be considered in determining development applications for rural subdivisions or rural dwellings.

5.3 COMMONWEALTH LEGISLATION

5.3.1 *Environmental Protection and Biodiversity Conservation Act 1999*

The EPBC Act provides an assessment and approval process for actions likely to cause a significant impact on Matters of National Environmental Significance (MNES). These include:

- World Heritage properties
- National Heritage places

- Wetlands of international importance (listed under the Ramsar Convention)
- Listed threatened species and ecological communities
- Migratory species protected under international agreements
- Nuclear actions (including uranium mines)
- Commonwealth marine areas
- The Great Barrier Reef Marine Park
- A water resource, in relation to coal seam gas development and large coal mining development.

Approval by the Commonwealth Environment Minister is required if an action is likely to have a significant impact on a MNES. Assessments of significance based on criteria listed in Significant Impact Guidelines 1.1 issued by the Commonwealth (Commonwealth of Australia 2013) are used to determine whether the proposed action is likely to have a significant impact (ie is likely to be considered a 'controlled action').

A search of the Commonwealth Protected Matters Search Tool (10 kilometre buffer, undertaken on 14 April 2017) indicated five threatened ecological communities, 18 threatened species and 11 migratory species within the search area. Surveys to determine the presence and likelihood of impact to these entities would be undertaken during the preparation of the EIS. Five important wetlands are indicated in the search, all more than 200 kilometres upstream, except for the NSW Central Murray State Forests, located 10-20 kilometres west and south of the site.

A summary of the EPBC Act search report is provided in Table 5-1.

Table 5-1 Summary of EPBC Act Protected Matters Report search results

Protected Matter	Entities within the search area
World Heritage Properties	0
National Heritage	0
Wetlands of International Significance (Ramsar)	5
Threatened Ecological Communities	5
Threatened Species	18
Migratory Species	11
Listed Marine Species	17
Commonwealth land	2
Commonwealth Heritage places	0
Critical habitats	0
Commonwealth reserves (terrestrial)	0
State reserves	0
Regional Forest Agreements	0
Invasive species	25
Nationally Important Wetlands	0

5.3.2 Native Title Act 1993

The *Native Title Act 1993* provides a legislative framework for the recognition and protection of common law native title rights. Native title is the recognition by Australian law that Indigenous people had a system of law and ownership of their lands before European settlement. Where that traditional

connection to land and waters has been maintained and where government acts have not removed it, the law recognises this as native title.

People who hold native title have a right to consult or continue to practise their law and customs over traditional lands and waters while respecting other Australian laws. This could include visiting to protect important places, making decisions about the future use of the land or waters, hunting, gathering and collecting bush medicines. Further, when a native title claimant application is registered by the National Native Title Tribunal, the people seeking native title recognition gain a right to consult or negotiate with anyone who wants to undertake a project on the area claimed.

Where native title does exist in relation to the proposal site, the proponent would comply with the provisions of the *Native Title Act 1993*.

6 CONSULTATION

Community and stakeholder consultation will be integral to the proposal. RES is actively consulting with a wide range of relevant Local Government, State and Commonwealth authorities, as well as local businesses, community groups and other interested parties.

A Community Consultation Plan (CCP) has been prepared to provide a framework to engage with the community and stakeholders about the proposal and ensure opportunities to provide input into the assessment and development process are understood. Stakeholders were identified as those potentially being impacted by the solar farm proposal or having an interest in the proposal. The CCP has set out consultation requirements with interested parties including adjacent neighbours, near neighbours, local businesses, any special interest groups and representative bodies. The plan also includes strategies for consultation for the local community and the broader community within the region.

To date, the following activities, consistent with the CCP, have been undertaken:

- Consultation with the Department of Planning and Environment, Transgrid, Edward River Council, Murray Irrigation Limited regarding the proposal and approval requirements including for potential subdivisions
- Consultation with Edward River Council Administrator
- Telephone calls to neighbours within two kilometres of the proposal site which resulted in discussions with landowners
- A press release in the Deniliquin Pastoral Times to advertise the proposal
- A front page article in the Deniliquin Pastoral Times (25 April 2017)
- A notification for registration of interest for Aboriginal stakeholders was advertised in the Deniliquin Pastoral Times and Southern Riverina News.

The CCP would aim to ensure that there is effective, ongoing liaison with the community. Measures to reduce adverse impacts and promote positive impacts would be identified in the EIS and appropriate management plans developed for the proposal. Agency consultation would also be undertaken in accordance with any requirements of the SEARs.

7 PRELIMINARY ENVIRONMENTAL ASSESSMENT

7.1 METHODOLOGY

NGH Environmental has undertaken a preliminary constraints assessment of the Currawarra solar farm proposal site. The assessment was based on a desktop review and preliminary site inspection undertaken on 4-5 April 2017 to identify potential high level constraints and major risks to the proposal.

The risk rating is a factor of the **likelihood** of the impact occurring and the **consequence** of the impact. Depending on the combination of consequence and likelihood, the overall risk rating could be low to extreme (refer Table 7-1). High to extreme risks (termed 'key risks') would warrant a higher level of investigation. Low to Medium risks would be discussed in less detail. Where uncertainty exists, a higher rating was applied. The preliminary constraints map is provided in Figure 7-1. This will be used to guide further detailed investigations and ultimately the site infrastructure layout.

A summary of the key environmental issues is provided in section 7.2. The intent of the discussion is to demonstrate an understanding of the issues that require further environmental assessment and proposed investigation strategies for these key issues. The potential impacts of other (less significant) issues are discussed in section 7.3.

Table 7-1 Risk assessment rating matrix

Likelihood	Consequence				
	Negligible	Minor	Moderate	Major	Catastrophic
Remote	Low	Low	Low	Medium	Medium
Unlikely	Low	Low	Medium	High	High
Possible	Low	Medium	High	Very High	Very High
Likely	Medium	High	Very High	Very High	Extreme
Almost certain/ inevitable	Medium	High	Very High	Extreme	Extreme

Table 7-2 summarises the results of the preliminary risk assessment. Fourteen environmental risks were investigated. The unmitigated risk rating is the risk rating prior to assessment and is therefore precautionary. It considers a 'worst case' in the absence of specific information.

The following environmental risks were considered to be key issues:

- Biodiversity
- Aboriginal heritage
- Visual amenity and landscape character
- Noise
- Land use and resources.

Table 7-2 Risk assessment of environmental issues

Environmental risk	Likelihood	Consequence	Risk rating (unmitigated)
Biodiversity	Likely	Moderate	Very High
Aboriginal heritage	Possible	Moderate	High
Visual amenity and landscape character	Possible	Moderate	High
Land use and resources	Likely	Minor	High
Noise	Likely	Minor	High
Soils and landforms	Possible	Minor	Medium
Watercourses and hydrology	Possible	Minor	Medium
Historic heritage	Unlikely	Moderate	Medium
Access and traffic	Unlikely	Moderate	Medium
Contamination	Possible	Minor	Medium
Air quality	Possible	Minor	Medium
Hazards and risks	Possible	Minor	Medium
Socio and economic impacts	Possible	Minor	Medium
Utilities	Possible	Minor	Medium
Resource use and waste generation	Possible	Minor	Medium

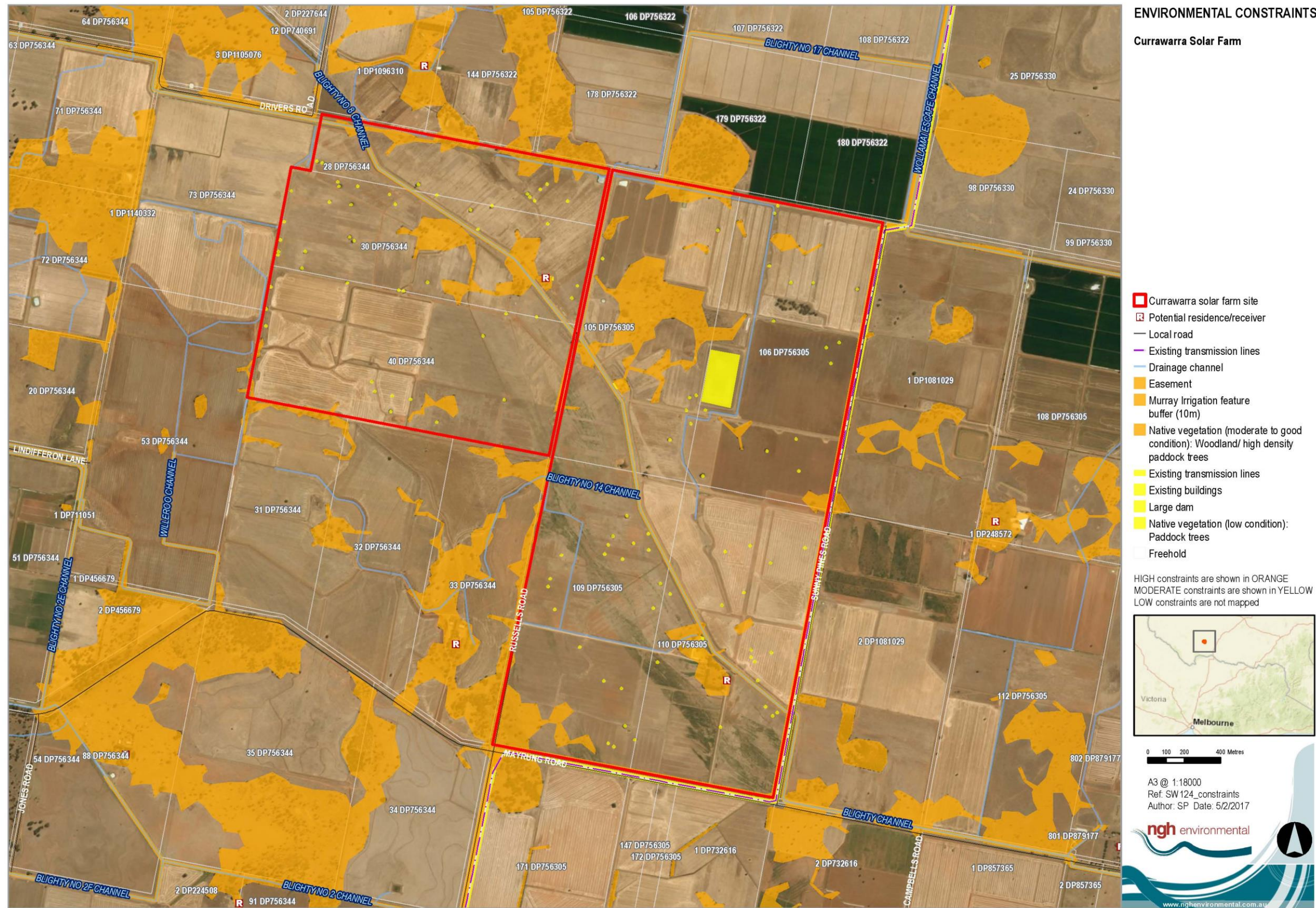


Figure 7-1 Currawarra proposal site environmental constraints map

7.2 ASSESSMENT OF KEY ISSUES

7.2.1 Biodiversity

The potential ecological constraints within the study area have been identified based on the following information sources:

- threatened species and community listings under the TSC Act and EPBC Act
- Commonwealth EPBC Act Protected Matters Search Tool, using a 10 kilometre search radius
- threatened species and communities records in the Bionet Database (OEH), using a 10 kilometre search radius
- a preliminary site inspection by an ecologist.

Database searches

The EPBC Act Protected Matters Search undertaken on 14 April 2017 indicated five nationally-listed threatened communities which may or are likely to occur in the search area:

- Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions
- Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia
- Natural Grasslands of the Murray Valley Plains Critically Endangered Community
- Weeping Myall Woodlands Endangered Community
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

The OEH Bionet database indicates the following Endangered Ecological Communities listed under the TSC Act for the search area:

- *Acacia melvillei* Shrubland in the Riverina and Murray-Darling Depression bioregions
- *Allocasuarina luehmannii* Woodland in the Riverina and Murray-Darling Depression Bioregions
- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions
- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions.

The EPBC Act search indicated 3 threatened flora species and 11 threatened fauna species (excluding fish) that are either known to occur or have potential to occur in the search area. The NSW Bionet search indicated 1 threatened flora and 13 threatened fauna records for the search area. The threatened species indicated by the searches are shown in Table 7-3.

Table 7-3 Threatened flora and fauna species indicated in the databases searches

Species	Indicated in search?	
	EPBC Act	TSC Act
Plants		
<i>Austrostipa wakoolica</i>	✓	✓
Slender Darling-pea, Slender Swainson, Murray Swainson-pea (<i>Swainsona murrayana</i>)	✓	-
Mossgeil daisy (<i>Brachyscome papillosa</i>)	✓	-
Frogs		
Growing Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog (<i>Litoria raniformis</i>)	✓	-
Birds		
Australasian Bittern (<i>Botaurus poiciloptilus</i>)	✓	✓
Curlew Sandpiper (<i>Calidris ferruginea</i>)	✓	-
Plains-wanderer (<i>Pedionomus torquatus</i>)	✓	✓
Australian Painted Snipe (<i>Rostratula australis</i>)	✓	✓
Painted Honeyeater (<i>Grantiella picta</i>)	✓	-
Little Eagle (<i>Hieraaetus morphnoides</i>)	-	✓
Black Falcon (<i>Falco subniger</i>)	-	✓
Superb Parrot (<i>Polytelis swainsonii</i>)	✓	✓
Swift Parrot (<i>Lathamus discolor</i>)	✓	-
Major Mitchell's Cockatoo (<i>Lophochroa leadbeateri</i>)	-	✓
Eastern Curlew, Far Eastern Curlew (<i>Numenius madagascariensis</i>)	✓	-
Brown Treecreeper - eastern subspecies (<i>Climacteris picumnus victoriae</i>)	-	✓
Black-chinned Honeyeater - eastern subspecies (<i>Melithreptus gularis gularis</i>)	-	✓
Grey-crowned Babbler - eastern subspecies (<i>Pomatostomus temporalis temporalis</i>)	-	✓
Flame Robin (<i>Petroica phoenicea</i>)	-	✓
Diamond Firetail (<i>Stagonopleura guttata</i>)	-	✓
Mammals		
Yellow-bellied Sheathtail-bat (<i>Saccolaimus flaviventris</i>)	-	✓
Corben's Long-eared Bat, South-eastern Long-eared Bat (<i>Nyctophilus corbeni</i>)	✓	-
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (<i>Phascolarctos cinereus</i>) (combined populations of Qld, NSW and the ACT)	✓	-

Site inspection

Most of the site is used for irrigated cropping and has lost native tree cover and understorey. Paddock trees are present in cropped areas, particularly in the north of the site. Paddock trees appear to be Grey Box (*Eucalyptus microcarpa*), with White Cypress (*Callitris glaucophylla*) trees in the south of the site. The dominant canopy species identified during the site inspection conform to the description for this community, thus this unit has been used to map the extent of vegetation within and surrounding the site.

Remnant woodland with native understorey is present in a fenced area in the north of the site which is not used for cropping. The patchy understorey includes native grasses and forbs, low chenopod shrubs

and sparsely scattered taller shrubs. The open woodland in the remnant is dominated by Yellow Box (*Eucalyptus melliodora*) and White Cypress, with Buloke (*Allocasuarina luehmannii*). Many of the pines in the remnant are dead. An area of vegetation within the central northern portion of the site exists on aerial photographs, but has been cleared entirely since the date of photography. Subject to further assessment, the woodland remnant has potential to belong to the Grey Box Grassy Woodlands threatened ecological community listed under the EPBC Act, or the Sandhill Pine Woodland EEC listed under the TSC Act and EPBC Act.

The paddock trees at the site have potential to be derived from the NSW EEC Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions.

The woodland remnant with native understorey has potential to support threatened woodland flora. The remnant and paddock trees may also provide habitat for threatened fauna, particularly woodland birds.

Preliminary vegetation mapping

An assessment was undertaken of existing vegetation mapping for the region (McNellie et. al, 2005), which mapped the central portion of the site vegetation as ALP17 – *Callitris glaucophylla Allocasuarina luehmannii* Tall Woodland. The vegetation immediately north of the site is mapped as ALP022 *Eucalyptus largiflorens* Mid-high Open Forest. The patch to the south-west of the site is mapped as APL026 *Eucalyptus microcarpa Eucalyptus melliodora Eucalyptus largiflorens* Tall Open Forest.

Based on the results of the site inspection and analysis of the existing vegetation mapping, preliminary vegetation mapping was undertaken through aerial photograph interpretation, and assigned to Plant Community Types (PCTs) in accordance with the Vegetation Information System Classification Database. Though PCT were determined based on the presence of diagnostic species identified within the site survey, the results are preliminary in nature and will be refined following detailed vegetation survey of the site, and the undertaking of BioMetric Plots in accordance with the BioBanking Assessment Methodology (OEH, 2014b).

An initial assessment of PCT was based on the presence of canopy species and the CMA region within which the proposal occurs. The list of potential PCTs was then refined based on the landscape, soil and understorey species, in addition to an assessment of PCTs that contained canopy trees on site as dominants. The two PCTs dominated by Western Grey Box are PCT 76 *Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions* and PCT 80 *Western Grey Box - White Cypress Pine tall woodland on loam soil on alluvial plains of NSW South Western Slopes Bioregion and Riverina Bioregion*. Additionally, PCT 75 *Yellow Box - White Cypress Pine grassy woodland on deep sandy-loam alluvial soils of the eastern Riverina Bioregion and western NSW South Western Slopes Bioregion* has the correct canopy species as those detected within portions of the site, however the description for PCT 80 has a greater number of understorey species that were identified in the understorey during the site inspection. As limited understorey data was collected during the site inspection, a full analysis cannot be made of the PCT. However; PCT 80 contained a higher proportion of understorey and canopy species than other PCT descriptions, thus for the purposes of this initial assessment, the vegetation within the site is considered to exist as variants of this community.

The NVIS database describes the PCT as the following:

Tall woodland up to 25 m high but averaging about 20m co-dominated by Western Grey Box (*Eucalyptus microcarpa*) and White Cypress Pine (*Callitris glaucophylla*) with the pine tending to be shorter than the eucalypts. Other trees may include Yellow Box (*Eucalyptus melliodora*), Buloke (*Allocasuarina*

luehmannii), *Pittosporum angustifolium* and Kurrajong (*Brachychiton populneus*). A sparse layer of shrubs is may be present however they may be absent where grazing has been intense or the understorey has been cleared. Tall shrub species may include Wilga (*Geijera parviflora*), *Eremophila deserti*, Quandong (*Santalum acuminatum*) and wattles such as *Acacia deanei* subsp. *deanei*, *Acacia hakeoides*, *Acacia brachybotrya* and *Acacia buxifolia*. The low shrub *Maireana microphylla* is often the most common shrub present when tall shrubs have been eliminated. A sparse to mid-dense ground cover includes short shrubs such as *Einadia nutans* subsp. *nutans* and *Eremophila debilis* with grass species such as *Austrostipa scabra* subsp. *scabra*, *Austrodanthonia setacea*, *Austrodanthonia fulva*, *Elymus scaber* subsp. *scaber*, *Enteropogon acicularis* and *Aristida ramosa*. Forb species include *Calotis cuneifolia*, *Sida corrugata*, *Dichondra* sp. A, *Daucus glochidiatus*, *Oxalis perennans*, *Arthropodium minus*, *Bulbine* spp. and *Goodenia pinnatifida*. The rock fern *Cheilanthes sieberi* subsp. *sieberi* is common along with the graminoid *Lomandra filiformis*. Occurs on sandy-loam to clay-loam soils on alluvial or stagnant alluvial plains in the predominantly winter rainfall belt of southern-central NSW with an average annual rainfall of between 400 to 550 mm. Mainly restricted to the eastern section of the Riverina Bioregion and the western section of the NSW South-western Slopes Bioregion. Most of this community has been cleared for grazing or crops but some sizable patches remain in state forests that have been managed for White Cypress Pine. Much of its remaining extent is threatened by grazing and weed invasion. Grades into Yellow Box - Pine community (ID75) on sandier soils e.g. from Narrandera to Urana. This community is endangered and very poorly conserved as of 2007.

The community may be consistent with the following Threatened Ecological Communities:

- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (EPBC Act, Endangered);
- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (TSC Act, Endangered);
- Mallee and Mallee-Broombush dominated woodland and shrubland, lacking Triodia, in the NSW South Western Slopes Bioregion (TSC Act, Critically Endangered).

Preliminary BioBanking Assessment

As the proposal will be assessed through the Framework for Biodiversity Assessment (OEH, 2014a), a preliminary BioBanking Assessment has been undertaken to determine species-credit species requiring consideration. As no BioMetric plots have been undertaken within the vegetation yet, benchmark values from the NVIS database for the PCT were used. Additionally, as no final development footprint has been designed, the calculations assume loss of all vegetation, thus generating a conservative “worst case” scenario. Based on the preliminary BioBanking Assessment, species requiring consideration include:

- A spear-grass (*Austrostipa wakoolica*) (TSC: Endangered, EPBC: Endangered);
- Grey Falcon (*Falco hypoleucos*) (TSC: Endangered);
- Koala (*Phascolarctos cinereus*) (TSC: Vulnerable, EPBC: Vulnerable);
- Lowly Greenhood (*Pterostylis despectans*) (TSC: Critically Endangered, EPBC: Endangered);
- Mossiel Daisy (*Brachysome papillosa*) (TSC: Vulnerable, EPBC: Vulnerable);
- Oaklands Diuris (*Diuris* sp.) (TSC: Endangered);
- Sand-hill Spider Orchid (*Caladenia arenaria*) (TSC: Endangered, EPBC: Endangered);
- Sloane’s Froglet (*Crinia sloanei*) (TSC: Vulnerable); and
- Squirrel Glider (*Petaurus norfolcensis*) (TSC: Vulnerable);
- Winged Peppercress (*Lepidium monolocoides*) (TSC: Endangered, EPBC: Endangered).

An additional detailed assessment will be undertaken following completion of detailed biodiversity surveys, and will incorporate the use of the Paddock Tree Calculator to determine offset requirements for the removal of paddock trees.

Constraints mapping

Remnant woodland vegetation has high conservation value in the heavily cleared Riverina region. The fenced and uncultivated remnant in the north of the site has been mapped as high constraint (refer Figure 7-1). Remnant vegetation would be considered moderate-good Biometric condition. Higher density woodland paddock trees have also been mapped as high constraint because these are potentially derived from a threatened community and would be considered moderate-good Biometric condition.

Mature paddock trees at the sites are hollow-bearing. Several threatened bird species have been recorded locally and paddock trees play an important role in supporting woodland bird populations. While isolated paddock trees would be considered low Biometric condition, they will likely require offsetting, and have been mapped as moderate constraint.

Further assessment

A flora survey is required to determine the floristic composition, condition, Plant Community Type and EEC status of native vegetation at the proposal site. Fauna survey and habitat assessment is also required to determine the potential for the presence of threatened fauna species and habitat features such as tree hollows. These surveys and assessments would be undertaken as part of the EIS, according to the Framework for Biodiversity Assessment. This will include the calculation of any biodiversity offset required for the project.

7.2.2 Aboriginal heritage

A search of the Aboriginal Heritage Information Management System (AHIMS) on 11 April 2017 identified a single Aboriginal site and no Aboriginal places within two kilometres of the proposal site and 92 Aboriginal sites and no Aboriginal places within 30 kilometres of the site. The closest registered Aboriginal site to the proposal is 1.5 kilometres to the north-east.

Landforms, vegetation and soils over much of the proposal site have been heavily disturbed by paddock levelling, cultivation, construction of irrigation channels, track formation and clearing for agriculture. This is likely to reduce the potential for Aboriginal heritage sites of significance in the affected areas. Conversely, unmodified areas with remnant woodlands are likely to have a higher potential for significance. It is noted that field assessment is required to confirm this and that any Aboriginal heritage sites/items/etc. identified would be a moderate to high constraint, requiring impact mitigation.

Further assessment

An Aboriginal heritage assessment of the development footprint and stakeholder consultation process would be completed as part of the EIS. The significance of any Aboriginal heritage sites that may be potentially affected by the proposal would be determined in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011).

7.2.3 Visual amenity and landscape character

The solar farm has potential to result in visual impacts to neighbouring houses and road users adjacent to the site. The site is located within a rural area with large lot agricultural production and sparsely distributed residences usually located some distance from roads. There are approximately 8 potential

(uninvolved) residences within 2 kilometres of the Currawarra site. The flat terrain and intermittent tree cover limits long range views in the locality.

An assessment of the level of visual impact would be undertaken as part of the EIS process. The EIS would also consider the potential for the solar farm to affect local landscape character. Additional consultation with specific affected residences would be undertaken to identify the nature and significance of impacts and the need for mitigation measures. The level terrain improves the potential effectiveness of vegetation planting around the site.

It is noted that solar panels are designed to absorb as much sunlight as possible. They therefore reflect a very low percentage of the light and are not considered likely to result in glare or reflections that would affect traffic or nearby receivers.

Further assessment

A visual impact assessment, including view shed analysis and community consultation, would be prepared as part of the EIS to investigate visual impacts and mitigation options.

7.2.4 Noise

There are approximately 8 potential (uninvolved) residences within 2 kilometres of the Currawarra site, and 3 residences within 1 kilometre (300 metres, 400 metres and 900 metres).

Noise impacts would, for the most part, only occur during construction (generated by construction vehicles and machinery), with minimal noise likely to be generated during operation. RES would adopt best practice mitigation measures during construction, such as standard working hours and regular vehicle and machinery maintenance to reduce the risk of adverse noise impacts.

During the operation of the solar farm, noise would potentially be produced by the solar tracking system (an optional feature which would operate for around half an hour per day), the substation and switchgear and any maintenance works undertaken at the site. Noise impacts during the operation of the solar farm are expected to be very low.

Further assessment

A construction noise assessment will be undertaken as part of the EIA to assess potential noise impacts. The assessment will be undertaken in accordance with the Interim Construction Noise Guideline (DECC 2009).

7.2.5 Land use and resources

The rural land in the study area is used primarily for agriculture including cropping and grazing. The rural land in the study area is used primarily for agriculture including cropping and grazing. The Currawarra property comprises several large paddocks which have been levelled and largely cleared for growing wheat, barley and canola. Cropping in Conargo Shire is characterised by the crops wheat, rice, canola and cereals (CSC 2016). Land and agricultural activities similar to the proposal site are widespread in the region.

There are no mineral titles or applications relevant to the site indicated in the Minview database (DPE 2017).

Although the proposal has the potential to impact on agricultural use of the site during construction and operation, the relatively small loss of productive land at a regional scale is not considered likely to have a significant impact on the overall agricultural productivity of the region.

There would be a loss of access to any resources that may be available at the site for the life of the proposal. The solar farm would be decommissioned at the end of its operational life, removing all above ground infrastructure and returning the site to its existing land capability.

Overall, the adverse impacts related to alienation of resources are expected to be low and restricted only to the period of operation.

Further assessment

The impact on agricultural production in the locality and region would be assessed in detail in the EIS

7.3 OTHER ENVIRONMENTAL ISSUES

There are a range of potential environmental issues associated with the proposed Currawarra solar farm which are not considered to be key issues. These are considered secondary issues for investigation, given the characteristics of the proposal and the availability of appropriate safeguards for mitigation. These issues are outlined in Table 7-4. The impacts and any required mitigation relating to these issues would be addressed at an appropriate level of detail in the EIS.

Table 7-4 Other environmental issues

Existing environment	Potential impacts	Management and mitigation
Soils		
The Murray Scalded Plains Mitchell Landscape is characterised by red brown texture-contrast soils with extensive scalds, prior stream channels of deep coarse sands with sandy levees and grey, brown and red cracking clays in depressions (DECC 2002). The relevant soil landscapes – Colleambally (Aeolian) and Wait-a-while (Stagnant Alluvial) – feature wind erosion hazard and localised salinity. Wait-a-while soils, which occupy a large part of Currawarra, have poor drainage in low-lying areas and poor trafficability when wet (OEH 2017). Soils at the site have been extensively disturbed by paddock levelling, repeated cultivation and construction of irrigation channels.	Construction activities would include minor excavations and vegetation removal which have the potential to cause soil erosion and sedimentation and dust issues.	The design would provide all weather access at the site during construction and operation to avoid erosion/sedimentation impacts and tracking of soil, in particular after rain events. The EIS would provide thorough consideration of soil impacts and proposed mitigation measures during construction and operation.
Watercourses and hydrology		
The proposal site is located on plains associated with the Murray River system. The natural hydrology of the site has been largely replaced by irrigation and drainage channels, and storage dams. Edward River Council (Marie Sutton) advised that there does not appear to be any flood prone land associated with the local areas on Council mapping. Murray Irrigation channels Gravity-fed irrigation channels managed by Murray Irrigation Limited (MIL) are present at the proposal site (refer Figure 3-1). MIL requires unrestricted access to all channels for construction, operation and maintenance (MIL 2008). The MIL Works Policy applies setbacks from the toe of channels, supply or drainage ditches in relation to works undertaken on landholdings, including fencing (5m), overhead power and phone lines (10m), excavation (100m), and other work (5m). The policy relates to work carried out by landholders, and by contractors or other agencies (MIL 2010). Landholders are required to obtain prior written approval to perform any work on any MIL land, channels or structures.	There is considered to be a low risk of off-site impact from soil erosion and sedimentation affecting irrigation waters and overland drainage flows. The proposed works would involve works in proximity to the Murray irrigation channels but none would be directly impacted.	The EIS would assess the impacts to waterways during construction and operation and include appropriate mitigation measures as required. The solar farm would be designed to comply with required setback, approval and consultation requirements of MIL.
Historic heritage		

Existing environment	Potential impacts	Management and mitigation
A search of the NSW heritage Register on 11 April 2017 for the Conargo LGA identified nil items under the NSW Heritage Act and three items listed under the Conargo LEP and by state agencies. The closest listed heritage item is a survey tree approximately 7.5 kilometres north of Deniliquin on the Cobb Highway. The site inspection did not identify any old structures or items that would potentially have historic significance.	There is considered to be a low risk of impact to heritage items.	The heritage status of the site would be assessed during fieldwork undertaken as part of the archaeological assessment. Appropriate management measures would be implemented if required.
Access and traffic		
The site would be accessed from Mayrung Road, which runs along the southern boundary of the property. The access track would be constructed as part of the works. The Riverina Highway, 14 kilometres south of the site via Marshalls Road and Russells Road, would be the major transport route for haulage and site vehicles during construction and operation of the proposal.	Construction traffic would impact traffic along the Riverina Highway, Marshalls Road and Russells Road. Maintenance access tracks during operation would also be required across the proposal site. Mayrung Road, Marshalls Road and Russells Road are unsealed. During construction, there may be impacts to residences along the access route associated with dust, vibration and noise.	Construction traffic impacts would be considered in the EIS and take into consideration existing traffic volumes and any requirements from RMS. Consultation would be undertaken before construction with RMS, the local council and local residents regarding the works that may affect roads or traffic. The design would also consider any requirements from RMS and other relevant stakeholders on access arrangements to the proposal site. The mitigation measures would require a Traffic Management Plan to be prepared.
Contamination		
There are no contaminated sites for the Conargo Shire Council LGA in the EPA contaminated land register (EPA 2017). Contamination associated with agricultural activities (eg pesticides, petrochemicals) or asbestos construction or insulation materials may still be present on the site.	There is potential that contaminants may be uncovered during excavation activities at the site.	Risk associated with contamination at the site are considered low and therefore no detailed investigation is likely to be required within the EIS. The mitigation measures would

Existing environment	Potential impacts	Management and mitigation
		require a CEMP be prepared to manage any contamination identified during site construction.
Air quality		
The air quality in the study area is expected to be good and typical of rural settings in NSW with low population density and no industrial pollution sources. Existing sources of air pollution are expected to include vehicle emissions, dust from agricultural practices and smoke from seasonal stubble burning. During colder months, solid fuel heating may result in a localised reduction in air quality, particularly if temperature inversions operate overnight.	The construction of the proposal is not anticipated to have a significant impact on air quality, and would mostly be related to dust during dry periods and vegetation removal. Impacts to air quality during operation would be negligible.	The mitigation measures would require a CEMP be prepared to manage air quality impacts during the construction phase. There is an opportunity to improve local air quality by maintaining ground cover vegetation under the panels.
Hazard and risk – electric and magnetic fields (EMF)		
Existing powerlines produce EMF at the site. Additional infrastructure which form part of the proposal such as connecting powerlines and substation would produce additional electromagnetic emissions at the site.	The substation, battery storage and network connection would be located on the proposal site. The powerlines constructed as part of the proposal would not pass through any neighbouring properties. The EMF that would be generated by the proposed powerlines, battery storage and substation is expected to be below the guideline for public exposure and would not be expected to have an adverse impact on human health.	The EMF levels of the proposed powerlines, battery storage and substation would be assessed as part of the EIS.
Hazard and risk - bushfire		
The proposal site has been predominantly cleared for agriculture. The property is not identified as fire prone land in the RFS online tool (RFS 2017). Edward River Council advised that there does not appear to be any fire prone land associated with the local areas on Council mapping.	The proposal is unlikely to be affected by bushfire, or pose a significant bushfire risk.	Bushfire impacts and risk would be assessed in the EIS.
Hazard and risk - Aviation		

Existing environment	Potential impacts	Management and mitigation
Airfields are located at Deniliquin 24 kilometres to the south-west and Finley, 36 kilometres to the south-east. Private airstrips are scattered in the region, including 10 kilometres east of Deniliquin, 3 kilometres north of Conargo and 7 kilometres north-west of the proposal site.	It is noted that solar panels are designed to absorb as much sunlight as possible. They therefore reflect a very low percentage of the light they receive and are not considered likely to result in glare or reflections that would affect air traffic.	The EIS would investigate the potential for glare impacts related to aviation.
Social and economic impacts		
The proposal site is in the former Conargo Local Government Area (LGA), now part of Edward River Council, which has a population of 1,540 people (ABS 2013). The Edward River Council area has a population of 8,972; covering an area of 8,881 square kilometres (NSW Government 2017). The main town and rural centre is Deniliquin with a population of 7,494. The main local industry for employment in the Conargo district is agriculture; sheep, beef cattle, grain farming and dairy cattle (56 % in 2011) (ABS 2013). The population of Lindifferon (state suburb) which incorporates the locality of Mayrung in the 2011 Census was 244 people.	The proposal would reduce the availability of agricultural land but would generate economic benefits during construction and operation, including local employment opportunities. Other socio-economic impacts would include traffic and access, noise, air quality and visual impacts.	The EIS would assess potential social and economic impacts of the proposal.
Utilities		
Electricity network TransGrid manages and operates the high voltage electricity transmission network in NSW. Essential Energy is a NSW Government-owned corporation, with responsibility for building, operating and maintaining the electricity network in the proposal area. Both TransGrid and Essential Energy have restrictions on development within powerline easements. TransGrid guidelines state that activities and encroachments are prohibited within a transmission line easement, including 'the installation of fixed plant or equipment', and 'the placing of obstructions within 20 metres of any part of a transmission line structure or supporting guy wire'. Roads or tracks within 10 metres of the centre-line of a transmission line 132kV are prohibited although roads that cross the transmission line as a thoroughfare may be permitted.	The proposed works would involve works adjacent to these utilities. The solar farm will need to connect to the TransGrid electricity network.	The EIS would assess the proposal against the setback and approval requirements of TransGrid/Essential Energy. The solar farm would be designed to comply with required setback, approval and consultation requirements of TransGrid and Essential Energy.

Existing environment	Potential impacts	Management and mitigation
Essential Energy's (2013) easement requirements specify a 40 metre wide easement for 132kV single pole powerlines (long span), and 45 metre wide easements for H-pole powerlines (long span). 66kV powerlines have 30 metre wide easements and 22kV line easements are 20 metres wide (long span).		
Waste management		
The proposal would generate several waste streams and utilise a variety of materials during the construction phase.	During construction, excavated material and green waste would be generated as waste. Packaging from panels and other components would require disposal. Limited operational waste would be associated with the proposal.	A Waste Management Plan would be incorporated into the CEMP, applying the principles to avoid, re-use and recycle to minimise wastes. Cleared trees would be recycled as fauna habitat where possible.

8 CONCLUSION

This Scoping Report has outlined the proposed Currawarra solar farm and established the environmental and planning context of the proposal. The proposal would be assessed under Part 4 of the EP&A Act and classed as State Significant Development under *State Environmental Planning Policy (State and Regional Development) 2011*.

The report has been prepared to assist the development of Secretary's Environmental Assessment Requirements (SEARs) for the proposal, which will guide the preparation of the Environmental Impact Statement (EIS).

The report identifies the following key environmental issues associated with the proposal, based on preliminary investigations:

- Biodiversity
- Aboriginal heritage
- Visual amenity and landscape character
- Noise (construction)
- Land use and resources.

These issues will be assessed in detail in the EIS. It is likely that other issues such as soil and water values, traffic impacts and natural hazards can be readily addressed by appropriate standard mitigation and management measures. The relevance and importance of issues would be reviewed throughout the EIS process.

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APPENDIX A SITE PHOTOGRAPHS



Fenced remnant with Yellow Box and White Cypress



Dead pines in fenced remnant



Cultivated paddock with isolated paddock trees



Laser levelled paddock for irrigation



Small area of remnant groundcover in NW corner



Clump of paddock trees in cultivated paddock