

Daroobalgie Solar Farm

Scoping Report

Request for Secretary's
Environmental Assessment
Requirements (SEARs)

6 December 2019

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Abbreviations

ACHA	Aboriginal Cultural Heritage Assessment
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
ALC	Aboriginal Land Council
ARTC	Australian Rail Track Corporation
BC Act	<i>NSW Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
BSAL	Biophysical Strategic Agricultural Land
CLM Act	<i>NSW Crown Land Management Act 2016</i>
CMA	Catchment Management Authority
DA	Development Application
DIRN	Defined Interstate Rail Network
DoEE	Department of the Environment and Energy
DPIE	NSW Department of Planning, Industry and Environment
DRE	NSW Department of Industry – Division of Resources and Energy
EMMP	Environmental Management and Monitoring Plan
EIS	Environmental Impact Statement
EMS	Environmental Management System
EP&A Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
EPA	NSW Environment Protection Authority
EPBC Act	<i>Commonwealth Environment Protection and Biodiversity Conservation Act 1999</i>
ETL	Electricity Transmission Line
GWh	Gigawatt hours
ICNG	Interim Construction Noise Guideline
LEP	Local Environmental Plan
LGA	Local Government Area
LLS	Local Land Services
LVIA	Landscape and Visual Impact Assessment
MDBA	Murray-Darling Basin Authority
MNES	Matters of National Environmental Significance
MW	Megawatt
O&M	Operations and Management
OEH	NSW Office of Environment and Heritage
PAC	Planning Assessment Commission
PCT	Preliminary plant community type
POEO Act	<i>NSW Protection of the Environment Operations Act 1997</i>
PV	Photovoltaic
REAP	Renewable Energy Action Plan
RF Act	<i>NSW Rural Fires Act 1997</i>
RFS	Rural Fire Service
RMS	NSW Roads and Maritime Service
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SPIC	State Power Investment Corporation
SSD	State Significant Development
TIA	Traffic Impact Assessment
TSR	Travelling Stock Reserve
WM Act	<i>NSW Water Management Act 2000</i>

1. Introduction

1.1 The project

Pacific Hydro Australia Developments Pty Ltd (Pacific Hydro) proposes to develop a utility scale solar photovoltaic (PV) generation facility and associated infrastructure to be known as the Daroobalgie Solar Farm. The site is located approximately 11 kilometres (km) north-east of Forbes and immediately east of Daroobalgie, New South Wales (NSW) (Figure 2). The solar farm is expected to have a generating capacity of approximately 100 Megawatts (MW).

The project will have a capital investment of greater than \$30 million and thus is a State Significant Development (SSD) under the State Environmental Planning Policy (State and Regional Development) 2011 (SRD SEPP). Therefore, a Development Application (DA) for the project, supported by an Environmental Impact Statement (EIS) is required to be submitted under Part 4, Division 4.1 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The NSW Minister for Planning or the Minister's delegate is the consent authority.

The project's development will be consistent with the NSW Large-Scale Solar Energy Guideline for State Significant Development (NSW Government, 2018) and is expected to deliver several benefits including:

- production of renewable energy, directly contributing to the State's renewable energy targets;
- creation of local employment opportunities, including approximately 160 full-time jobs during the peak construction period and approximately 4-6 permanent jobs during operations;
- direct and indirect benefits during the lifetime of the project including local investment through Pacific Hydro's Community Investment Program;
- diversification of local revenue streams; and
- increased energy security by contributing to Australia's diversifying energy mix and including the provision of grid support / security through energy storage systems.

A more detailed description of the project is set out in Section 3.

1.2 Purpose

The purpose of this scoping report is to request, and inform the content of, the Secretary's Environmental Assessment Requirements (SEARs) for the Daroobalgie Solar Farm project. The SEARs will identify the requirements for the Environmental Impact Statement (EIS) that will be prepared to support the DA for the project.

This report provides an outline of the existing project area and its surroundings, statutory framework for approval, a description of the proposal and identification of environmental considerations associated with the proposal.

1.3 Site and surrounds

The core development area is approximately 350 hectares (Ha) on land legally described as Lot 77 in Deposited Plan 750183. It is located in Daroobalgie approximately 11km north-east of Forbes and is accessed by Troubalgie Road to the north of the development area boundary. The core development area is part of a larger landholding and the area is the least productive land in the holding.

The topography of the core development area is generally uniform with an average elevation of 240 metres (m) above the Australian Height Datum (AHD). The land is largely cleared, having been highly modified by past disturbances associated with land clearing, cropping, and livestock grazing. A number of dams are present within the core development area and a natural watercourse runs to the east of the property boundary, intersecting the site in the southeast corner. Small ephemeral waterholes, known locally as gilgai, are present in some paddocks, predominately in the south-eastern section of the site. These have been progressively ploughed

and levelled by farming activities over time. A selection of photographs of the core development area are provided below (see Photos 1 - 6).

The surrounding land use is predominately agricultural, and the Forbes Livestock Exchange is located on Back Yamma Road, 2.5 km to the west of the site. Back Yamma State Forest is situated 7km to the east at an elevation of 340 m AHD, and the closest National Park is Goobang National Park, 30 km to the north-east. The Lachlan River runs approximately 3.5 km from the southern boundary of the project area.

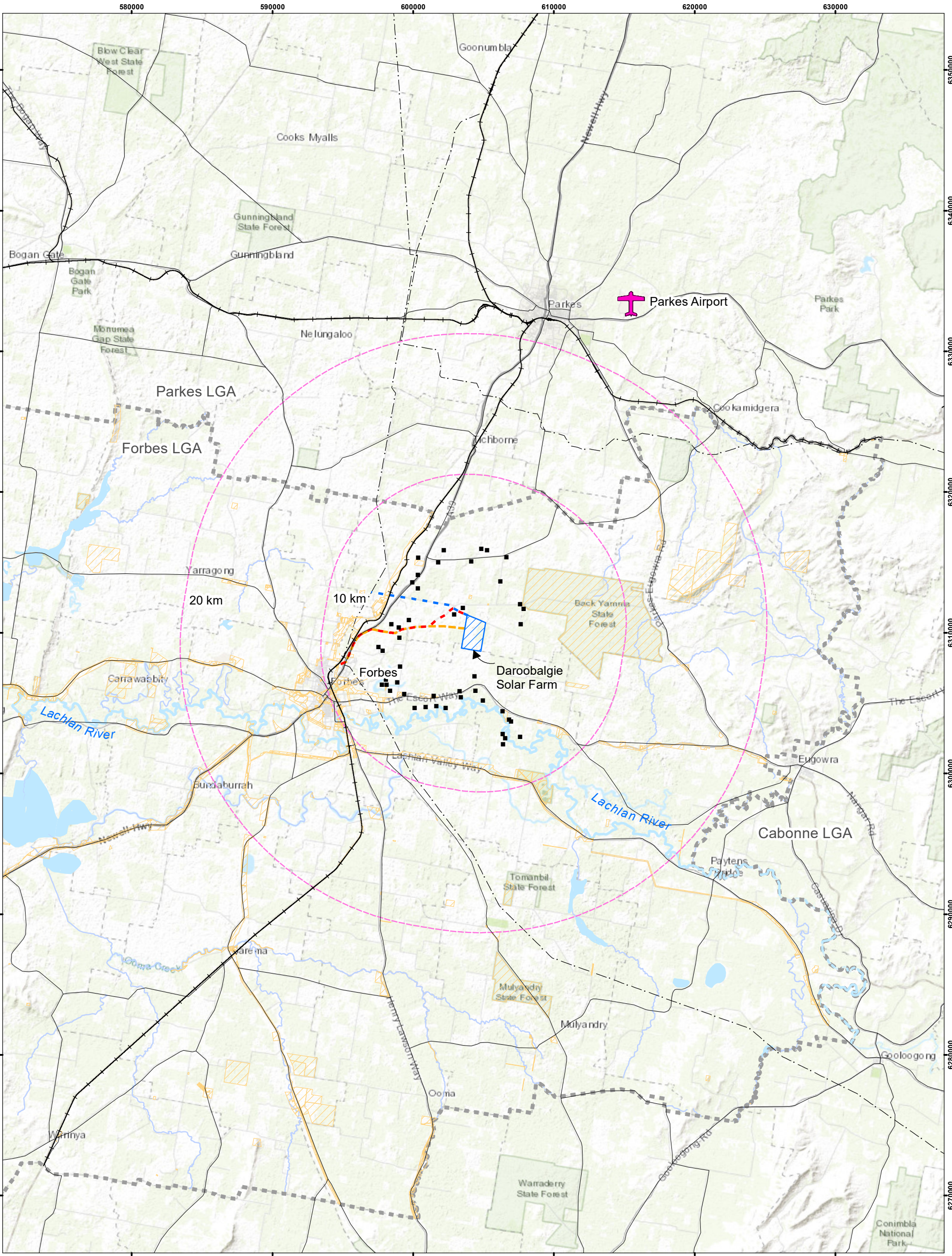
There are no residential dwellings within the core development area, the nearest dwelling is located approximately 600 m to the north- west of the western boundary. There are eight existing dwellings within 3km of the core development area. The Newell Highway runs north-south 5.5 km to the west of the project area.

The solar farm is proposed to connect into the Forbes substation, which is situated on the northern outskirts of Forbes. An existing 132kV powerline (Forbes-Parkes) runs to the west of the Newell Highway connecting directly to the substation. Three Electricity Transmission Line (ETL) route options to either connect into the 132kV powerline or connect the solar farm directly to the Forbes substation following road easements are being considered as part of the proposed development. The ETL route selection will be further refined once more detailed studies and consultation with relevant stakeholders is completed. The preferred ETL route will be identified and assessed within the EIS.

The project area (defined as the core development area and the ETL route options) is located within the Forbes Shire Council local government area (LGA) and is located within the Central West Local Land Services management region.



Figure 1 Daroobalgie Solar Farm - Core Development Area



Electricity Transmission Line (ETL) Options

Option 1

Option 2

Option 3

Rail Line

Major Road / Highway

Existing Transmission Line (132kV)

Residential dwelling

Distance from Project (km)

Crown Land

Local Government Area Boundary

Daroobalgie Solar Farm- Core Development Area

N

05,00010,000m

PROJECT	Daroobalgie, Australia		COORDINATE SYSTEM	MGA94 (55S)
TITLE	Figure 2: Locality Plan		SCALE	1:250,000 A3
FOR EXTERNAL DISTRIBUTION			DATE	26/11/19
<small>Maps marked "Internal Use Only" contain information that is of a private and confidential nature. These maps may only be distributed to, and viewed by, current Pacific Hydro Employees.</small> <small>Maps marked "For External Distribution" have been checked and approved for release for information purposes as at the date shown on the map. A Responsible Manager must approve release of these maps on any other date.</small>			CREATED	R.Khorsandi
			CLEARED	C.O'Riordan
			APPROVED	D.Walsh
			DRAWING NO	PH-1464
			REV	B



Photo 1 View south from northwest corner along the western boundary of the core development area



Photo 2 View from northeast corner south along the eastern boundary of the core development area



Photo 3 Southeast corner of core development area looking north-eastwards along unnamed waterway



Photo 4 View north from south-east corner of core development area



Photo 5 View north from south-west corner of the core development area



Photo 6 View west from the centre of the core development area showing a gilgai

1.4 Applicant – Pacific Hydro Australia Developments Pty Ltd

1.4.1 Company History

Founded in Australia in 1992, Pacific Hydro is a global renewable energy owner, operator and developer.

In Australia, Pacific Hydro operates a high quality, diversified portfolio with an installed capacity of over 660MW operating/under construction; it is also developing a substantial number of projects

totalling over 1300MW of potential capacity; and has a growing electricity retail business, Tango Energy.

Pacific Hydro has an established record of identification, development, and operation of renewable energy assets, and significant in-house expertise. Pacific Hydro has never sold any of the assets it has built.

Pacific Hydro was acquired by the State Power Investment Corporation (SPIC) through its subsidiary, State Power Investment Overseas of China (SPICOI) in January 2016, after obtaining approval from the Australian Government's Foreign Investment Review Board (FIRB) and participating in a highly competitive international sale process.

SPIC is one of the largest electricity generation companies in the world, with US\$154.3 Billion total assets and a total installed capacity that exceeds 131 GW. SPIC operates in the energy generation, aluminium, logistics, finance, environmental protection, and high technology industries. SPIC has a presence in 36 countries and regions abroad, including Australia, Chile, Malta, Japan, Brazil, Turkey and Vietnam.

Pacific Hydro's operating assets in Australia currently abate over one million tonnes of greenhouse gas pollution every year.

Pacific Hydro has built a strong reputation for engaging with the communities associated with its assets and has a track record of collaborating with local communities to deliver lasting, sustainable benefits.

1.4.2 Environmental Management System

Pacific Hydro has a certified ISO14001:2004 Environmental Management System (EMS) which applies to the management of all operating sites. To retain this certification, external annual audits are undertaken, and Pacific Hydro is required to demonstrate a process of review and continual improvement.

To manage site specific environmental obligations, Pacific Hydro integrates the Environmental Management and Monitoring Plans (EMMPs) approved as part of the planning process, within its overarching EMS. Under the EMS, an Environmental Aspects Register is maintained and monitored by a full-time Environmental Compliance Officer employed by Pacific Hydro.

2. Statutory and Planning Framework

2.1 Environmental Planning and Assessment Act 1979

2.1.1 Approval process

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) provide the framework for environmental planning and assessment in NSW.

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 Daroobalgie Solar Farm has a capital investment estimated to be \$130 million; therefore, the proposal is classified as a State Significant Development (SSD) and is required to be assessed under Part 4 of the *EP&A Act*.

State Significant Developments are major projects which require an Environmental Impact Statement (EIS). The EIS must be prepared in accordance with the requirements issued by the Secretary of the Department of Planning, Industry and Environment (DPIE), known as the Secretary's Environmental Assessment Requirements (SEARs). The Secretary must consult with relevant public authorities to develop the SEARs and will have regard to matters raised by those public authorities.

The Independent Planning Commission (the Commission) is the consent authority for SSD applications:

- that are not supported by relevant council(s), or
- where the Department has received more than 25 public objections, or
- that has been made by a person who has disclosed a reportable political donation in connection with the development application

The Minister for Planning is the consent authority for all other SSD.

2.1.2 Forbes Local Environment Plan 2013

The relevant local planning instrument is the Forbes Local Environmental Plan (LEP) 2013. Under the LEP, the core development area and most of the potential transmission route options are zoned RU1 primary production.

The objectives of RU1 primary production 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.*

While solar farm development is not specifically referenced as a development permitted with consent, solar developments are not inconsistent with the objectives and principles of the LEP. Whilst the development will impact the availability of the land for primary production, it will sustainably harness a natural resource, namely solar energy, and will provide for a diversified economic stimulus and support to rural communities.

Part 3 Division 4 of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP), relates to electricity generating works. Clause 34(1) states that development for the purpose of electricity generating works may be carried out by any person with consent on land in a prescribed rural, industrial or special use zone. A 'prescribed rural zone' is defined in Clause 33 as any of the following land use zones or a land use zone that is equivalent to any of those zones:

- a) Zone RU1 Primary Production,
- b) Zone RU2 Rural Landscape,
- c) Zone RU3 Forestry,
- d) Zone RU4 Primary Production Small Lots.

The proposed development is classified as electricity generating works and is located on land zoned RU1 – Primary Production under the Forbes LEP (Forbes LEP 2013).

Part 1, Clause 8 (1) of the Infrastructure SEPP, states that '*if there is an inconsistency between this Policy and any other environmental planning instrument, whether made before or after the commencement of this Policy, this Policy prevails to the extent of the inconsistency*'. As such the proposed development is permissible with consent under clause 8(1) and 34(1) of the Infrastructure SEPP as an SSD.

The proposed transmission line route to connect the solar farm to the grid has not been determined but three options are identified in this document and work is underway to determine a preferred route that will then be assessed within the project's EIS.

- Option 1 follows the road reserves on Troubalgie and Forrest Road to join the Newell Highway road reserve. The route runs along the Newell Highway for approximately 1.7km before crossing over the Newell Highway to connect into the Forbes substation.
- Option 2 is an opportunity to optimise Option 1 by running the ETL connection from the middle of the solar farm towards Forest Road, cutting out the need to construct down Troubalgie Road and a proportion of Forest Road. This option requires negotiated agreement with two private landowners, in addition to private landholders along Option 1.
- Option 3 runs within the road reserves of Troubalgie Road and Back Yamma Road before crossing the Newell Highway and three privately owned lots to connect with an existing 132kV transmission line to the west. This option will also need to cross the Newell Highway (State road), the Stockinbingal Parkes railway line, Crown land designated as a Travelling Stock Route and Hoppers Road (local road).

All options cross land zoned as RU1 – Primary Production until entry into the Newell Highway road reserve which is zoned SP2 - Special Purpose Zone Classified Road.

If Option 3 is preferred, connection into the 132kV ETL which runs to the west of the Newell Highway would also require the line to transverse land zoned as SP2 Rail Infrastructure Facilities

Under the Forbes LEP, the objectives of the SP2 zone are:

- *To provide for infrastructure and related uses.*
- *To prevent development that is not compatible with or that may detract from the provision of infrastructure.*

Clause 8(1), in conjunction with 34(1) of the Infrastructure SEPP allows electricity generating works to be permitted with consent in the SP2 Infrastructure zone of the Forbes LEP.

A Development Application (DA) for SSD is required to be accompanied by an EIS. Schedule 2 of the EP&A Regulation requires an EIS to be prepared in accordance with the SEARs issued for the project.

2.1.3 Relevant State Environmental Planning Policies (SEPPs)

The SEPPs considered to be relevant to this project include:

- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008
- State Environmental Planning Policy (Infrastructure) 2007
- State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007
- State Environmental Planning Policy No 1 – Development Standards
- State Environmental Planning Policy No 33 Hazardous and Offensive Development
- State Environmental Planning Policy (Rural Lands) 2008

There are no significant matters set out in the SEPPs that would preclude or significantly impact the proposed solar farm development from occurring at the site.

2.2 Other State legislation

2.2.1 Biodiversity Conservation Act 2016

The NSW *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017 requiring consideration and assessment of biodiversity impacts. The BC Act has replaced the *Threatened Species Conservation Act 1995*, the *Nature Conservation Trust Act 2001* and the animal and plant provisions of the *National Parks and Wildlife Act 1974*.

Under Section 7.9 of the BC Act an application for development consent must be accompanied by a biodiversity assessment report (BDAR) which contains an assessment of the potential biodiversity impacts associated with the proposed development.

A preliminary assessment of potential biodiversity impacts is provided in Section 5.2 of this report.

2.2.2 Crown Land Management Act 2016

Travelling Stock Reserves (TSR)

Travelling stock reserves (TSR) are parcels of Crown land reserved under the NSW *Crown Land Management Act 2016* (CLM Act) for use by travelling stock. Specific use of Crown land generally needs to be authorised by a lease, licence or permit. Approval from the NSW Crown Land Division is required under the CLM Act for any proposed works on Crown land.

ETL Option 3 which is proposed to connect into the 132kV ETL running to the west of the Newell Highway would cross a TSR classified as Category 2 for having high biodiversity value (OEH, 2017). TSRs classified as Category 2 are used for travelling stock, emergency management or biosecurity purposes, but they are also important for other purposes such as biodiversity conservation, Aboriginal cultural heritage or recreational purposes. Should this ETL connection option proceed, approval to undertake works within the TSR may be required under the CLM Act.

2.2.3 Heritage Act 1977

The NSW *Heritage Act 1977* (Heritage Act) defines 'environmental heritage' as those places, buildings, works, relics, moveable objects and precincts of State or local heritage significance. Heritage items are listed in the environmental heritage schedule of each local council's Local Environmental Plan or listed on the State Heritage Register, a register of places and items of importance to the people of NSW.

The proposal is unlikely to directly or indirectly affect any items of heritage significance (see Section 5.4 of this report) but an assessment would be undertaken as part of the EIS. If an impact was identified, under Section 4.41 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 that is authorised by a development consent.

2.2.4 Fisheries Management Act 1994

The NSW *Fisheries Management Act 1994* (FM Act) aims to conserve native fish stocks and key habitats to conserve the biological diversity of aquatic fauna and flora. An impact assessment addressing the FM Act would be undertaken as part of the EIS process to assess any impacts on fish passage.

Under Section 4.41 of the EP&A Act, a permit under Section 219 of the FM Act is not required for a State Significant Development that is authorised by a development consent.

2.2.5 National Parks and Wildlife Act 1974

Under the NSW *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 4.41 of the EP&A Act, an Aboriginal Heritage Impact Permit under Section 90 of the *National Parks and Wildlife Act 1974* is not required for a State Significant Development that is authorised by a development consent.

The potential impacts to Aboriginal heritage are discussed in Section 5.3 of this report.

2.2.6 Protection of the Environment Operations Act 1997

The NSW *Protection of the Environment Operations Act 1997* (POEO Act) is administered by the Environmental Protection Authority (EPA) and provides for a system of environmental protection licences for scheduled development work and activities, as well as the ability to issue environmental protection notices for pollution and waste management. Environmental offences are also described under the POEO Act.

Section 48 of the POEO Act requires an environmental protection licence (EPL) to undertake scheduled activities at a premise. Solar energy generation does not fall within the definition of electricity generation under Schedule 1 of the POEO Act and therefore does not require an Environment Protection Licence (EPL).

2.2.7 Roads Act 1993

The NSW *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.

Under Section 138 or Part 9, Division 3 of the NSW *Roads Act 1993*, a person must not undertake any works that impact on a road, including connecting a road (whether public or private) to a classified road, without approval of the relevant authority. RMS or local council will be the relevant authority depending upon classification of the road. Approval from the RMS or Forbes Shire Council would be required under section 138 of the Roads Act to erect a structure or carry out a work in, on or over a public road. This approval trigger would apply to any proposed ETL connection for the project as it will require, at a minimum works within Troubalgie Road to provide suitable site access and ETL works over the Newell Highway to connect into the Forbes substation.

Specific details of the proposed use of the local and regional road network and associated potential traffic impacts will be set out in the EIS. Under the provisions of the EP&A Act, an approval under Section 138 or Part 9, Division 3 of the NSW *Roads Act 1993* cannot be refused if it is necessary for carrying out a SSD authorised by development consent (see Section 2.2.10).

2.2.8 Rural Fires Act 1997

The NSW *Rural Fires Act 1997* (RF Act) aims to prevent, mitigate and suppress bush and other fires in local government areas of the State. Section 63(2) of the RF Act requires the owners of land to prevent the ignition and spread of bushfires on their land.

Under Section 4.41 of the EP&A Act, a bush fire safety authority under Section 100B of the RF Act is not required for SSD that is authorised by development consent.

The NSW Rural Fire Service Bush Fire Prone Land online mapping indicates that the site is not bush fire prone.

2.2.9 Water Management Act 2000

The NSW *Water Management Act 2000* (WM Act) regulates the use and interference with surface and groundwater in NSW where a water sharing plan has been implemented. The *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources* (Office of Water, 2012) applies to the region in which the Daroobalgie Solar Farm is proposed.

The potential impacts to surface and groundwater are briefly discussed in Section 5.6 of this report and the implications of the project with respect to the Water Sharing Plan will be further discussed in the EIS.

2.2.10 Other State Approvals required

Section 4.41 of the EP&A Act states that the following relevant authorisations are not required for a SSD that is authorised by development consent:

- (a) (repealed)
- (b) a permit under section 201, 205 or 219 of the *Fisheries Management Act 1994*
- (c) an approval under Part 4, or an excavation permit under Section 139, of the *Heritage Act 1977*,
- (d) an Aboriginal heritage impact permit under Section 90 of the *National Parks and Wildlife Act 1974*,
- (e) (repealed)
- (f) a bush fire safety authority under Section 100B of the *Rural Fires Act 1997*,
- (g) a water use approval under Section 89, a water management work approval under Section 90 or an activity approval (other than an aquifer interference approval) under Section 91 of the *Water Management Act 2000*.

In addition, Section 4.41 states that Division 8 of Part 6 of the *Heritage Act 1997* does not apply to, prevent or interfere with the carrying out of a SSD that is authorised by a development consent.

Section 4.42 of the EP&A Act lists the authorisations that must be obtained but cannot be refused if they are necessary for carrying out a SSD that is authorised by a development consent. These authorisations include (as relevant to the project):

- an environmental protection licence (EPL) under the *POEO Act*; and
- a consent under Section 138 of the *NSW Roads Act 1993* from the relevant road authority.

2.3 Commonwealth legislation

2.3.1 Environmental Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is administered by the Commonwealth Department of the Environment and Energy (DoEE) and aims to protect matters of national environmental significance (MNES) including:

- World heritage properties;
- National heritage places;
- Ramsar wetlands of international importance;
- Nationally threatened species and ecological communities;
- Migratory species;

- Commonwealth marine areas;
- The Great Barrier Reef Marine Park;
- Nuclear actions (including uranium mining); and
- A water resource, in relation to coal seam gas development and large coal mining development.

A search of the Commonwealth Protected Matters Search Tool (PMST) indicates that there are no World Heritage Properties or National Heritage Places within the vicinity of the site. The Commonwealth Protected Matters Search Tool and preliminary ecological investigations undertaken by GHD consultants (see Section 5.2 of this report) indicate that there is potential for listed threatened species and listed migratory species and communities to occur within the vicinity of the site.

If an action would, or is likely to, have a significant impact on any MNES, it is deemed to be a 'controlled action' and requires approval from the Commonwealth Environment Minister or the Minister's delegate. To determine whether a proposed action will or is likely to be a controlled action, a Referral of Proposed Action is submitted to Commonwealth Department of the Environment and Energy (DoEE).

It is considered unlikely to be a controlled action however, as a standard procedure Pacific Hydro will refer the project to DoEE.

2.3.2 Native Title Act 1993

The Commonwealth *Native Title Act 1993* provides for the recognition and protection of native title (i.e. the rights and interests, recognised by common law, possessed under traditional laws and customs of Aboriginal and Torres Strait Islander people).

The Act recognises the ownership (or set of rights and interest) of land or waters by Aboriginal and Torres Strait Island groups prior to European settlement; provides a mechanism for determining where native title exists and who holds it; and provides for compensation for actions affecting it. The Act establishes ways in which future actions affecting native title may proceed and sets standards for those actions.

People who hold native title have a right to practice their traditional laws and customs, whilst respecting Australian laws, and have a right to be consulted regarding any proposed action on their land and receive compensation for that action.

A search of the National Native Title Tribunal (NNTT) website did not indicate any native title claims, land use agreements, applications or determinations associated with the core development site. Once a final ETL route has been chosen, a review will be undertaken to determine any native title claims or agreements.

3. Project description

3.1 Overview

The Daroobalgie Solar Farm is proposed to comprise the installation of approximately 420,000 solar photovoltaic (PV) panels, associated infrastructure (i.e. substation, battery storage area, inverters, power cabling, site offices, car parking, and new access tracks) and a transmission line extension to connect the solar farm into the NEM grid. The project will have an estimated capacity of approximately 100 megawatts (MW) and will provide enough electricity to power up to the equivalent of 34,000 homes each year. Access to the site will be from Troubalgie Road but the final layout and capacity of the solar farm facility will be determined during detailed design stage and be subject to the conditions of the development consent and any other approvals granted.

3.2 Project components

3.2.1 Overview

The proposed Daroobalgie Solar Farm project comprises a number of key components:

- A network of PV solar panel arrays and Power Conversion Units (PCUs) (DC-AC inverters);
- Substation;
- Battery energy storage system (BESS) with embedded storage of approximately 40MW/160MWh;
- Electrical collection systems, substation, switchyard and control room;
- Temporary construction compound;
- Operations and Maintenance (O&M) facility, including demountable offices, amenities, equipment sheds, storage and parking areas;
- Internal access roads; and
- Electricity Transmission Line (ETL) infrastructure.

The boundary of the core development area presented in Figure 3 is a broad footprint which has been identified during initial concept design and planning stages. The development footprint will be further refined during the EIS preparation based on grid connection studies, environmental assessments, further engineering assessment and the design of project infrastructure.

The solar farm is proposed to connect directly or indirectly to the Forbes substation, located in Wyndham Avenue on the northern edge of the Forbes township, approximately 11km to the south-west of the site. A number of ETL route options are currently being considered, including the construction of a new transmission line along existing road reserves to connect directly into the substation or a connection to an existing 132 kV transmission line located approximately 500 m west of the Newell Highway.

3.2.2 PV solar panels

The project proposes the installation PV panels mounted on either fixed-tilt or single-axis-tracking structures that will be configured in rows and columns oriented to the north to optimise power generation achieved at the site.

The PV panels must be elevated on the mounting system to ensure the minimum flood level freeboard¹ requirements at the site and are expected to have a maximum height of up to 4.0 m when fully tilted at 60 degrees. Initial investigations indicate approximately 420,000 PV panels could be installed for the project however the final design will depend on a range of factors including available technologies, available grid capacity, economies of scale, grid connection and environmental constraints.

¹ Freeboard is a factor of safety expressed as the height above the flood used to determine the design floor level or ground level (Forbes Development Control Plan, 2013)

3.2.3 Electrical collection system and switchyard

PV panels are wired in a string array with each group feeding a DC-AC inverter, which converts DC current generated from the PV panels into AC current that can then be stepped up to 132kV at the substation and subsequently exported to the national electricity grid. Power Conditioning Units (PCUs) will contain the DC-AC inverters, medium-voltage transformers, switchgear, Supervisory Control and Data Acquisition (SCADA) and communications equipment. They are normally housed within 40-foot shipping container-like structures that measure approximately 12 m long x 2.5 m wide x 2.9 m high. Underground electrical cabling is proposed to be installed between the PV panels, PCUs and the substation and the electricity generated by the project exported to the grid.

A new electrical switchyard/substation will be constructed to enable a connection of the solar farm to the national electricity grid. The 132kV terminal station is expected to be co-located with the O&M facility, with electrical components generally between 5.0 m to 10 m tall.

3.2.4 Operation and Maintenance facility

The proposed Operation and Maintenance facility (O&M) is expected to be co-located with the proposed substation and battery storage facility, and together will occupy a footprint of approximately 6 ha. Structures will include demountable offices, staff amenities, equipment storage sheds, and at-grade car parking.

The final location and specifications of the substation/O&M building will be determined during detailed design and in accordance with detailed electrical engineering studies.

3.2.5 Network connection

The infrastructure required for connection to the local electricity distribution network between the site and the Forbes substation will be dependent on the requirements of the network service provider, outcomes of grid connection studies, transmission line route selection, engineering and environmental constraints.

ETL options currently being considered include:

- Option 1 - a new 10.9 km transmission line between the core development area to the Forbes substation. This alignment would follow road reserves along Troubalgie Road, Forest Road and the Newell Highway. There is an existing Essential Energy easement for a 66kV line that runs of the eastern side of the Newell Highway.
- Option 2 potentially optimises Option 1 by running the ETL connection from the middle of the core development area towards Forest Road, avoiding Troubalgie Road and a proportion of Forest Road. This option would require negotiated access through two additional land parcels. The length of this option would be approximately 10.5km.
- Option 3 - a new 7km transmission line (via Troubalgie and Back Yamma Rd) between the core development area and the existing 132 kV transmission line located approximately 500 m west of the Newell Highway. This option would cross the passenger and freight train line located west of the Newell Hwy and three privately owned land parcels.

Route selection will be further informed through consultation with TransGrid, Essential Energy and landholders and/or land managers. Once a preferred route is selected, further detailed assessments will be undertaken in accordance with the SEARs to inform the EIS process.

3.3 Construction

Construction of the project will take approximately 12-18 months from commencement of site works. During the peak construction period, a workforce of approximately 160 personnel will be required onsite.

Minor earthworks would be required for the preparation of the site, including minimal site levelling, laying of access track and site drainage works. Due to the relatively flat terrain of the project area minimal site preparation and civil works are anticipated prior to construction. Most of the

infrastructure would be pre-fabricated off-site, delivered and then assembled on-site. Access to the site will be from Troubalgie Road.

3.4 Operation

Once operational the solar farm will require between four and six full-time employees. The primary activities conducted on site will include day-to-day routine operations, maintenance of infrastructure, and general site maintenance and security. Operation of the solar farm will also likely be supported by local contractors for tasks such as repairs, minor works, weed/vegetation management, fencing and cleaning.

The operational lifespan of the facility is expected to be in excess of 25 years, depending on the nature of solar PV technology and energy markets.

3.5 End of Life Management

Once the project reaches the end of its operational life, a decision will be made to either decommission or re-power the facility, subject to approval requirements.

If the project is decommissioned, all above-ground structures built as part of the project will be removed and the site rehabilitated generally to its pre-existing land use, as far as practicable. The disposal and recycling of project infrastructure will be done in accordance with current waste management legislation at the time of decommissioning. Wherever possible, efforts will be made to reduce the amount going to landfill in line with best practice sustainability principles.

If re-powering the project is proposed, an appropriate stakeholder consultation process will be undertaken, and all necessary approvals will be sought.



- Core development area boundary
- Proposed O&M compound (including substation and BESS)
- Solar PV arrays
- Crown land
- Cadastral boundary
- Railway
- Waterway
- Public Road
- Existing Transmission Line (132kV)

Electricity Transmission Line (ETL) Options

- Option 1
- Option 2
- Option 3

PROJECT Darroobalgie, Australia	
TITLE Figure 3: Indicative non-optimised layout (100MW AC)	
FOR EXTERNAL DISTRIBUTION	
Maps marked "Internal Use Only" contain information that is of a private and confidential nature. These maps may only be distributed to, and viewed by, current Pacific Hydro Employees.	
Maps marked "For External Distribution" have been checked and approved for release for information purposes as at the date shown on the map. A Responsible Manager must approve release of these maps on any other date.	
CREATED R.Khorsandi	APPROVED D.Walsh
CLEARED C.O'Riordan	DATE 26/11/19
SCALE 1:25,000	A3
COORDINATE SYSTEM MGA94 (55S)	
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4. Stakeholder engagement

4.1 Overview

Positive relationships with our host communities are a priority – and just as critical to Pacific Hydro's success as technical or financial factors. From development and design, during construction and through operations, and into end of life management, our relationships with local communities must endure over a time scale of decades.

Pacific Hydro is committed to high quality, ongoing, and authentic engagement with the communities who host our clean energy projects.

A comprehensive community and stakeholder engagement plan that dovetails with the Forbes Shire Council Community Strategic Plan is currently being developed and will be further implemented following receipt of the SEARs: The following stakeholders will be considered

- NSW Department of Planning, Industry and Environment (DPIE);
- NSW Roads and Maritime Services (RMS);
- NSW Environment Protection Authority (EPA);
- NSW Department of Industry – Division of Resources and Energy (DRE);
- NSW Central West Local Land Services (LLS);
- NSW Rural Fire Service (RFS);
- Forbes Shire Council;
- Commonwealth Department of Environment and Energy (DoEE);
- Wiradjuri (Peak Hill) Aboriginal Land Council (ALC);
- Forbes Aboriginal Community Working Party;
- TransGrid;
- Essential Energy;
- Project neighbours, in particular those living within a 5km radius of the project area; and
- Surrounding community members (those living/based within or have a connection to the geographic area surrounding the project area).

4.2 Early Engagement

Pacific Hydro has already undertaken a series of activities to proactively begin to understand the local community context and inform engagement efforts. To date the following engagement activities have been undertaken:

- Desktop research using geographic information systems (GIS) to identify potential dwellings within 5 kms of the project area followed by field visits to every property to verify actual dwelling locations;
- Attended meetings and delivered presentations to Forbes Shire Council officers and councillors to discuss the proposed solar farm project in December 2018, January 2019, and February 2019;
- Meeting with Roads and Maritime Services (RMS) to explore transport and logistics options as well as gain insight into the local conditions, driver and road safety considerations;
- Visited all project neighbours within a 5km radius in January 2019 to introduce ourselves, share preliminary information about the proposed project, provide contact details and gauge initial community sentiments; and

- Developed a project [webpage](#) and accompanying [project summary](#) (<http://www.pacifichydro.com.au/files/2019/01/Daroobalgie-Solar-Farm-About.pdf>). We have provided project neighbours within 5km with these materials along with our free-to-call (from a landline) community telephone number (1800 730 734) and email address (enquiries@pacifichydro.com.au).

Pacific Hydro's approach to engagement is consistent with the International Association of Public Participation (IAP2) methodology and principles; and underpinned by our [culture statements](#).



Figure 4 Pacific Hydro Culture Statements

4.3 Agency consultation

In the early stages of development of this proposal, Pacific Hydro focuses on stakeholder identification, including but not limited to all levels of government; referral agencies, neighbours, community members, landholders, and special interest groups, Aboriginal community members and other potentially affected stakeholders such as mineral title holders and network service providers.

Consultation, especially face to face interactions during this phase, help to understand the unique aspects of a project, risk from a community perspective and to identify any potential concerns with a view to mitigating them. Table 1 details the early engagement activities that have taken place to date.

This early engagement with stakeholders informs a tailored community engagement plan for implementation in subsequent phases.

The Community Engagement plan will be reviewed regularly to ensure that it is current and relevant. It will also be used to inform contractual requirements in Pacific Hydro's procurement processes in the lead up to and during construction and operation of the solar farm.

Table 1 Agency consultation for the proposed Daroobalgie Solar Farm

Stakeholder	Date	Issues raised/Outcomes
Department of Planning and Environment	Meeting 13 December 2018	· Visual Impact

Stakeholder	Date	Issues raised/Outcomes
	Ongoing consultation through SEARs development and submission	<ul style="list-style-type: none"> · Battery Storage - Fire & Rescue NSW and the Rural Fire Service will need to be consulted. · Road upgrades and Transport routes · Soils · Large Scale Solar Energy Guideline should be consulted to help guide process.
Roads and Maritime Service	Meeting 13 December 2018	<ul style="list-style-type: none"> · A transmission line within/across the Newell Hwy may be supported by RMS. However, there must be solid justification (e.g. no practical alternative(s) and demonstration of effort to pursue other options) as the Newell Hwy is planned to be duplicated in the next 20-25 years. · Consideration of Livestock Exchange "sale days" schedule for traffic planning / management. · Consideration of use of rail for delivery access to site, noting proximity of Parkes rail interchange/ Inland Rail project · Importance of health and safety and consideration of high accident rates associated with construction workers/ traffic
Forbes Shire Council	Meeting 14 December 2018	<ul style="list-style-type: none"> · Community consultation planning · Consider impact on accommodation availability during the Parkes Elvis Festival · Potential to use local road reserves for transmission lines. Agreement will need to be entered into for any works (e.g. – if any transmission lines within the Council's road reserves. · Further consultation planned as the project commences.
	Meeting 29 January 2019	
	Email on 30 January 2019	
	Presentation to Councillors 2 February 2019	
Transgrid	Pre-enquiry lodgement on 1 February 2019	<ul style="list-style-type: none"> · Pre-enquiry with TransGrid lodged in accordance with their network connections guidelines to understand how the project would connect into the Forbes substation.

Stakeholder	Date	Issues raised/Outcomes
		<ul style="list-style-type: none"> For all third part generator connections, TransGrid requires the customer/developer to take responsibility for securing land access rights (i.e. ETL easement and substation acquisition) necessary to enable connection of the generator to our existing network. Further meetings planned as the project commences.
Essential Energy	October 2019	<ul style="list-style-type: none"> Further meetings planned as the project commences.

4.4 Landholder consultation

Initial discussions have been held with all of the landholders along the transmission route options to discuss the project.

These will be progressed further once a preferred option has been identified.

4.5 Early Community Consultation

An initial desktop assessment followed by a “windscreen survey” identified 46 potential dwellings within a 5km of the core development area. Each property was doorknocked during a site visit in January 2019 and the project was discussed if residents were present, or if not, information about the project was left at the property.

Of the project neighbours spoken to in January 2019, very few concerns were raised at the time and generally neighbours appeared to be supportive of the project. Issues of concern or for consideration that were raised included how the development may affect local property prices and the impact on local roads, in particular Troubalgie Road.

4.6 Future Consultation

Pacific Hydro will commit to active open communication with the community and stakeholders throughout preparation of the EIS, construction and operation of the project. Future activities are likely to include:

- A written update to landholders and neighbours in late 2019, noting that this request has been lodged;
- Further engagement with Forbes Shire Council in late 2019 to better understand potentially interested local community and environmental groups;
- Meeting face-to-face with landholders, residents and interested community groups in early 2020
- Conducting information sessions in early to mid 2020 to provide information about the project, and to seek community input into the proposed environmental assessments and the establishment of a local Community Investment Program;
- Engagement with local media to promote the information sessions;
- Promoting the project website, 1800 number and email address and monitoring enquiries through these channels.

4.6.1 Community Investment

As a leading renewable energy developer, Pacific Hydro is committed to supporting the communities that host our clean energy projects with positive and lasting social, environmental and economic benefits.

Our Community Investment Program is the key part of Pacific Hydro's community investment and support strategy. A Sustainable Communities Fund would be established to deliver a portion of revenue from the proposed Daroobalgie Solar Farm back into our local communities each year, for the life of the solar farm.

5. Preliminary environmental impact assessment

5.1 Issues identification

A preliminary review of existing environmental values and potential impacts resulting from the proposed solar farm development has been undertaken to identify the matters which require detailed consideration and technical studies to be prepared in support of the EIS for the project. An environmental constraints map has been prepared to provide an overview of the environmental and land use constraints on and around the project area (see Figure 9).

The key considerations identified in the preliminary review are as listed below. Each is discussed in-turn in the sub-sections:

- Biodiversity
- Aboriginal cultural heritage
- Historic heritage
- Land use & planning
- Water resources
- Traffic and transport
- Air quality
- Noise
- Landscape and Visual Impact
- Socio-economic Impact
- Cumulative Impacts

5.2 Biodiversity

5.2.1 Flora

Pacific Hydro commissioned GHD Pty Ltd to undertake a biodiversity assessment of the core development area and parts of the ETL route options. To-date spring and summer flora surveys and a targeted survey for Sloan's froglet have been undertaken at the core development area and along parts of the ETL route options. Access to some sections of the ETL routes was not possible due to access issues. A Biodiversity Development Assessment Report (BDAR) will be completed after the Secretary's Environmental Assessment Requirements (SEARs) have been received and a final ETL route option is chosen.

The following is a summary of the desktop and field surveys completed to-date.

Threatened Ecological Communities

An initial desktop search of the EPBC Act Protected Matters Search Tool database identified two EPBC-listed threatened ecological communities that may occur or are likely to occur at the project area:

- Grey box grassy woodlands and derived grasslands and Weeping Myall woodland; and
- White Box Yellow Box Blakely's red gum grassy woodland and derived native grassland.

Spring flora surveys were undertaken September 2018 within the core development area and along ETL route Option 1 (i.e. Troubalgie Road-Forest Road-Newell Highway). The surveys confirmed the presence of two ecological communities (both listed as Endangered under the Act and representative of threatened ecological communities under the EPBC Act):

- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penneplain, Nandewar and Brigalow Belt South Bioregions (occurs within the project area and sections within the ETL route Option 1); and

- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes Bioregions (only occurs along sections of ETL route Option 1 on Forest Road).

Both of these communities along ETL route Option 1 occur as small scattered patches of canopy trees or as derived grasslands of these communities with no canopy species present.

GHD consultants have prepared preliminary plant community type (PCT) mapping for the core development area and ETL route Option 1 along Troubalgie Road, Forest Road and the Newell Highway, showing the indicative results of the spring survey completed in September 2018 (refer to Figures 4, 5, and 6).

Threatened Flora Species

As part of the preliminary ecological assessment undertaken, targeted flora surveys were completed in September and October 2018 to capture the survey window for the following species:

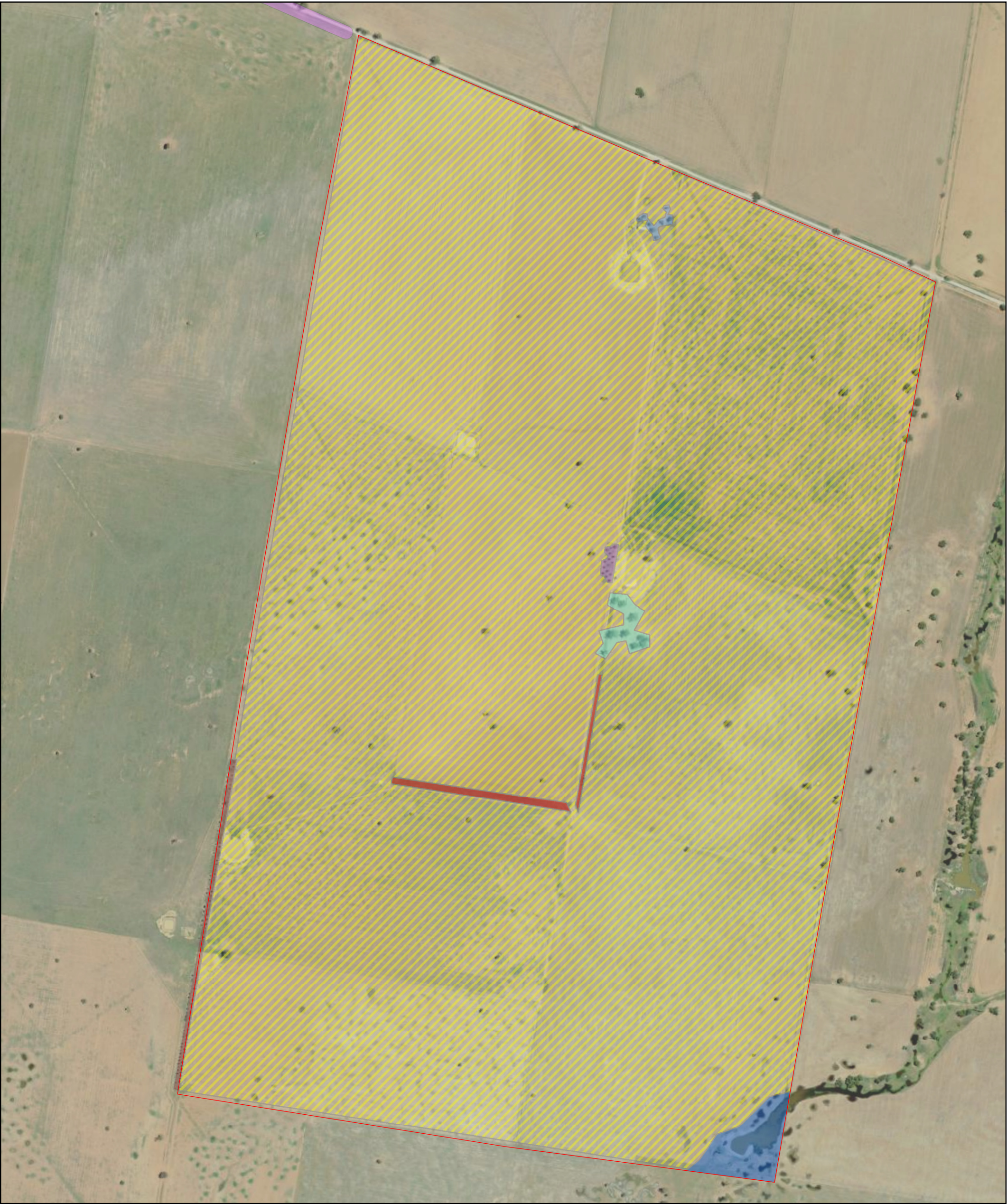
- *Diuris tricolour* Pine donkey orchid (vulnerable under *BC Act*)
- *Swainsona murrayana* Slender Darling pea (vulnerable under *BC Act* and *EPBC Act*)
- *Austrostipa wakoolica* Spear grass sp. (endangered under *BC Act* and *EPBC Act*)
- *Lepidium aschersonii* Spiny peppercress (vulnerable under the *BC Act* and *EPBC Act*)
- *Acacia ausfeldii* Ausfeld's wattle (vulnerable under *BC Act*)
- *Swainsona recta* Small purple-pea (endangered under *BC Act* and *EPBC Act*)
- *Tylophora linearis* (vulnerable under *BC Act*, endangered under *EPBC Act*)

The targeted flora surveys did not observe any threatened flora species listed under either the *BC Act* or *EPBC Act* within the core development area.



5.2.2 Fauna




The potential for the presence of a number of *EPBC* listed bird species, mammals and lizards within a 1 km radius of the property was also identified during the search of the *EPBC Act* Protected Matters Search Tool database (refer to Appendix A).

Further detailed information on the existing flora and fauna values and potential impacts associated with the proposed development will be contained in the BDAR that will accompany the EIS. This will include assessments for the final ETL route.



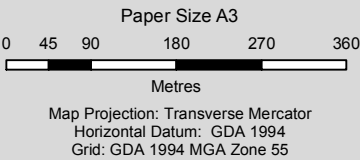
PCTs

-  Cropped and/or introduced grassland
-  PCT ID 217 -Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion (planted)

-  PCT ID 78 -River Red Gum riparian rall woodland/ open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (planted)
-  Paddock trees
-  PCT ID 76 -Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion

-  Non-NSW planted trees
-  PCT ID 76 -Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion (derived grassland)
-  PCTID360 -Gilgai wetland mosaic in the Southern NSW South Western Slopes Bioregion

-  Project site boundary



Pacific Hydro
BDAR

Daroobalgie Solar Farm BDAR
Preliminary PCT mapping

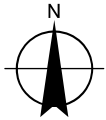
Job Number | 23-16511
Revision | A
Date | 05 Dec 2018

Figure A



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Paper Size A3
0 165 330 660
Meters
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55



Plant Community Types

Cropped and/or introduced grassland

PCT ID 9 -River Red Gum- wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion

PCT ID 26 -Weeping Myall open woodland of the Riverina Bioregionand NSW South Western Slopes Bioregion

PCT ID 26 -Weeping Myall open woodland of the Riverina Bioregionand NSW South Western Slopes Bioregion (derived grassland)

PCT ID 76 -Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion

Non-NSW planted trees

PCT ID 76 -Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion (derived grassland)



Pacific Hydro
Darroobalgie Solar Farm BDAR

Job Number 23-16511
Revision A
Date 05 Dec 2018

Transmission line option 1 (west) **Figure B-West**



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Paper Size A3

0 160 320 640

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Project site boundary

Plant Community Types

- Cropped and/or introduced grassland
- PCT ID 217 - Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion (planted)

PCT ID 78 -River Red Gum riparian rall woodland/ open forest wetland in the Nandewar Bioregion and Brigalow Belt South Bioregion (planted)

PCT ID 26 -Weeping Myall open woodland of the Riverina Bioregionand NSW South Western Slopes Bioregion

PCT ID 76 -Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion

PCT ID 76 -Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregion (derived grassland)

Pacific Hydro
Daroobalgie Solar Farm BDAR

Job Number 23-16511
Revision A
Date 05 Dec 2018

Tranmission line option 1 (east)

Figure B-East

5.2.3 Potential Impacts and Assessment Approach

The core development area is largely cleared and used for cropping, although small areas of native vegetation exist within the site boundaries, some of which is categorised as Endangered under the BC Act and EPBC Act. These threatened native vegetation communities have also been identified along sections of the ETL route Option 1 (along Troubalgie Road, Forest Road and the Newell Highway).

During construction land clearance and associated earthworks have the potential to directly or indirectly impact this vegetation, as well as any threatened fauna species which may occur in the area. Sections of the waterway that runs to the east of the site boundary are identified in the Forbes LEP as areas of High Biodiversity and as such any direct or indirect impacts to aquatic flora and fauna will also need to be considered. The potential introduction and spread of weed and pest species will need to be considered during the construction and decommissioning phases. Operational impacts on biodiversity are expected to be minimal.

Further ecological surveys will be undertaken after the Secretary's Environmental Assessment Requirements (SEARs) have been received. The surveys will inform the Biodiversity Development Assessment Report (BDAR) which will detail the biodiversity values potentially impacted by the proposed development and identify how impacts can be avoided or mitigated. Where impacts cannot be avoided, the report will detail any offset requirements. The project will be assessed in accordance with the *Framework for Biodiversity Assessment: NSW Biodiversity Offsets Policy for Major Projects* (the FBA) (OEI 2014) which provides the framework for assessment of biodiversity impacts for SSD projects.

As a standard procedure Pacific Hydro will refer the project to DoEE under the EPBC Act. Consultation with DoEE will be undertaken during the EIS process.

It is intended that the EIS will outline appropriate mitigation measures further. Impact mitigation measures would be implemented during construction activities through the Construction and Environmental Management Plan (CEMP) that would be prepared for the project. Similarly, ongoing management and mitigation measures would be implemented through an Operational Environmental Management Plan (OEMP).

5.3 Aboriginal cultural heritage

5.3.1 Existing environment

The project area is within the Wiradjuri Region, whose people are the largest Aboriginal Nation in NSW. Wiradjuri people are originally from the land that is bordered by the Lachlan, Macquarie and Murrumbidgee rivers in Central New South Wales.

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) within a 1 km radius of the core development area did not identify the presence of any known sites or places of Aboriginal heritage (refer to Appendix B). Landforms, vegetation and soils over much of the project area have been heavily disturbed by paddock levelling, cultivation, track formation and clearing for agriculture. This is likely to have reduced the potential for Aboriginal heritage sites of significance within the project area to remain. Conversely, areas within proximity to waterways are likely to have a higher potential for significance. Given that the core development area lies within proximity to the Lachlan River (3.5 km to the south) and an unnamed water way runs to the east of the property boundary and crosses into the project area in the southeast corner, field assessment is proposed to confirm the likelihood of unknown sites or places of Aboriginal heritage.

5.3.2 Potential Impacts and Assessment approach

Construction has the potential to disturb unknown sites of Aboriginal cultural heritage significance. Impacts during operation and decommissioning are expected to be minimal.

An Aboriginal cultural heritage assessment (ACHA) and associated stakeholder consultation will be completed as part of the EIS. This would include consultation with the Wiradjuri (Peak Hill Aboriginal Land Council) as well as any other relevant stakeholders in accordance with the *Aboriginal Cultural Heritage Requirements for Proponents* (DECC 2010). Should any Aboriginal

heritage sites be identified that may be potentially affected by the proposal, mitigation measures will be determined in accordance with the *Guide to Investigating, assessing and reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).

The required mitigation measures will be implemented during construction activities through a specific Cultural Heritage Management Plan as part of the Construction and Environmental Management Plan (CEMP) that would be prepared for the project. Similarly, any ongoing management and mitigation measures would be implemented through an Operational Environmental Management Plan (OEMP).

5.4 Historic heritage

5.4.1 Existing environment

European settlement of the Lachlan River catchment began in the 1830s with the establishment of pastoral landholdings (MDBA, 2019). There is no known evidence of previous settlements within the core development area. A search of the State Heritage Inventory for heritage items listed on the State Heritage Register, Interim Heritage Orders, State Agency Heritage Registers and the Forbes LEP do not identify any known areas of heritage significance within the core development area and ETL route options. Of the 157 items of heritage significance listed within the Forbes LEP, three listed sites are of State significance under the NSW *Heritage Act 1977*. The closest to the project area is the Wandary Homestead (local significance) located approximately 6km south west of the core development area. Forbes train station (State significance) is located approximately 1.5 kms to the south of the Forbes substation, where the ETL for the project may connect to the grid.

5.4.2 Potential Impacts and Assessment approach

The project is not likely to impact any known items or places of heritage significance during construction or operation. Unexpected or unidentified non-indigenous archaeological artefacts may be uncovered during construction, however given the current level of disturbance within the core development area, the risk of this occurring is considered to be low. A review of this risk will be undertaken during EIS preparation and the EIS will detail measures to be implemented should an unknown site of archaeological or built historical heritage significance be identified during works.

The required mitigation measures will be implemented during construction activities through a specific Cultural Heritage Management Plan as part of the Construction and Environmental Management Plan (CEMP) that would be prepared for the project. Similarly, any ongoing management and mitigation measures would be implemented through an Operational Environmental Management Plan (OEMP).

5.5 Land use

5.5.1 Existing environment

The project area is located within the NSW South Western Slopes Biogeographic Region, characterised by a large area of foothills and ranges comprising the western fall of the Great Dividing Range, to the edge of the Riverina Bioregion. The area lies within the Lachlan catchment area, with agriculture being the main industry of the catchment, occupying more than 80% of the land (MDBA, 2019).

The project area is part of a larger landholding that has been highly modified by agricultural activity associated with land clearing, cropping and livestock grazing. Current cropping practice includes a rotation of barley, wheat, oats, pasture and canola and 600 breeding ewes are agisted on the core development area.

The project area is not within an irrigation district and has been assessed as Class 4 under the NSW Land and Soil Capability classification. It is not mapped as Biophysical Strategic Agricultural Land (BSAL) and therefore is not considered to be high quality agricultural land.

The 1:100,000 Parkes Geological Map indicates that the site is predominantly underlain by Tertiary shallow slope colluvial plains and rises within some residual veneer. The southeast portion

of the site is underlain by an active alluvial plain with gilgais. Gilgai terrain is typically identified by mounds and depressions and makes up about 50% of the project area.

Pacific Hydro commissioned Golder Associates consultants to undertake a preliminary geotechnical assessment of the core development area to understand the existing ground conditions and any implications for the proposed development (the Golder report). Based on sub-surface testing using a combination of test pits and bore holes, the Golder report found that the core development area generally consists of topsoil (typically 100mm to 200mm thick), underlain by alluvial/colluvial soil. It also found that across the gilgai areas, alluvial soils were observed to have infilled the depressions. These infilled alluvial soils were observed to be up to 2.6 m thick and are considered to be highly reactive (i.e. high shrink-swell potential). Where present, the infilled alluvial soils overlie highly reactive alluvial/colluvial soil (Golder 2019).

The Golder report indicates that while the soils within the core development area are generally non-dispersive in their natural state, earthworks may result in some erosion and sediment loss if exposed to turbulent or rapid water flow. Initial tests for the potential for acid sulphate soils to be present found that one sample exceeded the criterion used and further investigation may be required.

5.5.2 Potential Impacts and Assessment approach

Construction impacts that will need to be considered during the assessment process include soil compaction, erosion, contamination and management of stormwater.

The proposed development will alter the current land use of the core development area from agriculture to electricity generation, although some agricultural activity may be able to continue alongside solar. At the end of the operational life of the project, a decision will be made to either re-power or decommission the project. In the event the project infrastructure is decommissioned the land will be returned to its pre-existing agricultural use. However, earthworks likely to be required for the project will not be significant (such as bulk earthworks or re-shaping) so it is anticipated that the integrity of the land and soil capability will be retained through appropriate land management practices.

An assessment of existing soils and land capability will be undertaken for the EIS. This will include as assessment of the impacts described above and a description of mitigation measures to manage potential impacts associated with the proposed development.

Mitigation measures to reduce impacts to soil will be implemented during construction activities through the Construction and Environmental Management Plan (CEMP) that would be prepared for the project. Similarly, ongoing management and mitigation measures would be implemented through an Operational Environmental Management Plan (OEMP).

5.6 Water resources

5.6.1 Existing environment

The project area is within the Lachlan catchment area, an area of approximately 90,000 square kms (km²) and supports over 106,000 people. Average annual rainfall within the catchment area varies from 1,100 mm in the eastern part of the catchment to as little as 200mm in the far west. Average annual rainfall around the Forbes area is between 500 mm and 600mm (MDBA, 2019). At its closest point the Lachlan River lies 3.5 kms from the southern boundary of the core development area.

An unnamed waterway (Stream Order 2) intersects the south-eastern corner of the core development area and flows in a south-westerly direction. Sections of this waterway are identified in the Forbes LEP as areas of High Biodiversity. The waterway appears to be a permanent feature but at the edge part of a wider ephemeral landscape of gilgai wetland features.

The Forbes Development Control Plan 2013 identifies a Flood Prone Area approximately 0.7 kms to the south of the core development area.

The preliminary geotechnical assessment did not encounter any evidence of a groundwater table during sub-surface investigations which were carried out up to 7.5 m below the ground level. Publicly available data shows that the groundwater table is likely to be in excess of 40 m below ground level (WaterNSW, 2019).

5.6.2 Potential Impacts and Assessment approach

During construction, potential impacts to water resources are expected to include demand for water during works and the impact of surface water run-off to nearby watercourses, noting that sections of the unnamed waterway to the east of the project area are identified in the Forbes LEP as areas of High Biodiversity.

During operation water will be required to clean the panels. Decommissioning impacts are likely to be similar to those considered during the construction phase.

A detailed surface water assessment will be included within the EIS. The assessment will include a review of the flood risks, and likely impacts on surface water and groundwater resources. If surface water or groundwater extraction is required for the project, an assessment of impacts to the water sources will be included in the EIS.

The required mitigation measures would be implemented during construction activities through the Construction and Environmental Management Plan (CEMP) that will be prepared for the project. Similarly, ongoing management and mitigation measures would be implemented through an Operational Environmental Management Plan (OEMP).

5.7 Traffic and transport

5.7.1 Existing environment

The primary access route to the core development area is via Troubalgie Road, which is an unpaved single carriage local road. Troubalgie Road can be accessed from the Newell Highway via either Back Yamma Road (paved single carriageway) or Forest Road (unpaved single carriageway) (see Figure 2).

Troubalgie Road primarily services local traffic and agricultural operations. The Newell Highway is a National Highway and likely to be the major transport route for haulage during the construction phase of the project. Several haulage route options will be considered for the project, either accessing from the north, via Orange and Parkes, through the Blue Mountains or from the south via Yass and Forbes.

To further support the NSW state government's target for increased rail modal share, the project will also explore the use of rail for haulage of project components. Rail is a safe, efficient, and ideal choice for transporting the many intermodal shipping containers that will be used to deliver solar panels and other components. The Stockinbingal-Parkes railway line is located close to the project site, which is managed by the Australian Rail Track Corporation (ARTC).

Parkes, which is approximately 25km from the core development area, is the crossroads of the Australian railway system, with access to all of the state capitals and major ports via the Defined Interstate Rail Network (DIRN), which is standard gauge.

Locations where intermodal containers might be unloaded include sidings at Forbes (Mountain Industries intermodal terminal) and Parkes (several sidings) with extensive intermodal handling and transshipment capabilities. There are also several local trucking contractors who can handle the 'last miles' from the railhead to the project site.

5.7.2 Potential Impacts and Assessment approach

During construction there will be a temporary increase in traffic along the Newell Highway and local road network as components are brought to site and construction workers travel to/from the site. This will indirectly lead to some increase in localised noise levels during the main construction period. Traffic management during construction will also need to consider activities at the nearby Forbes Livestock exchange, the associated vehicle movements and their timing.

Traffic impacts during operations will be minimal, with approximately six (6) full-time staff at the solar farm. Traffic is predicted to be limited to employee vehicle movements for full-time staff, plus a small number of daily vehicle movements associated with ongoing maintenance and associated activities performed by local contractors/consultants.

During the decommissioning phase, a temporary increase in construction traffic would be expected as infrastructure is removed.

A detailed Traffic Impact Assessment (TIA) will be included within the project's EIS. The TIA will identify the impacts and assess the significance of any impacts on the road network and community during construction, operation and decommissioning phases. The TIA will also consider the requirement for road upgrades. The required mitigation measures would be implemented during construction and operational activities through implementation of detailed Traffic Management Plans (TMPs) that would be prepared for the project for each relevant phase.

5.8 Air quality

5.8.1 Existing environment

The project area is within an agricultural area, including the Livestock Exchange, and in proximity to a key arterial road and freight rail line. These land uses are likely to influence local and regional air quality. Other sources of potential air pollution/emissions within the area are limited as there are no heavy industries. Air emissions would be primarily comprised of dust and vehicle/machinery exhaust emissions associated with transport and agricultural activities.

5.8.2 Potential Impacts and Assessment approach

The project is not anticipated to generate significant air quality impacts during construction, operations or decommissioning. Project earthworks and associated vehicle movements will likely generate some dust and an increase in traffic will lead to a short-term localised increase in vehicle exhaust emissions. Mitigation measures to manage dust generation on-site will be implemented during construction and decommissioning activities and as part of regular land management activities during operation.

The EIS will detail measures to be implemented during the life of the project to minimise dust emissions. As impacts during construction will not be significant and would be temporary in nature, a detailed air quality assessment is not expected to be required as part of the EIS. Notwithstanding this, appropriate dust mitigation measures will be implemented during construction activities through the project's Construction and Environmental Management Plan (CEMP). Similarly, ongoing management and mitigation measures would be implemented through an Operational Environmental Management Plan (OEMP).

5.9 Noise

5.9.1 Existing environment

Existing background noises levels on, and surrounding the core development area, are likely to be low and typical of a rural setting. Sources of background noise would include vehicle use along Troubalgie Road and equipment used on adjacent rural landholdings. Activity at the Forbes Livestock Exchange would also contribute to occasional increases in background noise.

In terms of sensitive receivers, there are eight residential dwellings within a 3 km radius of the centre point of the project area, two dwellings are within 1 km of the western boundary of the project area (refer to Figure 7).

5.9.2 Potential Impacts and Assessment Approach

Most noise impacts will occur during construction and decommissioning works, with little audible noise generated during operation. During construction the main source of noise from the core development areas is expected to be from traffic movements and piling of posts required to host the panel racking system. Once operational, noise emissions from the solar farm infrastructure would not expect to be audible at the nearest dwellings.

An assessment will be undertaken of the potential 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), and cumulative noise impacts (considering other developments in the area). Where required a noise management plan will be prepared if the assessment demonstrates that this is necessary.



PROJECT			Daroobalgie, Australia		
TITLE			Figure 8: Associated and Non-associated Receivers FOR EXTERNAL DISTRIBUTION		
<small>Maps marked "Internal Use Only" contain information that is of a private and confidential nature. These maps may only be distributed to, and viewed by, current Pacific Hydro Employees. Maps marked "For External Distribution" have been checked and approved for release for information purposes as at the date shown on the map. A Responsible Manager must approve release of these maps on any other date.</small>			CREATED	R.Khorsandi	
			CLEARED	C.O'Riordan	
			APPROVED	D.Walsh	
DATE			09/12/19		
SCALE			1:55,000	A3	
DATUM			MGA94 (55S)		
DRAWING NO			PH-1495	REV	C

- Associated Receiver (Residential dwelling)
- Non-associated Receiver (Residential dwelling)
- Core Development Area Boundary
- Distance from Solar Farm (km)
- Forbes Livestock Exchange
- Public Road
- Proposed Transport Route
- Railway
- Cadastral Boundary
- Watercourse
- State Forest

5.10 Landscape and Visual

5.10.1 Existing environment

The core development area and its surroundings are rural in character, largely cleared and used for large scale agricultural production. The Forbes Livestock Exchange, 2.5km to the west of the site is in an area zoned under the Forbes Shire Council LEP as IN1 General Industrial.

The topography of the site is generally uniform with an average elevation of 240 m above the Australian Height Datum (AHD). There is some vegetative screening around the boundaries of the core development area, however views of the proposed solar farm from most directions, in particular along Troubalgie Road and Forest Road. Views of the project area may also occur from Back Yamma Road which runs parallel to the north of Troubalgie Road. The Newell Highway runs north to south, 5km to the west of the site and views from this road will be largely obscured due to distance and existing vegetation, except for a small section of the Newell Highway at a higher elevation just north of Back Yamma Road. The proposed solar farm may also be viewed from the higher elevation section of Ashburnham Road located to the north of the core development area. Back Yamma State Forest located 3 kms from the eastern boundary of the core development area obscures views from further west beyond the forest.

Twenty-seven residential dwellings have been identified with a 5 km buffer of the core development area. Of these, eight are within 3 km and two of which are within 1 km of the proposed solar farm (refer to Figure 8). It is likely that views to the solar farm will occur from the two nearest dwellings located to the west and northwest of the site (approximately 600m) as there is limited vegetative screening in between. Dwellings on Back Yamma Road may also have partial views of the proposed solar farm.

5.10.2 Potential Impacts and Assessment approach

A detailed Landscape and Visual Impact Assessment (LVIA) will be prepared as part of the EIS process to assess the potential impacts of the proposed solar farm project on visual amenity, landscape character and values. While the PV panels are designed to absorb light rather than reflect it the LVIA will consider glare, glint/reflectivity and security lighting as well as any cumulative impacts. Consultation with nearby residents will provide context to this assessment and guide the necessity, or otherwise, for perimeter planting or residential screening.

5.11 Socio-economic impact

5.11.1 Existing environment

The 2016 census recorded 9,587 persons residing in Forbes LGA, with 11.1% of the population identifying as Aboriginal and/or Torres Strait Islanders (ABS Census, 2016). The most common ancestries in Forbes LGA were Australian 37.8%, English 30.7%, Irish 9.5%, Scottish 6.1% and German 2.7%. The median age of people in Forbes LGA was 42 years based on the 2016 Census. Children aged 0-14 years made up 20.3% of the population and people aged 65 years+ made up 21.8%.

4,167 people reported being in the labour force with 59.8% employed full-time, 28.2% employed part-time and 5.4% unemployed. The most common occupations in Forbes LGA included Managers (19.2%), Professionals (14.2%), Technicians and Trades Workers (13.9%), Laborers (12.9%), and Clerical and Administrative Workers (10.1%).

The Forbes Livestock Exchange operates nearby on Back Yamma Road selling livestock through weekly sales auctions. It is understood that these sales are typically scheduled on Mondays and Tuesdays. There are also numerous engineering/fabrication businesses in Forbes including a number in the IN1 General Industrial Zone to the west of the Livestock Exchange on Back Yamma Road.

5.11.2 Potential Impacts and Assessment approach

The project will provide employment opportunities within the Forbes Shire LGA as the proposed development will require approximately 160 workers during the construction period and

approximately 4-6 full-time positions during the approximately 25-year operational life of the project. In addition, to the direct employment created through the construction and operation of the solar farm facility, indirect economic benefits will be realised by local businesses.

Sectors/businesses expected to benefit, especially during construction include retail, hospitality/entertainment, accommodation, vehicle and fuel services, concrete suppliers, transport operators, quarries, general labour and electrician services. During operations it is likely that several local businesses will continue to provide services and support maintenance activities at the solar farm. As a result, the project is likely to benefit the broader community through opportunities to expand the workforce within the area diversify the skills for the local population.

Whilst the project will provide economic benefit to the region, potential impacts to be acknowledged and considered include the sourcing of labour from the local area and what impacts this may have on other business. It is anticipated worker accommodation will be available in the nearby towns of Forbes and Parkes, located approximately 12 kms and 30 kms from the project area respectively. However, it is acknowledged that the area's capacity to provide enough accommodation for the construction workforce alongside existing demand and other important community events will require consideration and planning. Decommissioning works will also require a temporary increase in personnel to assist in the removal of infrastructure.

Pacific Hydro operates a Community Investment Program that supports the local communities that host our clean energy projects with positive and lasting social, environmental and economic benefits. The Program delivers a portion of revenue back into local communities each year to initiatives identified by the local community.

The EIS will consider the potential socio-economic impacts and benefits of the project, including direct and indirect benefits to the economy during construction and operation. Cumulative impacts will also be addressed. The EIS will also provide further detailed information on the implementation of Pacific Hydro's Community Investment Program.

5.12 Cumulative impacts

Cumulative impacts, for the purpose of this assessment, relate to the combined potential effects of different types of impacts (i.e. traffic combined with noise) as well as the potential for combined impacts with other significant projects either under construction or already established land uses in the local area.

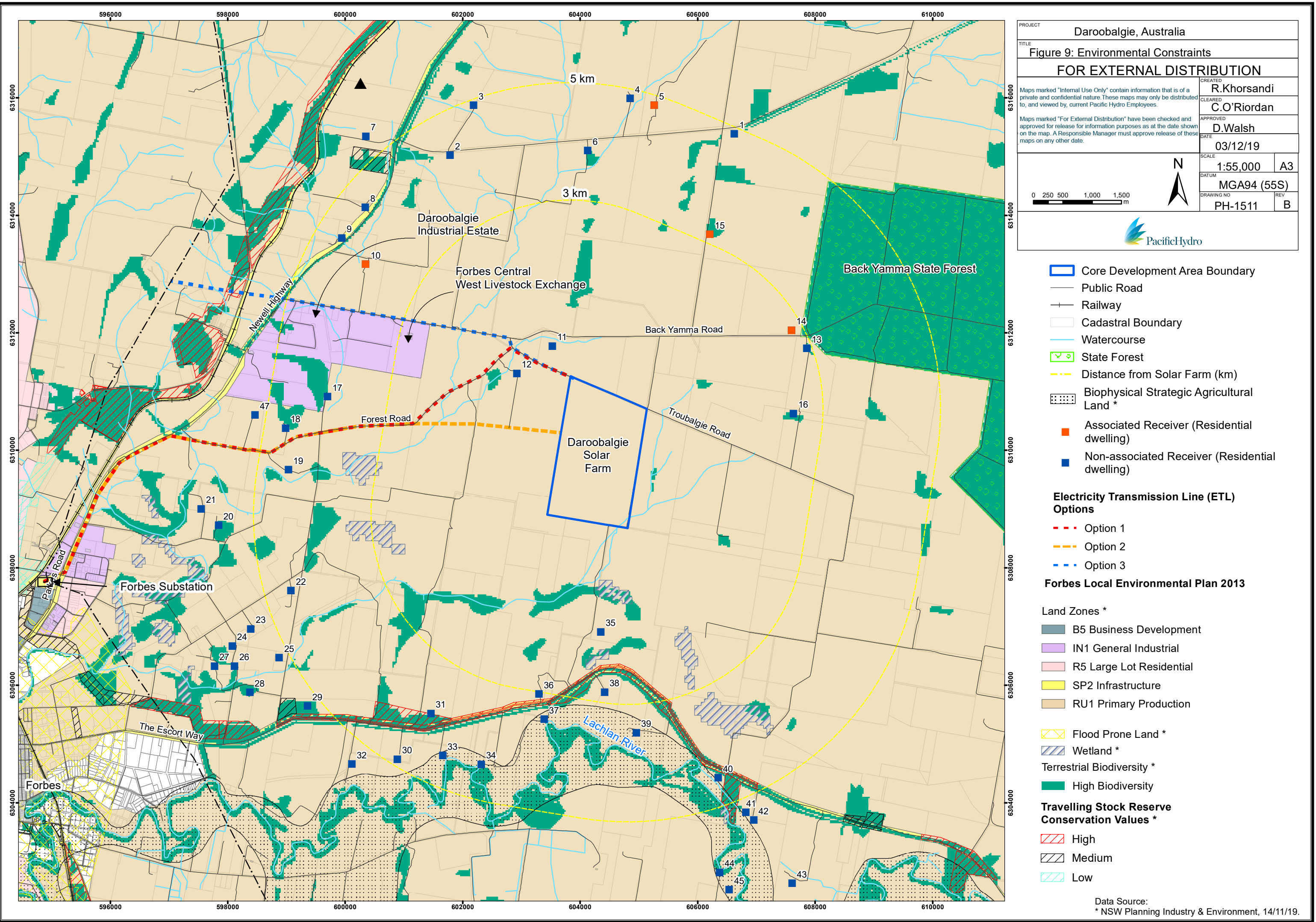
A review of the NSW Major Project database for the Forbes LGA was undertaken and identified the following major projects that are yet to commence construction and may be relevant to the proposed Daroobalgie solar farm project:

- Sunrise Mine (formerly Syerston Mine) is a cobalt and nickel mine located over 100 km to the northwest of the proposed Daroobalgie Solar Farm. It was originally granted development approval in 2001 and a recent modification to the consent was approved in December 2018. It is expected works on the site may begin in 2020.
- The proposed 50 MW Jemalong Solar PV Plant located 30 kms west of Forbes was granted development consent on 18 May 2018. Construction was expected to commence in late 2018, however the site was purchased by another developer in late 2018 and construction is expected to commence late in 2019.
- The proposed 67.8MW Goonumbla Solar Farm is located approximately 10km to the west of Parkes, adjacent to the Parkes Solar Farm. Construction has commenced and it is expected to begin operating in 2020.
- The proposed 160 MW Quorn Park Solar Farm is located 8.5km to the west of Parkes. The SEARs for this project was issued in March 2018.

There is the potential for cumulative socio-economic and traffic/transport impacts if the timing of the construction of the Jemalong or Quorn Park and Daroobalgie Solar Farms coincides. Consideration will also need to be given to established users of the road network such as the Forbes Livestock Exchange and major events like the Parkes Elvis festival.

5.12.1 Potential Impacts and Assessment Approach

At this stage, significant cumulative impacts are not expected. However, a more detailed assessment of cumulative impacts will be provided in each of the technical studies to be prepared as part of the EIS, wherever relevant. As part of ongoing engagement with Council and DPE, Pacific Hydro will seek regular updates on major projects and developments within the Forbes Shire LGA and region.



6. Conclusion

Pacific Hydro proposes to develop the Daroobalgie Solar Farm project, a 100 megawatt (MW) solar photovoltaic (PV) renewable energy facility on a 350 ha site approximately 11km north of the town of Forbes in New South Wales (NSW). The project area will accommodate up to 420,000 solar panels and supporting infrastructure and is proposed to connect to the national electricity grid via a new electricity transmission line (ETL). The new ETL will either directly or indirectly connect to the Forbes substation located on the northern extent of Forbes township. A number of ETL route options are being considered including the construction of a new ETL along existing State and local road reserves to connect directly into the substation. The current land use within the core development area is agricultural and the subject site is zoned RU1 under the Forbes Local Environmental Plan 2013.

A preliminary assessment of the potential impacts associated with the project has identified the following areas that will need further assessment and consideration as part of the Environmental Impact Statement (EIS) process:

- **Biodiversity** – while the core development area is largely cleared of remnant vegetation, some small patches of native vegetation protected under State and Commonwealth legislation are present. Native vegetation also occurs along sections of the ETL route options being considered. An assessment of the extent and significance of the potential biodiversity impacts will be detailed in the Biodiversity Development Assessment Report (BDAR) that will be prepared for the project and provided as part of the EIS. Pacific Hydro will refer the project under the EPBC Act.
- **Aboriginal cultural heritage** – a desktop assessment has not identified the presence of any known sites or places of Aboriginal cultural heritage significance. While the land forms within the project area have been heavily modified, proximity to the Lachlan River increase the potential for unknown heritage to be present. An Aboriginal cultural heritage assessment and consultation with the Traditional Owners will be undertaken as part of the preparation of the EIS for the project.
- **Historical heritage** – there are no known items or places of either built or archaeological historical heritage significance on the site. The potential for unknown archaeological sites to be present is considered low. A review of the risk to unknown archaeological sites will be undertaken as part of the EIS process.
- **Land use impact** – the proposed development will change the existing land use from agricultural to electrical generation. Once the facility is decommissioned, the project area will be returned to agricultural use. A review of measures that need to be taken to protect the soil and land capability during construction, operation and decommissioning of the project will be undertaken during the EIS process.
- **Water resources** – the proposed development is likely to have some minor impacts to water resources in the vicinity of the project either through construction impacts (i.e. surface water run-off) or the requirement for water for dust management purposes. A review of the likely impacts and requirement for management and mitigation measures will be undertaken during the EIS process.
- **Traffic and Transport** – the development of the project will lead to an increase in traffic volumes, especially during the construction period as components are brought to site and construction workers access the site. A Traffic Impact Assessment (TIA) will be prepared that will detail the potential impacts and set out appropriate management and mitigation measures.
- **Air Quality** – the project is not anticipated to generate any significant air quality issues but dust and vehicle exhaust emissions during construction will need to be managed. While a detailed air quality assessment is not proposed to be undertaken, the EIS will consider measures to be implemented during construction to reduce the potential impact of dust and vehicle exhaust emissions.

- **Noise**— temporary and intermittent noise impacts may occur during construction and decommissioning works. During operations however, noise impacts are not expected to be discernibly different than those existing in the surrounding rural environment. An assessment of construction noise impacts will be undertaken as part of the EIS.
- **Landscape and Visual Impact** – A limited number of nearby dwellings may have views of the proposed solar farm as would some traffic using the nearby road network. A detailed landscape and visual impact assessment will be undertaken as part of the EIS.
- **Socio-economic Impact** – during the construction period there is the potential for temporary socio-economic impacts such as an increase in the labour force, resulting in direct and indirect benefits for local businesses. A review of the potential risk and consequences of these impacts will be undertaken during the EIS process.

Wherever relevant, the impacts described above will also be considered in terms of cumulative effects in conjunction with other significant land uses and construction activities occurring in the locality.

Based on this preliminary assessment the proposed Daroobalgie Solar Farm project is expected to be compatible with the rural environment and surrounding land uses. The extent and scale of environmental risks and potential impacts associated with solar farm can be appropriately managed and mitigated through the development and implementation of a suite of specific management plans. This preliminary assessment finds that the proposed land use and development is generally consistent with the provisions of the relevant Environmental Planning Instruments (EPIs) that apply to the site including the suite of State Environmental Planning Policies (SEPPs) and Forbes Local Environmental Plan, 2013.

The project is expected to deliver a net community benefit to the local area and wider region whilst assisting the on-going transition of Australia's energy sector.

Further detailed assessments will be undertaken after the Secretary's Environmental Assessment Requirements (SEARs) are issued for this project. The assessments will address the SEARs and form part of the EIS that Pacific Hydro intends to lodge for the project.

7. References

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Appendix A – Protected Matters Search



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 25/10/19 10:17:00

[Summary](#)

[Details](#)

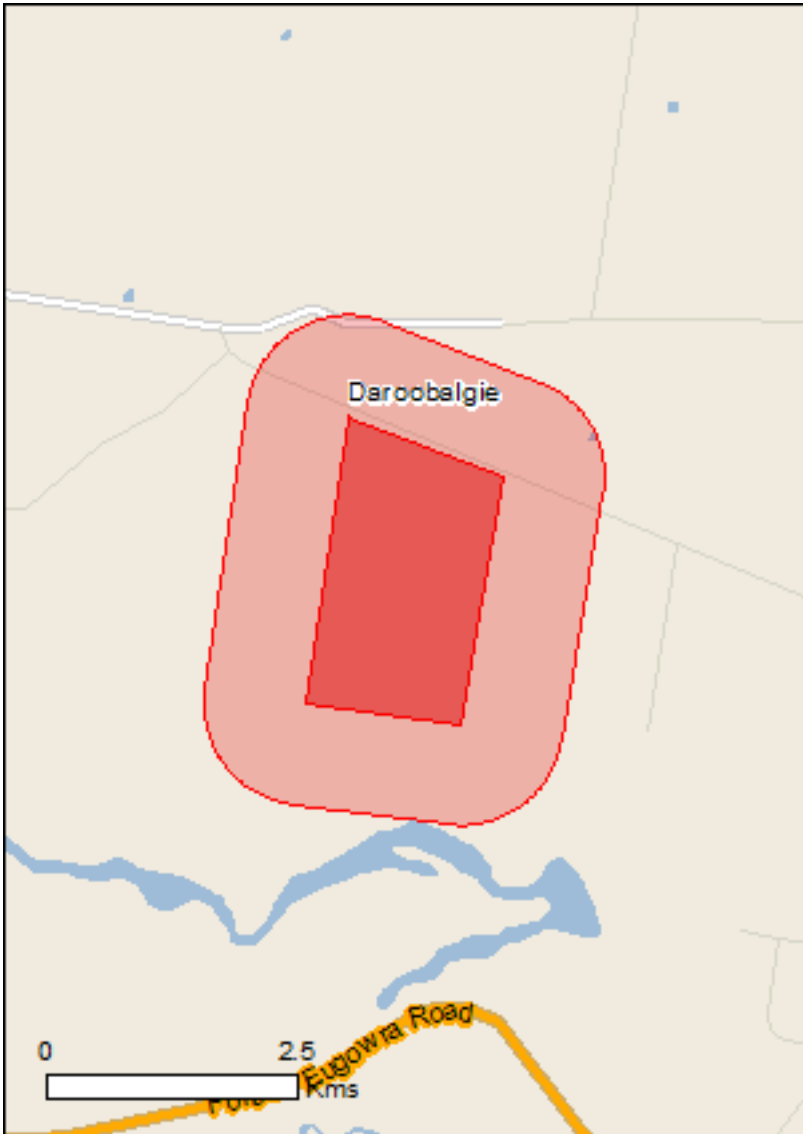
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

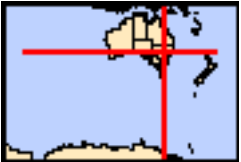
[Acknowledgements](#)



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[Buffer: 1.0Km](#)



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	21
Listed Migratory Species:	11

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	21
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)		[Resource Information]
Name	Proximity	
Banrock station wetland complex	700 - 800km upstream	
Hattah-kulkyne lakes	500 - 600km upstream	
Riverland	600 - 700km upstream	
The coorong, and lakes alexandrina and albert wetland	800 - 900km upstream	

Listed Threatened Ecological Communities	[Resource Information]
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For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area
Weeping Myall Woodlands	Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species	[Resource Information]
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Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species

Name	Status	Type of Presence
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	habitat likely to occur within area Species or species habitat likely to occur within area
Fish		
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat likely to occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Species or species habitat may occur within area
Plants		
Androcalva procumbens [87153]	Vulnerable	Species or species habitat may occur within area
Austrostipa metatoris [66704]	Vulnerable	Species or species habitat may occur within area
Austrostipa wakoolica [66623]	Endangered	Species or species habitat likely to occur within area
Tylophora linearis [55231]	Endangered	Species or species habitat may occur within area
Reptiles		
Aprasia parapulchella Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[<u>Resource Information</u>]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Extra Information

Invasive Species

[[Resource Information](#)]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Alauda arvensis Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Capra hircus Goat [2]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade,		Species or species habitat likely to occur

Name	Status	Type of Presence
Tomato Weed, White Nightshade, Bull-nettle, Prairie- berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf- nettle, Trompillo [12323]		within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-33.332981 148.11591,-33.33291 148.115996,-33.33291 148.115996,-33.332981 148.115996,-33.337427 148.129901,-33.355926 148.126124,-33.35442 148.112134,-33.332981 148.11591

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

Appendix B – AHIMS Extensive Search

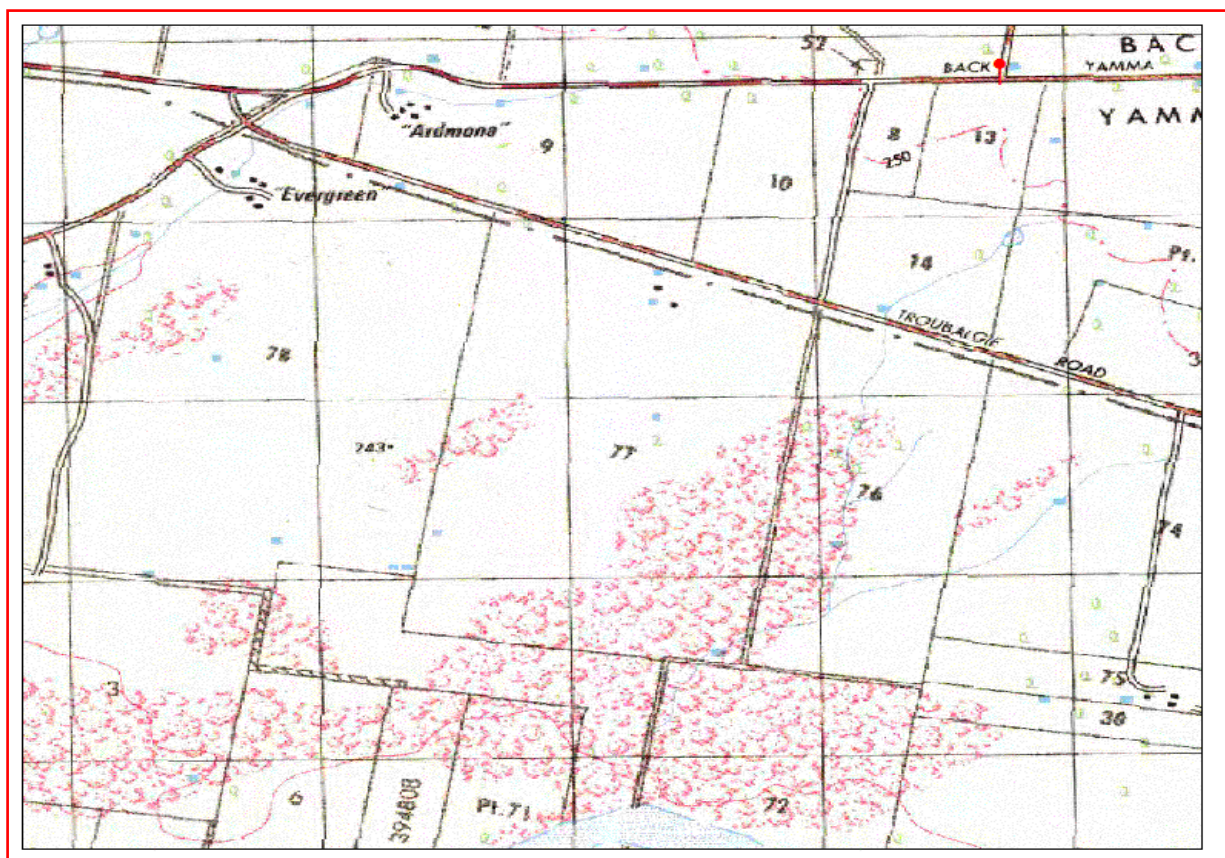
Pacific Hydro Pty Ltd
 11/474 Flinders Street
 Melbourne Victoria 3000
 Attention: Catherine O' Riordan
 Email: coriordan@pacifichydro.com.au

Date: 05 March 2019

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 77, DP:DP750183 with a Buffer of 1000 meters.
Additional Info : To inform request for SEARs, conducted by Catherine O' Riordan on 05 March 2019.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the [NSW Government Gazette \(http://www.nsw.gov.au/gazette\)](http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.