ibvogt

Preliminary Environmental Assessment

PROPOSAL

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ABBREVIATIONS AND ACRONYMS

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

1 INTRODUCTION

1.1 PROPOSAL OVERVIEW

ib vogt GmbH (ib vogt) propose to develop a solar farm ('the proposal') at Yanco, south of the town of Leeton, New South Wales (NSW). The 60 Megawatt (MW) alternating current (AC) proposal would occupy around 204 hectares of rural land currently used for agriculture. The proposal includes solar arrays on tracking systems, modules, inverters, an energy storage facility, a substation, underground cabling, security fencing, emergency lighting and associated infrastructure.

1.2 THIS REPORT

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

This Preliminary Environmental Assessment (PEA):

- Describes the proposal and the site.
- Identifies statutory approval requirements.
- Identifies key potential environmental issues associated with the proposal.

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

1.2.1 Terms used in this document

The Proposal – The entirety of the solar farm proposal, including auxiliary construction infrastructure, access etc.

The Proponent – ib vogt GmbH (ib vogt)

Subject Land – All affected lot boundaries.

Development Site – Survey footprint

Development footprint - The area of land which will potentially experience work related to the proposed solar farm and any additional infrastructure required for the operation of the solar farm (e.g. perimeter fence, solar array design, transmission line footprint, site access).

1.3 IB VOGT GMBH

Established in 2002, ib vogt specialises in the development, design and engineering, financing, operation and maintenance, and asset management of solar power plants. The company provides high-quality turnkey solar power plant solutions, designed and engineered in Germany, to end investors internationally. ib vogt is a manufacturer-independent integrated developer, focusing on tailor-made solar power plant solutions that maximise lifecycle performance and investor returns. ib vogt employs over 100 experts in all

areas along the solar power plant value chain. The company operates internationally from offices in Germany, the United Kingdom, the USA, Australia, Panama, Eastern Europe, India and Southeast Asia, as well as several joint ventures across Africa.

2 DEVELOPMENT SITE DESCRIPTION

2.1 LOCATION

The proposal development area is in the Leeton Local Government Area (LGA), approximately 1km west of Yanco and on the south-western outskirts of Leeton as shown in Figure 2-1. The development area is bound by Amato Road, Toorak Road, Hume Road, River Road, Yale Road and the Gogeldrie Branch Canal, and intersected by Research Road, Ronfeldt Road, Houghton Road and Junee – Hay railway line. Proposed transmission lines would connect to an existing TransGrid substation adjacent to the proposal located 1 km to the south-east.

The development area is located within the Murrumbidgee River Catchment, and the Murrumbidgee Irrigation Area (MIA). Local land use is primarily agricultural, including cropping, orchards and grazing.

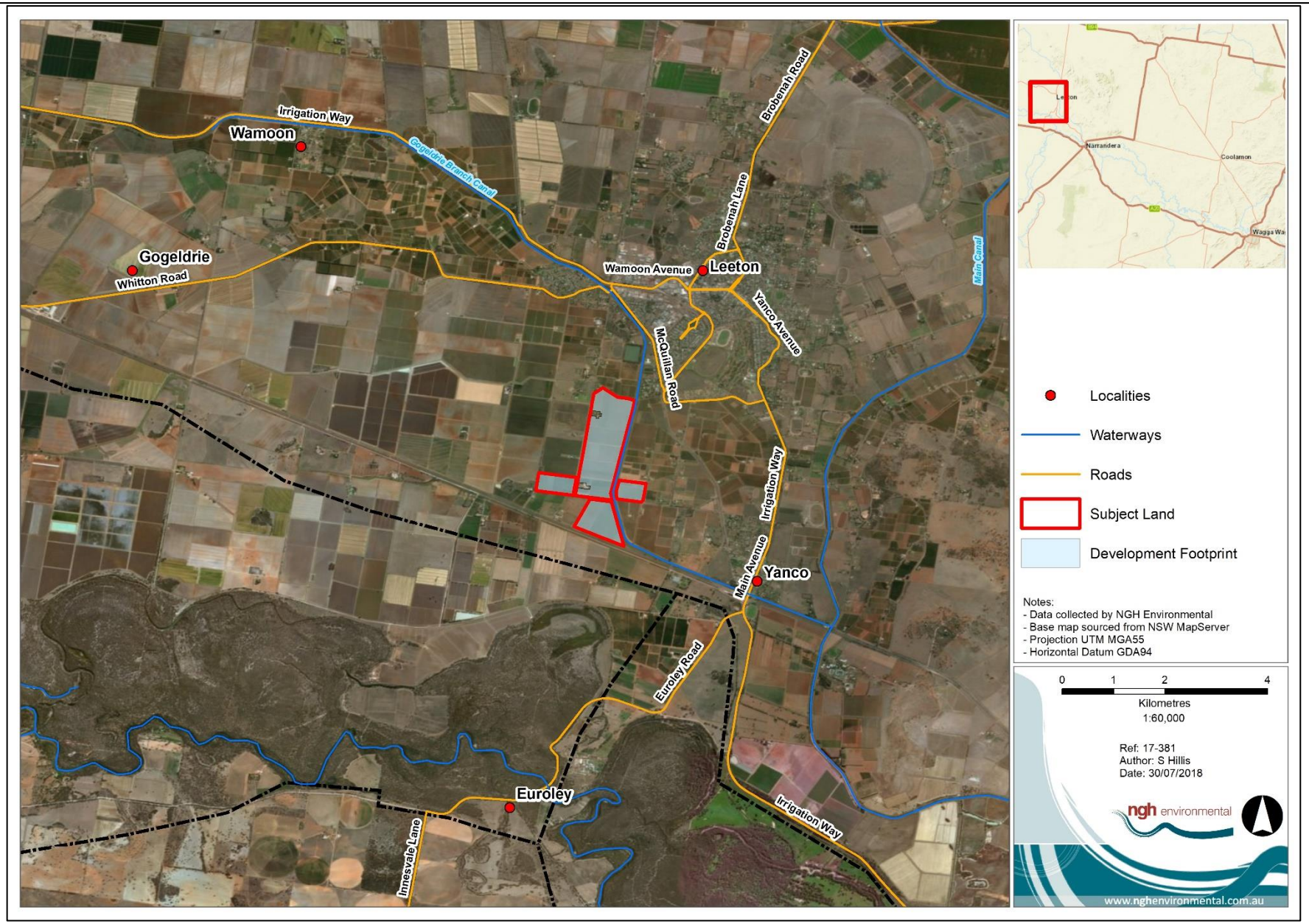


Figure 2-1 Location of the development site.

2.2 THE DEVELOPMENT SITE

The Development site (204 ha) and development footprint (200 ha) comprises of Lots 142, 145 – 152, 287, Lot 572 DP 751745, and Lot 6650 DP 1197165. Local land use is primarily agricultural, including cropping, orchards and grazing.

The land is classed as follows under the Land and Soil Capability Assessment Scheme (OEH 2012):

- Class 3: sloping land that is capable of sustaining cultivation on a rotational basis. This land can be readily used for a range of crops including cereals, oilseeds and pulses. Productivity will vary with soil fertility.
- Class 6: steeply sloping lands (20–33% slope) that can erode severely even without cultivation, or land that will be subject to severe wind erosion when cultivated and left exposed. Land generally is suitable only for grazing with limitations and is not suitable for cultivation (OEH 2012).

Class 3 land is considered **High Capability Land**: Land that has moderate limitations and is capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. The development site is not mapped as being **Biophysical Strategic Agricultural Land** (BSAL) (DPE 2017). BSAL is land that meets specific scientific criteria levels for soil fertility, land and soil capability classes and access to reliable water and rainfall levels. Crops currently cultivated and irrigated on the development site include oranges, grapes and cereals.

The Development site is primarily an irrigated cropping landscape, used as grape and orange orchards. The paddocks have been deep ripped and cultivated in past management practices. Most of the native vegetation has been removed but some scattered paddock trees remain. Native vegetation is mostly only left occurring along roadsides and fence lines. Some planted vegetation occurs along fence lines as windbreaks. Several irrigation canals occur throughout the development site. Gogeldrie Branch Canal borders the development site. Several farm buildings and dwelling also occur within the development site.

Figure 2-2 Typical landscape within the subject land

Figure 2-3 Typical landscape within the subject land

Figure 2-4 Example of an irrigation drain in the development site

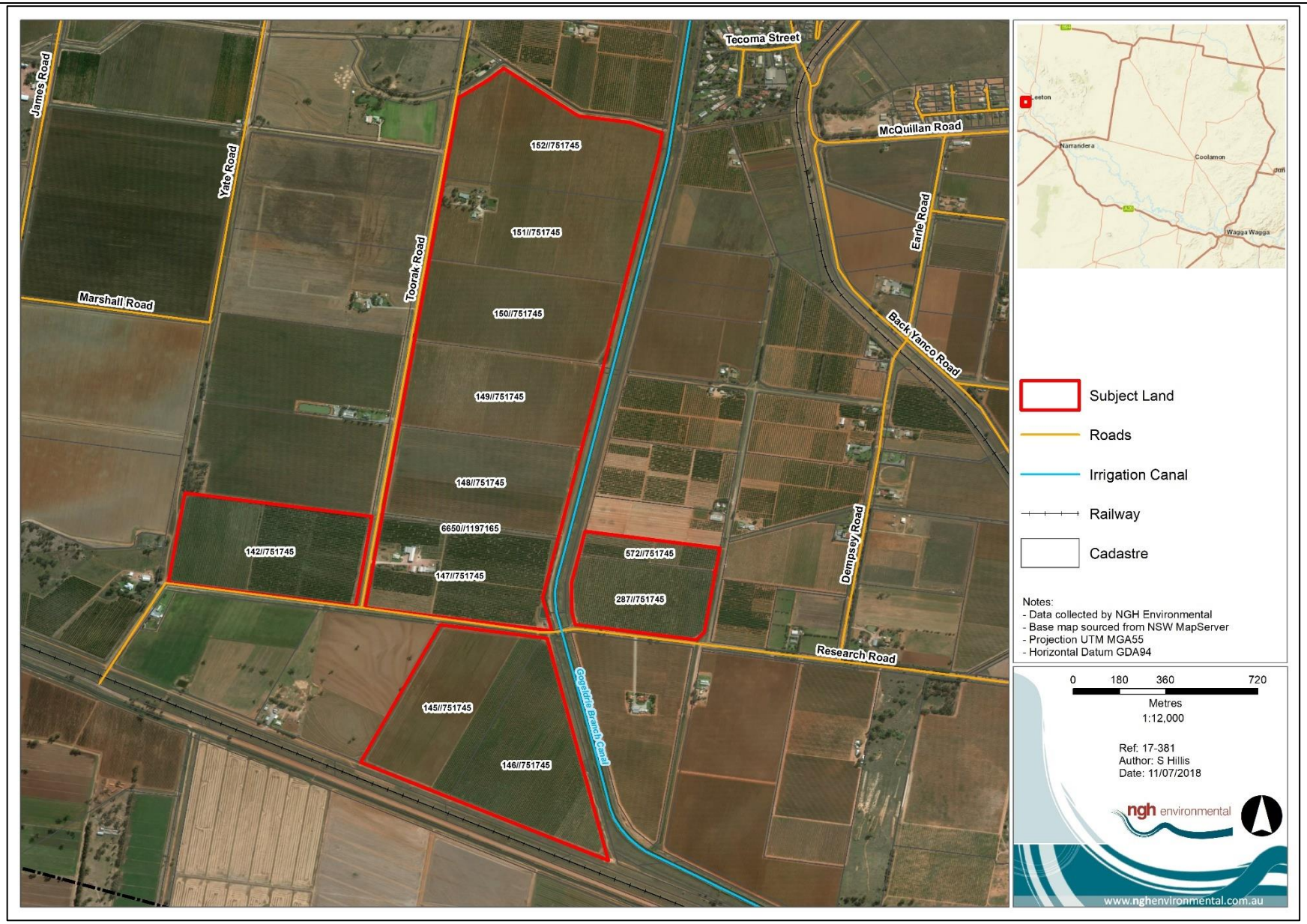


Figure 2-5 Proposal Subject Land

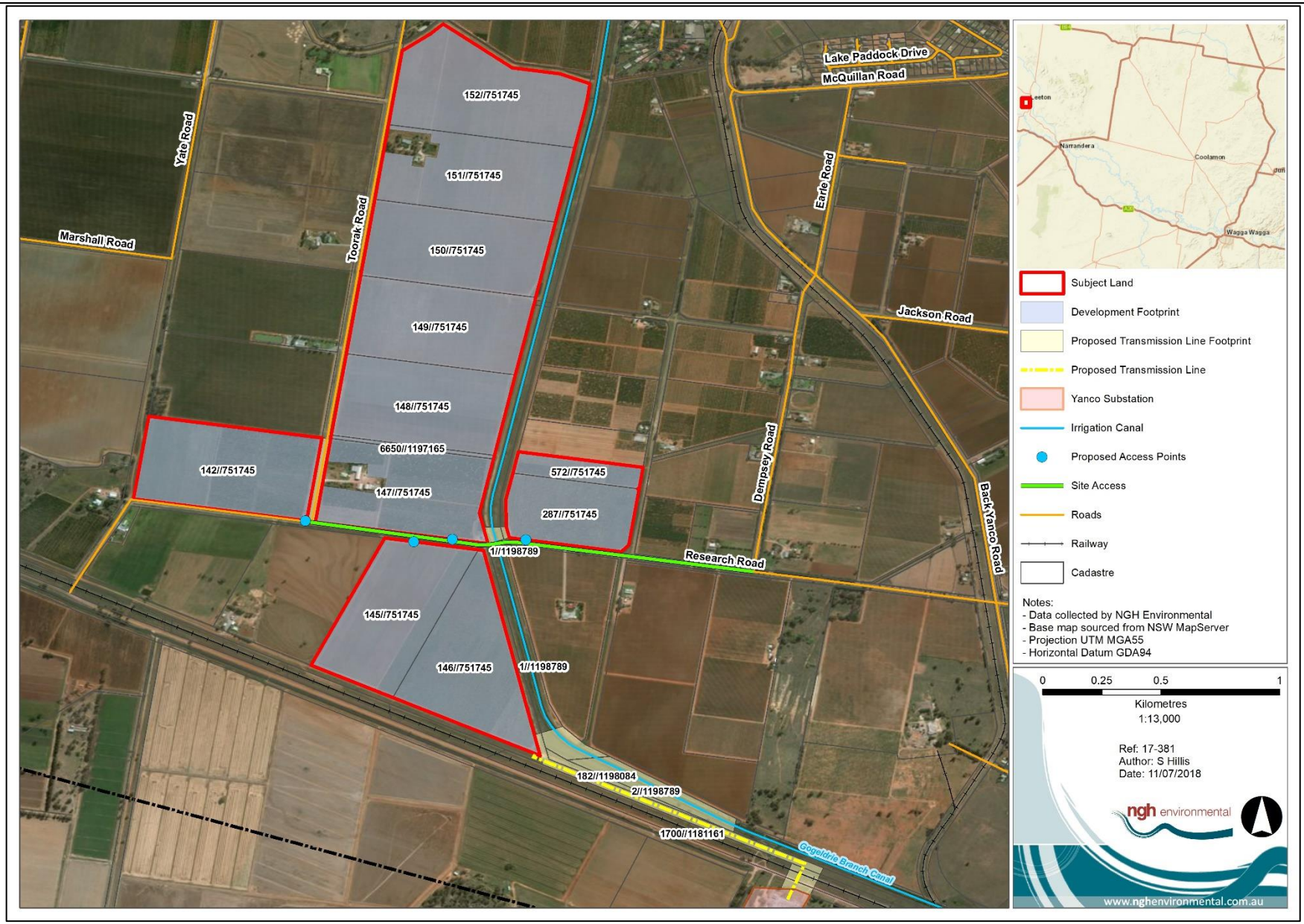


Figure 2-6 Proposed Proposal site layout

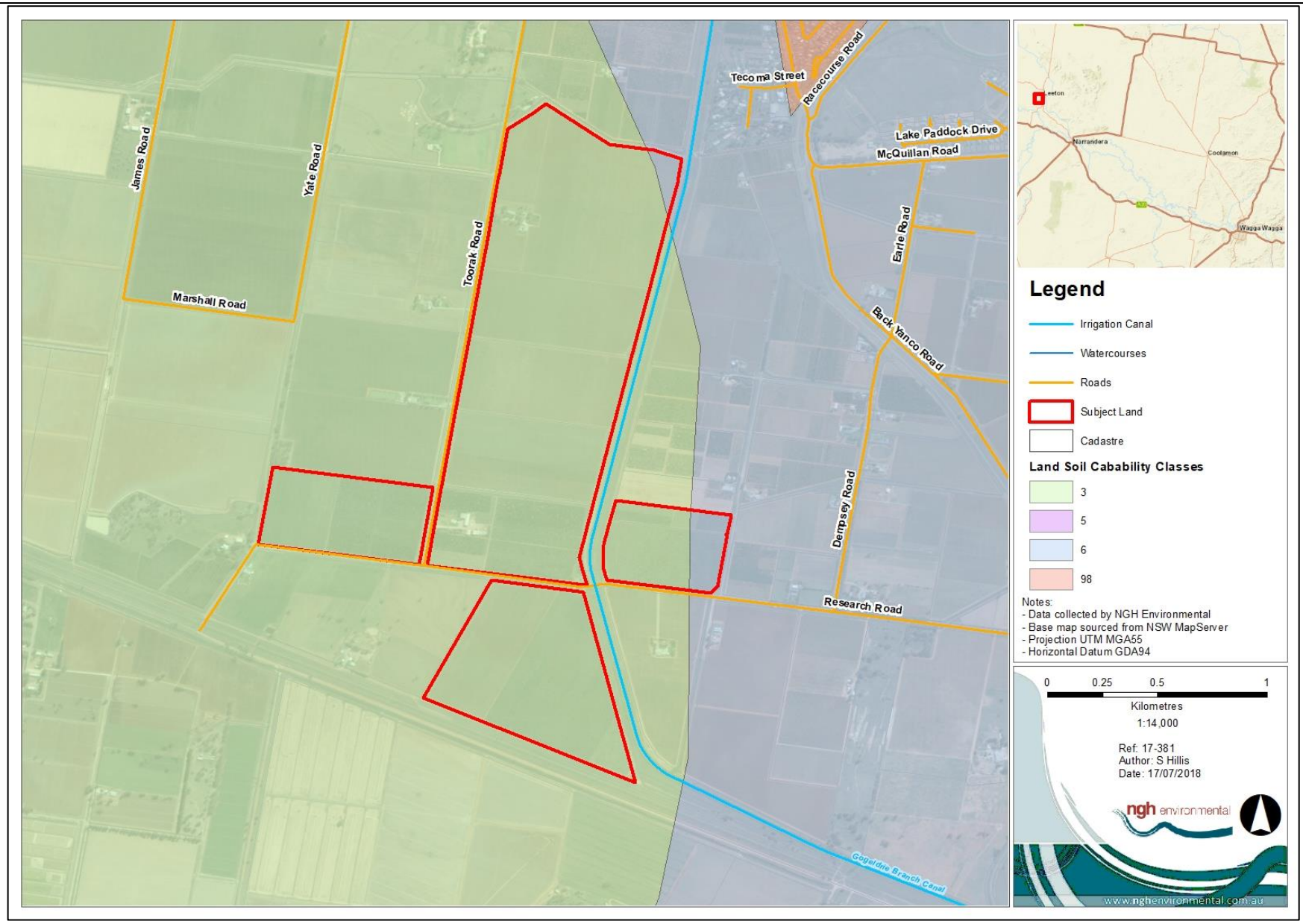


Figure 2-7 Land Soil Capability

2.3 THE LOCALITY

Leeton LGA is located within the Riverina area, approximately 584km from Sydney, 470km from Melbourne and 371km from Canberra. The LGA is 1,167km² (116,200ha), and encompasses the towns of Leeton, Yanco and Whitton and the villages of Murrami and Wamoon (Leeton Shire Council 2017).

Leeton LGA also forms part of the Murrumbidgee Irrigation Area (MIA), and was purposely built as part of the irrigation scheme. The MIA contributes to 38% of NSW's vegetable production.

Murrumbidgee Irrigation Area

The MIA covers an area of 660,000ha of which about 170,000ha is irrigated. Water is supplied by Burrinjuck and Blowering Dams in the upper Murrumbidgee Catchment. Water released from Burrinjuck and Blowering Dams flows down the Murrumbidgee and Tumut Rivers to their junction near Gundagai, then continues to flow down the Murrumbidgee river to Berembed Weir. Water is diverted from the weir to Bundidgerry Storage, which is the start of the irrigation canal system owned by Murrumbidgee Irrigation. The main canal feeds supply channels that take irrigated water to farms (Murrumbidgee Irrigation 2017).

The next significant point is the Yanco Regulator. The Gogeldrie Branch Canal diverts water off the Main Canal through the back of Yanco to Leeton.

Yanco

The town of Yanco, 5km south of Leeton, came into existence when the railway line was extended from Narrandera to Hay (Leeton Shire Council 2017). The population is approximately 500 people, and is home to the Yanco Powerhouse Museum, McCaughey Park, Murrumbidgee Rural Studies Centre and Yanco Agricultural High School.

Climate

Leeton LGA is part of the Riverina Bioregion of NSW, which generally experiences a dry semi-arid climate with hot summers and cool winters (OEH 2016). Seasonal temperatures vary little across the bioregion. Highest rainfall occurs in May and September. Climate statistics for the Bioregion are as follows (OEH 2016):

Table 1 Riverina Bioregion Climatic Data

Riverina Bioregion – Climate Variable Information	
Mean annual temperature	15-18°c
Minimum average monthly temperature	2.2-4.6°c
Maximum average monthly temperature	30.6-33.7◦c
Mean annual rainfall	238-617mm
Minimum average monthly rainfall	13-36mm
Maximum average monthly rainfall	26-70mm

Geology and Vegetation

The geology and vegetation characteristics for the Riverina-Murrumbidgee Sub-bioregion are as follows (OEH 2016):

Table 2 Murrumbidgee Subregion Geology and Vegetation

Geology	Characteristic Landforms	Typical Soils	Vegetation
Quaternary alluvial sediments. Clay dominant. Groundwater lakes present. Lower river discharge than other streams.	Complex alluvial fan with numerous distributary channels and floodplains, depression plains, and abandoned lake beds with lunettes. Limited source-bordering dunes.	Red and brown clays, red brown texture contrast soils on levees and terraces, minor deep sands.	Black box and river red gum on channels. Black box, lignum and cane grass in swamps. Saltbush and bluebush with old man saltbush, cottonbush, myall and grasses on the plains. White cypress pine on sandhills.

Population

The median age of persons in Leeton LGA is 40; this is higher than the Australian average of 38 (ABS 2016). The 2011 census records state that 5.7% of the population are Aboriginal and Torres Strait Islander people (ABS 2016). A large portion, 81.6% of the community were born in Australia; 2.5% in Europe, 1% in New Zealand and 1.6% in Asia (ABS 2016).

3 THE PROPOSAL

3.1 SITE SELECTION

The Proposal site has been selected for the following reasons:

- Excellent solar exposure.
- Excellent access to local and major roads.
- Excellent access to the grid transmission network
- Likely low level of environmental impact – the site has been largely cleared and heavily disturbed by cultivation and cropping.

The use of the site would be based on a lease agreement between ib vogt and the landowners for the life of the project.

3.2 PROPOSED WORKS

3.2.1 Proposed infrastructure

The proposal involves the construction of a photovoltaic array which would generate approximately 60 MW (AC) of renewable energy.

The proposal would consist of the following components:

- Single axis tracker photovoltaic solar panels mounted on steel frames over most of the site.
- Battery storage to store energy on site, allowing energy to be stored on site during periods of low demand and released to the network during periods of higher demand.
- Electrical conduits and transformers.
- On site substation.
- Site office, vehicle parking areas, access tracks and perimeter fencing.
- 33kv electrical transmission line to connect the proposal to the Yanco substation.

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

The proposed development footprint is shown in Figure 2-5. This includes all land likely to be directly impacted by the construction, operation and decommissioning of the proposal, including auxiliary construction facilities (site compound, laydown, stockpiling etc.), access and all considered options. It is important to note that the development footprint is indicative only and will be refined as part of the EIS process (considering environmental constraints and engineering studies), with project infrastructure layout to be detailed in the EIS.

The site will be accessed from the east via Research Road and the proposed access points illustrated in Figure 2-6.

3.2.2 Construction, operation and decommissioning

The Proposal is expected to operate for around 30 years. The construction phase of the proposal is expected to take 9 to 12 months. After the initial operating period, the solar farm would either be decommissioned, removing all above ground infrastructure and returning the site to its existing land capability, or upgraded with new PV equipment.

3.2.3 Capital investment

The proposal would have an estimated capital investment of approximately $100 million. A quantity surveyor's report would be prepared during the EIS process as part of the proposal which would confirm the capital investment cost.

3.2.4 Subdivision

The development footprint area will be leased from the landowner. Subdivision or creation of easements may be required for:

- The substation.
- The transmission line easement.

When land is leased from a landowner and the lease affects part of a lot or lots in a current plan, a subdivision under *s*.7A *Conveyancing Act 1919* (formerly s.327AA *Local Government Act 1919* now repealed) is required when the total of the original term of the lease, together with any option of renewal, is more than five years. When the lease affects the whole lot in a current plan, the body of the lease identifies the area by lot and DP number with a subdivision not required.

It is possible that any subdivision may result in a residual lot being below the minimum lot size for dwellings on rural land. This would be identified in the EIS process and consultation with Council would occur.

An easement may be created by means of an appropriate dealing registered in NSW Land Registry Service or by the inclusion in a Section 88B instrument lodged with a new deposited plan.

Subdivision for a substation is not required, as the proposal plans to use the existing Yanco substation adjacent to the development site.

4 JUSTIFICATION AND ALTERNATIVES

4.1 STRATEGIC JUSTIFICATION

4.1.1 Technical feasibility

The proposal would employ proven and mature solar technology. The solar site is highly suited to efficient, high out-put generation. Battery storage would also aid in storing and providing energy during high demand periods or when solar energy is unavailable.

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

A 33kV electrical transmission line would be constructed to connect the proposal to the existing Yanco Substation, located approximately 1km south east of the development site.

It is noteworthy that the electricity grid in New South Wales can present challenges in terms of having the capacity to connect utility scale renewable energy projects. The proposal benefits from having good connection options adjacent to the site with sufficient capacity in the transmission network to allow power generated at the Yanco site to be exported to wider NSW.

4.1.2 Climate change

Electricity generation is the largest individual contributor of greenhouse gas emissions in Australia (Department of Environment 2016).

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

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

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

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

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

The COP21, also known as the 2015 Paris Climate Conference, achieved a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C, chiefly by reducing greenhouse gas emissions. The Proposal would form part of the Australian effort to help meet this target.

4.1.3 Electricity supply

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

The electricity network was designed to deal with a small number of very large power generating stations. The localisation of power generation helps the grid to cope with the supply from diversified renewable energy projects.

4.1.4 Socio-economic benefits

Employment

The proposal would generate around 120 direct jobs during construction plus indirect supply chain jobs. In addition, it would employ approximately 2-3 full time staff during the operation and maintenance phase (expected to be 30 years).

The employment benefits extend through the local supply chains to fuel supply, vehicle servicing, uniform suppliers, hotels/motels, B&B's, cafés, pubs, catering and cleaning companies, tradespersons, tool and equipment suppliers and many other businesses. In 2015/16, 11,150 Australians were directly employed in the renewable energy sector with an additional 3,725 jobs expected to be created in the 2017/18 financial year (CEC 2016).

Electricity prices

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

Economic diversification

The proposal would diversify the use of land in the area. The predominant land use in the area is agriculture. The proposal would add to that and provide both local land holders and businesses in the broader area with an additional source of income and economic activity.

4.1.5 Land Use

It is important to note that solar farms do not preclude the use of land for agriculture. Some agricultural activity is still possible whilst a solar farm is operating (e.g. grazing). Additionally, the degree of permanent land disturbance in the construction and operation of solar arms is small, and it's likely that agricultural activities which were occurring before the solar farm was constructed would be able to be continued once the solar farm is decommissioned and removed.

4.2 ALTERNATIVES TO THE PROPOSAL

4.2.1 Alternative sites

ib vogt has reviewed the solar generation potential of many areas in NSW using a combination of computer modelling and analysis, on the ground surveying and observation and experience of the proponent. The site was selected because it provides the optimal combination of:

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

- Suitable planning context.
- Acceptable flood risk.
- Road access.
- Access to the distribution network.
- High levels of available capacity on the grid distribution system.

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

4.2.2 Alternative technologies

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

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

4.2.3 The 'Do Nothing' Option

Not proceeding with the proposal would forgo the benefits of the proposal, resulting in:

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

The 'do nothing' option may avoid any potential impact; however, the likelihood of significant negative impacts is low. It is considered the benefit of the proposed solar farm outweighs any potential impact whilst contributing to ecologically sustainable development.

5 PLANNING CONTEXT

5.1 NSW LEGISLATION

5.1.1 Environmental Planning and Assessment Act 1979

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

State Environmental Planning Policy (State and Regional Development) 2011

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

Development for the purpose of electricity generating works or heat or their co-generation (using any energy source, including gas, coal, biofuel, distillate, waste, hydro, wave, solar or wind power) that has a:

(a) capital investment value of more than $30 million, or

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

The Proposal would have an estimated capital investment cost greater than $30 million. The proposal is therefore classified as 'State Significant Development' under Part 4 of the EP&A Act.

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

An Environment Impact Statement (EIS) is prepared in accordance with environmental assessment requirements issued by the Secretary of the Department of Planning and Environment (SEARs). In determining the SEARs, the Secretary must consult with relevant public authorities and would have regard to the need to assess key issues raised by those public authorities. A scoping study is required to be submitted with the request for the SEARs.

5.1.2 State Environmental Planning Policy (Infrastructure) 2007

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

5.1.3 State Environmental Planning Policy (Rural Lands) 2008

The aims of the *State Environmental Planning Policy (Rural Lands) 2008* (Rural Lands SEPP) are:

(a) to facilitate the orderly and economic use and development of rural lands for rural and related purposes,

(b) to identify the Rural Planning Principles and the Rural Subdivision Principles to assist in the proper management, development and protection of rural lands for the purpose of promoting the social, economic and environmental welfare of the State,

(c) to implement measures designed to reduce land use conflicts,

(d) to identify State significant agricultural land for ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,

(e) to amend provisions of other environmental planning instruments relating to concessional lots in rural subdivisions.

The Rural Lands SEPP rural planning principles, listed under clause 7, are:

(a) the promotion and protection of opportunities for current and potential productive and sustainable economic activities in rural areas,

(b) recognition of the importance of rural lands and agriculture and the changing nature of agriculture and of trends, demands and issues in agriculture in the area, region or State,

(c) recognition of the significance of rural land uses to the State and rural communities, including the social and economic benefits of rural land use and development,

(d) in planning for rural lands, to balance the social, economic and environmental interests of the community,

(e) the identification and protection of natural resources, having regard to maintaining biodiversity, the protection of native vegetation, the importance of water resources and avoiding constrained land,

(f) the provision of opportunities for rural lifestyle, settlement and housing that contribute to the social and economic welfare of rural communities,

(g) the consideration of impacts on services and infrastructure and appropriate location when providing for rural housing,

(h) ensuring consistency with any applicable regional strategy of the Department of Planning or any applicable local strategy endorsed by the Director-General.

It is considered that the proposal is consistent with the aims and planning principles of the Rural Lands SEPP. Part 4 of the Rural Lands SEPP relates to state significant agricultural land. Given the development site is not identified in schedule 2, it is not identified as state significant agricultural land and Part 4 does not apply.

5.1.4 Roads Act 1993

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

5.1.5 Biodiversity Conservation Act 2016

The NSW government introduced new biodiversity legislation for the consideration and assessment of biodiversity impacts. The *Biodiversity Conservation Act 2016* (BC Act) and *Local Land Services Act 2013* (LLS Act) commenced on the 25th August 2017 and has replaced the *Threatened Species Conservation Act 1995*.

The proposal would require assessment under Section 7.9 of the BC Act. A preliminary assessment of potential impacts has been conducted in section 7 of this report.

5.1.6 National Parks and Wildlife Act 1974

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

5.1.7 Heritage Act 1977

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

5.1.8 Crown Lands Act 1989

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

Preliminary searches do not indicate Crown land to be present within the proposed solar farm site. This would be further investigated in the EIS and the Department of Industries (Lands) would be consulted during the assessment process.

5.1.9 Conveyancing Act 1919

The purpose of the *Conveyancing Act* is to amend and consolidate the law of property and to simplify and improve the practice of conveyancing; and for such purposes to amend certain Acts relating thereto.

Subdivision or creation of an easement may be required for the purpose of the transmission line and substation infrastructure.

5.2 LOCAL GOVERNMENT

5.2.1 Leeton Local Environmental Plan 2013

The proposal is in the Leeton LGA and is subject to the *Leeton Local Environmental Plan 2014* (LEP).

The aims of the LEP are:

a) to encourage sustainable economic growth and development.
b) to preserve rural land for all forms of primary production.
c) to identify, protect, conserve and enhance Leeton's natural assets.
d) to identify and protect Leeton's built and cultural heritage assets for future generations.
e) to allow for the equitable provision of social services and facilities for the community.
f) to provide housing choices for the community.
g) to minimise land use conflicts and adverse environmental impacts.
h) to promote ecologically sustainable development.

The development site is zoned RU1 - Primary Production under the Leeton LEP. Electrical generation is not listed among developments that are permitted within the zone. However, the ISEPP takes precedence over an LEP and permits solar energy systems with consent in the RU1 zone.

Land Use Zone Objectives

The LEP states that the consent authority must have regard to the objectives for development in a zone when determining a development application. The objectives of the RU1 zone are to:

a) To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
b) To encourage diversity in primary industry enterprises and systems appropriate for the area
c) To minimise the fragmentation and alienation of resource lands.
d) To minimise conflict between land uses within this zone and land uses within adjoining zones.
e) To provide opportunities for intensive and extensive agriculture in appropriate locations consistent with the environmental capability of the land and access to irrigation water.
f) To allow the development of processing, service and value-adding industries related to agriculture and primary industry production.
g) To protect and enhance the water quality of receiving watercourses and groundwater systems so as to reduce land degradation.

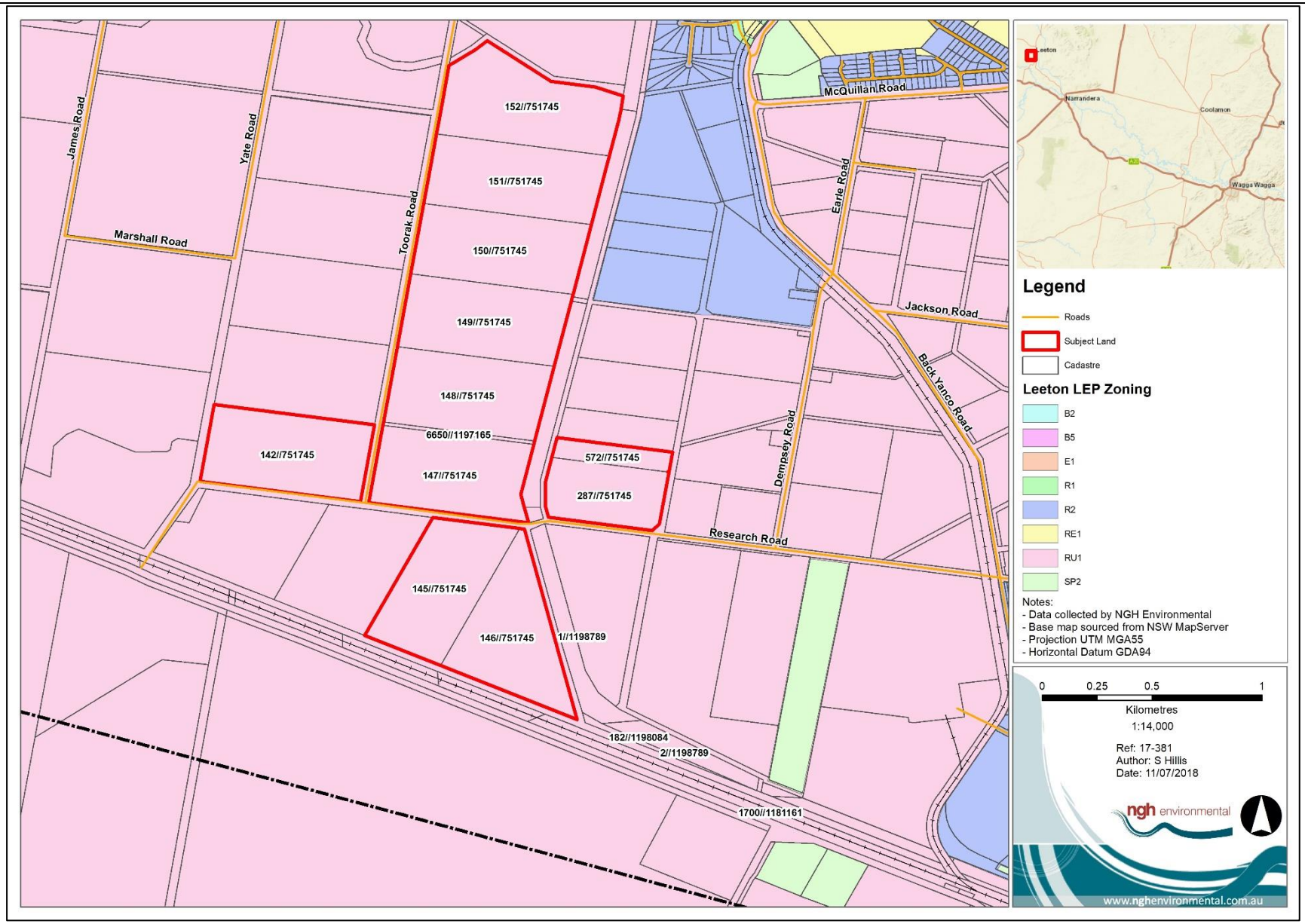


Figure 5-1 Leeton LEP zoning.

5.3 COMMONWEALTH LEGISLATION

5.3.1 Environmental Protection and Biodiversity Conservation Act 1999

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

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

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

A search of the Commonwealth Protected Matters Search Tool (10 km buffer, undertaken on 21 June 2017) indicated four threatened ecological communities, 20 threatened species and 20 migratory species within the search area. Surveys to determine the presence and likelihood of impact to these entities would be undertaken during the preparation of the EIS. Five important wetlands are indicated in the search, all of which are more than 300 km upstream, except for the Fivebough and tuckerbil swamps, located 10-20 km north and north east of the site.

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

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

Protected Matter	Entities within the search area
World Heritage Properties	0
National Heritage	0
Wetlands of International Significance (Ramsar)	5
Threatened Ecological Communities	4
Threatened Species	20
Migratory Species	20
Listed Marine Species	29
Commonwealth land	5
Commonwealth Heritage places	0
Critical habitats	0
Commonwealth reserves (terrestrial)	0
State reserves	1
Regional Forest Agreements	0

Protected Matter	Entities within the search area
Invasive species	29
Nationally Important Wetlands	2

5.3.2 Native Title Act 1993

The *Native Title Act 1993* provides a legislative framework for the recognition and protection of common law native title rights. Native title is the recognition by Australian law that Indigenous people had a system of law and ownership of their lands before European settlement. Where that traditional connection to land and waters has been maintained and where government acts have not removed it, the law recognises this as native title.

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

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

6 CONSULTATION

Community and stakeholder consultation will be integral to the proposal. ib vogt has begun consultation or is planning to consult with a wide range of relevant Local Government, State and Commonwealth authorities, as well as local businesses, community groups and other interested parties.

A Community Consultation Plan (CCP) has been prepared to provide a framework to engage with the community and stakeholders about the proposal and ensure opportunities to provide input into the assessment and development process are understood. Stakeholders were identified as those potentially being impacted by the solar farm proposal or having an interest in the proposal:

Table 2 Impacted or interested stakeholder groups

Stakeholder group	Defining characteristics
1. Adjacent Neighbours	Neighbours adjacent to the project and those who may be directly affected, for example: those with a view of infrastructure, noise or vibration from haulage route or construction activities. There is one dwelling within the development site and a number of farming buildings within the development site and footprint, with additional dwellings and buildings directly adjacent (Figure 6-1).
2. Near Neighbours	Being a major development within a small town, direct impacts may be of great interest to residents and businesses. Understanding the values and potential impacts to this group is highly important. It will assist the assessment process and development of appropriate mitigation strategies. Face to face consultation and direct feedback is required, and mitigation strategies may require changes to the project or the development of specific plans of management i.e. screening visual impact. The centre of Yanco and the Leeton Central Business District are within 3km of the development site potentially affecting a large number of homes.
3. Adjacent and Local Businesses	Being close to the town of Leeton and within the town of Yanco, there are many businesses located within 3 km of the site (Figure 6-2). This includes schools, accommodation, function facilities and eateries, a winery, and other goods and service suppliers. Some businesses may be directly or indirectly affected through view of infrastructure, noise or vibration from haulage route or construction activities. Positive impacts would be generated during construction through demand for accommodation, catering, supply of tools, plant, fuel, services, labour etc. Local businesses would be given the opportunity to tender for the supply of services for the project both during construction and during operation. Farming could also be considered a business and is addressed through the neighbour's analysis in Section 6.3.

Stakeholder group	Defining characteristics
4. Special interest groups	Special interest groups were identified specific to this proposal: • Griffith and District Citrus Growers Association Inc. • Landcare Irrigation Area Collective • Murrumbidgee Landcare • Yanco Agricultural High School and Yanco Public School • Yanco Agricultural Institute • Yanco Creek and Tributaries Advisory Council
5. Representative bodies	Representatives of groups such as: • Chamber of Commerce • Local State and National members of Parliament • Leeton and District Local Aboriginal Land Council • Leeton Visitors Information Centre • Leeton Shire Council • Murrumbidgee Irrigation Ltd. • NSW TrainLink • TransGrid
6. Media	Outlets to ensure a clear message is delivered: Local radio, television, newspapers, project website.
7. Broader community	The project is likely to be of interest to the broader local and regional community. The region's history has been rich in irrigated cropping and sheep farming. The proposed solar farm would provide an economic stimulus for the area during construction and would be a positive step forward in the renewable energy sector. Direct impacts to citrus and grape production, and reduction in agricultural land in the region are likely.
8. Leeton Shire Council	Consultation with the Leeton Shire Council and broader community has commenced. There is a perception and agreeance amongst the community that the land is classified as prime agricultural land. While broad scale direct impacts are unlikely, perceived negative impacts to agricultural capacity and productivity are likely.

The CCP has set out consultation requirements with interested parties including adjacent neighbours, near neighbours, local businesses, any special interest groups and representative bodies. The plan also includes strategies for consultation for the local community and the broader community within the region. This includes:

- Face to face meetings with neighbours, local business, interested stakeholders etc.
- Community participation
- Phone calls
- Feedback forms
- An avenue to receive information and provide specific feedback

- Newsletter and/or factsheet drops
- Key milestones communicated through a dedicated website, links to other projects and accreditations.

The CCP aims to ensure that there is effective, ongoing liaison with the community. Measures to reduce adverse impacts and promote positive impacts would be identified in the EIS and appropriate management plans developed for the proposal.

Agency consultation would also be undertaken in accordance with any requirements of the SEARs.

Consultation to date

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

- Immediate neighbours to the development site were contacted by phone (where phone numbers were available) during early June 2018 to advise of the proposal, with face to face meetings offered.
- On 6 June 2018 ib vogt staff visited all the immediate residences to advise of the proposal and discuss any concerns. Several residents were not at home and a letter with information about the proposal was left at all residences.
- On 6 June 2018 ib vogt staff met with one near neighbour (who owns three residences near to the site) to advise of the proposal and discuss any concerns.
- ib vogt staff met with Leeton Shire Council staff during 2017 to provide information about the proposal. ib vogt staff again met with met with Leeton Shire Council staff in early July 2018 to provide an update on the proposal.

During July 2018, the following activities will be undertaken:

- The Project website will go live.
- A letter and proposal factsheet (including a feedback form and reply-paid envelope) will be delivered to immediate neighbours to the proposal site.
- The first Community Open Day will be advertised in the local press and Leeton Shire Council will advertise the open day via Council's social media accounts.

The first Community Open Day will be held in Leeton on 9 August 2018, with s second Community Open Day will held in Leeton in late-2018.

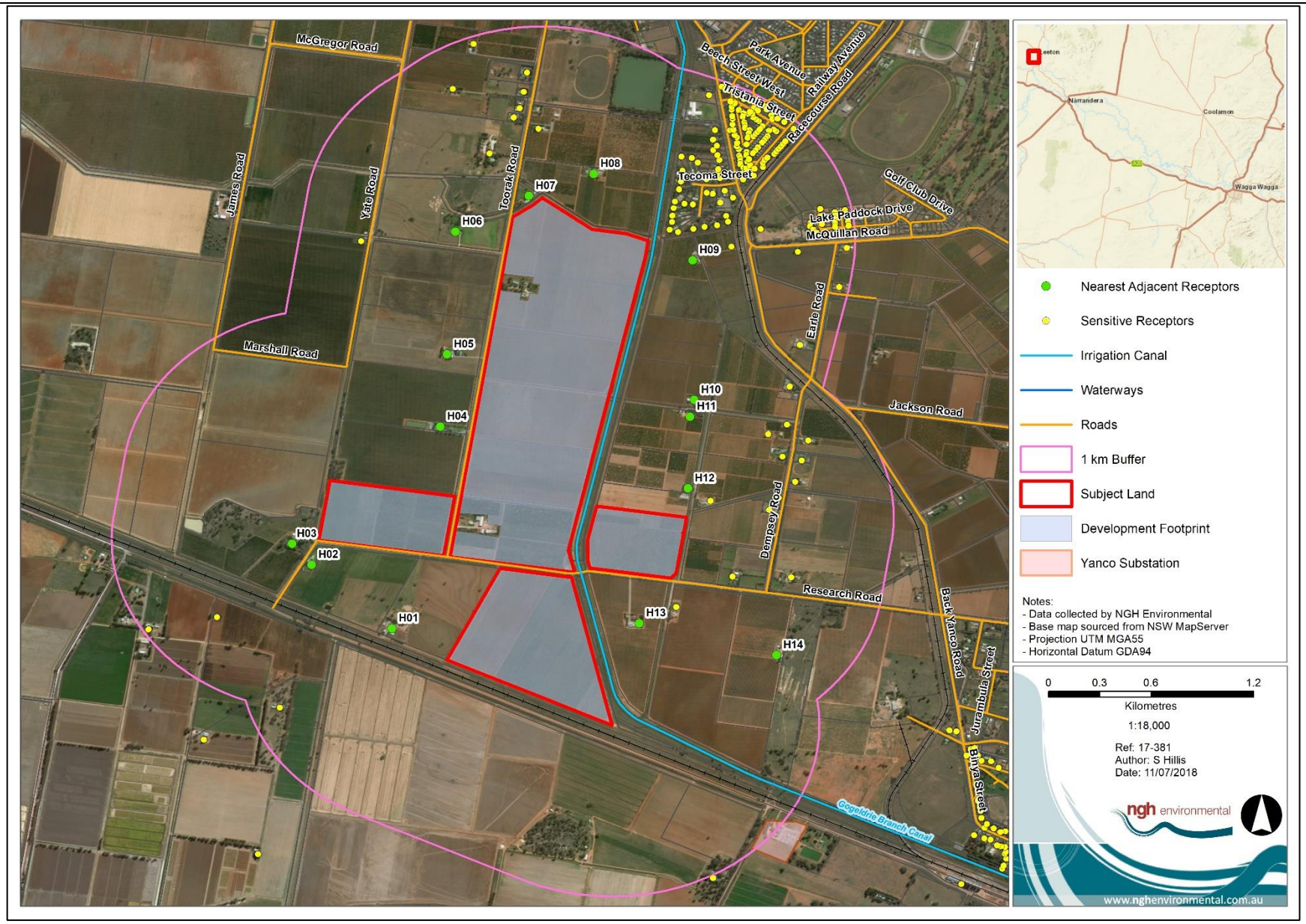


Figure 6-1 Sensitive Receptors

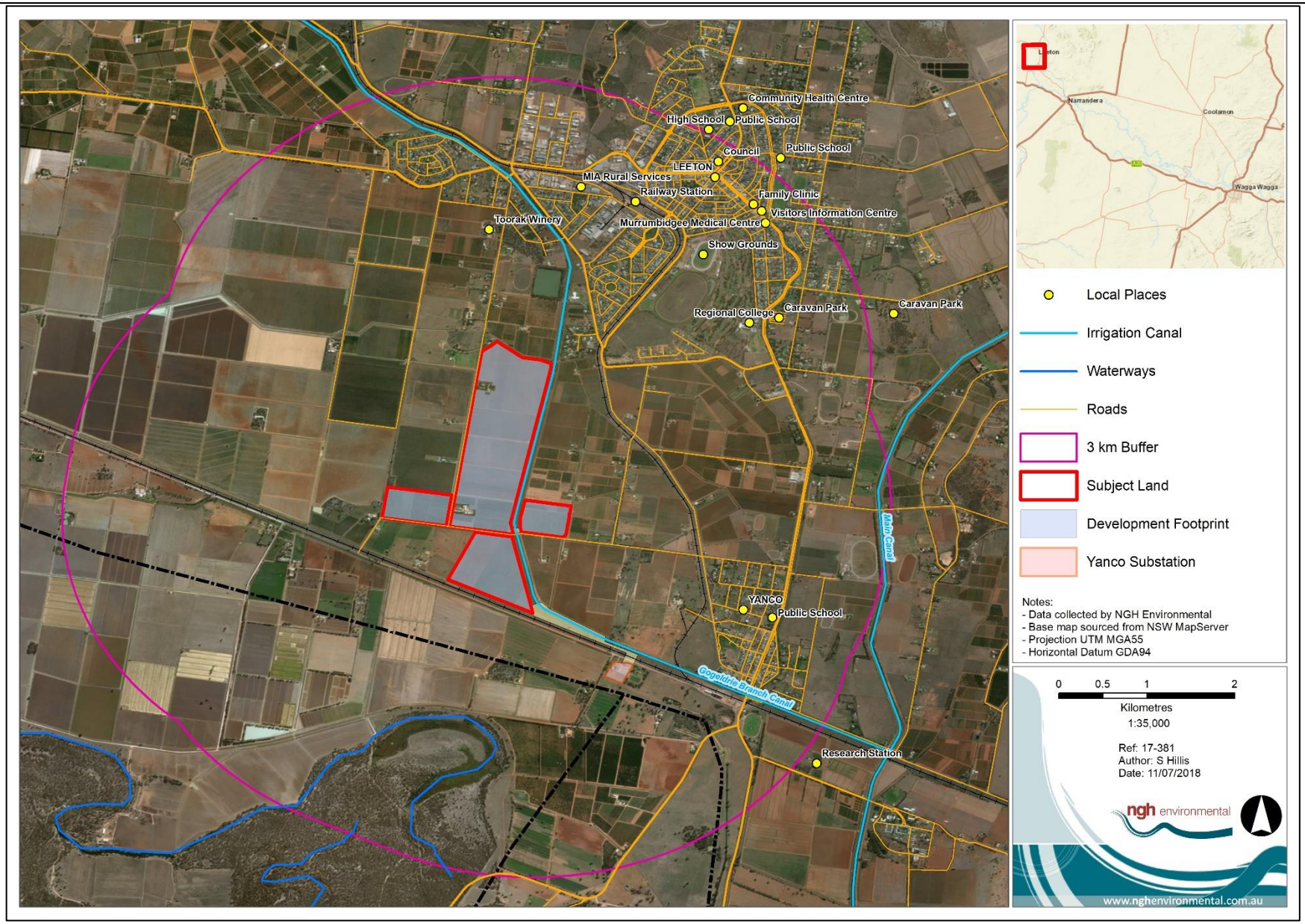


Figure 6-2 Local places

7 PRELIMINARY ENVIRONMENTAL ASSESSMENT

7.1 METHODOLOGY

A preliminary environmental risk assessment has been conducted to assist in the identification of key environmental matters that would require detailed assessment within the EIS. Risks were identified for both the construction and operation phase of the proposal and analysed in relation to their possible consequence and likelihood of occurrence. From this analysis, some environmental matters were deemed to be key issues on the basis that they had the potential to have a significant impact on the environment.

The assessment is based on a desktop review and preliminary site inspection (involving flora and fauna surveys) to identify potential high-level constraints and major risks to the proposal. A preliminary constraints map is provided in Figure 7-1. This will be used to guide further detailed investigations and ultimately the site infrastructure layout. Constraints mapping will also be refined based on these investigations, prior to submission of the EIS.

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

The following environmental risks are considered to be key aspects:

- Biodiversity.
- Aboriginal Heritage.
- Land use and resources.
- Noise.
- Watercourses and hydrology.

7.2 ASSESSMENT OF KEY ENVIRONMENTAL ISSUES

7.2.1 Biodiversity

Methodology

NGH Environmental has undertaken a preliminary constraints assessment of the proposal to identify potential high-level constraints and major risks to the proposal.

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

- Threatened species and community listings under the BC Act and EPBC Act.
- Commonwealth EPBC Act Protected Matter Search Tool, using a 10-km search radius.
- Areas of outstanding biodiversity values declared under the BC Act.
- Threatened species and communities' records in the Bionet Database (OEH), using a 10-km search radius.
- Office of Environment and Heritage (OEH) Vegetation Information System (VIS) Mapping.
- NSW Government's SEED (Sharing and Enabling Environmental Data) Mapping.
- A preliminary site inspection by an ecologist.

Overview

The development site has been selected on the basis that it supports limited native vegetation. The land has been extensively farmed, including cropping, over a long period of time. It supports limited flora and fauna features of significance.

The primary constraint is associated with native grassland and irrigation canals and dams throughout the proposal site. Whilst the development site has very little native vegetation, several irrigation channels occur through and around the edge of the development site. Further survey of the area is a requirement of the EIS, and a full assessment of the impact to potential habitat in these areas would be conducted.

Database searches

The EPBC Act Protected Matters Search undertaken on 21 June 2017 indicated four nationally-listed threatened communities which may or are likely to occur in the search area:

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

The OEH Bionet database indicates the following Endangered Ecological Communities listed under the BC Act could occur within the search area:

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

- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions
- Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions.

The EPBC Act search indicated 2 threatened flora species and 15 threatened fauna species (excluding fish) that are either known to occur or have potential to occur in the search area. The NSW Bionet search indicated 24 threatened fauna records for the search area. The threatened species indicated by the searches are shown in Table 7-1.

Table 7-1 Threatened flora and fauna species indicated in the databases searches

Species	Indicated in search?	
	EPBC Act	BC Act
Plants		
Austrostipa wakoolica	✓	✓
Slender Darling-pea, Slender Swainson, Murray Swainson-pea (*Swainsona murrayana*)	✓	-
Frogs		
Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog (*Litoria raniformis*)	✓	-
Birds		
Australasian Bittern (*Botaurus poiciloptilus*)	✓	✓
Curlew Sandpiper (*Calidris ferruginea*)	✓	-
Plains-wanderer (*Pedionomus torquatus*)	✓	✓
Australian Painted Snipe (*Rostratula australis*)	✓	✓
Painted Honeyeater (*Grantiella picta*)	✓	-
Little Eagle (*Hieraaetus morphnoides*)	-	✓
Black Falcon (*Falco subniger*)	-	✓
Superb Parrot (*Polytelis swainsonii*)	✓	✓
Malleefowl (*Leipoa ocellata*)	✓	✓
Bar-tailed Godwit (*Limosa lapponica baueri*)	✓	-
Major Mitchell's Cockatoo (*Lophochroa leadbeateri*)	-	✓
Eastern Curlew, Far Eastern Curlew (*Numenius madagascariensis*)	✓	-
Brown Treecreeper - eastern subspecies (*Climacteris picumnus victoriae*)	-	✓
Grey-crowned Babbler - eastern subspecies (*Pomatostomus temporalis temporalis*)	-	✓
Flame Robin (*Petroica phoenicea*)	-	✓
Mammals		
Corben's Long-eared Bat, South-eastern Long-eared Bat (*Nyctophilus corbeni*)	✓	-
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT)	✓	-
Grey-headed Flying-fox	✓	✓

Vegetation Mapping

An assessment was undertaken of existing vegetation mapping of the development site. The development site is not listed as an area of outstanding biodiversity value under the Biodiversity Conservation Act.

The NSW Government's SEED mapping for the locality shows exotic vegetation throughout the development site, with patches of Yellow Box – River Red Gum tall grassy woodland surrounding the subject land. A small patch of Riverine Plain Grassland was mapped within the proposal site along Houghton Road.

Site inspection

A field survey inspection was undertaken on the 7th of September 2017. The results of the field survey are shown in Figure 7-1.

Most of the development site has been largely cleared of native vegetation for the purposes of irrigated agriculture. The development site has been developed into grape and orange orchards and has lost almost all native tree cover and understorey. development site. A patch of planted Eucalypts occur surrounding a house block in the northern part of the development site and a windbreak of planted Casuarina species occur along the north-western boundary.

An area of Riverine Plain Grassland occurs along the road side of Houghton Road. Species present within this vegetation community include Curly Windmill Grass (*Enteropogon ramosus*), Speargrass (*Austrostipa spp.*), Red Grass (*Bothriochloa macra*), Wallaby Grass (*Rytidosperma* spp.) and Fuzzweed (*Vittadinia* spp.). These areas of grassland could provide habitat and fauna movement corridors. Native grasslands could provide habitat for the threatened Plains Wanderer (*Pedionomus torquatus*). Areas of remnant vegetation would be further surveyed during the preparation of the EIS for the potential for threatened species.

Irrigation channels and dams within the development site lack native vegetation and are surrounded by exotic vegetation such as Barley Grass (**Hordeum leporinum*), Prickly Lettuce (**Lactuca serriola*), Mallow (**Malva parviflora*) and Phalaris (**Phalaris aquatica*). The irrigation channels and dams could provide habitat for the threatened Southern Bell Frog (*Litoria raniformis*) and Sloane's Froglet (*Crinia sloanei*). The Sloane's Froglet is typically associated with periodically inundated areas of grassland, woodland and disturbed habitats, and the Southern Bell Frog is known throughout similar irrigated areas such as the Coleambally Irrigation Area. These areas would be further assessed for the presence of threatened species as part of the EIS.

Plant Community Types and Endangered Ecological Communities

Based on existing vegetation mapping and the initial site inspection, vegetation within the development site was assigned to Plant Community Types (PCTs) in accordance with the Vegetation Information System Classification Database. PCTs were determined based on the presence of diagnostic species identified in the site survey. The results are preliminary in nature and would be refined following detailed vegetation survey of the site, and the undertaking of Floristic Plots in accordance with the Biodiversity Assessment Methodology (OEH, 2017).

PCT's identified within the development site are:

PCT 44 – Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion.

PCT 26 – Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion.

PCT 74 – Yellow Box - River Red Gum Tall grassy riverine woodland of NSW Southwestern Slopes Bioregion and Riverina Bioregion.

Subject to further assessment, the vegetation communities may be consistent with the following Threatened ecological communities:

- Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions

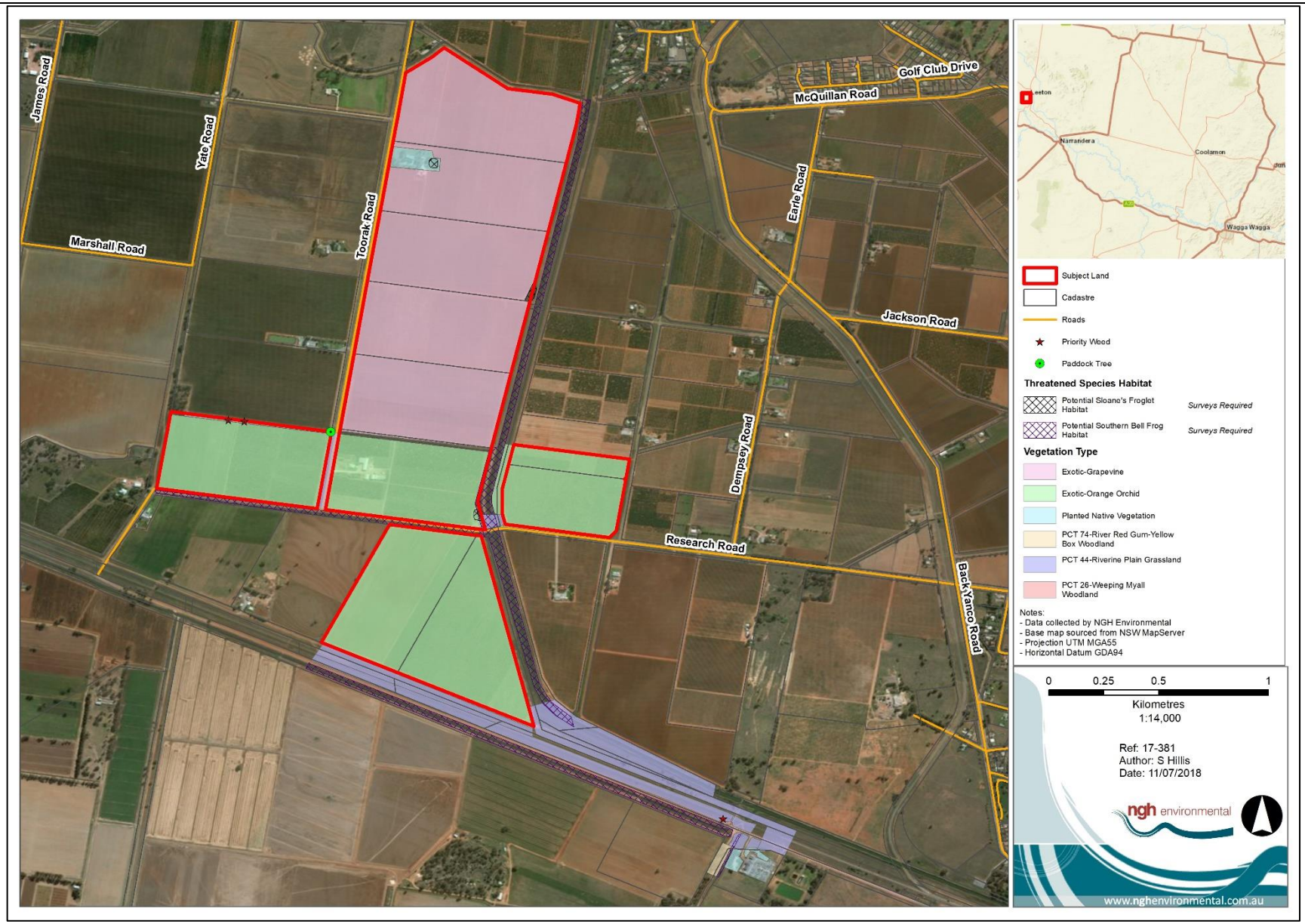


Figure 7-1 Proposal preliminary biodiversity survey results

Threatened Species

The proposal would be assessed through the Biodiversity Assessment Methodology (OEH 2017). Once full floristic plots have been undertaken in areas of native vegetation to be impacted, the Biodiversity Assessment Methodology Calculator would determine species credit species requiring further consideration. A draft BAM Calculator was run for the results of the initial biodiversity survey results. The results are preliminary and would be refined following detailed vegetation survey of the site, and the undertaking of Floristic Plots in accordance with the Biodiversity Assessment Methodology (OEH, 2017). The results of the BAM calculations are listed in Table 7-2 Preliminary BAM calculations and are used to provide preliminary advice on species that may require further assessment during the preparation of the EIS. A habitat table for the preliminary BAM indicated species are included in Appendix A.

Table 7-2 Preliminary BAM calculations

Common Name	Scientific Name	Survey Period
FAUNA		
Australian Bustard	*Ardeotis australis*	All year
White-bellied Sea-eagle	*Haliaeetus leucogaster*	July – December
Little Eagle	*Hieraaetus morphnoides*	August - October
Square-tailed Kite	*Lopoictinia isura*	September - January
Major Mitchell's Cockatoo	*Lophochroa leadbeateri*	September – December
Plains Wanderer	*Pedionomus torquatus*	August – October
Koala	*Phascolarctos cinereus*	All year
Superb Parrot	*Polytelis swainsonii*	September – November
Masked Owl	*Tyto novaehollandiae*	May - August
FLORA		
Claypan Daisy	*Brachyscome muelleroides*	September – November
Mossgiel Daisy	*Brachyscome papillosa*	September – November
Bindweed	*Convolvulus tedmoorei*	August – November
Small Scurf-pea	*Cullen parvum*	December – January
Winged Peppercress	*Lepidium monoplocoides*	November – February
Lanky Buttons	*Leptorhynchos orientalis*	September – November
Chariot Wheels	*Maireana cheelii*	September - February
Austral Pillwort	*Pilularia novae-hollandiae*	All year

Slender Darling Pea	*Swainsona murrayana*	September - February
Silky Swainson-pea	*Swainsona sericea*	September - February

Potential Impacts

The following impacts upon biodiversity have been considered as having potential to occur during the construction and operation of the proposal:

- Clearing, removal and disturbance of vegetation, in particular paddock trees;
- Clearing of limited habitat (including disturbance of foraging habitat, sheltering and breeding habitat);
- Loss of connectivity and nesting sites;
- Introduction and spread of invasive species and weeds;
- Increased risk of competition with regenerating native plants;
- Disturbance or displacement of fauna;
- Microclimate impacts due to shading, water availability, temperature etc.; and
- Movement barrier and collision hazard by perimeter fencing.

Further assessment

A full floristic plot survey is required to determine the floristic composition, condition and EEC status of native vegetation at the proposal site. Fauna survey and habitat assessment is also required to determine the potential for the presence of threatened fauna species and habitat features such as tree hollows. These surveys and assessments would be undertaken as part of the EIS, under the BAM. This would include the calculation of any biodiversity offset required for the project.

7.2.2 Aboriginal heritage

A search of the Aboriginal Heritage Information Management System (AHIMS) on 17 January 2018 identified no Aboriginal sites or places within one km of the proposal site and 15 Aboriginal sites and no Aboriginal places within 30 km of the site.

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

Aboriginal consultation

Consultation with Aboriginal stakeholders would be undertaken in accordance with clause *80C* of the *National Parks and Wildlife Amendment (Aboriginal Objects and Aboriginal Places) Regulation 2010* following the consultation steps outlined in the (ACHCRP) guide provided by OEH.

A brief summary of the consultation process includes:

1. Registration and initial consultation and registration of Aboriginal community members
2. Review of survey methodology by Registered Aboriginal Parties (RAPs)

3. Completion of field work and reporting
4. Review of report by RAPs
5. Report finalisation

Advertisement and registration for the Aboriginal Cultural Heritage Assessment process commenced 13 July 2018 and is proposed to close on 27th July 2018.

Potential impacts

The following impacts upon Aboriginal heritage have been considered as having potential to occur during the construction of the proposal:

- Uncovering an unexpected or unidentified Aboriginal heritage item.

Further assessment

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

7.2.3 Visual amenity and landscape character

The solar farm has potential to result in visual impacts to neighbouring houses and road users adjacent top the site. The site is located within a rural area with large lot agricultural production and sparsely distributed residences usually located some distance from main roads. There are approximately 213 potential (uninvolved) receptors, 14 of which are directly adjacent the subject land, within 1km of the Yanco site (see Figure 6-1). The flat terrain and intermittent tree cover limits long range views in the locality.

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

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

Further assessment

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

7.2.4 Noise

There are approximately 213 potential (uninvolved) residences within 1 km of the Yanco site (refer Figure 6-1).

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

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

Further assessment

A construction and operational noise assessment would be undertaken as part of the EIS to assess potential noise impacts. The assessment would be undertaken in accordance with the Interim Construction Noise Guideline (DECC 2009) and NSW Noise Policy for Industry (NSW EPA 2017).

7.2.5 Land use and resources

The rural land within the region is used primarily for agriculture including cropping and grazing. The Yanco development site comprises several large paddocks which have been deep ripped and largely cleared for growing oranges, grapes and cereal crops. Land and agricultural activities like the development site are widespread in the region. There is no evidence of horticulture or other intense farming activities within the development site.

The Mining, Petroleum, Production and Extractive Industries (The Mining SEPP) State Environmental Planning Policy 2007 does not extent as far as the proposed Proposal. It is unknown if the land is classed and Biophysical Strategic Agricultural Land (BSAL), it is however unlikely given the environmental context of the land; BSAL has been described as land with high quality soil and water resources capable of sustaining high levels of productivity. The land is classified as Class 3 and Class 6 under the Land and Soil Capability Assessment Scheme (OEH 2012) and is described as sloping land capable of sustaining cultivation on a rotational basis. The land is readily used for a range of crops including oranges, grapes and cereals. This class of land is not considered Prime Agricultural Land (Emery (undated)) and is not considered to be high quality soil with water resources capable of high level production.

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

For the construction of the period, there would be a complete reduction in agricultural activities within the development site. During the operational phase, not all agricultural activities would be precluded, and it is highly likely that limited production such as occasional grazing, could continue. As such, it can be expected that the nature of the agricultural activities would change from cropping to grazing within the development site. This would be further explored in the EIS.

The solar farm would be decommissioned at the end of its operational life, removing all above ground infrastructure. It is expected that the land would be returned to its prior production uses, as solar farms typically do not have significant permanent impacts to soil and landform.

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

Further assessment

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

7.3 OTHER ENVIRONMENTAL ISSUES

There are a range of potential environmental issues associated with the proposed Proposal which are not considered to be key issues. These are considered secondary issues for investigation, given the characteristics of the proposal and the availability of appropriate safeguards for mitigation. These issues are outlined in Table 7-3. The impacts and any required mitigation relating to these issues would be addressed at an appropriate level of detail in the EIS.

Table 7-3 Other environmental issues

Existing environment	Potential impacts	Management and mitigation
Soils		
An espade soil profile (OEH 2017) approximately 1km east of the proposal site records Red Brown Earth with very low relief (<9m). Surface condition is firm, and erosion hazard is slight, with no salting evident.	Construction activities would include minor excavations and vegetation removal which have the potential to cause soil erosion and sedimentation and dust issues.	The design would provide all weather access at the site during construction and operation to avoid erosion/sedimentation impacts and tracking of soil, in particular after rain events. The EIS would provide thorough consideration of soil impacts and proposed mitigation measures during construction and operation.
Watercourses and hydrology		
The development site is located approximately 3.5 km north of the Murrumbidgee River and approximately 300m north of Guises Creek. Manmade irrigation channels surround the development site. There are no prescribed streams within the development site. The proposal site is located in the Murrumbidgee Irrigation Area, and several irrigation channels run throughout the development site. These irrigation channels are involved in existing agricultural activities on the subject land. Irrigators in the MIA have licences which allow them to use a prescribed amount of water each year. The natural hydrology of the site has been largely replaced by irrigation and drainage channels, and storage dams. There would be no removal of irrigation channels throughout the proposal site. Water demand for the proposal would be relatively small, as construction of the solar farm is not water intensive. If surface or groundwater extraction is required to meet the demand for water, an assessment of impacts to water would be included in the EIS.	The proposed works would involve works in proximity to the Murrumbidgee irrigation channels but none would be directly impacted. Impacts upon watercourses and hydrology that are considered as having the potential to occur during the construction of the proposal include: • Accidental release of hydrocarbons by inappropriate storage, use and disposal of chemicals; • Domestic waste, effluent and putrescibles causing contamination;	The EIS would assess the impacts to waterways during construction and operation and include appropriate mitigation measures as required. The solar farm would be designed to comply with required setback, approval and consultation requirements of Murrumbidgee Irrigation.

Existing environment	Potential impacts	Management and mitigation
There is a low potential for groundwater to be encountered during excavations and earthwork for the construction and pole placements for the transmission lines. This is likely to be highly localised and no inception of ground water is considered. The development site is not identified as flood prone land under the Leeton LEP.	• Erosion of soil and sedimentation through stormwater runoff; and • Dewatering sediment laden water from excavations.	
Historic heritage		
A search of the NSW heritage Register on 18 January 2018 for the Leeton LGA identified 7 items under the NSW Heritage Act and 56 items listed under the Leeton LEP and by state agencies. The closest listed heritage item is the Gaol and Solitary Confinement Cell on Trunk Road, approximately 2km east of the proposal site. The site inspection did not identify any old structures or items that would potentially have historic significance.	There is considered to be a low risk of impact to heritage items.	The heritage status of the site would be assessed during fieldwork undertaken as part of the archaeological assessment. Appropriate management measures would be implemented if required.
Access and traffic		
The site would be accessed via Research Road. Access tracks would be constructed as part of the works. Irrigation Way, approximately 1km east of the proposal, and the Sturt Highway approximately 10km south of the proposal would be the major transport route for haulage and site vehicles during construction and operation of the proposal.	Construction traffic would impact traffic along Toorak Road and Research Road. Maintenance access tracks during operation would also be required across the proposal site. Houghton Road, Toorak Road and Research Road are all sealed roads. During construction, there may be impacts to residences along the access route associated with dust, vibration and noise.	Construction traffic impacts would be considered in the EIS and take into consideration existing traffic volumes and any requirements from RMS. Consultation would be undertaken before construction with RMS, the local council and local residents regarding the works that may affect roads or traffic. The design would also consider any requirements from RMS and other relevant stakeholders on access arrangements to the proposal site.

Existing environment	Potential impacts	Management and mitigation
		The mitigation measures would require a Traffic Management Plan to be prepared.
Contamination		
The EPA contaminated land register notes one registered site for the Leeton LGA, located in Yanco, approximately 1.5km east of the proposal site. Contamination associated with agricultural activities (eg pesticides, petrochemicals) or asbestos construction or insulation materials may still be present on the site.	There is potential that contaminants may be uncovered during excavation activities at the site.	Risk associated with contamination at the site are considered low and therefore no detailed investigation is likely to be required within the EIS. The mitigation measures would require a CEMP be prepared to manage any contamination identified during site construction.
Air quality		
The air quality in the study area is expected to be good and typical of rural settings in NSW with low population density and no industrial pollution sources. Existing sources of air pollution are expected to include vehicle emissions, dust from agricultural practices and smoke from seasonal stubble burning. During colder months, solid fuel heating may result in a localised reduction in air quality, particularly if temperature inversions operate overnight.	The construction of the proposal is not anticipated to have a significant impact on air quality and would mostly be related to dust during dry periods and vegetation removal. Impacts to air quality during operation would be negligible.	The mitigation measures would require a CEMP be prepared to manage air quality impacts during the construction phase. There is an opportunity to improve local air quality by maintaining ground cover vegetation under the panels.
Hazard and risk – electric and magnetic fields (EMF)		
Existing powerlines produce EMF at the site. Additional infrastructure which form part of the proposal such as connecting powerlines and substation would produce additional electromagnetic emissions at the site.	The substation, battery storage and network connection would be located on the proposal site. The powerlines constructed as part of the proposal would not pass through any neighbouring properties. The EMF that would be generated by the proposed powerlines, battery storage and substation is expected	The EMF levels of the proposed powerlines, battery storage and substation would be assessed as part of the EIS.

Existing environment	Potential impacts	Management and mitigation
	to be below the guideline for public exposure and would not be expected to have an adverse impact on human health.	
Battery storage is currently not utilised on-site	Batteries pose a potential fire or contamination risk to the site.	An assessment of hazard and risk would be assessed in the EIS
Hazard and risk - bushfire		
The proposal site has been predominantly cleared for agriculture. The property is not identified as fire prone land in the RFS online tool (RFS 2017), or in the Leeton Shire Council online mapping.	The proposal is unlikely to be affected by bushfire or pose a significant bushfire risk.	Bushfire impacts and risk would be assessed in the EIS.
Social and economic impacts		
The development site is located within the Leeton LGA. In 2016 Leeton LGA had a population of 11,168. The main industry of employment in 2016 was Grain Mill Product Manufacturing. Workforce accommodation would be required for potentially 120 staff members during peak construction periods. A large majority of these may already reside locally. For visiting workers, accommodation can be sought from Yanco or other towns within a 100km radius, including Leeton, Griffith, Narrandera or even Wagga Wagga.	The proposal would reduce the availability of agricultural land but would generate economic benefits during construction and operation, including local employment opportunities. Other socio-economic impacts would include traffic and access, noise, air quality and visual impacts.	The EIS would assess potential social and economic impacts of the proposal.
Utilities		
Electricity network TransGrid manages and operates the high voltage electricity transmission network in NSW. Essential Energy is a NSW Government-owned corporation, with responsibility for building, operating and maintaining the electricity network in the development site. Both TransGrid and Essential Energy have restrictions on development within powerline easements. TransGrid guidelines state that activities and encroachments are prohibited within a transmission line easement, including 'the installation of fixed plant or equipment', and 'the placing of obstructions within 20 metres of any part of a	The proposed works would involve works adjacent to these utilities. The solar farm will need to connect to the TransGrid electricity network.	The EIS would assess the proposal against the setback and approval requirements of TransGrid. The solar farm would be designed to comply with required setback, approval and consultation requirements of TransGrid.

Existing environment	Potential impacts	Management and mitigation
transmission line structure or supporting guy wire'. Roads or tracks within 10 metres of the centre-line of a transmission line 132kV are prohibited although roads that cross the transmission line as a thoroughfare may be permitted. Essential Energy's (2013) easement requirements specify a 40-metre-wide easement for 132kV single pole powerlines (long span), and 45-metre-wide easements for H-pole powerlines (long span). 66kV powerlines have 30-metre-wide easements and 22kV line easements are 20 metres wide (long span).		
Waste management		
The proposal would generate several waste streams and utilise a variety of materials during the construction phase.	During construction, excavated material and green waste would be generated as waste. Packaging from panels and other components would require disposal. Limited operational waste would be associated with the proposal.	A Waste Management Plan would be incorporated into the CEMP, applying the principles to avoid, re-use and recycle to minimise wastes. Cleared trees would be recycled as fauna habitat where possible.
Cumulative impacts		
The Proposal will contribute to overall infrastructure development in the region. A review of the State Significant Development register for the Leeton LGA and surrounding LGAs of Narrandera, Griffith, Murrumbidgee and Carrathool Shires (within 50km of the subject land) was conducted on 13/02/2018. Seven major solar farms developments have been applied for, including Avonlie, Sandigo, Griffith, Riverina, Coleambally, Darlington Point and Hillston. A number of other State Significant Developments have been applied for in the area.	During construction and operation, key cumulative impacts may include additional stress on the grid, community complaints such as visual amenity impacts, stress on local business for supply and demand (in particular staff accommodation), noise impacts, air quality, waste management, traffic etc.	Early consultation with the community regarding cumulative impacts should be conducted. Further assessment/investigation of cumulative impacts will be required, and the EIS would assess potential impact and risk

8 CONCLUSION

The Preliminary Environmental Assessment has outlined the proposal and established the environmental and planning context of the proposal. The proposal would be assessed under Part 4 of the EP&A Act and classed as State Significant Development under *State Environmental Planning Policy* (*State and Regional Development*) 2011.

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

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

- Biodiversity.
- Aboriginal Heritage.
- Visual amenity and landscape character.
- Noise (construction).
- Land uses and resources.

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

9 REFERENCES

ARENA (n.d). Establishing the social licence to operate large scale solar facilities in Australia: Insights from social research for industry, Australian Renewable Energy Agency (ARENA).

Australian Bureau of Statistics (ABS) (2013c) Leeton QuickStats, accessed 18 January 2017 from <http://www.censusdata.abs.gov.au/census_services/getproduct/census/2016

Australian Energy Market Operator (AEMO) (2016) National Electricity Forecasting Report - For the National Electricity Market (NEM) 2016 <https://www.aemo.com.au/-/media/Files/Electricity/NEM/Planning_and_Forecasting/NEFR/2016/2016-National-Electricity-Forecasting-Report-NEFR.pdf>, accessed 18 January 2018.

Department of Environment and Climate Change NSW (DECC) (2002). Descriptions for NSW (Mitchell) Landscapes, Version 2.

Department of Environment and Climate Change NSW (DECC) (2009) Interim Construction Noise Guideline. <http://www.epa.nsw.gov.au/noise/constructnoise.htm>

Department of Environment and Energy (2016) Quarterly update of the National Greenhouse Gas Inventory. http://www.environment.gov.au/climate-change/greenhouse-gas-measurement/publications/quarterly-update-australias-national-greenhouse-gas-inventory-jun-2016, accessed 18 January 2018.

Department of Planning and Environment – Resources and Energy (2017) Minview <http://www.resourcesandenergy.nsw.gov.au/miners-and-explorers/geoscience-information/services/online-services/minview>

EPA (NSW) (2017) Search the contaminated land record. http://www.epa.nsw.gov.au/prclmapp/searchregister.aspx

Institute for Sustainable Futures (ISF) (2017) Network Opportunity Mapping <http://www.uts.edu.au/research-and-teaching/our-research/institute-sustainable-futures/our-research/energy-and-climate-1>

Morgan G. and Terrey J. (1992) Riverina subregions, accessed 30 March 2017 from http://www.environment.nsw.gov.au/bioregions/Riverina-Subregions.htm

Office of Environment and Heritage (OEH) (2011) Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW. http://www.environment.nsw.gov.au/licences/investassessreport.htm

OEH (2012) The land and Soil capability assessment scheme, Accessed from http://www.environment.nsw.gov.au/resources/soils/20120394lsc2s.pdf

Office of Environment and Heritage (OEH) (2016) The bioregions of New South Wales – their biodiversity, conservation and history, accessed December 2017 from http://www.environment.nsw.gov.au/bioregions/BioregionOverviews.htm

Office of Environment and Heritage (OEH) (2017) eSpade v2.0 <http://www.environment.nsw.gov.au/eSpade2WebApp>

Rural Fire Service (2017) Check if you're in bush fire prone land. <http://www.rfs.nsw.gov.au/plan-and-prepare/building-in-a-bush-fire-area/planning-for-bush-fire-protection/bush-fire-prone-land/check-bfpl>

Transgrid (undated) TransGrid Easement Guidelines - Third Party Development <https://www.transgrid.com.au/being-responsible/public-safety/living-and-working-with-powerlines/Documents/Easement%20guidelines%20for%20third%20party%20developers.pdf>

APPENDIX A HABITAT TABLE

The tables in this appendix present the habitat evaluation for threatened species, ecological communities and endangered populations listed in the from the preliminary Biometric Assessment Methodology (BAM).

The likelihood of occurrence is based on presence of habitat, proximity of nearest records and mobility of the species (where relevant). The assessment of potential impact is based on the nature of the proposal, the ecology of the species and its likelihood of occurrence. The following classifications are used:

Presence of habitat:

Present: Potential or known habitat is present within the study area

Absent: No potential or known habitat is present within the study area

Likelihood of occurrence

Unlikely: Species known or predicted within the locality but unlikely to occur in the study area

Possible: Species could occur in the study area

Present: Species was recorded during the field investigations

Possible to be impacted

No: The proposal would not impact this species or its habitats. No further assessment would be necessary at this stage of the project.

Yes: The proposal could impact this species or its habitats. Further investigation into the likelihood and consequence of the impact of the proposal on these species would be considered under the BAM for the EIS.

Species	Description of habitat[1]	Presence of habitat	Likelihood of occurrence	Possible impact?
Flora				
Claypan Daisy *Brachyscome muelleroides* **BC-V, EPBC-V**	Occurs in seasonally damp situations such as shallow depressions and around the margins of swamps, lagoons and claypans, on heavy grey cracking clays to lighter clay loam soils, in grassland, grassy woodland and open forest habitats, growing in association with various grasses and seasonal aquatic plants such as *Marsilea* species. Associated species include *Pycnosorus globosus, Agrostis avenacea, Austrodanthonia duttoniana*, and *Calotis anthemoides.*	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Mossgiel Daisy *Brachyscome papillosa* **BC-V, EPBC-V**	The distribution of this species overlaps with the following EPBC Act-listed threatened ecological communities: Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions, and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Recorded primarily in clay soils on Bladder Saltbush (*Atriplex vesicaria*) and *Maireana aphylla* plains, but also in grassland and in Grey Box (*Eucalyptus A-Iacrocarpa*) – Cypress Pine (*Callitris* spp.) woodland.	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Bindweed *Convolvulus tedmoorei* **BC-E**	Originally known from only two areas on the Murrumbidgee and Darling River floodplains in central-western NSW, from Toganmain Station, Darlington Point, and from a locality 5 miles NW of Louth. Two other recorded localities for the species are ENE of Broken Hill on the road to Wilcannia, and Menindee Road, Scarsdale. Grows in self-mulching grey clay soils on the floodplains of the Darling and Murrumbidgee Rivers.	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Small Scurf-pea *Cullen parvum* **BC-E**	Extensive suitable habitat probably occurs across the border in NSW. In known populations in Victoria and NSW, plants are found in grassland, River Red Gum (*Eucalyptus camaldulensis*) Woodland and even grazing country and table drains, in areas with rainfall of between 450 and 700 mm. Plants often occur near watercourses.	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.

[1] Information sourced from species profiles on NSW OEH's threatened species database or the Australian Government's Species Profiles and Threats database (SPRAT) unless otherwise stated.

OEH threatened species database: http://www.threatenedspecies.environment.nsw.gov.au/index.aspx
SPRAT: http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

Species	Description of habitat[1]	Presence of habitat	Likelihood of occurrence	Possible impact?
Winged Peppercress *Lepidium monoplocoides* **BC-E, EPBC-E**	Occurs in a variety of habitats including woodland with a grassy understorey and grassland. Appears to respond to disturbance, having appeared after soil disturbance at one site. Almost all remaining populations of Basalt Peppercress occur in heavily modified, non-natural environments, usually amongst exotic pasture grasses and weed species, sometimes with an overstorey of introduced tree species. Soils are light to heavy, often friable, clay loams. Most sites are on roadsides, on fringes of developed agricultural land or occur in small reserves within an agricultural landscape.	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Lanky Buttons *Leptorhynchos orientalis* **BC-E**	Grows in woodland or grassland, sometimes on the margins of swamps. Communities include a Bimble Box plain in red-brown soil, dense *Acacia pendula* woodland with herbaceous understorey on red clay to clay-loam, open grassland areas on red soils, and red clay plains at the edge of a Canegrass swamp. Associated species include *Eucalyptus populnea subsp. bimbil, Acacia pendula, Eragrostis australasica, Lepidium monoplocoides, Enchylaena tomentosa, Minuria leptophylla, Rhodanthe floribunda*, *R. pygmaea* and *Ptilotus spathulatus*.	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Chariot Wheels *Maireana cheelii* **BC-V, EPBC-V**	Usually found on heavier, grey clay soils with *Atriplex vesicaria* (Bladder Saltbush). Recorded on the Hay Plain in *Atriplex vesicaria, Maireana aphylla* and *Acacia homalophylla* shrublands. Soils include heavy brown to red-brown clay-loams, hard cracking red clay, other heavy texture-contrast soils. Tends to grow in shallow depressions, often on eroded or scalded surfaces, and does not extend to the higher soils in the habitat. It has been found on the edges of bare, windswept claypans, in shallow depressions of eroded surfaces where rainwater collects and on a "shelf" in the crabhole complex of heavy grey soils.	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Austral Pillwort *Pilularia novae-hollandiae* **BC-E**	This species is probably ephemeral (especially in the drier parts of its range), appearing when soils are moistened by rain. Grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous.	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.

Species	Description of habitat[1]	Presence of habitat	Likelihood of occurrence	Possible impact?
Slender Darling Pea *Swainsona murrayana* **BC-V, EPBC-V**	Found in grassland, herbland, and open Black-box woodland, often in depressions. Has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with Maireana species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated. The species may require some disturbance and has been known to occur in paddocks that have been moderately grazed or occasionally cultivated.It is often associated with low chenopod shrubs (*Maireana* spp.), wallaby-grass (*Austrodanthonia* spp), and spear grass (*Austrostipa* spp.).	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Silky Swainson-pea *Swainsona sericea* **BC-V**	Found in Natural Temperate Grassland and Snow Gum *Eucalyptus pauciflora* Woodland on the Monaro. Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Sometimes found in association with cypress-pines *Callitris* spp.	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Amphibians				
Sloane's Froglet *Crinia sloanei* **BC-V**	Recorded from widely scattered sites in the floodplains of the Murray-Darling Basin, with the majority of records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales. Typically associated with periodically inundated areas in grassland, woodland and disturbed habitats. Typically breeds in ephemeral wetlands, or periodically inundated areas of permanent wetlands, in grasslands, woodlands, and disturbed environments. Shelters in any vegetation, ground debris, or cracks in the soil that would provide suitable refuge.	**Present** Irrigation drains present in the development site.	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Birds				
Regent Honeyeater *Anthochaera Phrygia (Breeding)* **BC-CE, EPBC-E, Migratory**	Mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River She-oak. Key eucalypt species include Mugga Ironbark, Yellow Box, Blakely's Red Gum, White Box and Swamp Mahogany. Also utilises *E. microcarpa, E. punctata, E. polyanthemos, E. mollucana, Corymbia robusta, E. crebra, E. caleyi, Corymbia maculata, E. mckieana, E. macrorhyncha, E. laevopinea,* and *Angophora floribunda*. Nectar and fruit from the mistletoes *A. miquelii, A. pendula* and *A. cambagei* are also eaten during the breeding season.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.

Species	Description of habitat[1]	Presence of habitat	Likelihood of occurrence	Possible impact?
Australian Bustard *Ardeotis australis* **BC-E**	Mainly inhabits tussock and hummock grasslands, though prefers tussock grasses to hummock grasses; also occurs in low shrublands and low open grassy woodlands; occasionally seen in pastoral and cropping country, golf courses and near dams. Breeds on bare ground on low sandy ridges or stony rises in ecotones between grassland and protective shrubland cover; roosts on ground among shrubs and long grasses or under trees.	**Present** Pastoral and cropping country present in study area	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Bush Stone-curlew *Burhinus grallarius* **BC-E**	Found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber.	**Marginal** Some woodlands. Fallen timber is absent.	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Glossy Black-cockatoo *Calyptorhynchus lathami* **BC-V**	Dependent on large hollow-bearing eucalypts for nest sites. One or two eggs are laid between March and August. Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species, particularly Black She-oak (*Allocasuarina littoralis*), Forest She-oak (*A. torulosa*) or Drooping She-oak (*A. verticillata*) occur. In the Riverina area, inhabits open woodlands dominated by Belah (*Casuarina cristata*). Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
White-bellied Sea-eagle *Haliaeetus leucogaster* **Migratory**	Feeds mainly off aquatic animals, such as fish, turtles and sea snakes, but it takes birds and mammals as well. Build a large stick nest, which is used for many seasons in succession. The nest can be located in a tree up to 30m above the ground but may be also be placed on the ground or on rocks, where there are no suitable trees.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Little Eagle *Hieraaetus morphnoides* ***BC-V***	Found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.

Species	Description of habitat[1]	Presence of habitat	Likelihood of occurrence	Possible impact?
Swift Parrot *Lathamus discolour* **BC-E, EPBC-E**	In NSW mostly occurs on the coast and south west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there is abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Major Mitchell's Cockatoo *Lophochroa leadbeateri* **BC-V**	In NSW it is found regularly as far east of about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Square-tailed Kite *Lophoictinia isura* **BC-V**	In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Barking Owl *Ninox connivens* **BC-V**	Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Denser vegetation is used occasionally for roosting. During the day they roost along creek lines, usually in tall understorey trees with dense foliage such as *Acacia* and *Casuarina* species, or the dense clumps of canopy leaves in large *Eucalypts*. Feeds on a variety of prey, with invertebrates predominant for most of the year, and birds and mammals such as smaller gliders, possums, rodents and rabbits becoming important during breeding. Live alone or in pairs. Territories range from 30 to 200 hectares and birds are present all year. Three eggs are laid in nests in hollows of large, old eucalypts including River Red Gum (*Eucalyptus camaldulensis*), White Box (*Eucalyptus albens*), (Red Box) *Eucalyptus polyanthemos* and Blakely's Red Gum (*Eucalyptus blakelyi*). Breeding occurs during late winter and early spring.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.

Species	Description of habitat[1]	Presence of habitat	Likelihood of occurrence	Possible impact?
Plains Wanderer *Pedionomus torquatus* **BC-E, EPBC-V**	Occur in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. These grasslands support a high diversity of plant species, including a number of state and nationally threatened species. Grassland habitat structure is more important than species composition. Preferred habitat typically has 50% bare ground, 10% fallen litter, and the remaining 40% comprised of herbs, forbs and grasses. Most of the vegetation is <5 cm high but some vegetation up to a maximum of 30 cm is important for concealment, as long as grass tussocks are spaced 10-20 cm apart.	**Present** Associated native grassland habitat present in the development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Superb Parrot *Polytelis swainsonii* **BC-V, EPBC-V**	Found throughout eastern inland NSW. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Between April and August, they inhabit forests and woodlands dominated by River Red Gum, box-gum, White Cypress Pine (*Callitris glaucophylla*) and Boree. When foraging on the ground, Superb Parrots often eat the seeds of plants such as the native Ringed Wallaby-grass (*Danthonia caespitosa*), barley-grasses (*Critesion*), as well as cereal crops including wheat, oats and canola (*Brassica napus*); and spilt grain. They also eat the seed-pods of many understorey species of wattles such as Gold-dust Wattle (*Acacia acinacea*), Silver Wattle (*A. dealbata*) and Deane's Wattle (*A. deanei*) and cultivated Cootamundra Wattle (*A. baileyana*). When foraging in the forest canopy, Superb Parrots eat the flowers and fruits of eucalypts, especially in spring and summer, the berries of mistletoe, such as Box Mistletoe (*Amyema miquelii*) and Grey Mistletoe (*A. quandang*), and, in winter, lerps from the foliage of eucalypts.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Masked Owl *Tyto novaehollandiae* **BC-V**	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. Habitat for this species is also widespread throughout the dry eucalypt forests of the tablelands, western slopes and the undulating wet-dry forests of the coast. Optimal habitat includes an open understorey and a mosaic of sparse (grassy) and dense (shrubby) ground cover on gentle terrain. Roosts in hollows in live or occasionally dead eucalypts; dense foliage in gullies; and caves. Nest in old hollow eucalypts, live or dead, in a variety of topographic positions, with hollows greater than 40 cm wide and greater than 100 cm deep. Hollow entrances are at least 3 m above ground, in trees of at least 90 cm diameter at breast height.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the development site	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.

Species	Description of habitat[1]	Presence of habitat	Likelihood of occurrence	Possible impact?
Bats				
Southern Myotis *Myotis Macropus* **BC-V**	Generally, roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the proposal are	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.
Mammals				
Koala *Phascolarctos cinereus* **BC-V**	Occurs in eastern Australia, from north-eastern Queensland to south-eastern South Australia and to the west of the Great Dividing Range. In NSW it mainly occurs on the central and north coasts with some populations in the western region. Inhabits a range of eucalypt forest and woodland communities, including coastal forests, the woodlands of the tablelands and western slopes, and the riparian communities of the western plains. Examples of important shelter trees are cypress pine and brush box. The quality of forest and woodland communities as habitat for koalas is influenced by a range of factors, such as; species and size of trees present; structural diversity of the vegetation; soil nutrients; climate and rainfall; size and disturbance history of the habitat patch.	**Present** Scattered Paddock Trees present in development site	**Possible** Habitat for this species is present in the proposal are	The possibility of impact on this species as a result of the proposal would be further investigated during the preparation of the EIS.

APPENDIX B DATABASE SEARCHES

Australian Government
Department of the Environment and Energy

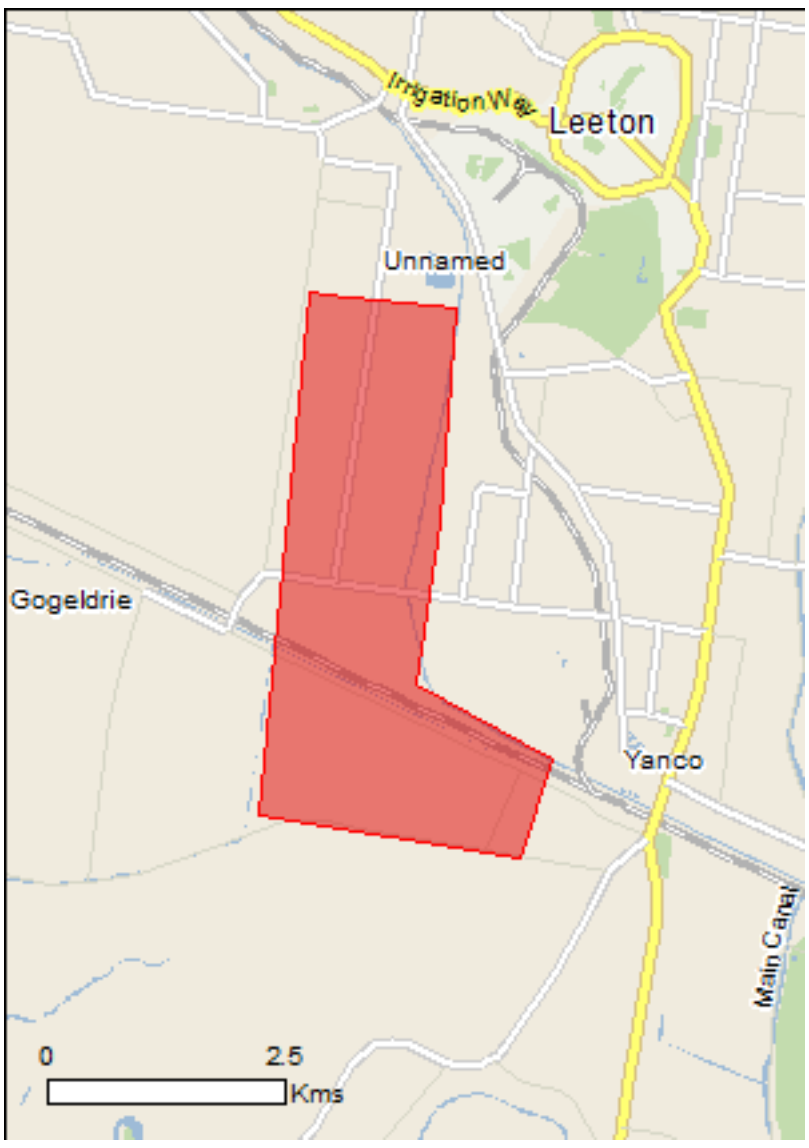
EPBC Act Protected Matters Report

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: 21/07/17 10:44:42



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
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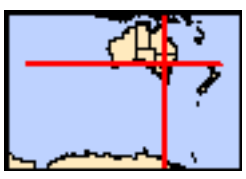

Summary

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:	5
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	20
Listed Migratory Species:	20

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:	5
Commonwealth Heritage Places:	None
Listed Marine Species:	29
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	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:	1
Regional Forest Agreements:	None
Invasive Species:	29
Nationally Important Wetlands:	2
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Banrock station wetland complex	500 - 600km upstream
Fivebough and tuckerbil swamps	Within Ramsar site
Hattah-kulkyne lakes	300 - 400km upstream
Riverland	400 - 500km upstream
The coorong, and lakes alexandrina and albert wetland	600 - 700km upstream

Listed Threatened Ecological Communities		[Resource Information]

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
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus		
Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Grantiella picta		
Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area
Leipoa ocellata		
Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri		
Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat may occur within area
Limosa lapponica menzbieri		
Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	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

Name	Status	Type of Presence
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat may occur within area
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Breeding known to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Fish		
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat may occur within area
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Frogs		
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog [1828]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may 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	Foraging, feeding or related behaviour may occur within area
Plants		
Austrostipa wakoolica [66623]	Endangered	Species or species habitat may occur within area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to 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	
Motacilla flava Yellow Wagtail [644]	Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]	Species or species

Name	Threatened	Type of Presence
		habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Commonwealth Land -
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Commonwealth Bank of Australia
Commonwealth Land - Telstra Corporation Limited
Defence - LEETON ARES DEPOT ; 4/3 RNSWR ANNEX & POL STORE

Listed Marine Species [Resource Information]

* 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 known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to 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
Philomachus pugnax Ruff (Reeve) [850]		Species or species habitat known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Stiltia isabella Australian Pratincole [818]		Species or species habitat known to occur within area
Tringa glareola Wood Sandpiper [829]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Murrumbidgee Valley	NSW

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		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
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
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
Streptopelia chinensis Spotted Turtle-Dove [780]		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

Name	Status	Type of Presence 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
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Cylindropuntia spp. Prickly Pears [85131]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Prosopis spp. Mesquite, Algaroba [68407]		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
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Fivebough Swamp	NSW
Tuckerbil Swamp	NSW

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

-34.564832 146.377799,-34.565822 146.390158,-34.582501 146.388785,-34.595219 146.386382,-34.601154 146.399428,-34.608784 146.396338,-34.605393 146.371447,-34.56455 146.376254,-34.56455 146.376254,-34.564832 146.377799

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.

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Proposed Yanco Solar Farm

Date: 5/10/2017
Compiled By: Tom Steele

Scale: N/A A3 Print
Projection: GDA 1994 - Zone 55