

# STATEMENT OF ENVIRONMENTAL EFFECTS

Quirindi 1B Solar Farm



for ITP Development Pty Ltd

3 May 2024

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**Attachment A: Property Report**

**Attachment B: AHIMS Search Results**

### Project details

<b>Project number</b>	<b>0523</b>
<b>Project title</b>	Quirindi Solar Farm
<b>Document title</b>	Statement of Environmental Effects
<b>Property</b>	Lots 130 & 134 DP 751009 Borah Creek Road, Quirindi, NSW
<b>Client</b>	ITP Development Pty Ltd
<b>Author</b>	Allen Grimwood, Director
<b>Company</b>	Zenith Town Planning Pty Ltd PO Box 591 Moruya NSW 2537
<b>ABN</b>	11 624 467 349
<b>Qualifications</b>	Bachelor of Arts (Honours), UNSW Master of Urban & Regional Planning, USyd   
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## EXECUTIVE SUMMARY

This Statement of Environmental Effects supports an application to Liverpool Plains Shire Council to develop a solar farm on Lots 130 and 134 DP 751009 Borah Creek Road, Quirindi NSW. The land is located approximately 5 kilometres north-east of Quirindi town centre. The development is referred to as the Quirindi 1B Solar Farm. The proponent is ITP Development Pty Ltd. The application is for regionally significant development that needs consent and is to be determined by the Northern Regional Planning Panel.

ITP Development Pty Ltd is proposing to construct a solar farm with a DC capacity of 7.5 MWp and AC output of 5.0 MW on approximately 11.09 hectares that is currently used for cropping of a total site area of 141.75 hectares.

There are to be approximately 10,750 solar modules installed in 128 rows (each row being approximately 92 metres long) running east to west. There is approximately 6.0 metres spacing between each row. The height of each module is approximately 2.0 metres to 2.75 metres and the mounting system is constructed on piles that are driven into the ground, typically within the depths of 1.5 metre to 3 metres. Each row of solar photovoltaic (PV) modules will rotate to track the sun across the sky from east to west each day.

The solar farm will also consist of an inverter station, which incorporates the high/medium voltage switchgear and transformers, and two 3.4 MW inverters. The inverter station is ground mounted and incorporated on a 12.19 metre skid. Allowance is made for a 2.9 metre high battery energy storage system (BESS) on a 12.1 metre skid alongside the inverter stations.

The array is to be wholly contained within Lot 130. Access is to be via an existing track off Porters Lane that enters Lot 134 and then by way of a new access track into Lot 130.

During construction, there is expected to be 50 personnel on site working from 7 am – 4 pm Monday to Friday with approximately 40 light vehicle trips per day. The construction stage is expected to take approximately 3 months. Once operational, the site will be unmanned. Maintenance is expected to be carried out quarterly by a crew of 2 to 3 people.

Solar panels and related infrastructure will be decommissioned and removed upon cessation of operations. This is likely to occur within two years of the end of the project. The site can then be returned to the pre-development land use.

The site selection process has involved liaison with Liverpool Plains Shire Council officers; identification of environmental and topographical constraints; existence of necessary infrastructure including accessways, power lines and sub-stations; proximity to the settlement of Quirindi to enable supply of power direct to the township; sufficient cleared land area; willingness of the land owner to develop the property and enter lease arrangements to facilitate the solar farm; and the availability of solar resources.

The application is not integrated development as there are no separate approvals required to be issued under section 4.46 of the *Environmental Planning and Assessment Act 1979*. The development is satisfactory to the objects of the *Environmental Planning & Assessment Act 1979* and applicable environmental planning instruments. The land is zoned RU1 Primary Production under *Liverpool Plains LEP 2011*. The development is defined as *electricity generating works* which means a building or place used for the purpose of making or generating electricity. The proposed development of the Quirindi 1B Solar Farm is to be located on land zoned RU1 and the use is prohibited in that zone. However, it is made permissible by provisions of *SEPP (Transport and Infrastructure) 2021*.

The proposed development is consistent with the statutory planning framework that applies to the local government area, the site itself and to the development of electricity generating works. The strategic goals, objectives and actions of the *Central West and Orana Regional Plan 2041*, the *Liverpool Plains Growth Management Strategy 2009* and the *Liverpool Plains Shire Local Strategic Planning Statement 2040* are also satisfied.

Key issues are potential impacts on biodiversity, management of water issues, access to the site and traffic impacts, the effects of noise emissions, impacts on agricultural uses and impacts on scenic amenity. The likely impacts of the development have been considered and measures recommended to avoid, minimise or mitigate these impacts. The use is suited to a rural location due to the need for a large land area and the ability to connect to the local electrical transmission network. The addition of a solar farm to the rural area of Quirindi would not detract unreasonably from local amenity or the natural environment.

The expected operating life of the Quirindi 1B Solar Farm (excluding the construction and decommissioning phases) is expected to be approximately 35 years depending upon market conditions. The proponent is seeking a flexible approach to any limits imposed on the period of operation of the solar farm that enables the operator to respond to market conditions and any technological changes that occur over the next few decades.

The NSW Government is committed to achieving a 50% emissions reduction by 2030 and net zero emissions by 2050. The aim is to produce 82% of the state's energy needs using renewable facilities by 2030. . The

Commonwealth Government's target is to reduce emissions in 2030 to 43% below 2005 levels, for 82% of Australia's energy to be generated by renewable technologies in 2030 and net zero in 2050.

Electricity generated by the system will be directed to the settlement of Quirindi via existing electrical infrastructure to contribute to the supply of electricity for use by households and businesses. The solar farm will generate community economic benefits through local employment opportunities during the planning and construction phases as well as maintenance and inspection jobs once operational. The land may continue to be used for agriculture and returned to its current condition once the facility is decommissioned. It will assist the Commonwealth and NSW Government to achieve targets and objectives relating to emissions to address climate change.

The cumulative impacts of the proposed development are minor as the proposal is a small town-scale facility. Several solar farms have been developed in neighbouring areas but there have been no other solar farm proposals in the vicinity of the development site. There is sufficient capacity in the electricity grid system to accommodate the Quirindi 1B Solar Farm as evidenced by prior arrangements made by ITP Development to connect to Essential Energy infrastructure.

## 1. INTRODUCTION

### 1.1 Overview

The purpose of this Statement of Environmental Effects is to support an application to Liverpool Plains Shire Council to develop a solar farm at Lots 130 and 134 DP 751009 Borah Creek Road, Quirindi, referred to as the Quirindi 1B Solar Farm. The application is for regionally significant development that needs consent and is to be determined by the Northern Regional Planning Panel.

The purpose of this report is to assist Council's assessment of the proposal against the matters for consideration listed in section 4.15 of the *Environmental Planning and Assessment Act 1979*.

The proposal is not integrated development as there are no other approvals that are required to be issued under section 4.46 of the *Environmental Planning and Assessment Act 1979*. Table 1 below is a checklist of this application against relevant sections of legislation that may generate the need for a separate approval.

**Table 1: Integrated development checklist**

Act	Provision	Approval	The proposal	Integrated (Y/N)
<b>Coal Mine Subsidence Compensation Act 2017</b>	s 22	approval to alter or erect improvements, or to subdivide land, within a mine subsidence district	The land is not designated a mine subsidence district	No
<b>Fisheries Management Act 1994</b>	s 144	aquaculture permit	It is not proposed to carry out aquaculture	No
	s 201	permit to carry out dredging or reclamation work	It is not proposed to carry out dredging or reclamation work	No
	s 205	permit to cut, remove, damage or destroy marine vegetation on public water land or an aquaculture lease, or on the foreshore of any such land or lease	It is not proposed to remove, damage or destroy marine vegetation	No
	s 219	permit to— (a) set a net, netting or other material, or	It is not proposed to carry out any works across or within a bay, inlet,	No

Act	Provision	Approval	The proposal	Integrated (Y/N)
		(b) construct or alter a dam, floodgate, causeway or weir, or (c) otherwise create an obstruction, across or within a bay, inlet, river or creek, or across or around a flat	river or creek, or across or around a flat	
<b>Heritage Act 1977</b>	s 58	approval in respect of the doing or carrying out of an act, matter or thing referred to in s 57(1)	The application does not relate to an interim heritage order or an item listed on the State Heritage Register	No
<b>Mining Act 1992</b>	ss 63, 64	grant of mining lease	The development does not involve an application for a mining lease	No
<b>National Parks and Wildlife Act 1974</b>	s 90	grant of Aboriginal heritage impact permit	Due diligence indicates that there is no item or place of Indigenous significance and an application is not being made for a permit	No
<b>Petroleum (Onshore) Act 1991</b>	s 16	grant of production lease	The development does not involve an application for a petroleum production lease	No
<b>Protection of the Environment Operations Act 1997</b>	ss 43(a), 47 and 55	Environment protection licence to authorise carrying out of scheduled development work at any premises.	The application does not involve scheduled development	No
	ss 43(b), 48 and 55	Environment protection licence to authorise carrying out of scheduled activities at any premises (excluding any activity described as a "waste activity" but including any activity described as a "waste facility").	The application does not involve scheduled activities	No
	ss 43(d), 55 and 122	Environment protection licences to control carrying out of non-scheduled activities for the purposes of regulating water pollution resulting from the activity.	The application does not involve non-scheduled activities that would generate water pollution	No
<b>Roads Act 1993</b>	s 138	consent to— (a) erect a structure or carry out a work in, on or over a public road, or	There are no works proposed or required to be	No

Act	Provision	Approval	The proposal	Integrated (Y/N)
		(b) dig up or disturb the surface of a public road, or (c) remove or interfere with a structure, work or tree on a public road, or (d) pump water into a public road from any land adjoining the road, or (e) connect a road (whether public or private) to a classified road	undertaken on a classified road	
<b>Rural Fires Act 1997</b>	s 100B	authorisation under section 100B in respect of bush fire safety of subdivision of land that could lawfully be used for residential or rural residential purposes or development of land for special fire protection purposes	The application does not involve subdivision for a residential use or a special fire protection purpose	No
<b>Water Management Act 2000</b>	ss 89, 90, 91	water use approval, water management work approval or activity approval under Part 3 of Chapter 3	The proposed development is not located in close proximity to a watercourse and does not necessitate a controlled activity approval. The application does not involve a water use approval or water management work approval	No

## 1.2 Scope of the report

This Statement has been prepared having regard to information that has been sourced from the Council's website, the NSW legislation website, SIX Maps, the website of the Department of Planning & Environment, the Planning Portal and SEED (Sharing and Enabling Environmental Data). All information referenced in this Statement has been sourced from publicly available documents or websites and from expert reports produced to support the application that are listed in Table 2. A Property Report sourced from the Planning Portal is appended as Attachment A.

This statement is accompanied by the documents listed in Table 2 which support the development application and have been submitted under separate cover.

Note that the findings and recommendations of expert reports that accompany the application are summarised in this Statement. Further information about these matters should be sought from the original documents.

**Table 2: Development application documents**

<b>Plan/Doc No.</b>	<b>Plan/Doc Title</b>	<b>Prepared by</b>	<b>Issue</b>	<b>Date</b>
<b>QDI1B</b>	Quirindi 1B Solar Farm Drawing Pack	ITP Development Pty Ltd	-	01/05/24
<b>MAC180781-24RP1V1</b>	Noise Assessment	Muller Acoustic Consulting Pty Ltd	-	12/01/24
<b>K1058</b>	Traffic Impact Assessment Report	Price Merrett Consulting Pty Ltd	2	22/02/24
-	Water Assessment	ITP Renewables	2	09/01/24
<b>23073</b>	Glare and Glint Assessment	ITP Renewables	2	11/01/24
-	Waste and Decommissioning Assessment	ITP Development Pty Ltd	2	15/01/24
-	Fire and Hazard Assessment	ITP Development Pty Ltd	3	01/05/24
-	Biodiversity Inspection Report	Red-Gum Environmental Consulting Pty Ltd	-	13/12/23
<b>0523</b>	Visual Impact Assessment	Zenith Town Planning Pty Ltd	Final	08/01/24

### **1.3 The proponent**

The proponent for the proposed solar farm is ITP (Development) Pty Ltd. ITP (Development) is a private sector organization based in Canberra and Sydney, which was established in 2003. It is part of the IT Power Group which was formed in 1981 in the UK to bring together specialists in renewable energy, energy efficiency and carbon markets. IT Power offers expertise in renewable energy and energy efficiency, including research, development and implementation, managing and reviewing government incentive programs, high level policy analysis (including carbon markets), engineering design and project management.

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## 1.4 Justification

Solar energy is energy created by the heat and light of the sun. Solar power is produced when this energy is converted into electricity or used to heat air, water, or other substances. Australia has the highest average solar radiation per square metre of any continent in the world. Despite uncertainty regarding energy policy, the Commonwealth and NSW Governments have recognized the need to supplement energy derived from fossil fuels with energy generated from renewable sources. Alternative energy supply may be sourced from solar photovoltaic, geo-thermal, solar thermal, wave and tidal action, and wind.

The development of solar photovoltaic power is well underway in NSW and across Australia. This growth in the local solar PV sector continues to provide a significant boost for Australia's regional economy with renewable infrastructure development estimated to create upwards of 2,300 direct jobs plus indirect employment.

According to the Australian Renewable Energy Agency (ARENA), the deployment of household solar PV that generates about 5 kW is expected to continue and at the same time an increase in rooftop solar PV installations on commercial premises generating around (10-100 kW) is expected. Large scale solar PV is also rapidly expanding in Australia with several solar farms being constructed that will have the capacity to generate over 50MW. The proposed solar farm aims to fill the gap in the mid-sized plants. It will generate 5MW of AC power and contribute to renewable energy supply to supplement electricity generation from coal, oil and gas.

The proposed development is in accordance with relevant objects of the *Environmental Planning and Assessment Act 1979* in that it will assist to generate power to be distributed to residents of NSW thereby promoting the social and economic welfare of the community in a manner that manages and conserves natural resources. The proposed solar farm will further the goals of sustainability, and the orderly and economic use of land.

## 1.5 Electromagnetic radiation

The information presented in this section has been sourced from the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA). It includes a description of the type of electromagnetic radiation that may be produced by the generation and distribution of electricity.

The generation, distribution and use of electricity can produce extremely low frequency (ELF) electromagnetic fields (EMF) from electrically charged particles. The electric field is produced by the

voltage whereas the magnetic field is produced by the current. The strength of the electric field is measured in units of volts per metre whilst the strength of the magnetic field is expressed in units of tesla (T), microtesla ( $\mu$ T), gauss (G) or milligauss (mG).

ELF EMF is produced by both natural and artificial sources. Naturally occurring ELF EMF is associated with atmospheric processes such as ionospheric currents, thunderstorms and lightning. Artificial sources are the dominant sources of ELF EMF and are usually associated with the generation, distribution and use of electricity at the frequency of 50 or 60 Hz. The widespread use of electricity means that people are exposed to ELF electric and magnetic fields in the home, in the environment and in the workplace.

According to the Australian Radiation Protection and Nuclear Safety Agency, which maintains continual oversight of emerging research into the potential health effects of the EMF exposure, there is no established evidence of health effects from exposure to electric and magnetic fields from powerlines, substations, transformers or other electrical sources, regardless of proximity.

## 2. SITE DESCRIPTION AND CONTEXT

### 2.1 Description

The site of the proposed Quirindi 1B Solar Farm is described as Lots 130 and 134 DP 751009 Borah Creek Road, Quirindi, NSW that are part of a parcel comprising 8 lots over 141.75 hectares. The property is located approximately 5 kilometres north-east of Quirindi town centre and about 4 kilometres from the edge of the urban area. The site is currently vacant and is used for cropping.

The location of the site is shown in Figure 1 below.

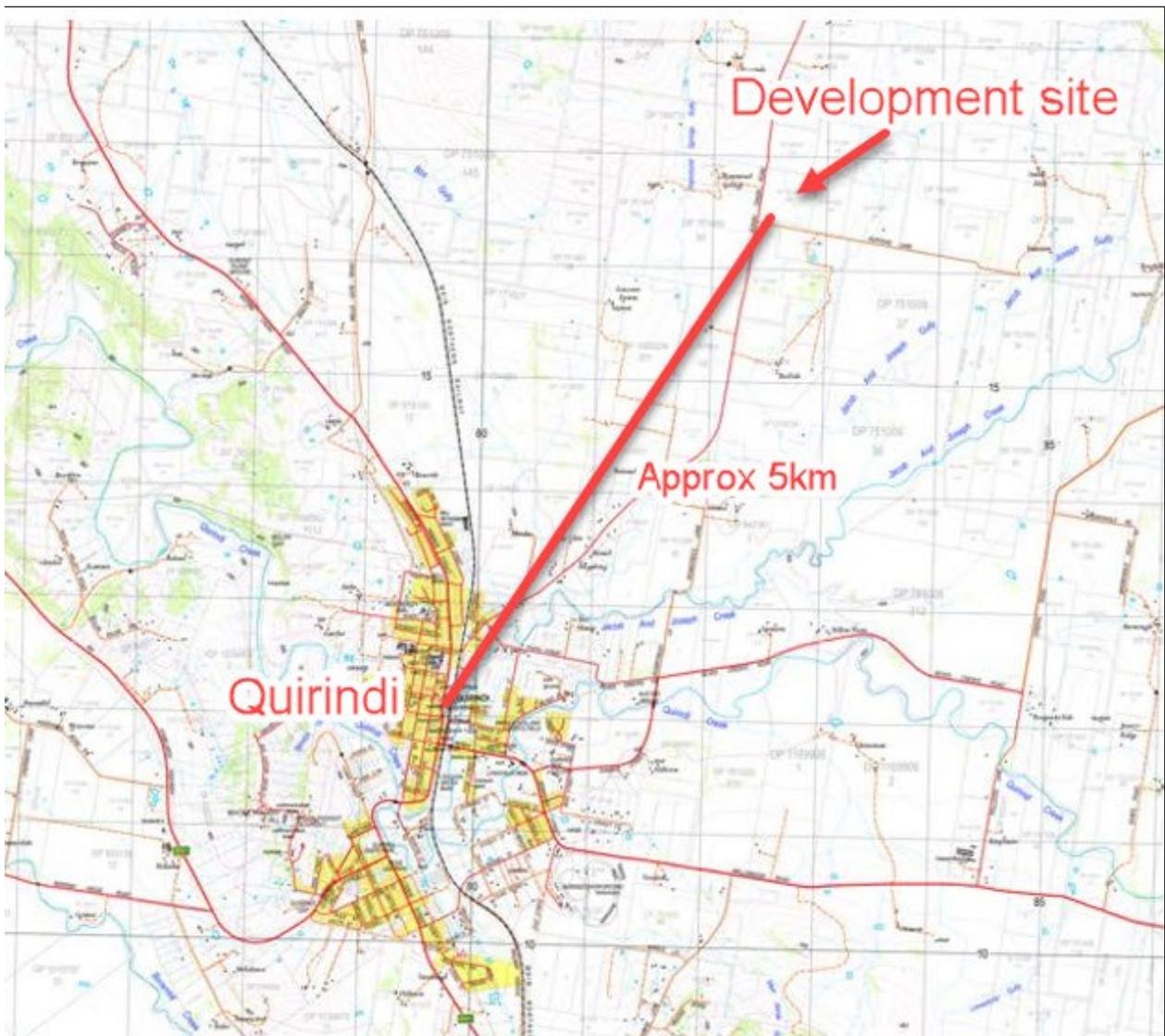


Figure 1: Locality map. Source: SEED, 2023

The development site is located at the intersection of Borah Creek Road which is a sealed road and Porters Lane which is unsealed. The solar farm array is proposed on Lot 130 DP 751009 and is to be accessed from an existing track that runs along the western boundary of Lot 134 DP 751009. Lot 130 is currently under crop and contains four eucalypts in the south-west corner. A row of mature eucalypts exists along the southern boundary within the Porters Lane road reserve which is 50 metres wide alongside Lot 130 reducing to 20 metres adjoining Lot 134. A large cluster of eucalypts exists in the south-western section of Lot 134. The topography of the site is flat with a very slight crossfall to the east. There are no natural watercourses within the property considered for the solar farm although a man-made drainage channel has been cut along the eastern boundary within Lot 130 parallel to the access track.

Current access to the site is by way of an entrance off Porters Lane through existing farm gates at the south-western corner of Lot 134. Porters Lane adjoins the southern boundary of Lots 130 and 134, is unsealed and the road reserve is vegetated with grasses. 11kV power lines run north-south along Borah Creek Road and east-west along Porters Lane.



Figure 2: Aerial image with cadastre. Source: SIX Maps

## 2.2 Context

Liverpool Plains local government area is located in the north west slopes region of NSW. Its traditional custodians are the Gamilaraay people. The township of Quirindi is the administrative centre of the LGA which includes the villages of Blackville, Premer, Spring Ridge, Pine Ridge, Caroona, Werris Creek, Currabubula, Wallabadah, Ardglen and Willow Tree. Quirindi township is located approximately 350 kilometres north-west of Sydney GPO.

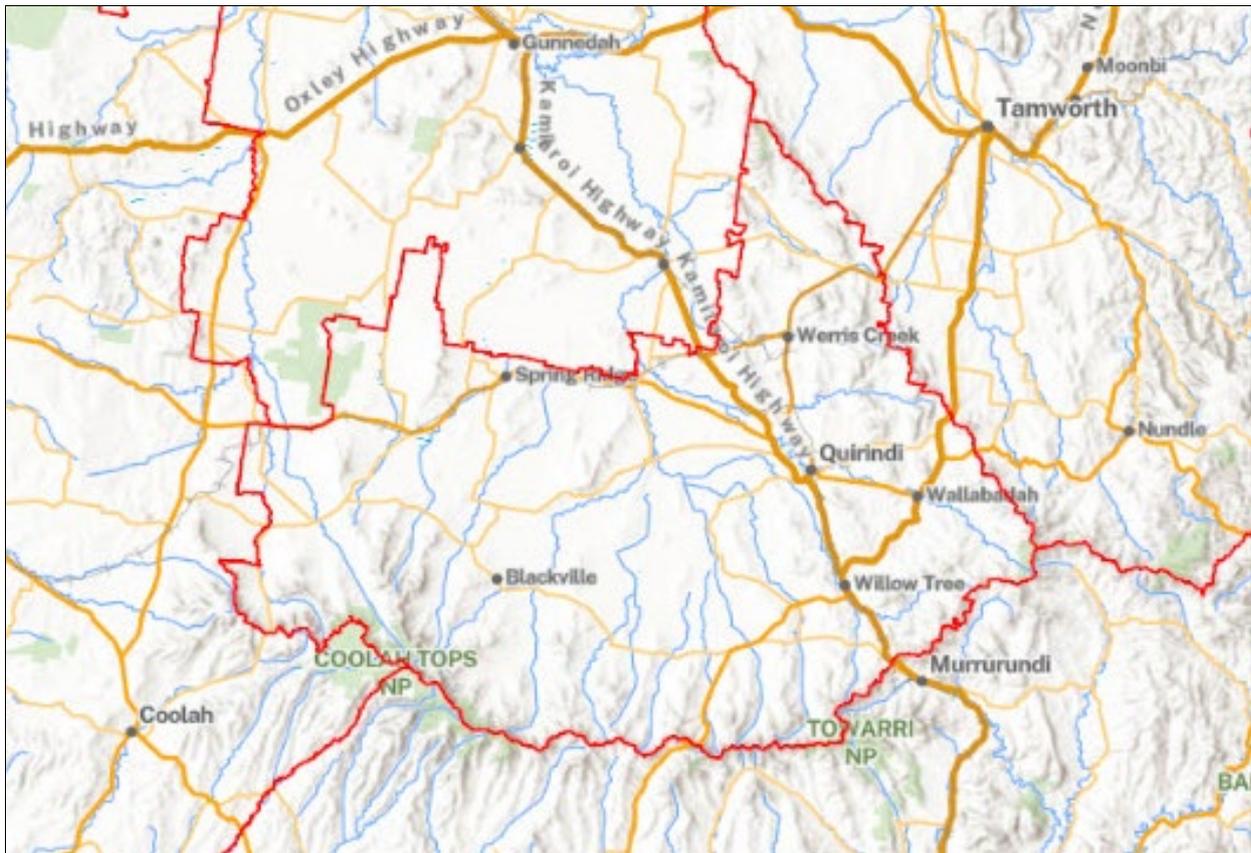


Figure 3: Liverpool Plains LGA. Source: NSW Office of Local Government

Land surrounding the development site is predominantly used for farming with some rural living development. There are scattered remnant and regrowth patches of native vegetation along road reserves, property boundaries and within paddocks. Quipolly dam lies approximately 5 kilometres to the north of the site and is accessed via Borah Creek Road. A motorcross track and shed are sited on the southern side of Porters Lane opposite the development site.



Plate 1: Quipolly Dam from Borah Creek Road

## 2.3 Climate

Global solar exposure is described by the Australian Bureau of Meteorology as being the total amount of solar energy falling on a horizontal surface. The daily global solar exposure is the total solar energy for a day. Typical values for daily global solar exposure range from 1 to 35 MJ/m<sup>2</sup> (megajoules per square metre). The values are usually highest in clear sun conditions during the summer, and lowest during winter or very cloudy days. Global solar exposure coincides with seasons – the longer the daylight hours the greater the solar radiation due to the tilt of the earth during summer months.

Solar exposure estimates are important for a wide range of applications, including for agriculture, power generation and solar heating system design and use. This climatic information sourced from the Australian Bureau of Meteorology indicates that the global solar exposure, or solar radiation, is sufficient to support power generation in the proposed location which benefits from the presence of electricity power lines in the vicinity of the development site.

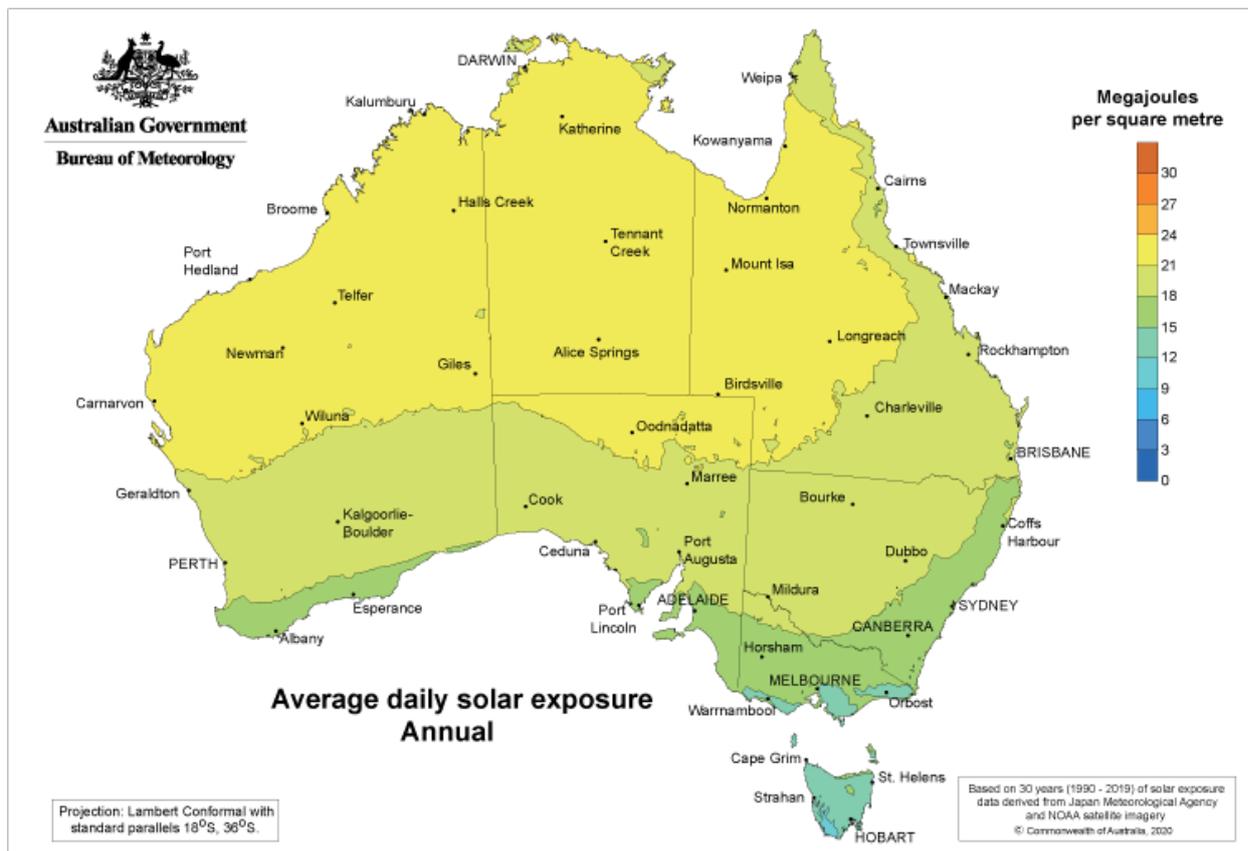
The mean monthly global solar exposure measured at Quirindi Post Office (station number 055049), the closest measuring station to the solar farm site, is given in Table 3 below. The annual mean daily global

exposure for 2022 was 17.3MJ/m<sup>2</sup>. This data demonstrates that Quirindi receives adequate solar energy to harness and convert to clean electricity and the area is suitable for solar electricity generation.

**Table 3: Mean monthly global solar exposure at Quirindi Post Office, 2022**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly mean	23.5	21.6	16.1	14.1	11.3	10.9	10.7	12.7	16.2	19.4	25.0	26.1

The map below (Figure 4) indicates that Quirindi receives an average daily solar exposure of 15 to 18 MJ/m<sup>2</sup> based on readings taken over the 30-year period from 1990 to 2019. This map has been sourced from the Australian Bureau of Meteorology.



**Figure 4: Average daily solar exposure. Source: Australian Bureau of Meteorology**



**Plate 2: Looking across the site from the intersection of Porters Lane and Borah Creek Road**



**Plate 3: Looking south along Borah Creek Road with the site in the distant left side**

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### 3. DETAILS OF THE PROPOSED DEVELOPMENT

#### 3.1 Overview

ITP Development Pty Ltd is proposing to construct a solar farm with a DC capacity of 7.5 MWp and AC output of 5.0 MW on an approximately 11.09 ha site that is currently used for cropping. The estimated development cost of the solar farm is estimated to be \$8.67 million.

There are to be approximately 10,750 solar modules installed in 128 rows (each row being approximately 92 m long) running east to west. There is approximately 6.0 m spacing between each row. The height of each module is approximately 2.0 m to 2.75 m and the mounting system is constructed on piles that are driven into the ground, typically within the depths of 1.5 m to 3 m. Each row of solar photovoltaic (PV) modules will rotate to track the sun across the sky from east to west each day.

The solar farm will also consist of an inverter station, which incorporates the high/medium voltage switchgear and transformers, and two 3.4 MW inverters. The inverter station is ground mounted and incorporated on a 12.19 m skid. Allowance is made for a 2.9-metre high battery energy storage system (BESS) on a 12.1m skid alongside the inverter stations.

The array is to be wholly contained within Lot 130 with access off Porters Lane using an existing track into Lot 134. The layout and exact placement of the array is shown on General Arrangement Plan prepared by ITP Development Pty Ltd.

#### 3.2 Construction and maintenance

The mounting system for the PV panels is constructed on piles that are driven into the ground using a vibrating pile driver. The piles will be driven approximately 1.5 to 3.5 metres into the ground, as to be confirmed by a geotechnical and structural engineer.

During construction there is expected to be up to 50 personnel engaged with only approximately 30 workers on site at any time between 7.00am and 4.00pm Monday to Friday. The construction is expected to take approximately three months. Should it be necessary to carry out work outside these hours then activities would be limited to those generating low noise emissions.

Once operational the site will be unmanned. Maintenance is expected to be carried out quarterly by a crew of 2 to 3 people. Maintenance workers would not be required to remain on site. Cleaning of the PV

panels would be carried out on an annual basis to maximise the performance of the system. This is done using water brought into the site and a sponge mop.

Labourers comprise 14.3% of the labour force of Liverpool Plains Shire, technicians and trades workers 11.4% and machinery operators and drivers 13.4%. Workers for construction of the facility and ongoing maintenance would be sourced locally where possible or from nearby larger centres such as Gunnedah and Tamworth. Should all workers come from outside the immediate area, there is adequate accommodation available to cater for them in visitor accommodation establishments in Quirindi and surrounding area plus short-term rentals and unregulated accommodation providers.

Construction may be limited to the off-peak tourist season if necessary. It is important to ensure that the timing of construction of the solar farm does not coincide with the period of construction of other infrastructure or local events that attract visitors to avoid additional pressure on visitor accommodation.

### **3.3 Access and car parking**

It is proposed to utilise the existing access entry into the development site off Porters Lane located at the south-western corner of Lot 134 and 460 metres east of the intersection of Porters Lane and Borah Creek Road. A 4metre wide internal access track will be constructed to enter Lot 130 at the south-eastern corner of Lot 130 which then follows the southern boundary to the western edge of the array then north to the centre western edge of the array. This route avoids the need for a culvert to be installed to enable crossing of the man-made drainage line that runs parallel to and between the development footprint and the access track.

A temporary materials laydown and car parking area is to be located at the centre of the western edge of the array. It is expected that temporary car parking for up to 24 small vehicles will be needed to cater for the 30 construction workers at the rate of 0.8 spaces per worker. A shuttle bus to transport construction workers to and from Quirindi will be provided if feasible.

Car parking spaces will be temporary and not require bitumen sealing. Permanent parking spaces for the maintenance crew are not considered necessary as maintenance activities would be carried out by way of a utility vehicle carrying a water cube and mowing/slashing equipment. The crew will be mobile and moving around and between rows of panels to clean and maintain grasses.

Traffic generation is given in Table 4 below. It is proposed that heavy vehicles only access the site between 10.00am and 2.00pm.

**Table 4: Expected traffic generation**

Phase	Description of vehicles	Expected one-way vehicle movements
<b>Establishment</b>	10-15 trucks and trailers to deliver gravel with 4 to 5 workers with 2 persons per vehicle	5 vehicle trips per day for 2 to 3 days
	Light vehicles	6 to 8 vehicle trips per day
<b>Construction</b>	45 B-double articulated trucks of 26m length to deliver equipment	4 vehicle trips per day on average non-peak
	24 light vehicle one-way trips for 30 construction workers (worst case without shuttle bus and one person per vehicle)	24 vehicle trips per day
	Potential shuttle bus service to and from the site	2 vehicle trips per day
<b>Commissioning</b>	Light & 12 metre heavy rigid vehicles for 10 workers with 2 persons per vehicle	5 vehicle trips per day
<b>Operational</b>	1 light vehicle for maintenance contractor	1 vehicle trip every 2 to 3 months

### 3.4 Services

Reticulated water and sewer services are not required to be provided to the solar farm as there are no permanent offices or amenities proposed on site. Portaloos for wastewater disposal (see <https://www.kennards.com.au/site-equipment/showers-toilets.html> ) and water supply by way of a portable tank or cart ( <https://www.kennards.com.au/site-equipment/water-tank.html> ) are proposed to be installed during the construction phase.

### 3.5 Landscaping

In line with the recommendations of the *Visual Impact Assessment*, it is considered that landscaping to screen the facility is not necessary. A setback of 121 metres from Borah Creek Road at the nearest point of the security fence will mean visual impacts to Borah Creek Road are minimised. Existing trees within the Porters Lane road reserve and within Lot 134 will partially screen the facility from this public road.

No trees are to be removed during construction or for operation of the solar farm. Land that is disturbed during construction of the solar farm and not to be used for access or other maintenance purposes will be sown with grasses following completion of construction to minimise site disturbance.

Regular inspections of the site will be carried out to ensure that grassland is managed to reduce the risk of bushfire to surrounding land and to control weeds. Mowing or slashing between rows of PV panels and in the area immediately surrounding the arrays would be carried out as required. Livestock grazing

may be carried out around and beneath panels and will benefit from condensation of moisture on the panels that will assist the growth of pasture grasses.

### **3.6 Security and setbacks**

The solar array is to be an irregular shape positioned at the south-western section of the parcel. It is to be enclosed within a 1.8 metre high chain mesh fence topped with three rows of barbed wire giving a total height of 2.3 metres. The array is to be setback 10 metres from the security fence to provide an asset protection zone and access for fire-fighting vehicles.

Perimeter lengths are to be 318 metres to the north, 391 metres to the east, 249 metres to the south and 400 metres to the west. The security fence is to be setback 5 metres from the eastern and southern boundaries, 121 metres from the western boundary at the north-western corner of the fence, 188 metres from the south-western corner of the fence, and 50 metres from the northern boundary.

Security lighting is not proposed to be installed.

### **3.7 Waste management**

A *Waste and Decommissioning Assessment* of the waste generated during construction and operation of the proposed solar farm has been carried out by ITP Development Pty Ltd to determine the appropriate means of waste disposal and recycling. The findings of the assessment are summarized below. Reference should be made to the *Waste and Decommissioning Assessment* that is submitted with the development application for further information or clarification of any matter concerning the assessment and recommendations.

The largest amount of waste will be generated during the construction phase and be classified as general solid waste (non-putrescible). Wastes would include wooden pallets, cardboard, plastics, green waste and domestic waste. Construction of a solar farm would not generate any putrescible waste products. Minimal waste would be generated when the farm is operational other than small amounts of replacement parts and packaging required for maintenance and repair works.

Local waste management facilities and capacities are identified in the assessment. Technology for recycling of PV panels is advancing rapidly worldwide and while recycling options currently exist, they are likely to be more advanced and readily available at the time of decommissioning. Options for recycling of PV panels should be reviewed as the project progresses.

Estimates of waste materials and proposed management arrangements for each phase of the development project are provided in Table 5 below.

**Table 5: Estimated waste materials and waste management arrangements**

Waste	Source	Estimated quantity (tbc by contractor)	Bin/container	Disposal and management
<b>Commssioning</b>				
<b>Cardboard</b>	<ul style="list-style-type: none"> <li>Solar panel cardboard packaging</li> </ul>	30m <sup>3</sup>	Cardboard only recycling skip bin (3)	Laydown area to set up skip bins for transfer to waste contractor's off-site facilities or to Liverpool Plains Shire Council waste management facility
<b>Wooden pallets</b>	<ul style="list-style-type: none"> <li>Solar panel shipment</li> <li>Solar tracker mounting shipment</li> </ul>	97 m <sup>3</sup>	Landfill skip bin (15)	Transfer to waste contractor's facilities or to Liverpool Plains Shire Council waste management facility
<b>Plastics</b>	<ul style="list-style-type: none"> <li>Plastic pipe offcuts/scrap</li> <li>Solar panel plastic wrapping</li> <li>Drums used to temporarily store diesel fuel and water</li> <li>Electric cable reels</li> </ul>	Minimal		Transfer to waste contractor's facilities or to Liverpool Plains Shire Council waste management facility
<b>Scrap metal</b>	<ul style="list-style-type: none"> <li>Electric cable waste</li> </ul>	Minimal		Transfer to waste contractor's facilities or engaging a scrap metal merchant
<b>Concrete</b>	<ul style="list-style-type: none"> <li>Excess concrete waste from inverter and battery foundations and piling works</li> </ul>	Minimal		Specialised concrete recycling for repurposing into recycled products
<b>Chemicals</b>	<ul style="list-style-type: none"> <li>Used lubricating oils and filters</li> <li>Unused or spent chemicals</li> </ul>	Minimal	-	Fluids recycled where possible, or transfer to waste contractor's facilities

Waste	Source	Estimated quantity (tbc by contractor)	Bin/container	Disposal and management
<b>Operation</b>				
	<ul style="list-style-type: none"> <li>Waste as a result of maintenance or replacement of equipment</li> </ul>	Minimal	-	Taken offsite to appropriate recycling/disposal
<b>Decommissioning</b>				
<b>PV panels</b>	<ul style="list-style-type: none"> <li>Glass for panels</li> <li>Silicon for wafers</li> <li>Supporting poles and mounts</li> </ul>	10,750 panels, 270 tonnes glass 40 tonnes silicon for wafers	-	Laydown area to set up skip bins for transfer to waste contractor's off-site facilities or to appropriate recycling facility
<b>Scrap metal</b>	<ul style="list-style-type: none"> <li>Electrical cable waste</li> </ul>	860 tonnes scrap metal	Landfill skip bins	Transfer to waste contractor's facilities
<b>Equipment</b>	<ul style="list-style-type: none"> <li>Inverters and batteries</li> </ul>	240 m <sup>3</sup>	Landfill skip bins	Transfer to waste contractor's facilities
<b>Concrete</b>	<ul style="list-style-type: none"> <li>Foundations of the inverter, transformer and battery</li> </ul>	19 m <sup>3</sup>	Concrete recycling bin	Specialised concrete recycling for repurposing into recycled products
<b>Other</b>	<ul style="list-style-type: none"> <li>Fencing and storage containers</li> </ul>	40-ft container (2)	-	Removed from site and reused where possible

Waste management should be predicated on the international hierarchy of waste management to avoid/reduce, reuse, recycle, recover, treat and dispose of waste products to avoid or reduce waste materials where possible, and to re-use, recycle and recover the majority of waste materials generated during each of the construction, operational and decommissioning phases.

It is recommended that a waste management plan be developed to provide detailed procedures to manage the waste stream. The plan should contain:

- Strategies to reduce waste during all project phases,
- Recycling, re-use and recovery strategies and opportunities,
- Classification of all waste streams with a tracking register and details,
- On site recycling management,

- Allocation of responsibilities for recycling, re-use and disposal, and
- Reporting and notification procedures if a waste incident occurs and there is a threat to the environment.

### 3.8 Decommissioning

The expected operating life of the Quirindi 1B Solar Farm (excluding the construction and decommissioning phases) is expected to be approximately 35 years depending upon market conditions. The proponent is seeking a flexible approach to any limits imposed on the period of operation of the solar farm that enables the operator to respond to market conditions and any technological changes that occur over the next few decades.

Upon decommissioning all infrastructure, including cabling and panels and mounting frames including footings and inverters would be disassembled and removed from the site. ITP Development Pty Ltd uses photovoltaic panels that may contain small amounts of silver, tin and lead, much of which are recoverable and also disposed of (if applicable) in a safe manner at decommissioning stage. The panels used are identical to those found in residential rooftop solar panels across Australia. Solar panels are made almost entirely with abundant, earth-friendly materials like glass, aluminium, copper, and silicon. Solar farms do not produce air or water pollution or greenhouse gases in operation.

Decommissioning will involve:

- Notification of stakeholders (e.g. Essential Energy, Liverpool Plains Shire Council) of proposed de-energisation,
- De-energisation of the solar farm and disconnection of assets,
- Removal of PV modules and associated infrastructure,
- Removal of electrical wiring, and
- Remediation of land.

Relevant equipment will be brought on to the site to facilitate decommissioning, including amenities for site crew for the duration of the works. This equipment may include mobile cranes, excavators, skid steers, loaders, rollers/compactors, pile drivers, telehandlers, skip bins, water carts, temporary shipping containers for storage, site office and site ablution blocks.

Full details of the process are provided in the *Waste and Decommissioning Assessment* prepared by ITP Development Pty Ltd. Reference should be made to that report for an explanation of each step in the decommissioning process.

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## 4. STATUTORY FRAMEWORK

### 4.1 Legislation

#### 4.1.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment (EPA) Act 1979* is the principal piece of legislation governing the use and development of land in NSW. The objects of the Act are:

- (a) *to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,*
- (b) *to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,*
- (c) *to promote the orderly and economic use and development of land,*
- (d) *to promote the delivery and maintenance of affordable housing,*
- (e) *to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,*
- (f) *to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),*
- (g) *to promote good design and amenity of the built environment,*
- (h) *to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,*
- (i) *to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,*
- (j) *to provide increased opportunity for community participation in environmental planning and assessment.*

The objects of the EPA Act are intended to guide land planning and management. Section 4.15 of the Act lists matters for consideration when assessing and determining an application for development.

#### 4.1.2 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* introduced the *Biodiversity Offsets Scheme* which is used to determine whether the *Biodiversity Assessment Method* is necessary to assess the impacts of a development proposal on threatened species, endangered ecological communities and habitats. Determining whether a *Biodiversity Development Assessment Report* is required under the *Biodiversity Conservation Act 2016* and subsequently whether the *Biodiversity Offsets Scheme* would apply to the proposed works is subject to three steps.

- The first step is to identify whether the site is mapped on the *Biodiversity Values Map*.
- The second step is to estimate whether the extent of native vegetation to be cleared for the proposed development is above the clearing threshold for the minimum lot size.
- The third step is to carry out a test of significance to predict whether impacts on biodiversity are likely to be significant.

Under the *Biodiversity Offsets Scheme*, offset obligations may apply where the biodiversity assessment finds that the removal of vegetation to facilitate the development will have significant impacts on flora. These offsets are in the form of credit obligations whereby payment is made to a biodiversity conservation fund which enable vegetation removal and provides funds to assist to preserve the same vegetation community elsewhere. Credit obligations also apply to fauna species where particular species are likely to be living in or frequenting the property. These matters are addressed in section 5.1 *Biodiversity* of this Statement.

#### **4.1.3 Water Management Act 2000**

The *Water Management Act 2000* includes provisions to control or permit works near a watercourse or stream. Works within specified distances of the top of the bank of a watercourse may necessitate issue of a *controlled activity approval* by the Natural Resources Assessment Regulator. Impacts on surface and groundwaters are addressed in 5.3 *Water resources* of this Statement.

#### **4.1.4 Local Land Services Act 2013**

The *Local Land Services Act 2013* regulates the clearing of native vegetation on rural land and where an activity is permitted without Council consent. There are two broad categories of land under the LLS Act - Category 1 (Exempt) land and Category 2 (Regulated, Vulnerable or Sensitive) land which are shown on the Native Vegetation Regulatory Map .

Clearing may be authorised on Category 1 (Exempt) Land but only where the activity is permitted without consent and when no other permit is required under other legislation. The onus is on the applicant to ensure they are not committing an offense under other legislation. If located on Category 2 (Regulated, Sensitive or Vulnerable) Land, the clearing may be authorised as an Allowable Activity or under the Land Management (native vegetation) Code within the *LLS Act*. If the clearing on Category 2 Land is not an Allowable Activity or is not authorised under the Land Management (native vegetation) Code, the clearing will need to be offset under the Biodiversity Offset Scheme. This means a Biodiversity Development Assessment Report is needed and the clearing will need to be approved by the Native Vegetation Panel.

The LLS Act does not apply to the proposed solar farm as development consent is required to be obtained to enable the works to proceed.

#### **4.1.5 National Parks and Wildlife Act 1974**

The objectives of the *National Parks and Wildlife Act 1974* are to conserve and protect habitat, ecosystems, biodiversity, landforms, landscapes and objects, places or features of cultural value in NSW. Under the NPW Act, it is an offence to knowingly harm or desecrate an Aboriginal object. Harm includes destroy, deface or damage an Aboriginal object or Aboriginal Place, and in relation to an object, move the object from the land on which it has been situated. Aboriginal objects include sites, relics or cultural material such as scar trees, middens and ancestral remains.

The NPW Act can also protect areas of land that have no Aboriginal objects, that is, they may have no physical evidence of Aboriginal occupation or use. These areas can be declared 'Aboriginal places' if they have spiritual, natural resource usage, historical, social, educational or other type of significance.

Anyone who exercises due diligence in determining that their actions will not harm Aboriginal objects has a defence against prosecution for the strict liability offence if they later harm an object. The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* provides a process whereby a reasonable determination can be made as to whether or not Aboriginal objects will be harmed by an activity, whether further investigation is warranted and whether the activity requires an application for an Aboriginal Heritage Impact Permit.

#### **4.1.6 Heritage Act 1977**

The aims of the *Heritage Act 1977* are to identify, protect and conserve items of State heritage significance. Provisions of the Heritage Act facilitate the establishment of a State Heritage Register for the listing of items of State significance and the preparation of conservation management plans for these items. The Heritage Act also sets out the procedures for the approval of works relating to items listed on the State Heritage Register. Impacts on listed heritage items are addressed in section 5.9 *Heritage* of this Statement.

#### **4.1.7 Noxious Weeds Act 1993**

The aims of the *Noxious Weeds Act 1993* are to prevent the establishment, reduce the risk of spread and minimise the extent of noxious within NSW. The extent of noxious weeds and procedures to eradicate

weed infestation from the development site are addressed in section 3. *Details of the proposed development* in this Statement.

#### **4.1.8 Roads Act 1993**

Under section 138 of the Roads Act 1993, consent is required to carry out works in, on or over a public road, remove or interfere with a structure, work or tree on a public road or connect a road to a classified road. The consent of Transport for NSW is required in the case of works relating to a classified road. Traffic impacts are addressed in section 5.6 *Traffic* and access of this Statement.

#### **4.1.9 Commonwealth Environment Protection and Biodiversity Conservation Act 1999**

The *Environment Protection and Biodiversity Conservation Act 1999* aims to protect nationally and internationally important flora, fauna, ecological communities and heritage places. The approval of the Commonwealth Minister for the Environment is required for actions that may have a significant impact on matters of national environmental significance. The *EPBC Act* also requires Commonwealth approval for certain actions on Commonwealth land.

An assessment of the potential impact of the proposed works on any matters of national environmental significance under the *EPBC Act* and the need for referral to the Commonwealth is provided in section 5.1 *Biodiversity* of this Statement.

## **4.2 State Environmental Planning Policies**

### **4.2.1 State Environmental Planning Policy (Resilience and Hazards) 2021**

*Chapter 4 Hazardous and offensive development of SEPP (Resilience and Hazards) 2021* and the *Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis* require that a preliminary hazard assessment (PHA) be prepared for potentially hazardous or offensive development. ITP Development Pty Ltd has carried out a hazard analysis and risk screening, submitted separately and entitled *Fire and Hazard Assessment*.

The results of risk screening are that a PHA is not required for dangerous goods to be stored on the site. However, the following management measures have been recommended to be implemented:

- Installing reliable, automated monitoring and control systems, with an alarm and shutdown response capability,

- Taking reasonable and safe measures to prevent the risks of external heat effects in the event of a bushfire,
- Designing appropriate separation and isolation between battery cubicles, and between the BESS and other infrastructure, in accordance with the manufacturer's recommendations, and including gravel set-off areas around the facility,
- Compliance with all applicable Australian codes and standards,
- Preparation of a BESS-specific fire response plan, in conjunction with the NSW Rural Fire Service,
- Installing an adequate automatic fire suppression system integrated into the detection and control system,
- Disposal (and where possible, recycling) of any potentially hazardous material in accordance with the best international practices available at that time, and
- Fuels and pesticides/herbicides in use at the site will be stored at the laydown area in appropriately bunded areas designed in accordance with AS1940-2004.

In terms of fire safety including the threat of bushfire, the report recommends that the facility with battery storage can be made safer through the integration of safety in design principles from bushfire standards including APZ clearances, internal protection areas, comprehensive system fault monitoring, automated fire detection and suppression systems and safety procedures built into WHS policies and procedures to ensure these farm assets and the surrounding area are protected from the risk of fire.

The layout of the solar array is proposed to include an Asset Protection Zone (APZ) surrounding the entire site with a 10 metre wide setback from a non-combustible chain-link fence. The APZ will not be located on land exceeding a slope of 18 degrees. This 10 metre wide APZ is also intended to act as a defensible space and a buffer against radiant heat effects for emergency services. A 10 metre wide APZ shall also be established around the battery station (which includes the cubicles, switching station and associated structures of the BESS) and other infrastructure such as the inverter station and DC-DC converters located at the centre of the array.

Road access to the site and fencing are excluded from the APZ. Internal access roads are to be 5.5 metres width with 4 metres of gravel and vertical clearances of 4 metres. Internal curves of the APZ and inner protection area (IPA) are designed with minimum 6 metre radius turning circles to assist in vehicle access. The 10 metre APZ around the array provides access for fire-fighting vehicles. The surface of the site is level and fire-fighting vehicles are able to traverse and manoeuvre through the grasslands with open vision and adequate ability to pass each other.

The solar farm includes an early warning system of issues such as earth faults and automatically initiates safety systems to prevent uncontrolled outbreaks of hazards such as electricity disturbances on the grid or localised issues such as fire.

*Chapter 4 Remediation of land of SEPP (Resilience and Hazards) 2021* requires the consent authority to consider whether land is contaminated and to determine whether the proposed use is suitable with or without contamination. Council can require an applicant for development to conduct a preliminary investigation and a subsequent more detailed investigation if warranted. Where contamination exists and remediation is necessary, Council must be satisfied that the remediation will take place before the land is used for the proposed purpose. It is noted that should the preliminary investigation identify contamination on the site then the *NSW Contaminated Land Planning Guidelines* apply to subsequent investigations.

#### **4.2.2 State Environmental Planning Policy (Transport and Infrastructure) 2021**

*Chapter 2 Infrastructure of SEPP (Transport and Infrastructure) 2021* aims to facilitate the delivery of infrastructure across NSW. The policy contains provisions relating to approval processes and assessment requirements for infrastructure proposals according to the type or sector of infrastructure. It outlines land use zones where types of infrastructure are permissible with or without consent and identifies certain works as exempt and complying development.

Part 2.3 Division 4 of the policy relates to electricity generating works and solar energy systems. Section 2.36(9) enables the development of a solar energy system with consent by any person on any land. Part 3 Division 4 of the policy relates to electricity generating works and solar energy systems. The proposed development is permitted with consent by *SEPP (Transport and Infrastructure) 2021*.

Section 2.42 applies to the development of a solar energy system that is state or regionally significant in a mapped regional city. Under this section the consent authority must be satisfied that the development is located to avoid significant conflict with existing or approved residential or commercial uses of land surrounding the development. The consent authority must also be satisfied that the development is unlikely to have a significant adverse impact on the regional city's capacity for growth, or scenic quality and landscape character. Quirindi is not mapped as a regional city under this policy.

Part 2.3 Division 5 of the policy relates to energy transmission or distribution. Section 2.48 requires the consent authority to consult with the electricity supply authority where development occurs near electricity infrastructure. If an electricity line runs within an easement on or near the development site,

or the development is adjacent a substation, the consent authority is to consult the energy authority prior to determination of the application.

Part 2.3 Division 17 relates to roads and traffic. Section 2.118 requires that a consent authority must not grant consent to development with a frontage to a classified road where there is an alternative access, where the safety, efficiency and ongoing operation of the classified road is expected to be adversely affected and where the development is sensitive to use of the classified road. Section 2.122 triggers a referral to Transport for NSW where an electricity generating works is expected to generate 200 or more vehicles per hour with access to a road, or 50 or more vehicles per hour where access is to a classified road or a road that connects to a classified road.

#### **4.2.3 State Environmental Planning Policy (Primary Production) 2021**

Relevant objectives of *Chapter 2 Primary production and rural development of SEPP (Primary Production) 2021* are:

- (a) *to facilitate the orderly economic use and development of lands for primary production*
- (b) *to reduce land use conflict and sterilisation of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity and water resources*
- (c) *to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations*
- (d) *to simplify the regulatory process for smaller-scale low risk artificial waterbodies, and routine maintenance of artificial water supply or drainage, in irrigation areas and districts, and for routine and emergency work in irrigation areas and districts*
- (e) *to encourage sustainable agriculture, including sustainable aquaculture*

The policy applies to *State significant agricultural land*, farm dams and other artificial waterbodies, livestock industries and aquaculture. There is no *State significant agricultural land* listed in the schedule to the policy.

The Department of Primary Industries (Agriculture) has released draft mapping of *State Significant Agricultural Land* in NSW to assist decision-making regarding development on rural land. This matter is addressed in section 5.7 *The community and economy*.

#### **4.2.4 State Environmental Planning Policy (Planning Systems) 2021**

Development that is state and regionally significant is identified in *SEPP (Planning Systems) 2021*. Electricity generating works including solar farms which have an estimated development cost of more

than \$30 million, or an estimated development cost of more than \$10 million and are located in an environmentally sensitive area of State significance, are declared state significant development. Private infrastructure, including electricity generating stations, that have an estimated development cost of over \$5 million are declared regionally significant and are to be determined by a Regional Planning Panel.

### 4.3 Local Environmental Plans

The property is zoned RU1 Primary Production under *Liverpool Plains LEP 2011* as shown in Figure 5.

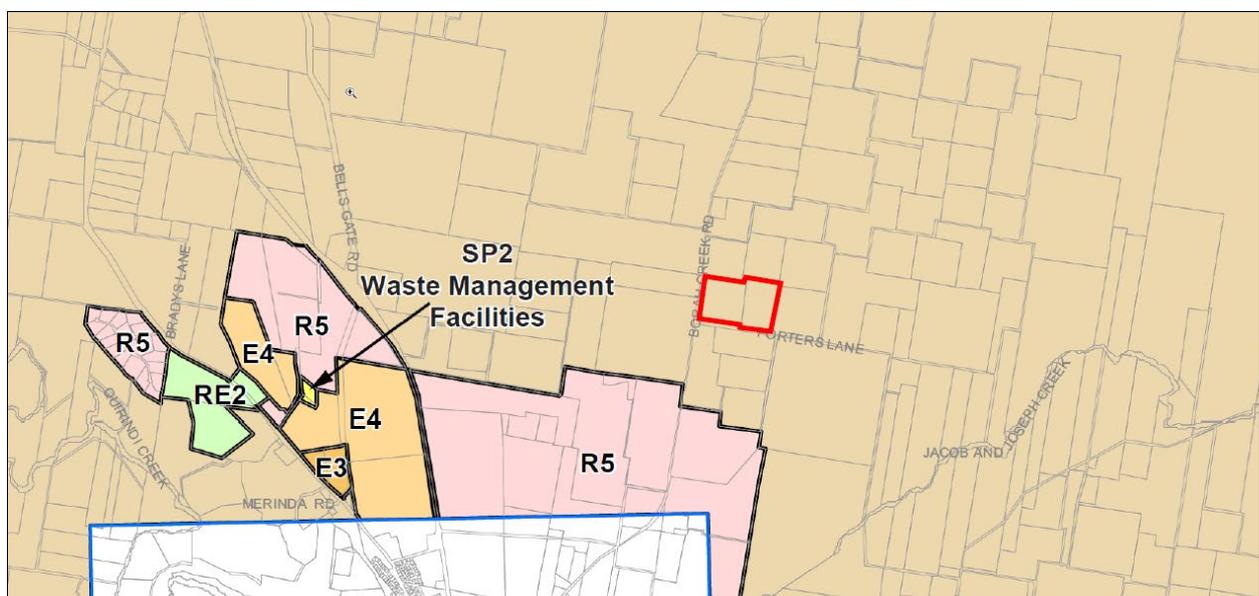


Figure 5: Land zoning. Source: Liverpool Plains LEP 2011

The objectives of zone RU1 are:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.

The development is defined as **electricity generating works** which means a building or place used for the purpose of making or generating electricity. This use is prohibited in zone RU1 but is made permissible with consent by *State Environmental Planning Policy (Transport and Infrastructure) 2021*.

Although prohibited in the zone the proposed development is satisfactory to the objectives of zone RU1 in that renewable energy through the harnessing of sunlight is a form of primary industry and is a sustainable means to utilise a source of infinite energy that does not reduce the natural resource base. The development will not cause fragmentation or alienation of resource land as livestock grazing may continue beneath and around the solar array when the facility is constructed and operating.

The solar farm will diversify rural activities and provide an alternative means of income thereby supporting other on-farm activities. It will not lead to land use conflict with other rural activities as it is a benign development during the operational phase that will not produce noise, odour, dust or other emissions that would impact on the amenity of surrounding land. Employment opportunities will be created for the local community both during construction and operation. There are no statutory intentions to expand the urban settlement of Quirindi towards the development site and the solar farm will not obstruct any unplanned growth of the township of Quirindi. The development site is not mapped as an Urban Release Area in *Liverpool Plains LEP 2011*.

The solar farm would not adversely affect valuable environmental assets and would not have a significant impact on biodiversity or the ecological integrity of water resources, native vegetation or habitat linkages between patches of native vegetation.

It is considered that the proposed development is not inconsistent with the aims of *Liverpool Plains LEP 2011* or the objectives of zone RU1 Primary Production.

The following clauses of *Liverpool Plains LEP 2011* apply to the proposed development.

*Clause 6.5 Essential services*

This clause requires a consent authority to be satisfied that any of the following services that are essential for the development are available or that adequate arrangements have been made to make them available when required:

- (a) *the supply of water,*
- (b) *the supply of electricity,*
- (c) *the disposal and management of sewage,*
- (d) *stormwater drainage or on-site conservation,*
- (e) *suitable road access.*

The supply of reticulated water and sewerage services is not required for the proposed development. However, portaloos for wastewater disposal (see <https://www.kennards.com.au/site->

[equipment/showers-toilets.html](#) ) and water supply by way of a portable tank or cart (see <https://www.kennards.com.au/site-equipment/water-tank.html> ) are proposed to be installed during the construction phase.

Electrical services are available to the site. Stormwater management is proposed to be addressed by controls recommended in this Statement with full details to be provided with the application for a construction certificate. An existing access off Porters Lane is proposed to provide access to the site.

There are no draft environmental planning instruments that are on exhibition or have been exhibited but not yet published that apply to the site, or that relate to the proposed development of electricity generating works.

## **4.4 Development Control Plans**

### **4.4.1 Liverpool Plains Development Control Plan 2012 Amendment No. 5**

*Liverpool Plains DCP 2012 Amendment No. 5* provides guidance for development, however, the DCP does not contain any provisions that apply to the development of a solar farm. The DCP contains requirements to demonstrate impacts and mitigation measures that relate to landscaping and environmental effects such as traffic, flood liability, slope, construction impacts, solid and liquid waste, air quality, noise emissions, water quality, biodiversity, sustainability, erosion and sediment control, and stormwater management.

These matters are addressed in specialist reports prepared to support the development application which are summarised in section 5. *Environmental Effects* of this Statement. Waste Management is addressed in section 3. *Details of the proposed development* above.

## **4.5 Land use strategies**

### **4.5.1 New England North West Regional Plan 2041**

The *New England North West Regional Plan 2041* sets a 20-year strategic land use planning framework for the region. Objective 9 under *Part 3 Sustainable and resilient* is to *lead renewable energy technology and investment*.

Quirindi is located adjacent the New England Renewable Energy Zone and it is noted in the *Regional Plan* that the *Large-scale Solar Energy Guideline* applies to state significant proposals. Although not

applicable to a town scale solar farm such as that proposed by ITP Development the considerations of the guideline have been taken into account in this Statement of Environmental Effects and specialist studies.

#### **4.5.2 Liverpool Plains Growth Management Strategy 2009**

The aims of the *Liverpool Plains Growth Management Strategy 2009* prepared by Edge Land Planning were to focus on strategic planning at the local level within a state and regional context, to implement a set of modern planning controls, consult with the community, to develop a single planning scheme for the LGA, undertake sub-regional planning based on catchments and natural resource management and to implement best practice land use management.

The strategy addresses the expansion of Quirindi and proposes that land on the rural fringe be zoned for rural living north-east of the township along Borah Creek Road in recognition of existing small rural lots. This recommendation has been enacted and land is now zoned R5 Large Lot Residential under *Liverpool Plains LEP 2011* up to 640 metres from Porters Lane.

An addendum to the strategy prepared by GHD in June 2021 to further address rural residential development in Liverpool Plains LGA. The strategy and addendum do not make any recommendations that affect the development site or the development of electricity generating works. The strategy and addendum do not propose future urban or rural residential expansion over the development site.

#### **4.5.3 Liverpool Plains Shire Council Local Strategic Planning Statement 2040**

*Liverpool Plains Shire Council Local Strategic Planning Statement 2040* sets a vision and framework to guide detailed land use planning.

Planning Priority 5 of the LSPS is to *manage resources and renewable energy* notes that the LGA is well placed to take advantage of its wind and solar resources as well as its strategic location on the transmission network. Council aims to achieve a balance for agriculture, mining and renewables to co-exist and to provide greater certainty for investment. It is also an aim to investigate flexible subdivision controls in association with renewable energy projects that do not sterilize land for future farming or mining.

An action is to review and update the *Liverpool Plains Growth Management Strategy 2009* to ensure sustainable management of resources and renewable energy opportunities.

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## 5. ENVIRONMENTAL EFFECTS

### 5.1 Biodiversity

#### 5.1.1 Assessment of impacts

A biodiversity assessment has been carried out by Red-Gum Environmental Consulting Pty Ltd to determine the potential impact on any threatened species and endangered ecological communities that are present on the development site and in the vicinity of the site. The findings of the assessment are summarized below. Reference should be made to the *Biodiversity Inspection Report* that is submitted with the development application for further information or clarification of any matter concerning the assessment and recommendations.

Methodology for the biodiversity assessment involved desktop research and a site inspection. The assessment covered details of recorded sightings of threatened species including koalas and identification of vegetation communities in the vicinity of the development site.

The *Biodiversity Inspection Report* provides a test of significance in accordance with requirements of the *Biodiversity Conservation Act 2016*, an assessment of potential koala habitat as required by *SEPP (Biodiversity and Conservation) 2021*, and also satisfies requirements of the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999*.

#### 5.1.2 Findings

Red-Gum contends that the site is dominated by exotic planted crop and pasture grasses which have little to no value to threatened fauna and threatened flora are not present in these previously cultivated areas. The works area also closely neighbours three native remnant White Box (*E. albens*) trees which are to be retained. If the development extends beyond the exotic mapped groundcovers then impact to these areas should be kept below the allowable clearing thresholds or the *Biodiversity Conservation Act 2016* provisions will come into play and further assessment will be required.

The proposed activities are unlikely to have an adverse effect on the foraging ability or the life cycle of threatened species that may be opportunistically using the site or surrounding areas and all works remain under the 1 hectare clearing threshold for the site.

This project is unlikely to displace any rare or threatened species. However, it is a possibility that a number of threatened and declining bird species and Koalas may be using the wooded corridor bordering

the south of the site and other surrounding heavily wooded areas. Hence the construction activities may prove to disturb foraging activities for a short period. The Superb Parrot, Grey-crowned Babbler & Little Eagle are three species that are likely to be using habitats in the vicinity, and potentially the fringe areas of the assessment site. The assessment extended to the access track entering the property and to the site. The road is a formed track with little to no work required to make it passable for heavy machinery, therefore no native vegetation losses are anticipated in this zone.



Figure 6: Mapped vegetation cover. Source: Red Gum Environmental Consulting Pty Ltd 2023

The area assessed was largely exotic species, planted crop and pasture grasses, with many species commonly regarded as 'highly invasive' in more natural woodland settings. While the proposed works are unlikely to introduce noxious weeds, vermin, feral species or genetically modified organisms into an area, the movement of vehicles, plant, equipment and people on and off the subject site has the potential to introduce such impacts. Wherever possible, the removal of weeds should be undertaken prior to seed developing, which for most species occurs during the warmer months (i.e. summer).

The typical home ranges of Koalas are from 2 hectares of connected vegetation to hundreds of hectares. Koalas feed almost exclusively on a few preferred tree species which are generally divided or ranked as either primary and secondary in importance. The occurrence of both primary and secondary tree species varies widely on a regional, local and even a seasonal basis, meaning that koalas are unevenly distributed across their range.

In the surrounding area, primary food tree species are River red gum (*E. camaldulensis*) and Coolabah (*E. coolabah*) with secondary food tree species including Dirty (or Baradine) gum (*E. chloroclada*), Blakely's red gum (*E. blakelyi*), *E. camaldulensis*, Poplar or Bimble box (*E. populnea*), white box (*E. albens*), and *Callitris glaucophylla*. Minimal viable food sources are present in the development area and importantly, there are numerous core vegetation areas surrounding the site which represent areas of viable Koala habitat. The three remnant White Box trees adjacent to the works area are all scattered, not in close proximity to connected vegetation and therefore, possess little habitat value to Koalas. The site is highly unlikely to be traversed or used by the species who are much more likely to stay within the connected canopy of roadside vegetation corridors and more heavily wooded areas.

The report concludes that the activities as proposed will not see the loss of greater than 1 hectare of native vegetation. The development is therefore unlikely to have a significant effect on any threatened species and ecological communities and/or their conservation, provided that the three White Box trees are avoided by the development.

### 5.1.3 Mitigation measures

By way of a clearing process that minimizes the risk to threatened species that may be opportunistically using the site, it is recommended that:

- I. Construction limits and exclusion zones be clearly identified prior to work,
- II. A visual inspection is conducted by environmental staff before construction commences to identify any areas of the site that might be supporting native fauna,

- III. Vehicle movements around the site will be restricted to the construction footprint and away from any existing native trees and flagging exclusion fencing to be installed,
- IV. Soil disturbance by vehicle and pedestrian access is to be kept to a minimum outside the construction footprint, and
- V. Any weeds removed (particularly those bearing seeds) are to be disposed of appropriately at the nearest waste management facility.

## 5.2 Natural hazards

### 5.2.1 Flooding

The site is not mapped as a Flood Planning Area in *Liverpool Plains LEP 2011*. The development site does not have any significant drainage lines passing through it due to the relatively uniform topography of the immediate area. However, an intermittent drainage line runs across Lot 130 from the north-western corner to the south-eastern corner of the property.

### 5.2.2 Bushfire

The site is mapped as being affected by bushfire on the bushfire prone land map (see Figure 7 below). Infrastructure comprising electricity generating works is not a habitable building and is not listed as a *special fire protection purpose* under section 100B of the *Rural Fires Act 1997*.

However, section 8.3.5 *Wind and solar farms* of *Planning for Bushfire Protection 2019* has been considered. Defendable space is available within the 10 metre setback between the array and the security fence which is to be managed as an inner protection zone for the operating life of the solar farm.

It is also proposed that a fire emergency management plan be prepared through liaison with Council, Essential Energy and the Rural Fire Service. That plan would establish procedures to respond to a fire event and other measures such as maintenance of ground fuels, access arrangements, on site fire-fighting equipment and isolation of electrical infrastructure.

### 5.2.3 Land contamination

A search of the Environment Protection Authority's *List of Notified Contamination Sites and Protection of the Environment Operations Act Public Register* has been undertaken which revealed that there is no contaminated site listed in or around the development site. The property is not listed on a Council register of potentially contaminated land. There are no known prior land-uses on the development site that are

likely to have resulted in the contamination of the land. A preliminary assessment is not considered necessary in this instance.



**Figure 7: Bushfire prone land map. Source: NSW Planning Portal**

#### **5.2.4 Mitigation measures**

- See section 5.3 *Water resources* for recommended mitigation measures to address flooding and stormwater management.
- Prepare a fire emergency management plan and include that plan in the environmental management plan.
- There are no mitigation measures recommended in relation to land contamination.

### **5.3 Water resources**

#### **5.3.1 Assessment of impacts**

A *Water Assessment* of potential impacts on groundwater and surface water flows and flooding has been carried out by ITP Development Pty Ltd. The findings of the assessment are summarized below. Reference should be made to the *Water Assessment* that is submitted with the development application for further information or clarification of any matter concerning the assessment and recommendations.

### 5.3.2 Findings

Quirindi is located in the south-eastern part of Namoi Water Resource Plan Area. Other towns in the broad vicinity include Tamworth to the north-east, Gunnedah to the north and Nundle to the east. Within the town area of Quirindi, Quirindi Creek confluences with Jacob and Joseph Creek. The broader Namoi River catchment area occupies 4% of the Murray-Darling Basin. Major tributaries include the Macdonald, Manilla, Peel, Mooki and Cockburn rivers, and Coxs, Baradine and Bohena creeks.

The topography of the Namoi River catchment is characterised by mountainous ranges with cool temperatures and high rainfall areas in the east to low rainfall areas on extensive riverine plains to the west. Agriculture is the main land use in the region and is dominated by cattle and sheep grazing, along with wheat, cotton and other broadacre crops on the alluvial floodplains. These land use practices are dependent on the waterways of the catchment, especially for irrigation purposes.

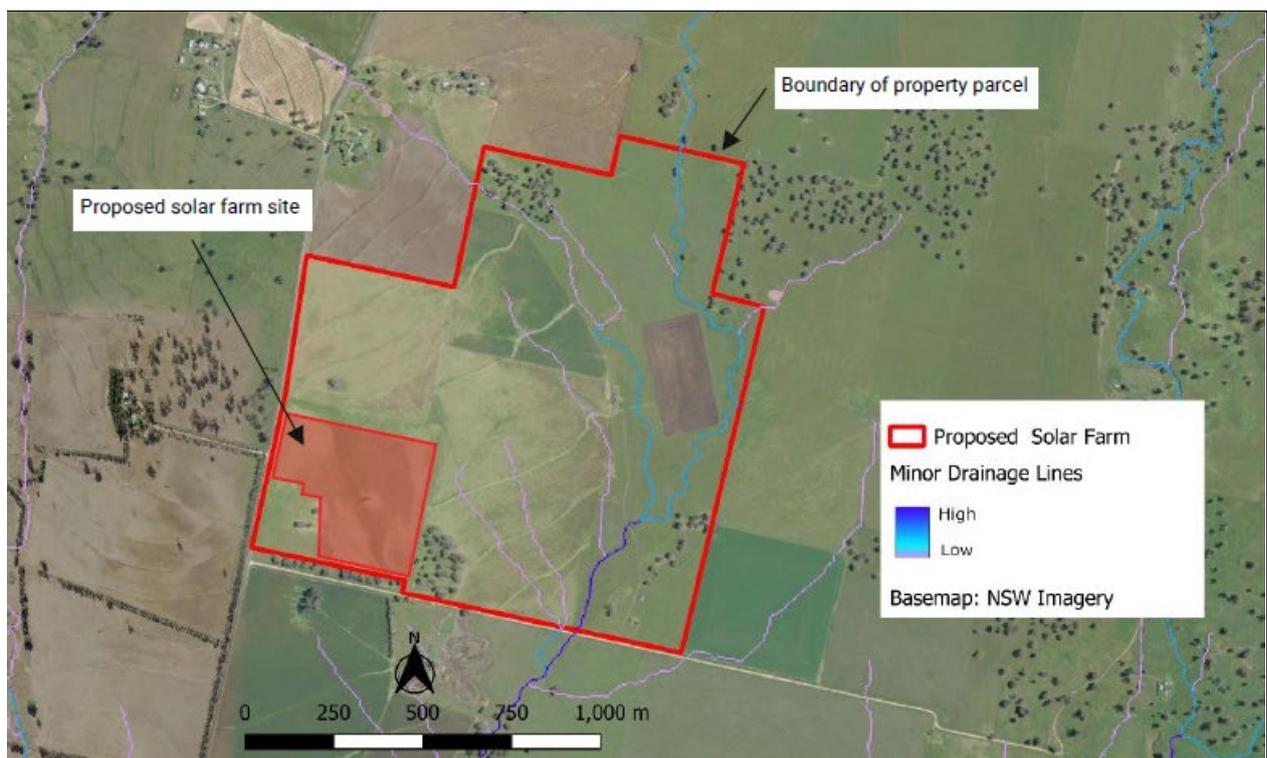


Figure 8: Localised drainage patterns. Source: ITP Development Pty Ltd, 2024

The flood planning area from the *Liverpool Plains LEP 2011* and the 100-year ARI floodway modelled by GHD in 2011 indicate that the project site is at low risk of flooding from the direction of Quirindi Creek and Jacob and Joseph Creek.

There is some potential for localised (minor) inundation from minor drainage lines running through the site. The water will flow in a south-easterly direction towards the Jacob and Joseph Gully which flows into Jacob and Joseph Creek.

Potential adverse surface water-related impacts to the site relate to site accessibility and managing downstream sedimentation. There will be no extraction of groundwater or interference with the groundwater table and the works are not expected to contribute to any regional groundwater issues.

The development has the potential to alter existing water quality conditions within the site. The impervious area of solar facilities is typically only marginally increased owing to associated hardstand and building areas.

However, the panels may impact the nature of vegetation/grass coverage on the site, which has the potential to increase surface runoff and peak discharge. Increased flow concentration off the panels also has the potential to erode soil at the base of solar panels.

As the site has been historically used for farming there is very little natural ground cover vegetation. Modelling by the NSW Government indicates a soil profile of brown light silty clay with minimal cracks in the top horizons and heavy brownish black in the lower horizons. There is the potential that the proposed solar site runoff will contain sediments and increase turbidity or other water quality parameters in downstream water ways.

### **5.3.3 Mitigation measures**

The following mitigation measures given in Table 6 are recommended to manage downstream sedimentation.

The potential for site accessibility and the potential for inundation issues during flood events should be reviewed and procedure developed to halt construction during heavy rainfall to reduce potential impacts to the development and to increases in downstream sedimentation.

**Table 6: Proposed mitigation measures to manage downstream sedimentation**

Stage	Measure	Activities/approach
<b>Design</b>	Site drainage and water quality controls	<p>Design Basis</p> <ul style="list-style-type: none"> <li>• Undertake hydrological assessment of the site’s catchment in accordance with relevant methods outlined in Australian Rainfall and Runoff</li> <li>• Determine sediment management targets and drainage control standards in accordance with Managing Urban Stormwater: Soils and Construction Vol 1 (Blue Book) (DECC, 2008).</li> <li>• Develop a site erosion and sediment control plan in accordance with the Blue Book.</li> <li>• Develop site drainage design incorporating detention basins and sedimentation management structures where relevant.</li> <li>• Permanent site drainage should coincide with temporary arrangements where possible</li> </ul>
<b>Construction and/or demolition</b>	Site drainage and water quality controls	<p>General site works:</p> <ul style="list-style-type: none"> <li>• Catch drains to be located downslope of any proposed road works.</li> <li>• Install location appropriate sediment fences or other applicable control measures depending on whether the feature is upstream or downstream of a disturbed part of the site or will need to be trafficable.</li> <li>• All stormwater collection points need to have appropriate sedimentation and erosion controls.</li> <li>• Undertake ongoing inspections of stormwater facilities and water control measures to assess their effectiveness.</li> <li>• Vibration grids or wash bays at all construction exits.</li> <li>• Level spreaders at locations where concentrated flow is discharged offsite to ensure sheet flow like conditions are maintained.</li> <li>• Flat land erosion control options include erosion control blankets, gravelling, mulching, soil binder, turfing and revegetation</li> </ul>
<b>Construction and/or Demolition</b>	Stormwater point source control	<p>In the event of concrete works:</p> <ul style="list-style-type: none"> <li>• Do not undertake works if chance of heavy rain.</li> <li>• Store rinsate water, if applicable, separately to other water on site and dispose of offsite as appropriate.</li> <li>• Block on site drains in the area of the works and remove any contaminated runoff.</li> </ul> <p>In the event that dewatering practices are required:</p> <ul style="list-style-type: none"> <li>• Elevate pump hose intakes for withdrawing water from excavations to minimise sediment pumping and direct hose to a containment area for settling prior to discharge of water.</li> <li>• Limit direct discharge off site (consistent with the design requirements for sediment pond discharge).</li> <li>• Stormwater collected on site should be reused where possible. Controls should be inspected and maintained on a regular basis. All water released from sediment basins should be clear or disposed of off site by vehicle.</li> <li>• Material and waste storage areas should be designed and operated to minimise interaction with surface waters.</li> <li>• Vehicle washdown areas should be located away from water courses</li> </ul>

## 5.4 Air quality

### 5.4.1 Assessment of impacts

The Department of Planning, Industry and Environment maintain air quality monitoring stations across rural NSW. The instruments used at most rural network sites are low cost indicative particulate monitors that respond to all aerosols including smoke and fog.

Total suspended particles are solid particles and liquid droplets 100 micrometres or less in diameter. They come from natural and human-made sources, such as pollen, bushfires and motor vehicle emissions. Dust emissions are also a source of air pollution and can cause poor air quality. The pollutants measured by the Department are nitrogen dioxide, sulphur dioxide and ammonia.

Particles are also measured as PM<sub>10</sub> and PM<sub>2.5</sub>. PM<sub>10</sub> are particles less than 10 micrometres in diameter. Sources include crushing or grinding operations and dust stirred up by vehicles on roads. PM<sub>2.5</sub> are fine particles less than 2.5 micrometres in diameter. Sources include all types of combustion, including motor vehicles, power plants, residential wood burning, forest fires, agricultural burning, and some industrial processes.

Table 7 gives average hourly readings of total suspended particles, PM<sub>10</sub> particles, PM<sub>2.5</sub> particles and the DPE rating for the nearest monitoring station to Quirindi which is located at Gunnedah.

**Table 7: Average hourly air quality readings**

Monitoring station	Gunnedah	
Period	3 October 2023, 10am-11pm	
Particles	Reading	Rating
Total suspended particles	n/a	n/a
PM <sub>10</sub>	24.0	Good
PM <sub>2.5</sub>	11.2	Good

Activities that disturb the earth's surface and that are carried out with the use of machinery have the potential to generate dust emissions. This may be exacerbated by wind exposure to an exposed ground surface. The previous use of the land for farming may have involved regular tilling, sowing and harvesting that may create dust and impact on air quality. Similarly, grazing would generate dust as animals trample the ground surface. The land has been modified for agriculture with the consequent loss of most native vegetation leading to exposed soil surfaces.

The construction of the solar farm will not involve extensive earthworks. Pile driving for footings for the array framework and excavation for roads and ancillary structures will be carried out. Along with the delivery of materials using heavy vehicles, these construction works may generate dust, however, once operational the change of use of the land from agricultural to solar photovoltaic electricity generation is expected to reduce particulate emissions and lead to an improvement in local air quality. Vehicle movements would be restricted to internal access roads and the majority of the site would be revegetated with native or pasture grasses.

In addition to agriculture, there are extractive industries that operate on adjoining properties that may generate dust or air particle pollution that would affect the optimal functioning of the PV panels. These are located to the south and south-west of the development area and would only be affected when winds originate from those directions. The proposed regular maintenance regime of cleaning panels every two to three months would ensure that the array operates at maximum efficiency.

#### **5.4.2 Mitigation measures**

To minimize dust generation during the construction and operational phases the following mitigation measures are proposed:

During construction:

- Limit vehicle movements to areas necessary to deliver panels, ancillary structures and equipment,
- Suppress dust emissions using watering and cease works during dry and windy condition,
- Ensure ground disturbance is limited to areas necessary to place footings or to be used for access,
- Ensure minimal handling of excavated materials, and
- Ensure stockpiles of excavated material is banded and protected from wind and vehicle movements.

During operation:

- Grade and add road base to internal accessways,
- Revegetate the site with suitable groundcover immediately after construction works are completed, and
- Ensure all plant and equipment is maintained in a clean condition and operates in accordance with specifications.

## **5.5 Noise**

### **5.5.1 Assessment of impacts**

A *Noise Assessment* of the impacts of noise emissions has been carried out by Muller Acoustic Consulting. The findings of the assessment are summarized below. Reference should be made to the *Noise Assessment* that is submitted with the development application for further information or clarification of any matter concerning the assessment and recommendations.

The purpose of the *Noise Assessment* is to quantify potential environmental noise emissions associated with the construction and operation of the project. Where impacts are identified, recommendations are made to mitigate and manage noise.

### **5.5.2 Findings**

The results of the Noise Assessment demonstrate that noise levels are expected to comply with noise management levels at the identified receivers shown in Figure 9 during standard construction hours.

Similarly, operational noise management levels are satisfied at all receiver locations.

Sleep disturbance is not anticipated, as there are no operational noise sources that generate significant maximum noise events and noise emissions from the project are predicted to satisfy the EPA maximum noise level criteria.

Road noise emissions associated with the project are anticipated to satisfy the relevant Road Noise Policy criteria at any receiver along the proposed transportation route.

A qualitative assessment of potential vibration impacts has been completed. Due to the nature of the works proposed and distances to potential vibration sensitive receivers, vibration impacts from the project would be negligible.

Based on these results, there are no noise related issues which would prevent approval of the proposed project subject to the proposed recommended mitigation measures.



Figure 9: Location of noise sensitive receivers. Source: Muller Acoustic Consulting

### 5.5.3 Mitigation measures

The following mitigation measures are recommended to address noise emissions during the construction phase:

- a construction noise management protocol to minimise noise emissions, manage out of hours (minor) works to be inaudible, and to respond to potential concerns from the community,
- where possible use localised mobile screens or construction hoarding around piling rig/plant to act as barriers between construction works and receivers, particularly where equipment is near the site boundary and/or a residential receiver including areas in constant or regular use (e.g. unloading and laydown areas),
- operating plant in a conservative manner (no over-revving), shutdown when not in use, and be parked/started at farthest point from relevant assessment locations,
- selection of the quietest suitable machinery available for each activity,
- minimise noise plant/machinery working simultaneously where practicable,
- minimise impact noise wherever possible,
- utilise a broadband reverse alarm in lieu of the traditional high frequency type reverse alarm,

- provide toolbox meetings, training and education to drivers and contractors visiting the site during construction so they are aware of the location of noise sensitive receivers and to be cognisant of any noise generating activities,
- signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off-site, and
- utilise project related community consultation forums to notify residences within proximity of the site with project progress, proposed/upcoming potentially noise generating works, its duration and nature and complaint procedure.

It is recommended that noise emissions from the solar farm be minimised when operational. To assist in noise management, it is recommended that a one-off noise validation monitoring assessment be completed to quantify emissions from the site and to confirm that relevant criteria are satisfied. The monitoring assessment would consist of operator attended noise measurements during normal operation to determine the noise contribution from the project.

## **5.6 Traffic and access**

### **5.6.1 Assessment of impacts**

A *Traffic Impact Assessment Report* of the impacts on traffic and the adequacy of access arrangements has been prepared by Price Merrett Consulting Pty Ltd. The findings of the assessment are summarized below. Reference should be made to the *Traffic Impact Assessment Report* that is submitted with the development application for further information or clarification of any matter concerning the assessment and recommendations.

The traffic assessment includes a description of the existing road network and considers expected traffic generation during site construction and operation. Site access arrangements and intersection capacity are also considered.

### **5.6.2 Findings**

#### **Traffic impacts**

During the 12-week construction period an estimated 45 trucks (including up to B-Doubles) will access the site with an expected daily average of 4 trucks. The trucks will access the site throughout the day generally between 10.00am and 2.00pm and would therefore not contribute to morning or afternoon peak hour.

A maximum of 30 construction workers on site at any one day are likely to generate movements in the order of 24 vehicles entering the site in the morning between 6:30am to 8:00am and leaving at the afternoon peak around 4:00pm to 5:00pm. This is based on the number of vehicles being 80% of the workforce. This figure is very conservative and more likely to be 50% with an average of 2 people per car as well as a shuttle bus or other ride share system that would be provided. The contractor responsible for building the solar farm will be responsible for organising the services of light vehicles and/or shuttle bus arrangements and until the works have been awarded and staff locations determined the exact details on ride share system is unknown.

The provision of a shuttle bus system and or car pooling has added site benefits in the reduction in site car spaces required. This can also reduce potential for site accidents through limiting driver fatigue and reducing vehicle movements within the carpark. Prior to construction, a traffic management plan produced for the development construction phase will focus in more detail on the implementation of a shared commuting system for workers.

Traffic including truck movements generated at the site are likely to impact the local traffic conditions along Borah Creek Road for the short duration construction period. However, impacts can be mitigated through early consultation with local users of the road and continual updates on any changes to traffic movements during construction.

### **Sight distances**

The intersection of Borah Creek Road and Porters Lane has sight lines over 800 metres in both directions which is more than sufficient for the existing 100km/hr speed zone. The minimum site distance required is 285 metres based on 110km/hr (100km/hr + 10km/hr) with a 2.0 second reaction time. Porters Lane access also has adequate site distances in both directions.

### **Access type**

The type of rural access arrangement off Porters Lane should accommodate the turning movement of a 26 metre B-Double vehicle and any specific requirements of the Liverpool Plains Shire Council. The access would be upgraded in the initial stage of the development and be utilised during the construction phase and operation phase of the development. The access road into the site laydown area should be all weather construction.

The traffic report includes concept sketches of B-double turn movements from Borah Creek Road in to Porters Lane and then from Porters Lane into Lot 134 based on rectified imagery and digitised data.

Detailed survey and design drawings would need to be provided to understand the scope of works at the intersection and Porters Lane.

### **5.6.3 Mitigation measures**

The following recommendations are made by Price Merrett Consulting:

- Prior to commencing works, it is recommended that an easement or similar agreement for the duration of the solar project be provided through Lot 134 to secure access into the future for Lot 130.
- Prior to commencing works a traffic management plan be developed that incorporates notification of local residents of the works and informs them of the construction period and operating hours.
- Shared transport for workers should be incorporated into the site management during construction period.
- Access improvements required off Porters Lane to accommodate the largest vehicle that would access site (B-Double).
- Driveway improvements for wet weather operation be considered including surfacing with additional gravel.
- Dilapidation survey to be undertaken along Borah Creek Road and Porters Lane prior to construction works to assess any impacts on the road during construction period.

## **5.7 The community and economy**

### **5.7.1 Population and accommodation**

The population of Quirindi urban centre in 2021, as defined by the Australian Bureau of Statistics which includes the town of Quirindi and rural land surrounding the settlement, was 2,602 persons. The total population of Liverpool Plains local government area in 2021 was 7,551 persons.

The median age of people in Quirindi urban centre in 2021 was 47 years compared to 47 for the LGA. The population of Liverpool Plains LGA has decreased by 1.8 % between 2016 and 2021 and increased by 0.9% over the ten-year period 2011 and 2021.

Unemployment at the time of the 2021 Census of Population and Housing was 7.4% of the labour force comprising persons aged 15 years and over in Quirindi urban centre. The labour force participation rate in 2021 was 48.0%. The top three occupations were community and personal service workers, machinery

operators and drivers, and labourers. The top three industries of employment were hospitals, local government administration, and supermarket and grocery stores.

There were a total of 1,276 private dwellings in Quirindi in 2021. 87.7% of these were occupied private dwellings. There were 139 unoccupied private dwellings or 12.1% of all private dwellings. There were a further 323 unoccupied private dwellings across the LGA. The majority of dwellings in Quirindi (91.4%) were separate houses and the remainder were medium density dwellings comprising semi-detached, row or terrace houses, townhouses, flats and apartments.

There are 11 establishments offering accommodation for visitors to Quirindi and the surrounding district listed on the NSW Government's VisitNSW website <https://www.visitnsw.com/destinations/country-nsw/tamworth-area/quirindi/accommodation>. These include holiday parks, motor inns, bed and breakfasts, serviced apartments and hotels.

In addition to these establishments there are 139 unoccupied private dwellings some of which may be available as short term rentals, and unregulated accommodation places such as AirBnB and Stayz. Accommodation is also on offer in the nearby towns of Tamworth and Gunnedah and numerous villages within a short distance of Quirindi.

**Table 8: Key demographic characteristics**

Sector	Characteristic	Quirindi urban centre	Liverpool Plains LGA	NSW
<b>Population</b>	Total persons	2,602	2,340	8,072,163
	Median age	47	47	39
<b>Employment</b>	Labour force participation rate	48.0%	52.0%	58.7%
	Unemployment rate	7.4%	5.8%	4.9%
<b>Housing</b>	Occupied private dwellings	87.7%	86.1%	90.6%
	Unoccupied private dwellings	12.1%	14.0%	9.4%
	Total private dwellings	1,146	3,686	3,199,992
	Average occupancy rate	2.2	2.3	2.6
	Median monthly mortgage repayments	\$1,083	\$1,133	\$2,167
	Median weekly rent	\$250	\$230	\$420
	Proportion separate houses	91.4%	95.5%	65.6%

### 5.7.2 Agriculture and land capability

Quirindi is located in the New England and North West Region as defined by the Australian Bureau of Agricultural and Resource Economics and Sciences. Agriculture, forestry and fishing supports an estimated 9,352 jobs or 19.3% of regional employment in the region. ([https://public.tableau.com/app/profile/australian.bureau.of.agricultural.and.resource.economic.s.and.sci/viz/AMR\\_v9\\_A3L/Dashboard1](https://public.tableau.com/app/profile/australian.bureau.of.agricultural.and.resource.economic.s.and.sci/viz/AMR_v9_A3L/Dashboard1)).

Data released in 2022 indicates that the estimated annual economic output of the agricultural sector was \$3,265 billion in the region with wheat and cattle and calves contributing half of this value. Agricultural land in the region occupies 73.8 per cent of the region. The most common land use by area is grazing native vegetation followed by cropping and modified pastures. There are 1,728 specialised beef cattle farms of a total of 4,036 farms.

The Liverpool Plains area that lies within the New England and North West Region is known to be the most fertile and productive agricultural land in Australia due to its rich black alluvial soils. The major agricultural uses of the Liverpool Plains are cropping (barley, chickpeas, beans, sorghum, sunflowers, maize, wheat and cotton) and beef cattle and sheep grazing.

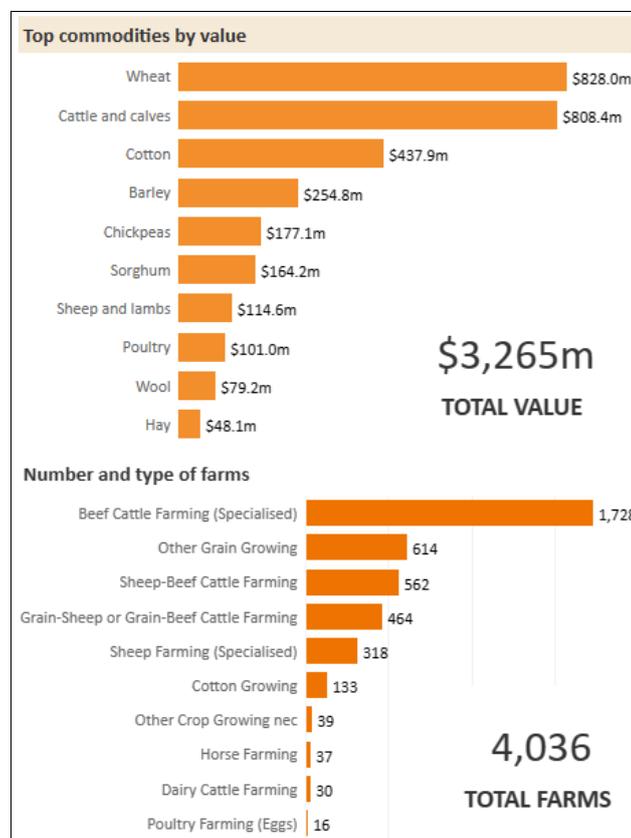


Figure 10: Regional agricultural data. Source: ABARES 2022

DPI Agriculture uses the land and soil capability mapping scheme as the preferred methodology for the classification of agricultural land. Eight classes of rural land are mapped plus flood irrigation, and mining and quarrying land.

Figure 11 below shows land capability mapping for the development site and surrounding land. The development site has a land capability of class 3. This is high capability 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. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation. (The land and soil capability assessment scheme – A general rural land evaluation scheme for NSW, 2<sup>nd</sup> Approximation, OEH).



Figure 11: Land capability mapping. Source: OEH 2023

The Department of Primary Industries (Agriculture) has recently released draft mapping of *State Significant Agricultural Land* in NSW under *SEPP (Primary Production and Rural Development) 2019*. The development site is mapped as being *State Significant Agricultural Land* under *State Environmental Planning Policy (Primary Production) 2021* as shown in Figure 12 below.

Strategic regional land use mapping in Figure 13 indicates that the development site is not affected by designation as additional rural village land, future residential growth area or as strategic agricultural land.

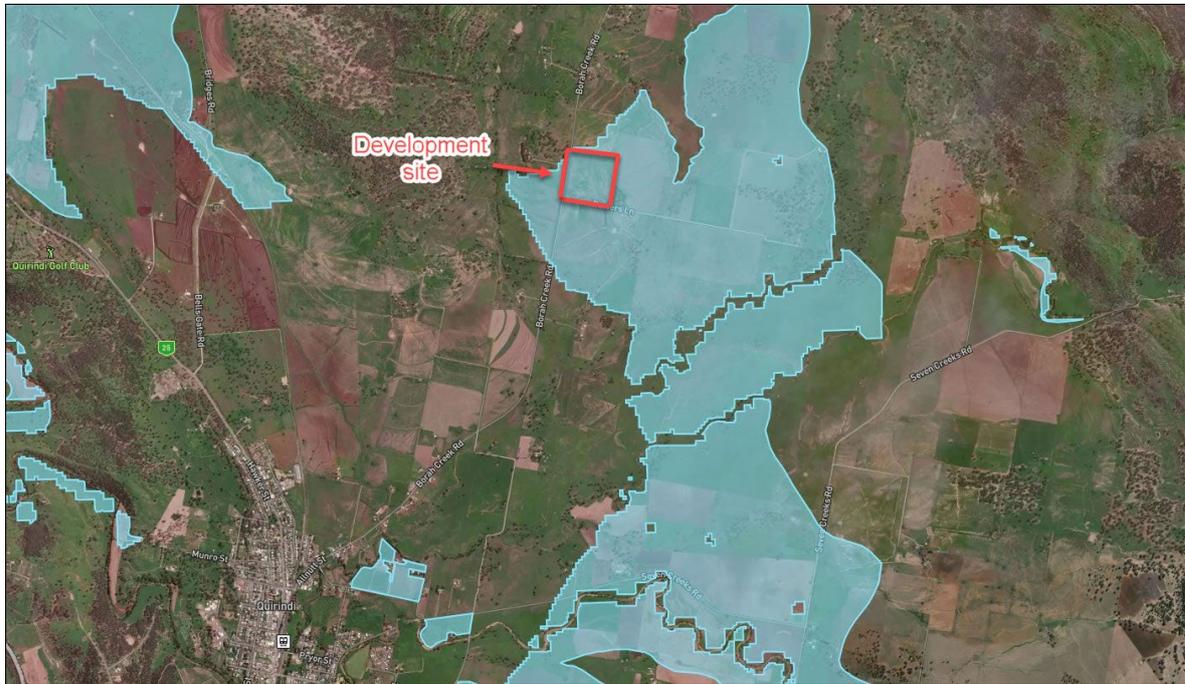


Figure 12: Draft State Significant Agricultural Land Map. Source: DPI 2022

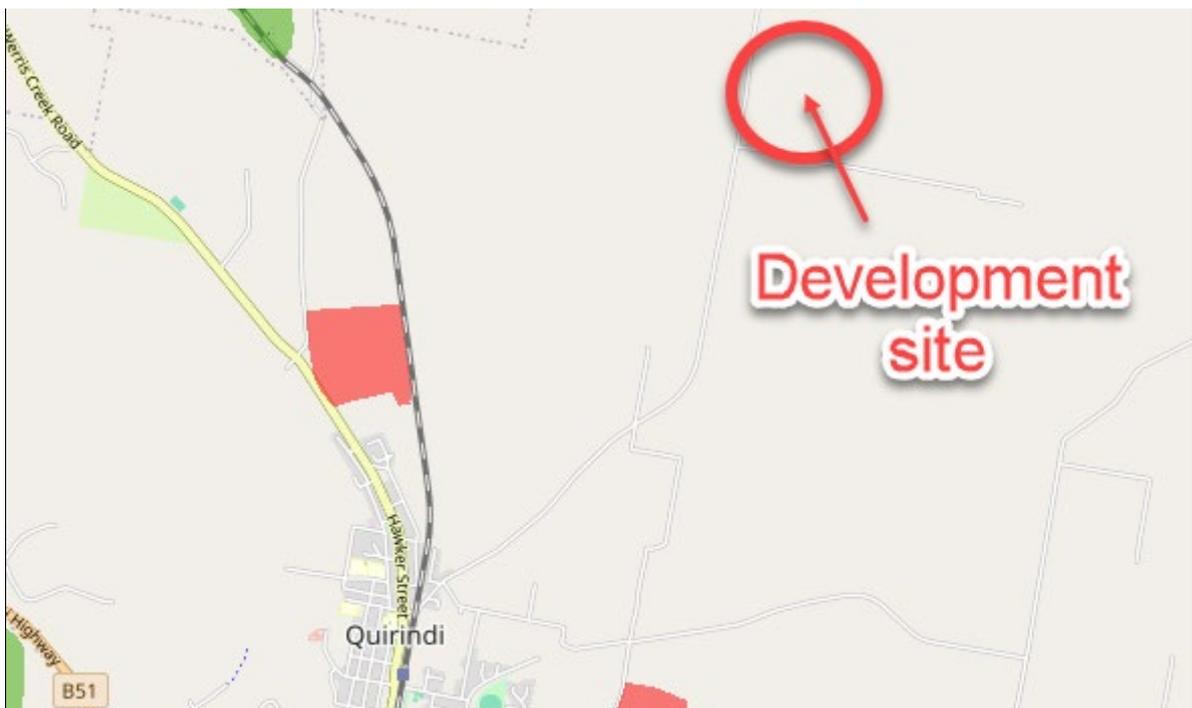


Figure 13: Strategic Regional Land Use Policy. Source: DPE 2023

### **5.7.3 Potential socio-economic impacts**

The benefits to the community of the solar farm will be through an understanding of sustainable development and by gaining a commitment to greater reliance on renewable energy. The power generated by the solar farm would be directed to the township of Quirindi for consumption by households and businesses. Employment and education will bring direct economic benefits to the local economy through wages and salaries and indirect benefits through the need for accommodation and sustenance in the area for non-local employees. Restaurants, cafes, bakeries, supermarkets, pubs, newsagents would all benefit from the additional business this will bring.

It is anticipated that there will be 50 personnel directly involved in construction with a maximum of 30 workers on site at any one time. Construction is expected to take approximately three months. Varying levels of expertise will be required ranging from labourers to qualified electricians and project managers. In addition, personnel would be involved in transport and delivery of materials to the site. Some of this employment may be able to be sourced locally. The construction period and availability of workers is subject to the availability of skilled and unskilled labour which is currently in short supply in regional areas due to high levels of development including infrastructure renewal.

This initial expenditure generates flow on effects throughout the local economy through income and employment. ITP (Development) Pty Ltd will commission local professionals to carry out the land survey of the development site. If necessary, sites officers employed by the Local Aboriginal Land Council will be engaged to carry out a cultural survey prior to commencement of works to identify any Indigenous items or places present on the development site.

It is considered that there is adequate accommodation available to cater to the 50 construction workers given the number of visitor accommodation establishments in the area. In addition, there are 139 unoccupied private dwellings in Quirindi urban centre some of which may be available for short term rentals and as unregulated visitor accommodation. There are likely to be negligible effects on the availability of affordable rental over the short construction period as it is not expected that landlords would evict long-term tenants in preference of short term workers. Workers coming to the area would be likely to take up tourist accommodation similar to mine workers across country NSW, however, construction may be limited to the off-peak tourist season if necessary.

The amount of land given over to renewable energy production will be 11.09 hectares which is 7.8% of the total property. There will be a minor temporary loss of agricultural land, however, the landowners may continue to farm the development site, for example, by grazing livestock within and around the array. These activities which are defined as extensive agriculture in *Liverpool Plains LEP 2011*, do not require

development consent in zone RU1 Primary Production and may proceed at any time. The additional lease income may be put to improvements elsewhere on the property. The facility will contribute to the local economy through direct and indirect employment over the short term and through the benefits that renewable energy supply will bring to the region.

In summary:

- The solar farm will generate community economic benefits through local employment opportunities during the planning and construction phases as well as limited maintenance and inspection jobs once operational,
- The development of a solar farm will create a new market for local contractors and expand diversity of income for the landowners,
- There will be only a minor temporary loss of agricultural land although agricultural use of the land may continue, and
- The array of panels can be removed once the facility is decommissioned and the land returned to its current condition.

#### **5.7.6 Mitigation measures**

It is recommended that labour to construct the solar farm and for ongoing maintenance be sourced from within Liverpool Plains LGA wherever possible. Where labour needs to be brought into the area, it is considered that there would be sufficient accommodation options for employees in the LGA for the estimated 50 workers engaged during the three month construction phase. It is also recommended that advertising be placed in local media and to approach local businesses to determine whether there is the capacity and expertise available in Quirindi and surrounding districts to participate in the construction and ongoing maintenance activities.

### **5.8 Heritage**

#### **5.8.1 Indigenous heritage**

##### **5.8.1.1 Determining whether to use the generic due diligence process**

The property lies within the area managed by Nungaroo Local Aboriginal Lands Council. To determine whether due diligence should be carried out a number of questions are posed:

1. *Is the activity a Part 3A project declared under s.75B of the EP&A Act?*

The proposed development is of regional scale and is not considered major development, noting that Part 3A of the EP&A Act no longer exists.

2. *Is the activity exempt from NPW Act or NPW Regulation?*

The proposed development is not exempt from NPW Act or NPW Regulation.

3. *Will the activity involve harm that is trivial or negligible?*

The proposed development will not cause harm that is trivial or negligible and involves ground disturbance.

4. *Do either or both of these apply:*

- *Is the activity in an Aboriginal Place?*
- *Have previous investigations that meet the requirements of this code identified Aboriginal objects?*

The site of the proposed development is not a declared Aboriginal Place under the NPW Act and there are no known previous investigations into the presence of Aboriginal objects on the site.

5. *Is the activity a low impact one for which there is a defence in the NPW Regulation?*

The proposed development is not a low impact activity that is listed in the NPW Regulation.

6. *Do you want to use an industry specific code of practice, adopted by the NPW Regulation or other due diligence process?*

There is no industry code that applies to the development of small scale solar farms or other form of renewable energy that has been adopted under the NPW Regulation. No other due diligence process has been carried out.

It is therefore necessary to follow the generic due diligence process outlined in the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW*. This code was implemented by the NSW Government in 2010 to ensure that an adequate due diligence process that addresses Aboriginal cultural heritage issues has been carried out. This process follows the steps shown in Figure 14 below.

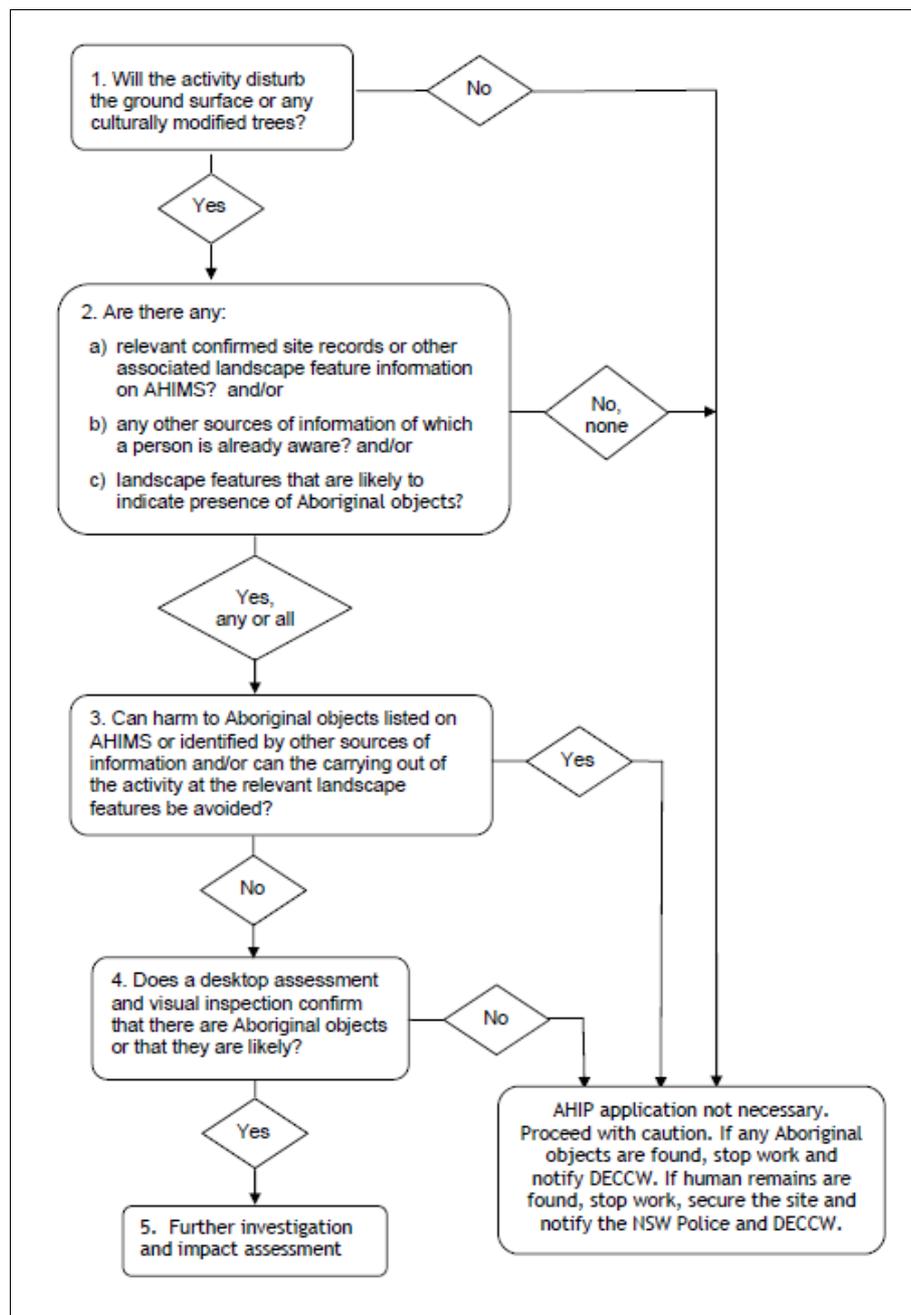


Figure 14: The generic due diligence process.

Source: Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, 2010

### 5.8.1.2 Implementing the due diligence process

The generic due diligence process outlined in the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* was implemented to ensure that an adequate due diligence process that addresses Aboriginal cultural heritage issues has been carried out. This process follows the following five steps:

1. *Will the activity disturb the ground surface?*

Yes. Earthworks will involve trenching which is required for the cabling of each PV array/module to inverters and a substation. Other earthworks would be pile-driving to support module frames, and to enable the placement of concrete slabs and gravel accessways. However, most of the infrastructure would be pre-fabricated off-site, delivered and assembled on-site.

2a. *Search the AHIMS database*

In accordance with the code, an on-line search was carried out of the *Aboriginal Heritage Information Management Service (AHIMS)* that is maintained by Heritage NSW. The search is part of the due diligence process and remains valid for 12 months.

A search of Lot 130 DP 751009 with a buffer of 200 metres to encompass the development footprint and access tracks was performed on 3 October 2023. The search results are:

- There are no Aboriginal sites recorded in or near the selected location, and
- There are no Aboriginal places that have been declared in or near the selected location.

It is noted that surveys for Aboriginal objects have not been carried out in all parts of NSW and Aboriginal objects may exist on a parcel of land even though they have not been recorded in *AHIMS*. Further, not all known Aboriginal sites are registered on the *AHIMS* database and not all sites consist of physical evidence or remains, e.g. dreaming and ceremonial sites.

2b. *Activities in areas where landscape features indicate the presence of Aboriginal objects*

The development area does not possess landscape features that indicate the presence of Aboriginal objects. The vast majority of the site has been cleared for many years and used to graze livestock and grow crops. It is not located within 200 metres of a waterbody, within a sand dune or on a ridge top, ridgeline or headland, is not located within 200 metres of a cliff face or within 20 metres of a cave, rock shelter or cave mouth. There is a very low probability of Aboriginal objects occurring on the development site.

3. *Can you avoid harm to the object or disturbance of the landscape features*

This step only applies if the proposed development is on land that is not disturbed land or contains known Aboriginal objects.

The development area has been disturbed and farmed, does not possess significant landscape features and no known Aboriginal objects are listed in AHIMS.

4. *Desktop assessment and visual inspection*

This step only applies if the proposed development is on land that is not disturbed land or contains known Aboriginal objects.

A site inspection was made in September 2020 and there was no obvious evidence of any artefacts or items of cultural significance on the surface of the land.

5. *Further investigations and impact assessment*

A basic search of AHIMS records has been carried out and the generic due diligence process has been implemented. It is considered that extensive search of AHIMS records or further investigations and an Aboriginal Heritage Impact Permit are not required as there are no Aboriginal sites or places that have been recorded or observed on the development site and the landscape features of the site do not indicate the presence of any Aboriginal cultural objects.

Nungaroo LALC has been advised of the plans to develop the solar farm by email. As not all culturally significant items or places are made public and listed on AHIMS, a request was forwarded to the LALC enquiring as to whether the organization has any knowledge of Indigenous items or places of significance on the property and whether a site survey is required to be carried out prior to commencement of works.

A representative of Nungaroo LALC replied to the email advising that very few broad area cultural surveys have been done in the surrounding areas and that it is unknown when the last physical survey for cultural sites and objects was completed for the development site.

The LALC further advised that *if the area has not been previously surveyed or the previous survey is more than 2 years old, Nungaroo LALC would be of the opinion that a cultural survey is required. Besides helping complete the picture of past history, this would also help avoid delays further down the track if cultural objects are present in the landscape. Past use of the area included hunting Emu, Kangaroos and Possum when the semi permanent creeks (now barely visible as dips in the landscape) held water in pools and wet areas where grass was sweet.*

It is acknowledged that a condition of consent may be imposed to require a site survey to be carried out either before any work commences or prior to the issue of a construction certificate. This is the preference of the applicant rather than carry out a survey during the planning phase.

### **5.8.2 Non-indigenous heritage**

The development site is not listed as a heritage item in Schedule 5 Environmental heritage of *Liverpool Plains LEP 2011*. There are no listed heritage items in the vicinity of the development site. It is considered that a heritage management document is not required.

### **5.8.3 Mitigation measures**

Council may recommend that a condition of consent be imposed to require a site survey be carried out by an LALC sites officer either before any work commences or prior to the issue of a construction certificate. Council may also recommend a condition of consent to comply with provisions of the *National Parks and Wildlife Act 1974* should any evidence of Aboriginal occupation be found during site works. An *Aboriginal Heritage Impact Permit* may be required to be obtained if indigenous heritage objects are found during ground disturbance.

There are no recommendations in relation to non-Indigenous heritage.

## **5.9 Glare and glint**

### **5.9.1 Assessment of impacts**

A *Glint and Glare Assessment* has been carried out using the Solar Glare Hazard Analysis Tool by ITP Renewables. The findings of the assessment are summarized below. Reference should be made to the *Glint and Glare Assessment* that is submitted with the development application for further information or clarification of any matter concerning the assessment and recommendations.

The assessment is based on identifying the potential sensitive receptors in close proximity to the development site having regard to the elevation of the site relative to surrounding land and structures or vegetation that would act as visual barriers. Potential glare and glint impacts are assessed and if necessary mitigation measures are recommended to reduce potential impacts to an acceptable level.

## **5.9.2 Findings**

A total of 11 observation points and two road routes were identified as potential visual receptors. The results of the GlareGauge analysis indicated that two observations points received green glare and both road routes received yellow glare. Yellow glare has the potential to cause afterimage to observers, while green glare has low potential to cause after image. No observation point, or routes, received more than seven minutes of glare in any single day.

In general, most of the glare occurred during early mornings and late evenings when backtracking is active. The existing roadside vegetation and structures are expected to provide a physical obstruction between the solar farm and receptors. This will reduce the visual impact of the project. The green glare impact is low and further mitigation is not required.

## **5.9.3 Mitigation measures**

There are no measures recommended to mitigate the impacts of glint and glare.

## **5.10 Landscape character and visual amenity**

### **5.10.1 Assessment of impacts**

Impacts on landscape character and visual amenity of the proposed solar farm have been assessed by Zenith Town Planning Pty Ltd. Reference should be made to the *Visual Impact Assessment* that is submitted with the development application for further information or clarification of any matter concerning the assessment and recommendations.

The methodology included site inspections of the location of the proposed works and the surrounding area in June 2022 and April 2023 to identify potential viewpoints, land uses and characteristics of the surrounding area, and includes an assessment against planning principles for visual impact established by the Land and Environment Court.

The assessment estimates the likely impacts on landscape character and viewpoints within a 2 kilometre radius based on the sensitivity to physical change and the magnitude, or relative size and scale, of the works to apply an impact rating. The observation points and public roads shown within the visual assessment catchment in Figure 15 below are the same as those used for the glint and glare analysis by ITP Renewables.

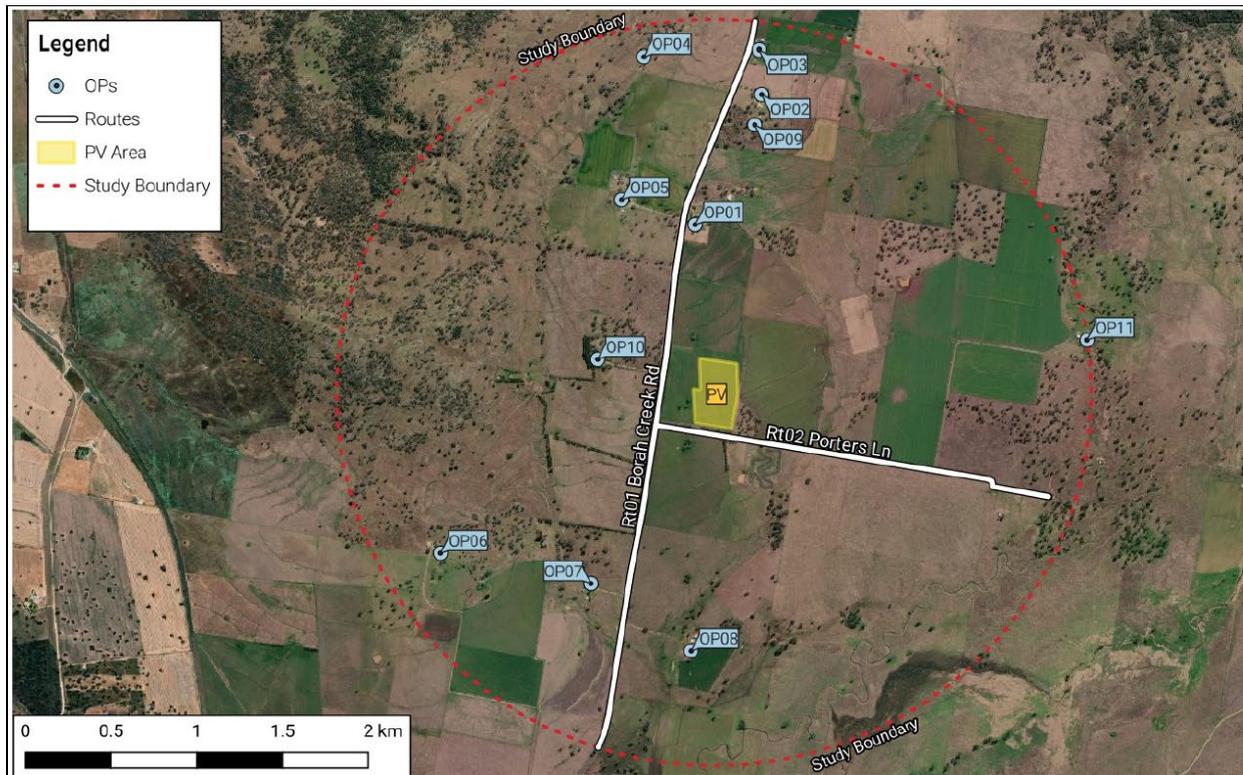


Figure 15: The visual catchment and observation points

### 5.10.2 Findings

The character of the landscape near the site of the Quirindi 1B Solar Farm is a modified agricultural landscape with expansive views across farmland to the east with low ranges in the distant east and south of the site and undulating hills to the west. The settlement of Quirindi is visible in the distance to the south. The landscape in the immediate vicinity of the development site is relatively flat with remnant/regrowth native vegetation along the Porters Lane road reserve and within some nearby properties and on hilly country.

Structures within the vicinity of the site comprise rural farm buildings and rural dwellings. Quipolly Dam is located approximately 5 kilometres to the north of the site and is accessed by Borah Creek Road. The overall impact on landscape character is assessed to be moderate-high for both private property and the public domain. However, distance, the presence of roadside and boundary vegetation and paddock trees, and the flat to undulating topography temper the effects on landscape character.

Based on proximity to the development site, topography, and vegetation and structures on intervening land, the visual impact of the proposed works is assessed to range from negligible to moderate for eleven residential observation points within the visual catchment.

Two dwellings are likely to have a direct line of sight to the solar farm. Other observation points would have nil visual connection due to the topography and vegetation either on the land surrounding these receivers or on intervening land. OP10 is close to the development site, being 590 metres west. However, there are large eucalypt trees on the western side of Borah Creek Road that would filter views of the solar farm. Residents of OP11 which is located at the eastern edge of the visual catchment may see the facility, but this would be tempered by distance (2 kilometres). OP1 to the north is in close proximity but lacks visual connection due to vegetation surrounding the dwelling.

Due to the lack of roadside vegetation, impacts are assessed to be high from the western boundary of the development site and on approach from either direction for motorists, cyclists and pedestrians using Borah Creek Road. Views towards and across the site from Porters Lane and the intersection with Borah Creek Road would be partially affected by vegetation giving a high impact rating.

On balance and having regard to other matters for consideration under section 4.15 *Evaluation of the Environmental Planning and Assessment Act 1979*, any impacts are considered acceptable given that:

- the solar farm will contribute to renewable energy generation and provide a source of electricity for local domestic and commercial use whilst at the same time assisting to reduce greenhouse gas emissions and our reliance on fossil fuels,
- The solar farm will demonstrate the commitment of the community of Quirindi to renewable energy and will assist the NSW Government to meet its emissions reduction target,
- It will generate employment opportunities during the construction phase and once operational will provide employment for maintenance crews, and
- Any existing vegetation along road reserves and property boundaries is to be maintained.

The township of Quirindi is not mapped as a 'regional city' in *SEPP (Transport and Infrastructure) 2021*. Impacts on scenic quality and landscape character have been assessed to be acceptable and no vegetation screening is warranted.

The rural landscape is a primary production environment and appropriate uses including solar farms are permissible in the zone. The presence of the solar farm in the landscape can be reversed without permanent impact. The land will return to its current appearance after the solar farm is decommissioned in approximately 35 years time. The process of decommissioning will see the removal of all panels, supporting frames and ancillary items such as the inverter stations and fencing.

Solar farms are becoming a common component of rural landscapes and are less intrusive than other forms of electricity generation. The urgency with which we need to develop renewable energy production is becoming accepted by mainstream society.

### **5.10.3 Mitigation measures**

There are no measures recommended to mitigate impacts on landscape character and visual amenity.

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## 6. CONCLUSION

### 6.1 Findings

#### 6.1.1 Suitability of the site

The site is considered suitable for the proposed development of the Quirindi 1B Solar Farm. A connection and capacity are available to the Essential Energy zone substation to transfer power generated by the solar panels to the township and on to the grid.

The development area is relatively flat, is free of constraints and is accessible to large delivery vehicles during the construction phase and for utility vehicles for ongoing maintenance.

#### 6.1.2 Triple bottom line assessment

##### *Environmental*

The likely impacts of the development have been considered in this Statement and supporting documents. Considerations include impacts on biodiversity, natural hazards, visual and scenic amenity, glare and glint, traffic, noise, air quality, water resources, indigenous and non-indigenous heritage, the community and the local economy. Any impacts on these interests have been found to be acceptable and mitigation measures have been recommended where necessary.

There will be no dust or air emissions resulting from the development. Dust generated by any nearby industries would be managed through regular clearing of solar panels and is not considered a threat to the effective operation of the facility. Noise impacts once operational have been assessed to be within noise management levels and therefore are not expected to interfere with inhabitants of dwellings near the site.

##### *Social*

It is considered that the solar farm can co-exist with surrounding rural activities. The array is to be placed away from sensitive receivers such as farm dwellings and is screened by existing vegetation and topography which will ensure that visual amenity for future residences is maintained.

There will be no dust or air emissions resulting from the development. Dust generated by nearby extractive industries would be managed through regular clearing of solar panels and is not considered a

threat to the effective operation of the facility. Noise impacts once operational have been assessed to be within noise management levels and therefore are not expected to interfere with inhabitants of farm dwellings near the site.

According to the Australian Radiation Protection and Nuclear Safety Agency, which maintains continual oversight of emerging research into the potential health effects of the EMF exposure, there is no established evidence of health effects from exposure to electric and magnetic fields from powerlines, substations, transformers or other electrical sources, regardless of the proximity, causes any health effects. The location of the solar farm and the distance separation between nearby dwellings and the site mean that any potential impacts on health are mitigated.

### *Economic*

The solar farm will generate community economic benefits through local employment opportunities during the planning and construction phases as well as maintenance and inspection jobs once operational. The development of a solar farm will create a new market for local contractors and expand diversity of income for the landowners,

The land is of high capability land that has moderate limitations and is capable of sustaining high-impact land uses, such as cropping and livestock grazing. The site is mapped as state significant agricultural land, however, there will be no permanent loss of agricultural land as the array can be removed once the facility is decommissioned. Livestock grazing is permitted without consent and may continue on the site amongst the array should the landowner choose to do so.

### **6.1.3 Potential cumulative impacts**

The cumulative impacts of the proposed development are minor. There have been no other utility scale solar farm proposals in the vicinity of the development site. There are no other electricity generating works in the immediate area and the use is suited to a rural location due to the need for a large area of land. The addition of a solar farm to that rural area would not detract unreasonably from local amenity or the natural environment.

### **6.1.4 Consistency with planning framework**

The proposed development is consistent with the strategic planning framework that applies to the local government area, the site itself and to the development of electricity generating works. The solar farm is permissible with consent under provisions of *SEPP (Transport and Infrastructure) 2021* which prevails

over provisions of *Liverpool Plains LEP 2011* and is satisfactory to relevant provisions of other applicable SEPPs. The site is not located in a regional city as mapped in *SEPP (Transport and Infrastructure) 2021* and the proposed development will not interfere or prevent the planned growth of Quirindi.

The proposed rural location implements the planning priorities, goals and actions of the *New England and North West Regional Plan 2041* and the *Liverpool Plains Shire Local Strategic Planning Statement*. These objectives seek to capitalize on solar energy resources to increase the provision of renewable energy using rural land in locations that will not cause land use conflict.

### **6.1.5 Contribution to government targets**

Electricity generated by the system will be directed to the settlement of Quirindi via existing electrical infrastructure to contribute to the supply of electricity for use by households and businesses. Any surplus electricity will be sent to the grid and any deficit will be drawn from the grid. As well as the potential to utilize local contractors to construct the facility, the township will benefit through the ability to use clean energy that is generated adjacent the settlement.

Currently, Australia's energy grid operates on about 60% coal and 40% renewables. Australia subsidises fossil fuels by \$65 billion a year, or 2.5 per cent of GDP. The International Monetary Fund has found that in 2022 Australia granted \$9.7 billion in explicit fossil fuel subsidies, such as household electricity bill relief or tax breaks for coal and gas producers. In addition, there was another \$55.6 billion in implicit subsidies, with taxpayers footing the bill for premature deaths and poor health caused by air pollution, as well as environmental damage and global warming.

The NSW Government is committed to achieving a 50% emissions reduction by 2030 and net zero emissions by 2050. The Commonwealth Government's target is to reduce emissions in 2030 to 43% below 2005 levels, for 82% of Australia's energy to be generated by renewable technologies in 2030 and net zero in 2050.

The development of the solar farm will assist the transition of our economy from reliance on fossil fuels to renewable sources. It will assist Commonwealth and NSW Governments to achieve targets and objectives relating to emissions to address climate change. Capacity exists to cater for the electricity generated by proposed solar farm as evidenced by contractual arrangements that are in place with Essential Energy to connect with and contribute to the grid system.

Given the local, regional and national benefits of renewable energy generation and based on implementation of the recommended mitigation measures to avoid, minimize or mitigate impacts to the existing natural and built environment, the development is considered to be in the public interest.

## 6.2 Summary of mitigation measures

Table 9 provides a summary of mitigation measures. It is recommended that an environmental management plan be prepared to cover the construction and operational phases. Where necessary Table 9 includes a recommendation as to whether the mitigation measure should be included in the management plan. In addition to the mitigation measures detailed below, it is recommended that a waste management plan be prepared for inclusion in an environmental management plan.

**Table 9: Summary of mitigation measures**

Consideration	Mitigation measures	Environmental Management Plan
<b>Fire assessment</b>	<ul style="list-style-type: none"> <li>• Install a reliable, automated monitoring and control systems, with an alarm and shutdown response capability</li> <li>• Take reasonable and safe measures to prevent the risks of external heat effects in the event of a bushfire</li> <li>• Design appropriate separation and isolation between battery cubicles, and between the BESS and other infrastructure, in accordance with the manufacturers' recommendations, and including gravel set-off areas around the facility</li> <li>• Comply with all applicable Australian codes and standards</li> <li>• Prepare a BESS-specific fire response plan, in conjunction with the NSW Rural Fire Service</li> <li>• Install an adequate automatic fire suppression system integrated into the detection and control system</li> <li>• Dispose (and where possible, recycle) of any potentially hazardous material in accordance with the best international practices available at that time</li> <li>• Fuels and pesticides/herbicides in use at the site will be stored at the laydown area in appropriately bunded areas designed in accordance with AS1940-2004</li> </ul> <p>In terms of fire safety including the threat of bushfire, the report recommends that the facility with battery storage can be made safer through the integration of safety in design principles from bushfire standards including APZ clearances, internal protection areas, comprehensive system fault monitoring, automated fire detection and suppression systems and safety procedures built into WHS policies and procedures to ensure these farm assets and the surrounding area are protected from the risk of fire.</p>	Yes, for operational phases

Consideration	Mitigation measures	Environmental Management Plan
<b>Biodiversity</b>	<p>By way of a clearing process that minimizes the risk to threatened species that may be opportunistically using the site, it is recommended that:</p> <ol style="list-style-type: none"> <li>I. Construction limits and exclusion zones be clearly identified prior to work;</li> <li>II. A visual inspection is conducted by environmental staff before construction commences to identify any areas of site that might be supporting native fauna;</li> <li>III. Vehicle movements around the site will be restricted to the construction footprint and away from any existing planted trees and flagging exclusion fencing to be installed.</li> <li>IV. Soil disturbance by vehicle and pedestrian access is to be kept to a minimum outside the construction footprint.</li> <li>V. Any weeds removed (particularly those bearing seeds) are to be disposed of appropriately at the nearest waste management facility.</li> </ol>	<p>Yes, with reference to ongoing site access during both construction and operational phases, and to the storage of materials within the site</p>
<b>Natural hazards</b>	<p>Prepare a fire emergency management plan and include that plan in the environmental management plan</p>	<p>Yes, for construction and operational phases</p>
<b>Water resources</b>	<p>Design – site drainage and water quality controls:</p> <ul style="list-style-type: none"> <li>• Undertake hydrological assessment of the sites catchment in accordance with relevant methods outlined in Australian Rainfall and Runoff.</li> <li>• Determine sediment management targets and drainage control standards in accordance with Managing Urban Stormwater: Soils and Construction Vol 1 (Blue Book) (DECC, 2008).</li> <li>• Develop a site erosion and sediment control plan in accordance with the Blue Book.</li> <li>• Develop site drainage design incorporating detention basins and sedimentation management structures where relevant.</li> <li>• Permanent site drainage should coincide with temporary arrangements where possible</li> </ul> <p>Construction and/or demolition – site drainage and water quality controls:</p> <ul style="list-style-type: none"> <li>• Catch drains to be located downslope of any proposed road works.</li> <li>• Install location appropriate sediment fences or other applicable control measures depending on whether the feature is upstream or downstream of a disturbed part of the site or will need to be trafficable.</li> <li>• All stormwater collection points need to have appropriate sedimentation and erosion controls.</li> <li>• Undertake ongoing inspections of stormwater facilities and water control measures to assess their effectiveness.</li> <li>• Vibration grids or wash bays at all construction exits.</li> </ul>	<p>Yes, for construction and operational phases. Include an erosion &amp; sediment control plan or soil and water management plan</p>

Consideration	Mitigation measures	Environmental Management Plan
	<ul style="list-style-type: none"> <li>• Level spreaders at locations where concentrated flow is discharged offsite to ensure sheet flow like conditions are maintained.</li> <li>• Flat land erosion control options include erosion control blankets, gravelling, mulching, soil binder, turfing and revegetation</li> </ul> <p>Construction and/or demolition – stormwater point source control:</p> <p>In the event of concrete works:</p> <ul style="list-style-type: none"> <li>• Do not undertake works if chance of heavy rain.</li> <li>• Store rinsate5 water, if applicable, separately to other water on site and dispose of offsite as appropriate.</li> <li>• Block on site drains in the area of the works and remove any contaminated runoff.</li> </ul> <p>In the event that dewatering practices are required:</p> <ul style="list-style-type: none"> <li>• Pump hose intakes for withdrawing water from excavations will be elevated to minimise sediment pumping and directed to a containment area for settling prior to discharge.</li> <li>• Limit direct discharge off site (consistent with the design requirements for sediment pond discharge).</li> <li>• Stormwater collected on site should be reused where possible. Controls should be inspected and maintained on a regular basis. All water released from sediment basins should be clear or disposed off site by vehicle.</li> <li>• Material and waste storage areas should be designed and operated to minimise interaction with surface waters.</li> <li>• Vehicle washdown areas should be located away from water courses</li> </ul>	
<b>Air quality</b>	<p>During construction:</p> <ul style="list-style-type: none"> <li>• Limit vehicle movements to areas necessary to deliver panels, ancillary structures and equipment</li> <li>• Suppress dust emissions using watering and cease works during dry and windy conditions</li> <li>• Ensure ground disturbance is limited to areas necessary to place footings or to be used for access</li> <li>• Ensure minimal handling of excavated materials</li> <li>• Ensure stockpiles of excavated material is banded and protected from wind and vehicle movements</li> </ul> <p>During operation:</p> <ul style="list-style-type: none"> <li>• Grade and add road base to internal accessways</li> <li>• Revegetate the site with suitable groundcover immediately construction works are completed</li> <li>• Ensure all plant and equipment is maintained in a clean condition and operates in accordance with specifications.</li> </ul>	Yes, for construction and operational phases
<b>Noise</b>	The following mitigation measures are recommended to address noise emissions during the construction phase:	Yes, for construction and operational phases

Consideration	Mitigation measures	Environmental Management Plan
	<ul style="list-style-type: none"> <li>• a construction noise management protocol to minimise noise emissions, manage out of hours (minor) works to be inaudible, and to respond to potential concerns from the community,</li> <li>• where possible use localised mobile screens or construction hoarding around piling rig/plant to act as barriers between construction works and receivers, particularly where equipment is near the site boundary and/or a residential receiver including areas in constant or regular use (e.g. unloading and laydown areas),</li> <li>• operating plant in a conservative manner (no over-revving), shutdown when not in use, and be parked/started at farthest point from relevant assessment locations,</li> <li>• selection of the quietest suitable machinery available for each activity,</li> <li>• minimise noise plant/machinery working simultaneously where practicable,</li> <li>• minimise impact noise wherever possible,</li> <li>• utilise a broadband reverse alarm in lieu of the traditional high frequency type reverse alarm,</li> <li>• provide toolbox meetings, training and education to drivers and contractors visiting the site during construction so they are aware of the location of noise sensitive receivers and to be cognisant of any noise generating activities,</li> <li>• signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off-site, and</li> <li>• utilise project related community consultation forums to notify residences within proximity of the site with project progress, proposed/upcoming potentially noise generating works, its duration and nature and complaint procedure.</li> </ul> <p>It is recommended that the noise emissions from the solar farm be minimised when operational. To assist in noise management, it is recommended that a one-off noise validation monitoring assessment be completed to quantify emissions from site and to confirm emissions relevant criteria are satisfied. The monitoring assessment would consist of operator attended noise measurements during normal operation to determine the noise contribution from the project.</p>	
<p><b>Traffic</b></p>	<ul style="list-style-type: none"> <li>• Prior to commencing works, it is recommended that an easement or similar agreement for the duration of the solar project be provided through Lot 134 to secure access into the future for Lot 130.</li> <li>• Prior to commencing works a traffic management plan be developed that incorporates notification of local residents of the works and informs them of the construction period and operating hours.</li> <li>• Shared transport for workers should be incorporated into the site management during construction period.</li> </ul>	<p>Yes, with reference to site access during the construction phase</p>

Consideration	Mitigation measures	Environmental Management Plan
	<ul style="list-style-type: none"> <li>• Access improvements required off Porters Lane to accommodate the largest vehicle that would access site (B-Double).</li> <li>• Driveway improvements for wet weather operation be considered including surfacing with additional gravel.</li> <li>• Dilapidation survey to be undertaken along Borah Creek Road and Porters Lane prior to construction works to assess any impacts on the road during construction period.</li> </ul>	
<b>The community &amp; local economy</b>	<ul style="list-style-type: none"> <li>• labour to construct and maintain the solar farm be sourced from within the Liverpool Plains local government area wherever possible</li> <li>• advertising be placed in local media and local businesses contacted to determine whether there is the capacity and expertise available to participate in the construction and ongoing maintenance activities</li> <li>• Ensure that the timing of construction of the solar farm does not coincide with the construction of major infrastructure projects to avoid a shortage of visitor accommodation</li> </ul>	n/a
<b>Heritage</b>	<p>Council may recommend that a condition of consent be imposed to require a site survey be carried out by a Numgaroo LALC sites officer either before any work commences or prior to the issue of a construction certificate.</p> <p>Council may also recommend a condition of consent to comply with provisions of the <i>National Parks and Wildlife Act 1974</i> should any evidence of Aboriginal occupation be found during site works. An <i>Aboriginal Heritage Impact Permit</i> may be required to be obtained if indigenous heritage objects are found during ground disturbance.</p> <p>There are no recommendations in relation to non-Indigenous heritage.</p>	n/a
<b>Visual impacts</b>	No mitigation measures are recommended	n/a
<b>Glare and glint</b>	No mitigation measures are recommended	Yes. Implement once facility is operational

## Property Report

BORAH CREEK ROAD QUIRINDI 2343



### Property Details

Address: BORAH CREEK ROAD QUIRINDI 2343  
 Lot/Section 1/-/DP40368 103/-/DP751009 104/-/DP751009  
 /Plan No: 130/-/DP751009 134/-/DP751009 135/-/DP751009  
 181/-/DP665201 185/-/DP751009  
 Council: LIVERPOOL PLAINS SHIRE COUNCIL

### Summary of planning controls

Planning controls held within the Planning Database are summarised below. The property may be affected by additional planning controls not outlined in this report. Please contact your council for more information.

Local Environmental Plans	Liverpool Plains Local Environmental Plan 2011 (pub. 9-12-2011)
Land Zoning	RU1 - Primary Production: (pub. 14-4-2023)
Height Of Building	NA
Floor Space Ratio	NA
Minimum Lot Size	200 ha
Heritage	NA
Land Reservation Acquisition	NA
Foreshore Building Line	NA

### Detailed planning information

#### State Environmental Planning Policies which apply to this property

State Environmental Planning Policies can specify planning controls for certain areas and/or types of development. They can also identify the development assessment system that applies and the type of environmental assessment that is required.

This report provides general information only and does not replace a Section 10.7 Certificate (formerly Section 149)

- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Allowable Clearing Area (pub. 21-10-2022)
- State Environmental Planning Policy (Biodiversity and Conservation) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004: Land Application (pub. 25-6-2004)
- State Environmental Planning Policy (Exempt and Complying Development Codes) 2008: Land Application (pub. 12-12-2008)
- State Environmental Planning Policy (Housing) 2021: Land Application (pub. 26-11-2021)
- State Environmental Planning Policy (Industry and Employment) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Planning Systems) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Primary Production) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Resilience and Hazards) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Resources and Energy) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy (Transport and Infrastructure) 2021: Land Application (pub. 2-12-2021)
- State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development: Land Application (pub. 26-7-2002)

### Other matters affecting the property

Information held in the Planning Database about other matters affecting the property appears below. The property may also be affected by additional planning controls not outlined in this report. Please speak to your council for more information

Bushfire Prone Land	Vegetation Category
Land near Electrical Infrastructure	This property may be located near electrical infrastructure and could be subject to requirements listed under ISEPP Clause 45. Please contact Essential Energy for more information.
Local Aboriginal Land Council	NUNGAROO
Regional Plan Boundary	New England North West

This report provides general information only and does not replace a Section 10.7 Certificate (formerly Section 149)

Zenith Town Planning

Date: 03 October 2023

P O Box 591

Moruya New South Wales 2537

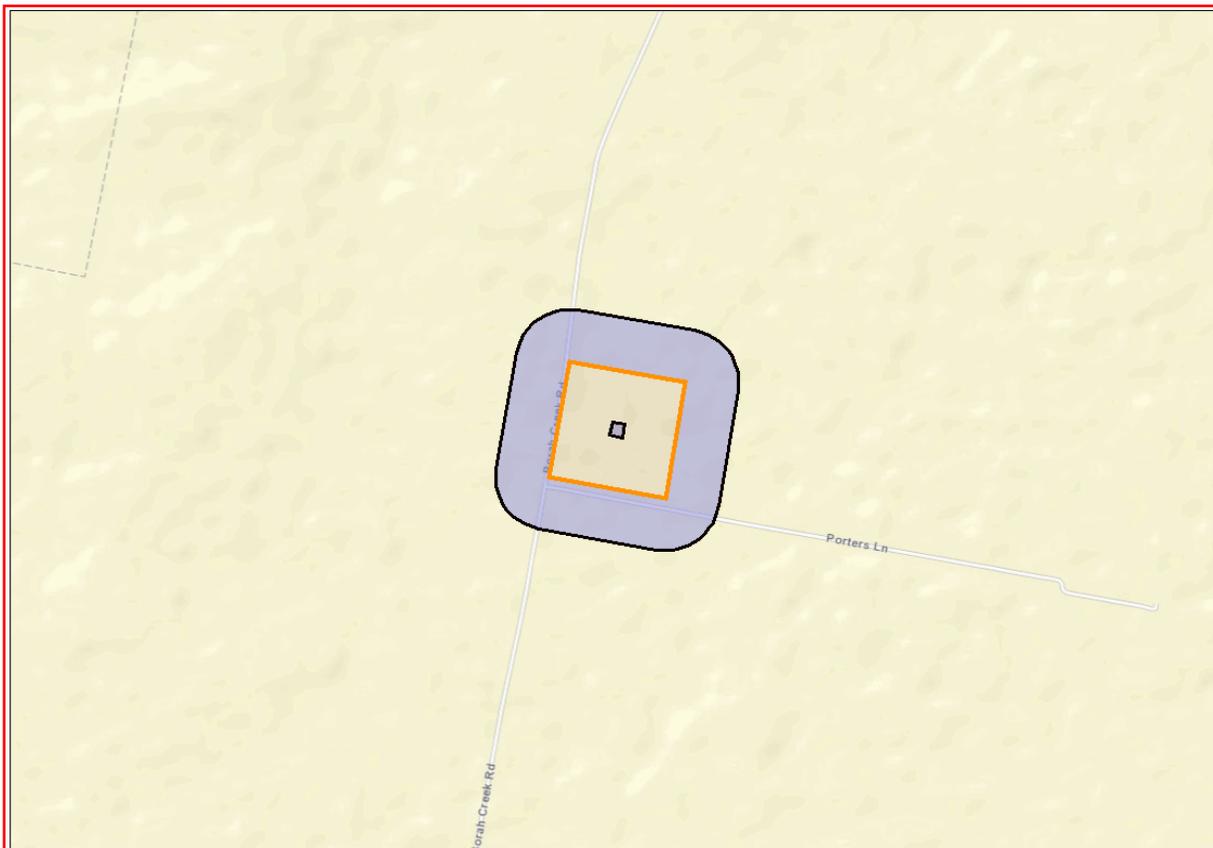
Attention: Allen Grimwood

Email: zenithplan@bigpond.com

Dear Sir or Madam:

**AHIMS Web Service search for the following area at Lot : 130, DP:DP751009, Section : - with a Buffer of 200 meters, conducted by Allen Grimwood on 03 October 2023.**

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



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

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

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

### **Important information about your AHIMS search**

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