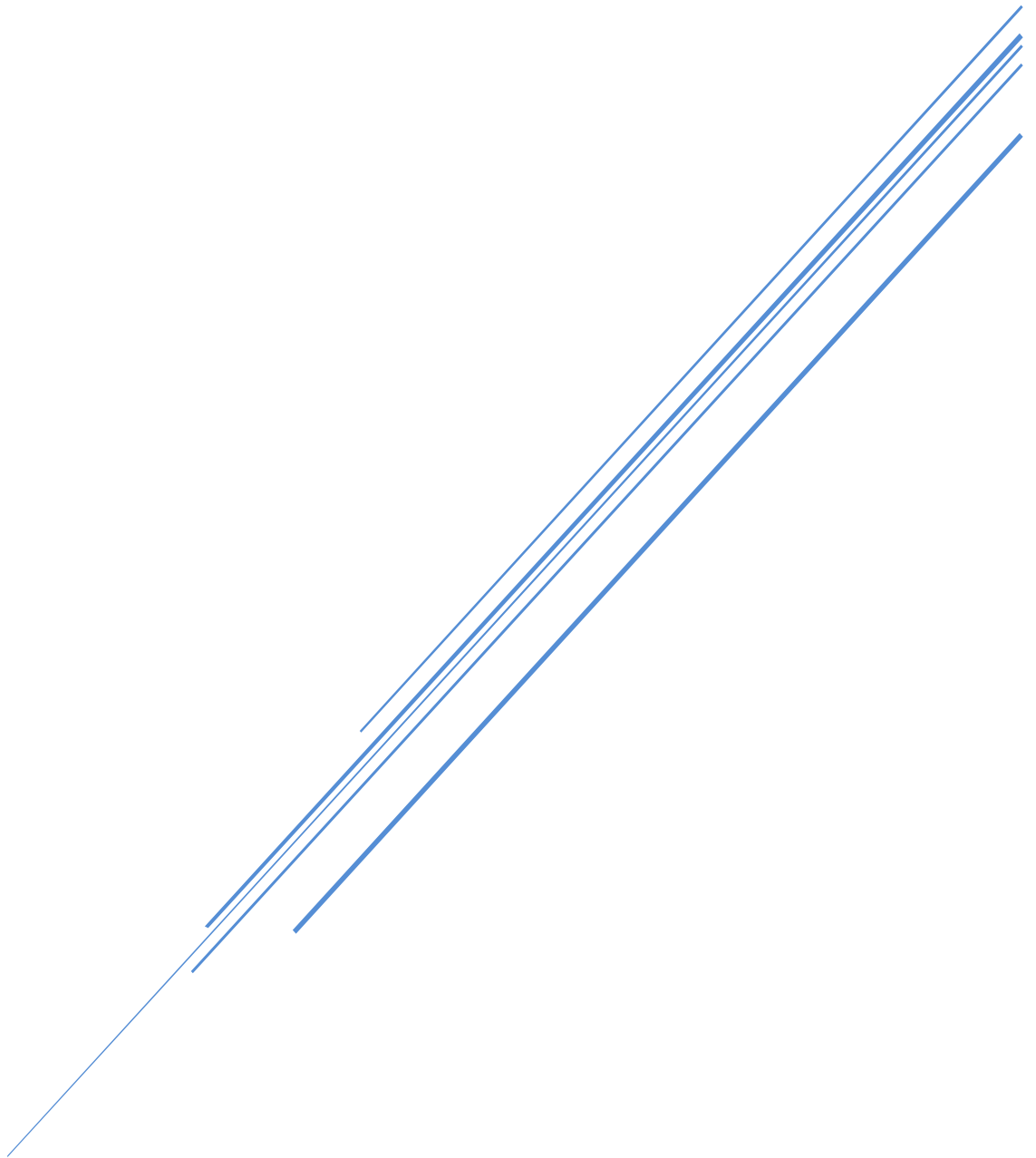


STATEMENT OF ENVIRONMENTAL EFFECTS

Temora 1C Solar Farm

4 March 2021



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Attachment A: AHIMS Search Results

Document Details & History

Project number	2220
Project title	Temora 1C Solar Farm
Document title	Statement of Environmental Effects
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Version	Draft 2 March 2021
	Final 4 March 2021

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EXECUTIVE SUMMARY

This Statement of Environmental Effects supports an application to Temora Shire Council to develop a solar farm at Lot 1 DP 1110693 No 197 Moroneys Lane, Temora, referred to as the Temora Solar Farm. The proponent is ITP (Development) Pty Ltd. The site is located 2.8 kilometres directly south-east of Temora township, or about 3.5 kilometres by road and occupies 11 hectares of the 48.6 hectare property. The application is for regionally significant development that needs consent and is to be determined by the Southern Regional Planning Panel. It is integrated development as a separate approval is required to be issued by WaterNSW under the *Water Management Act 2000* for works within 40 metres of a watercourse.

The proposed development comprises a solar farm and ancillary facilities with a DC capacity of 6.4MWp and an AC output of 5.0MW. There are proposed to be 12,100 solar modules installed in 140 rows running north to south with approximately 6.25 metres spacing centre to centre between each row. The hub height of each tracker is 1.5 metres with the peak of the modules reaching an approximate height of 2.7 metres. Ancillary facilities comprise two 3.4MW AC inverter stations each mounted on a 12.2 metre long skid. Each of these inverter stations incorporates high and moderate voltage switchgear and transformers and connect by way of underground cables to the 11kV feeder line that connects to the electricity grid at the Essential Energy Temora Zone substation. The solar modules are to be enclosed within a chain mesh steel security fence topped with three rows of barbed wire to a total height of 2.3 metres. The fence is to be setback a minimum of 3 metres from a fence separating the northern section of the property, 3 metres from the eastern boundary, variable from the southern boundary ranging from 66.2 metres at the south-eastern corner and 97.3 metres at the south-western corner of the security fence, and variable from the western boundary ranging from 171.9 metres at the north-western corner and 226.3 metres at the south-western corner of the security fence. Solar arrays are to be setback a further 8 metres within the fence. A landscaped screen is proposed on all four sides of the outer side of the security fence and inside a stock fence. Construction is expected to take approximately three months employing 50 workers. Maintenance is expected to be carried out quarterly by a crew of 2 to 3 people. The solar farm will be decommissioned in approximately 35 years from approval.

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

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 *Temora LEP 2010*. 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 Temora Solar Farm is permissible under provisions of *SEPP (Infrastructure) 2007* and *Temora LEP 2010*.

The likely impacts of the development have been considered as summarized below. Mitigation measures have been recommended where necessary including preparation of a construction environmental management plan. On balance and having regard to matters for consideration under section 4.15 of the *Environmental Planning & Assessment Act 1979*, the impacts are considered acceptable.

Biodiversity

The project requires less than 1 hectare clearance of native grass and zero remnant native trees. The proposed works 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. The small amount of native grass that will be impacted by the development will not endanger or have a significant effect on any existing native vegetation, habitats within the site, or fauna species that may be using the site.

The small sections of remnant EEC Box Gum Woodland on the southern boundary of the lot are unlikely to be impacted by the development given that the nearest edge of the works is over 100 metres north. This project will not displace any rare or threatened species, however, it is likely that a number of threatened and declining bird species may be using the area to the south and along the heavily wooded road reserve on the western boundary, hence the construction activities may prove to disturb foraging activities for a short period.

The site comprises exotic species 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 development site has the potential to introduce such impacts. Wherever possible, removal of weeds should be undertaken prior to seed developing, which for most species occurs during summer months.

It is concluded that the proposed works will not have a significant effect on any threatened species and ecological communities and/or their conservation.

Natural hazards

The site is not mapped as being flood prone in *Temora LEP 2010* and is not identified as being potentially contaminated. A small area at the south-western corner of the development site is mapped as being a bushfire buffer on the bushfire prone land map.

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*. The development footprint is not mapped as bushfire prone land and is over 250 metres from the mapped bushfire buffer. Defendable space of 8 metres between the array and security fence is proposed.

Surface and ground waters

An intermittent watercourse flows across the property from the lower part of the western boundary to the mid point of the southern boundary, flowing in a south-easterly direction to join other watercourses which drain to Narraburra Creek some 5 kilometres east of the development site. The watercourse is classified as a first order stream. The setback to the watercourse is 29.2 metres at the closest point.

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.

Air quality

The current use of the land for farming involves activities that may create dust and impact on air quality. The construction of the solar farm and delivery of materials using heavy vehicles, 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.

Noise

Predicted construction noise levels are expected to exceed the NMLs at four receivers when works are nearest to those locations. The exceedances would be temporary and of short duration. The exceedances would be due primarily to piling and earthworks. Operational and road noise levels satisfy the management levels for all assessed receivers.

Electromagnetic radiation

According to the Australian Radiation Protection and Nuclear Safety Agency 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. The location of the proposed solar farm and the distance separation between nearby dwellings and the site mean that any potential impacts on health are mitigated.

Traffic and access

Proposed access to the development site is off Moroneys Lane at the centre of the development site using an existing driveway entrance. Safe intersection sight distances can be achieved. There is expected to be a daily maximum of 4 heavy vehicles accessing the site during the construction phase. Heavy vehicles would only access the site between 10.00am and 2.00pm and would not contribute to the morning or afternoon peak hour traffic periods. The access point is proposed to be upgraded to accommodate B-Double access with drainage and fencing improvements. B-Double trucks are currently approved to use Burley Griffin Way and Old Cootamundra Road, however, approval would be required for heavy vehicles to utilize Gallipoli Street and on to Moroneys Lane to access the site.

There is likely to be 20 to 30 vehicles transporting construction workers to the site in the morning between 6:30am to 8:00am and leaving at the afternoon peak around 4:00pm to 5:00pm. These will be light vehicles and possibly a shuttle bus service.

The community and economy

The development of a 5MW solar farm will contribute to the electricity grid in a sustainable manner that reduces greenhouse gas emissions and will assist the transition of our economy from reliance on fossil fuels to renewable sources to decarbonise electricity production, assisting governments to achieve emissions reduction targets.

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 land holder.

The land may continue to be used for agriculture and returned to its current condition once the facility is decommissioned.

Heritage

The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* was applied and it was found that there would not be any impacts on Indigenous places or objects. The development site is not located in the vicinity of any non-indigenous heritage items.

Glare and glint

The impact of glare and glint was analysed for 21 residential and commercial properties and 11 road routes within a 2 kilometre radius of the development site. There are not expected to be any impacts due to glare or glint on residents or motorists due to distance separation and the presence of vegetation and/or structures that will impede direct vision of the facility.

Landscape character and visual amenity

The character of the landscape near the site of the Temora Solar Farm is a modified agricultural landscape with scattered remnant or regrowth native vegetation existing along road reserves and boundaries and within private properties. The landscape is generally flat with a gentle slope to the south. Structures within the vicinity of the site comprise rural lifestyle and farm dwellings, the bulk grain terminal and Temora Essential Energy sub-station.

The overall impact on landscape character in relation to private property is assessed to be moderate-high. The overall impact on landscape character in relation to the public domain is assessed to range from low to moderate to moderate-high depending upon proximity to the development site.

The solar farm would be partially visible to dwellings in close proximity to the site located on the western side of Moroneys Lane. Setbacks to Moroneys Lane combined with vegetation on private property and the roadside would interfere with direct visibility of the development from the dwellings. The development would be visible to motorists using Moroneys Lane, Old Cootamundra Road including the intersection with Reynolds Lane, and Trigalong Road at varying levels of impact.

To mitigate impacts on the landscape and visual amenity, it is recommended that a vegetation screen be planted around all four sides of the array. Native plants that grow to a maximum height of 2.5 metres are recommended to be selected for all boundaries.

Waste management

Estimates of waste materials and proposed management arrangements for each phase of the development project are provided in light of the capacity and functions of local waste management facilities.

Cumulative impacts

The cumulative impacts of the proposed development are minor. There are no other electricity generating works in the locality and the use is suited to a rural location due to the need for a large land area. The immediate area is already used to accommodate infrastructure such as a large grain storage facility and an electrical sub-station. The addition of a solar farm to that area would not detract unreasonably from local amenity or the natural environment.

The system is designed to generate in excess of 12.9GWh of energy annually with the system offsetting almost 8.5 thousand tonnes of CO² equivalent emissions (Sources: *National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Schedule 1)* and Department of the Environment and Energy) and providing enough energy to power about 2,150 NSW homes.

Electricity generated by the Temora Solar Farm will be directed to the settlement via existing electrical infrastructure for use by local 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, Temora will benefit through the ability to power the township with clean energy that is generated adjacent the settlement.

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

1. INTRODUCTION

1.1 Overview

The purpose of this Statement of Environmental Effects is to support an application to Temora Shire Council to develop a solar farm at Lot 1 DP 1110693 No 197 Moroneys Lane, Temora, referred to as the Temora Solar Farm. The application is for regionally significant development that needs consent and is to be determined by the Southern Regional Planning Panel.

A separate approval is required to be obtained under section 4.46 of the *Environmental Planning and Assessment Act 1979* and is therefore integrated development. Works are proposed within 40 metres of a watercourse therefore a controlled activity approval is required to be issued by WaterNSW under the *Water Management Act 2000*.

This Statement has been prepared having regard to advice provided by Temora Shire Council during a site visit in November 2020. Information has also been sourced from the Council's website, the NSW legislation website, SIX Maps, the website of the Department of Planning, Industry & 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.

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

1.2 Scope of the report

The scope of this report is to describe the location and physical characteristics of the site on which the development is proposed, identify relevant provisions of plans and policies applying to the land, and to discuss any potential environmental impacts of the development and proposed servicing arrangements.

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*.

This statement is accompanied by the documents listed in Table 1 which support the development application and have been submitted under separate cover. This documentation is submitted in accordance with *Schedule 1 Forms Part 1 Development Applications* of the

Environmental Planning and Assessment Regulation 2000. Summaries of the findings of these studies and reports are provided in this Statement. Reference should be made to these documents for further details and information about methodology, findings and recommendations.

Table 1: Development application documents

Plan/Doc No.	Plan/Doc Title	Prepared by	Issue	Date
TEM1C-G-0100	Temora 1C 5MW Solar Farm Development Application	ITP Renewables	-	-
TEM1C-G-0400	Location Plan, Site Plan	ITP Renewables	4	03 /03/21
TEM1C-G-2100	General Arrangement Plan	ITP Renewables	5	03/03/21
TEM1C-G-2200	Site Elevations	ITP Renewables	4	03/02/21
TEM1C-C-4300	Inverter Station Footing Detail	ITP Renewables	4	03/03/21
TEM1C-C-5300	Typical Fencing Detail	ITP Renewables	4	03/03/21
TEM1C-C-5301	Gate Sections	ITP Renewables	4	03/03/21
TEM1C-C-6300	Access Path Details	ITP Renewables	4	03/03/21
TEM1C-E-3400	Typical Array (Nextracker) Detail	ITP Renewables	4	03/03/21
TEM1C-E-4300	Typical Inverter Station Details	ITP Renewables	4	03/03/21
MAC180781-13RP1	Noise Assessment	Muller Acoustic Consulting Pty Ltd	-	08/10/20
F8619	Traffic Impact Assessment Report	Price Merrett Consulting	Final	15/01/21
18105488-020-Rev2-Temora1C-WaterAssess	Water Assessment	Golder Associates Pty Ltd	-	28/10/20
202011GG02-Rev02	Glare and Glint Assessment	ITP Renewables	1	23/02/21
-	Waste Assessment	ITP Renewables	1	11/09/20
-	Decommissioning Plan	ITP Renewables	Rev 2	15/02/21
-	Biodiversity Inspection Report	Red-Gum Environmental Consulting Pty Ltd	-	05/02/21
2220	Landscape Character and Visual Impact Assessment	Zenith Town Planning Pty Ltd	-	01/03/21
L-01	Landscape Master Plan	Space Landscape Designs	B	24/02/21

Plan/Doc No.	Plan/Doc Title	Prepared by	Issue	Date
L-02	Landscape Concept Plan	Space Landscape Designs	B	24/02/21
L-03	Elevation & Detail Plan	Space Landscape Designs	B	24/02/21

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.

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 the residents of NSW thereby promoting the social and economic welfare of the community in a manner that manages and conserves natural resources. The Temora Solar Farm will further the goals of sustainability, and the orderly and economic use of land.

2. SITE DESCRIPTION AND CONTEXT

2.1 Description

The site of the proposed Temora Solar Farm is described as Lot 1 DP 1110396 No. 197 Moroneys Lane, Temora, NSW. It is located approximately 2.8 kilometres directly south-east of Temora township, or about 3.5 kilometres by road. It is a rectangular shape with a total area of 48.56 hectares. The location of the site is shown in Figure 1 below.

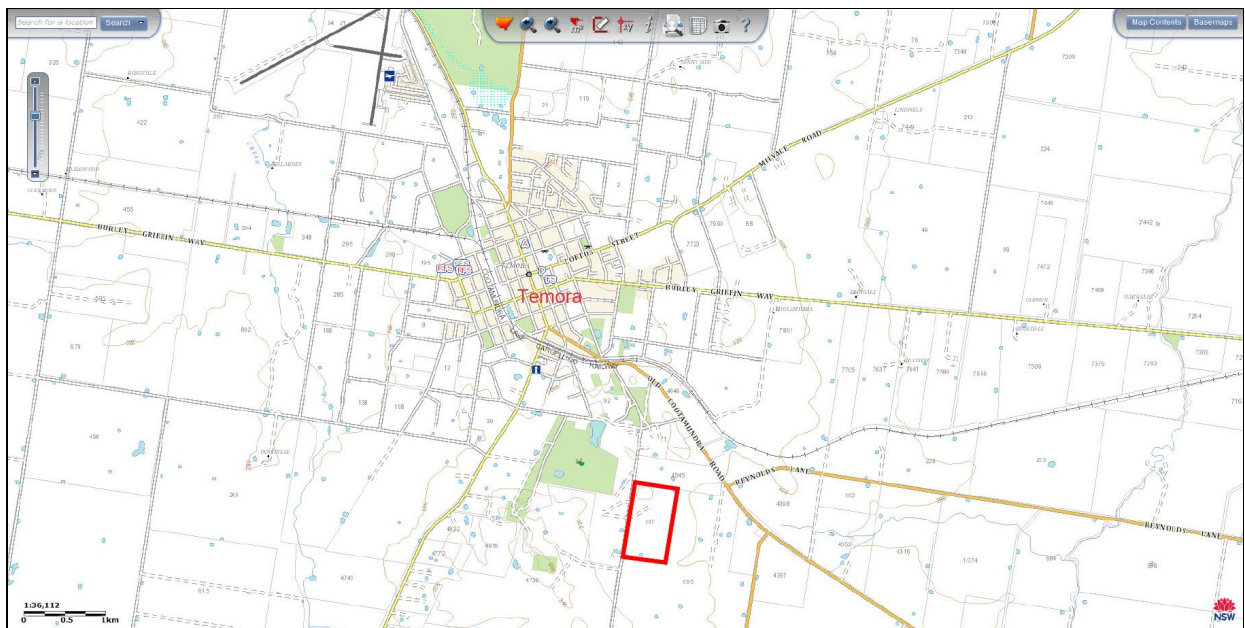


Figure 1: Locality map. Source: SIX Maps, 2020

The site is occupied by a dwelling and a number of farm sheds that are sited on the northern half of the property. The topography of the site is generally flat with a gentle fall to the south.

The development site was purchased by the current owners about 5 years ago and has not been cropped in that time. Existing ground vegetation comprises mostly exotic grasses and weeds although a stand of native vegetation is located at the north-western corner.

Current access to the site is by way of an entrance off Moroneys Lane which is located approximately half way along the western boundary. The northern half of the property is separated by a fence from the southern half which is now grazed by alpacas. An intermittent watercourse flows across the property from the lower part of the western boundary to the mid point of the southern boundary, flowing in a south-easterly direction to join other watercourses which drain to Narraburra Creek some 5 kilometres east of the development site. A dam has

Temora Airport is located approximately 6 kilometres north-west of the site and 3 kilometres from the centre of the township.

A bulk grain terminal is located to the north-east along Old Cootamundra Road. The Cootamundra Lake Cargelligo rail line runs to the north of the site before reaching a terminal in Temora.

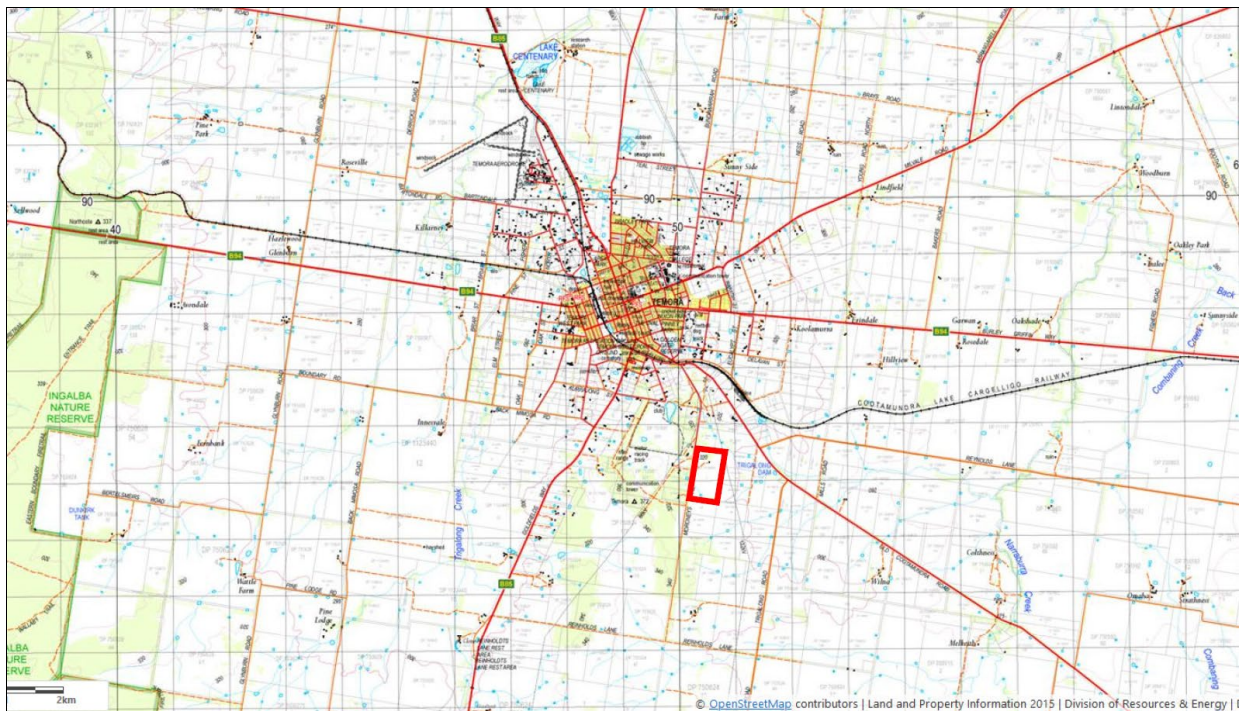


Figure 3: Extract from the topographic map. Source: Land & Property Information 2015

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/m² (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. Rainfall is spread relatively evenly across the year and so does not appear to impact on the level of solar radiation.

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 11kV power lines in the vicinity of the development site.

The map below (Figure 4) shows the average daily hours of sunshine across Australia. Temora LGA receives an average of between 7 and 8 hours of sunshine each day.

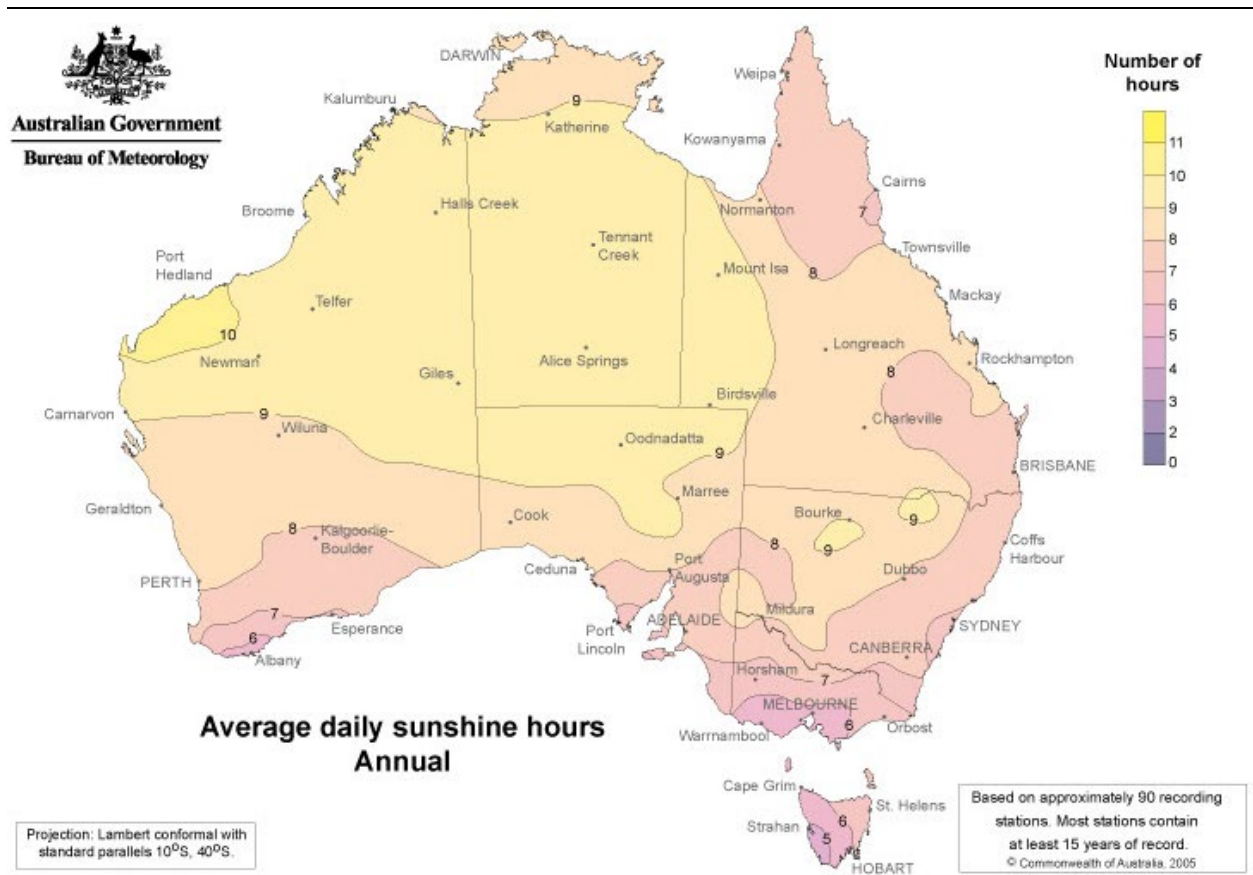


Figure 4: Average daily sunshine hours. Source: Australian Bureau of Meteorology

The mean monthly global solar exposure measured at Temora Airport (station number 073151), the closest measuring station to the solar farm, site, is given in Table 2 below. The annual mean daily global exposure for 2020 was 17.2MJ/m².

Table 2: Mean monthly global solar exposure at Temora Airport, 2020

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Monthly mean	26.1	22.4	18.7	12.3	11.0	8.8	9.7	12.3	16.5	19.0	24.3	25.7

Figure 5 below shows average daily solar exposure across NSW for the 12 month period 1 January 2020 to 31 December 2020. Temora LGA has received an average of 16 to 18 MJ/m² each day.

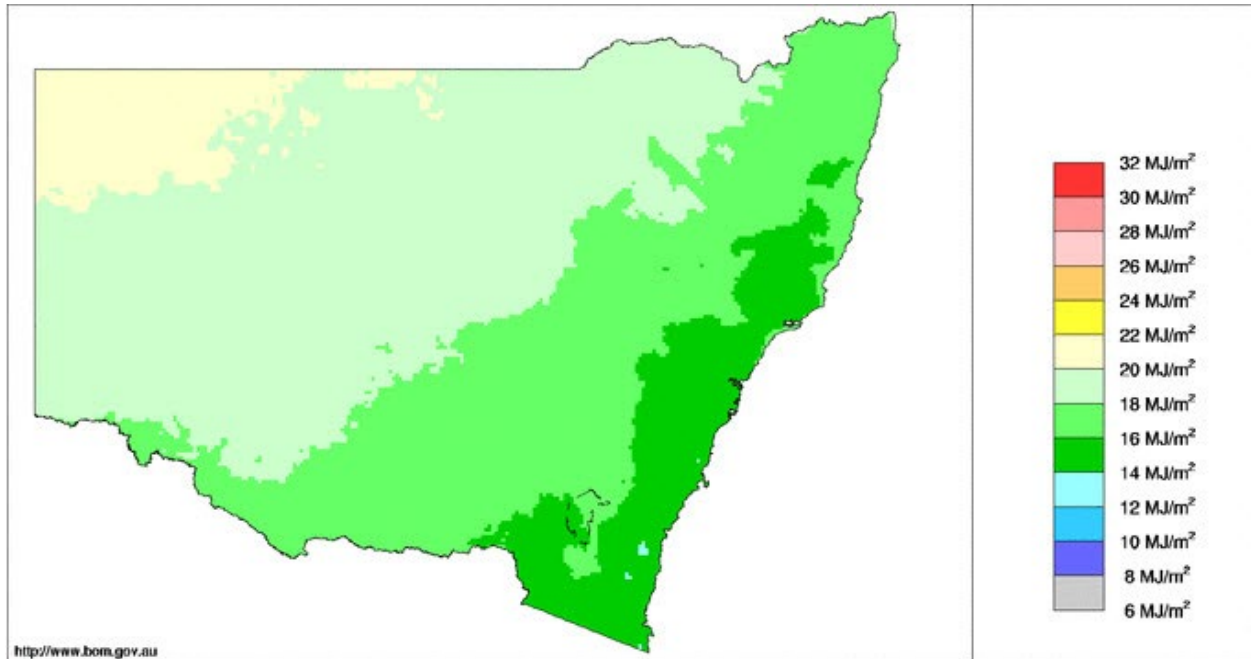


Figure 5: Average daily solar exposure 2020. Source: Australian Bureau of Meteorology

3. DETAILS OF THE PROPOSED DEVELOPMENT

3.1 Overview

The proposed development comprises a solar farm and ancillary facilities with a DC capacity of 6.4MW and an AC capacity of 5.0MW on approximately 11 hectares of the total site. The array is proposed to be placed in the lower half of the property adjacent the eastern boundary. The closest point of the array to a first order watercourse at the southern end of the property is 29.2 metres.

3.2 The array

There are proposed to be 12,100 solar modules installed in 140 rows that are 103 metres long and 2 metres wide running east to west. There is approximately 6.25 metres spacing between each row.

Each row of PV modules will rotate to track the sun across the sky from east to west each day. The hub height of each tracker is 1.5 metres with the peak of the modules reaching an approximate height of 2.7 metres when the array is fully tilted to 60 degrees from horizontal, i.e. in the early morning and late evening.

The layout of the solar farm is shown on General Arrangement Plan (Drawing No TEM1C-G-210).

3.3 Inverters and ancillary items

Two 3.4MW AC inverter stations and a transformer will be installed at the solar farm. These inverters are to be located within the centre of the array and are each mounted on a 12.2 metre long skid. Each of these inverter stations incorporate high and medium voltage switchgear. Each will connect by way of underground cables an 11kV feeder to inject power to the electricity grid at the Essential Energy Temora 66/11 Zone Substation. Dial-before-you-dig investigations would be carried out prior to commencing all subsurface work.

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 (see <https://www.kennards.com.au/site-equipment/water-tank.html>)

) are proposed to be installed during the construction phase. 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.

Proposed access to the development site is off Moroneys Lane at the centre of the development site using the existing main driveway entrance. A 4 metre wide internal road will run west to east, turning south midway along the northern edge of the array and then south to a point near the centre of the array where the inverter station is to be located.

During the initial site establishment phase it is estimated that there will be 6 to 8 light vehicle trips per day and an average 6 to 8 truck and trailer movements. During the construction stage there would be the equivalent of 45 B-Double loads of materials and equipment, with an expected daily maximum of 4 vehicles, accessing the site to deliver PV panels, mounting frame equipment and inverters plus construction machinery to grade the accessways and erect the mounting system.

It is expected that car parking for up to 40 small vehicles will be needed to cater to the 50 construction workers at the rate of 0.8 spaces per worker. Temporary car parking and materials laydown areas are to be sited at the north centre of the array of panels.

3.5 Construction

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 50 personnel on site working from 7.00am – 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.

3.6 Landscaping

A landscape plan prepared by Space Landscape Designs that contains details of appropriate species, pot sizes and the like has been prepared and submitted with the development application.

It is proposed to plant a vegetated screen around the perimeter of the array between the security fence and a stock fence. A mix of native shrubs and ground covers that grow to a maximum height of 2.5 have been selected. The plants would be spaced to provide a continuous screen upon maturity. Plantings will be placed on the outer side of security fencing, i.e. between the stock fence and the security fence.

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. Planting will also assist to minimise site disturbance and contribute to the rural landscape and character of the immediate area.

Plantings will be maintained and watered by maintenance crew on a regular basis. The planting will be carried out whilst construction takes place to enable use of the hired portable tank or cart that will provide water supply to the site. Construction will take approximately 3 months so regular watering during that period would ensure the establishment of plants. The use of native plants means that watering requirements once established would be minimal and would be done once every 2 or 3 months by the landowner. There would be nil impact on Council's infrastructure and no augmentation of services would be required. Bore water would be sourced to maintain the plants if available, otherwise water may be brought onto the site in tanks fixed to utility trays.

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 is being trialled elsewhere and may be carried out around and beneath panels in the future.

3.7 Security

The solar farm is to be enclosed within a 1.8 metre high security fence setback 3 metres from the fence separating the northern section of the property, 3 metres from the eastern boundary, variable from the southern boundary ranging from 66.2 metres at the south-eastern corner and 97.3 metres at the south-western corner of the security fence, and variable from the western boundary ranging from 171.9 metres at the north-western corner and 226.3 metres at the south-western corner of the security fence. Solar arrays are to be setback 8 metres from the security fence. The proposed fence is to be chain mesh steel topped with three rows of barbed wire giving a total height of 2.3 metres similar to that shown in Plate 1 below.

Security lighting is not proposed to be installed.



Plate 1: Example of security fencing

3.8 Decommissioning

The expected life of the Temora Solar Farm is projected to be 35 years. The plant and equipment may have a design life beyond this timeframe, however, it is intended to return the entire site to its original state after 35 years of electricity production. This process will involve:

- Notification of Essential Energy of proposed de-energisation,
- Notification of the Temora Shire Council of the proposed decommissioning and removal of assets from site,
- Deployment of plant and equipment required for decommissioning, site amenities for crews,
- De-energisation of the solar plant and isolation of all electrical and data circuits,
- Disconnection of the HV transformers from the grid,
- Disconnection of the inverters/battery from site assets,
- Removal of PV modules and de-construction of mounting mechanicals/piles,
- Removal of electrical wiring,
- Demobilisation of plant and equipment,

- Dismantling and removal of ancillary items, e.g. fencing, and
- Remediation of land.

In the unlikely event that decommissioning is required during construction, the tasks involved will be contingent on the progress of works at that particular point in time but in essence will be the same as the decommissioning process described above.

This decommissioning plan is written from a standpoint of the methodology, procedures and technology available in 2021. It is expected that when decommissioning takes place circa 2056, many other solar farms across the world would have reached the decommissioning stage with the ability to take advantage of improvements in processes and the availability of recycling. It is expected these advances would be applied to this decommissioning plan at that time.

Full details of the process are provided in the *Decommissioning Plan* prepared by ITP Renewables dated 15 February 2021. Reference should be made to that report for an explanation of each step in the decommissioning process.

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 threshold which in this case is 1 hectare.
- 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 whereby 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. The closest point of the array to a first order watercourse at the southern end of the property is 29.2 metres. A controlled activity approval is required in this instance due to being within 40 metres of the watercourse. 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 5.7 *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 No 55 – Remediation of Land

SEPP 55 requires Council 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.

The property has been cleared and farmed for many years and is not known to be listed on a Council register of potentially contaminated land. There has been no known historical usage that would cause the land to be contaminated. NSW Health advise that the use of farm chemicals such as pesticides and fertilisers is not considered to contaminate soils to the extent that mediation is required. It is considered that a preliminary investigation is not required for the development of a solar farm.

4.2.2 State Environmental Planning Policy (Infrastructure) 2007

The aims of *SEPP (Infrastructure) 2007* are to ensure a consistent and flexible planning system to facilitate the delivery of services. The policy identifies environmental assessment categories for types of infrastructure, matters to consider when assessing development adjacent to infrastructure and provides for consultation with relevant public authorities. The policy applies to the whole of NSW.

SEPP (Infrastructure) 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 3 Division 4 of the policy relates to electricity generating works or solar energy systems. Section 35 enables development for the purpose of a solar energy system to be carried out by any person with consent on any land, although this is limited to no more than 100kW in a prescribed residential zone. The proposed development is located in zone RU1 Primary Production and is therefore permitted with consent by *SEPP (Infrastructure) 2007*.

Clause 45 of *SEPP (Infrastructure) 2007* requires the consent authority to consult with the electricity supply authority where development occurs near electricity infrastructure. An 11kV power line runs within an easement near the development site, therefore, Council is to consult Essential Energy prior to determination of the application.

Clause 104 - Traffic-generating development also applies. The proposed development will not generate vehicle movements within the threshold required by Schedule 3 to trigger a referral to Transport for NSW.

4.2.3 State Environmental Planning Policy (Primary Production and Rural Development) 2019

The aims of *SEPP (Primary Production and Rural Development) 2019* 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,*
- (f) *to require consideration of the effects of all proposed development in the State on oyster aquaculture,*
- (g) *to identify aquaculture that is to be treated as designated development using a well-defined and concise development assessment regime based on environment risks associated with site and operational factors.*

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. It is noted that, separately, the Department of Primary Industries are in the process of preparing mapping of *Important Agricultural Land* in NSW to assist decision-making regarding development on rural land.

4.2.4 State Environmental Planning Policy (State and Regional Development) 2011

Development that is state and regionally significant is identified in *SEPP (State and Regional Development) 2011*. Electricity generating works including solar farms which have a capital investment value of more than \$30 million, or a capital investment value 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 a capital investment value of over \$5 million are declared regionally significant. In this case the proposed development has a CIV of \$6.6 million and is regionally significant. The application will be determined by the Southern Regional Planning Panel.

4.2.5 State Environmental Planning Policy (Koala Habitat Protection) 2019

SEPP (Koala Habitat Protection) 2019 commenced on 1 March 2020. This policy aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current

trend of koala population decline. The new policy is implemented through the *Koala Habitat Protection Guideline*. The policy lists 123 feed tree species. Temora Shire is not listed in Schedule 1 as an LGA to which the policy applies, therefore, a koala assessment report is not required.

4.3 Local Environmental Plans

4.3.1 Temora Local Environmental Plan 2010

The property is zoned RU1 Primary Production under *Temora LEP 2010*. 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.*
- *To minimise the degradation of natural scenery and rural landscapes.*
- *To encourage the conservation and efficient use and of water.*
- *To protect, enhance and conserve the natural environment, including native vegetation, wetlands and other natural features that provide wildlife habitat, protect flora and fauna, provide scenic amenity and that may prevent or mitigate land degradation.*
- *To encourage the provision of tourist accommodation in association with agricultural activities.*

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 permitted with consent in zone RU1.

The following clauses of *Temora LEP 2010* apply to the proposed development:

Clause 6.1 Biodiversity

The objectives of this clause are *to protect, maintain or improve the diversity of the native vegetation, including:*

- a) *protecting biological diversity of native flora and fauna, and*
- b) *protecting the ecological processes necessary for their continued existence, and*
- c) *encouraging the recovery of threatened species, communities or populations and their habitats.*

The consent authority must consider the following matters before granting consent to development on land identified as a sensitive area on the Natural Resources Sensitivity – Biodiversity Map:

- a) *identification of any adverse impact of the proposed development on any of the following—*
 - (i) *a native vegetation community,*
 - (ii) *the habitat of any threatened species, population or ecological community,*
 - (iii) *a regionally significant species of plant, animal or habitat,*
 - (iv) *a habitat corridor,*
 - (v) *a wetland,*
 - (vi) *the biodiversity values within a reserve, including a road reserve or a stock route, and*
- b) *a description of any proposed measures to be undertaken to ameliorate any such adverse impact.*

Clause 6.1 requires that development on affected land must be designed, site and managed to avoid an adverse impact on the natural environment. In this case, the land mapped as a sensitive area is located at the north-eastern corner of the property, along the Moroneys Lane road reserve adjacent the western boundary and at the south-eastern corner of the property along the southern boundary. The array is proposed to be positioned on the lower half of the property adjacent the eastern boundary. This ensures that there is sufficient distance separation from land mapped as a sensitive area in order to avoid any adverse impacts. Access to the property is across the sensitive area of the Moroneys Lane road reserve, however, it is proposed to use the existing access. Impacts on biodiversity are assessed in section 5.1 of this SEE.

Clause 6.4 Earthworks

The objective of this clause is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.

Development consent is required for earthworks unless the earthworks are ancillary to development for which development consent has been given. In deciding whether to grant development consent for development involving ancillary earthworks, the consent authority must consider:

- (a) *the likely disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality of the development,*
- (b) *the effect of the development on the likely future use or redevelopment of the land,*
- (c) *the quality of the fill or the soil to be excavated, or both,*

- (d) *the effect of the development on the existing and likely amenity of adjoining properties,*
- (e) *the source of any fill material and the destination of any excavated material,*
- (f) *the likelihood of disturbing relics,*
- (g) *the proximity to, and potential for adverse impacts on, any waterway, drinking water catchment or environmentally sensitive area.*

Earthworks associated with the development comprise minor excavation to 150mm to install road base for accessways, 750mm footings for the inverters and security fence strainer posts, 1,000mm footings for the access gate and 1,500mm to 3,500mm footings for the panel mounting frames. Cable trenching of 600mm for low voltage cables and 1,200mm deep trenching is also to be carried out.

All of these earthworks are ancillary to the development of a solar farm and are not expected to impact adversely on drainage, future use of the land if the facility is decommissioned, relics, the natural environment or adjoining developments.

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 Temora Shire Council DCP 2012

Temora Shire Council DCP 2012 applies to the whole of Temora Shire LGA. The objectives of DCP 2012 are to:

- *help achieve the aims and objectives of the Temora LEP 2010 by providing more detailed controls for development.*
- *outline Council policies, standards and indicate the preferred future direction for development within Temora Shire.*
- *assist in the preparation of development proposals by providing applicants and owners the relevant details of Council requirements.*

The DCP contains environmental controls that apply to all developments. The DCP does not contain controls that apply to the development of a solar farm. Relevant sections of the DCP are described below.

Environmentally sensitive areas

The objective of this section of DCP 2012 is *to provide environmental controls for development that affects tree and vegetation preservation, waterways, water bodies and wetlands, riparian corridors, groundwater and biodiversity management*. As part of the development site is mapped as being sensitive on the Natural Resources Sensitivity – Biodiversity Map of *Temora LEP 2010*, certain development controls apply. A biodiversity assessment is required to determine the potential ecological impacts of the development. A setback of 10 metres is required for any new development from the first order watercourse in the southern part of the property. Impacts of development on groundwater are also to be addressed.

Erosion and sediment controls

The objectives of controls relating to erosion and sediment are to:

- *prevent the pollution of waterways in Temora Shire by sediment loss from building and development sites*
- *provide simple and practical methods for erosion control on building and development sites*

The DCP provides guidance in the form of a checklist to manage erosion and sedimentation.

Landscaping

The objectives of landscaping controls are to:

- *encourage a high standard of landscape design and construction throughout the Shire*
- *encourage developers and designers to consider landscape design as an integrated component of building and subdivision*
- *maximise the compatibility of development with the urban and rural landscapes of the Shire*
- *set minimum criteria for landscaping based on climatic influences*

The proposed solar farm is a Category 3 development which includes those developments that are highly visible or are of such value that they require high quality landscape design and construction. These developments are likely to have a major impact on the visual environment. A written submission from a landscape designer and a detailed landscape plan are required to be submitted with the development application.

4.5 Land use strategies

4.5.1 Riverina Murray Regional Plan 2036

The *Riverina Murray Regional Plan 2036* was released in March 2017. It establishes a framework for growth over the next 20 years for the Riverina Murray Region which includes Temora LGA.

The plan supports the protection of high-value environmental assets and aims to develop a strong and diverse economy with supportive communities. The plan contains the following four goals:

1. *A growing and diverse economy*
2. *A healthy environment with pristine waterways*
3. *Efficient transport and infrastructure networks*
4. *Strong, connected and healthy communities*

A series of directions and actions are to guide land use planning priorities and decisions. Direction 11 is to *promote the diversification of energy supplies through renewable energy generation*. Actions associated with this direction are:

- 11.1 *Encourage renewable energy projects by identifying locations with renewable energy potential and ready access to connect with the electricity network.*
- 11.2 *Promote best practice community engagement and maximise community benefits from all utility-scale renewable energy projects.*
- 11.3 *Promote appropriate smaller-scale renewable energy projects using bioenergy, solar, wind, small-scale hydro, geothermal or other innovative storage technologies.*

Direction 21 is to *align and protect utility infrastructure investment*. It is noted that there are opportunities to provide cost-effective extended and upgraded services for stand-alone alternative energy generation and the use of renewable options such as solar generation.

4.5.2 Temora Shire Local Strategic Planning Statement

The purpose of the *Temora Shire Local Strategic Planning Statement* is to guide current and future land uses for over the next 20 years. The Statement sets out Temora Shire's land use planning priorities and actions over the short-medium term. It uses population data, future projections, housing needs, economic issues, transport, social issues, and environmental factors to explain current growth and change, and guide priorities and actions. The Statement identifies the planning priorities of the community, including agriculture, housing, aviation, employment, tourism, heritage, environment, amenity and liveability. The Statement also considers zoned available land, infrastructure supply, hazards and constraints.

The 20 year Vision of the *Temora Shire Local Strategic Planning Statement* is:

Temora Shire has a population that is growing and thriving. Temora Shire offers the ideal place to enjoy a relaxed, connected and productive regional lifestyle, where residents have access to housing choice, business and employment opportunities, social connectivity and the widest possible range of services and facilities.

The *Temora Shire Local Strategic Planning Statement* provides four key themes that support the achievement of the Vision. Themes priorities and actions of relevance to the proposed development of Temora Solar Farm are given below.

Theme 1: A diverse and resilient economy

Planning Priority 1: Support agriculture and grow the agribusiness sector

Agriculture continues to be Temora Shire's major employment sector and economic driver. Temora Shire's land and climate supports diverse agricultural production and Temora Shire is strategically located between Sydney and Melbourne benefitting from connections to the national freight network.

This planning priority reflects Temora Shire aspirations to support its agricultural identity and to ensure a strong local economy that leverages the favourable climate and strategic connectivity to domestic and international markets via the regional freight routes. A strong agricultural economy and technological advances will continue to provide an opportunity to attract boutique, innovative, complementary and more intensive agribusinesses to Temora Shire.

Action 1.1 Manage land use conflict and protect the right to farm, within normal farming practices, through use of comprehensive pre-lodgement discussions and the identification and management of risks to continued farming operations, through the implementation of Council's updated Development Control Plan, by the end of 2021.

Action 1.2 Support new and expanding agribusiness opportunities creating investment and employment opportunities, through the active support of a range of permitted land uses that complement traditional agricultural production, which will be reported to Council by the end of 2021.

Planning Priority 2: Encourage a diverse local economy to meet local needs

Economic diversity is critical for Temora Shire's future, to strengthen the local economy, create economic resilience, and spread the benefits of growth more widely across the entire Shire. When communities are largely reliant on a single industry, such as agriculture, this presents challenges during fluctuations in commodity prices or global demand. New opportunities to diversify economic activities, including health care, training, professional and personal services, manufacturing, construction, retail, and food services will assist Temora Shire to become more resilient to economic, social and environmental shifts.

Action 2.1 Support a wide range of land uses that are permitted with consent, suitable within relevant land zones, through finalisation of the permitted and prohibited land uses LEP amendment and DCP review, by end 2021.

Action 2.2 Support a range of business opportunities within the Temora CBD, through active support for new and existing businesses, to be reported by Council by end 2021.

Action 2.3 Promote Temora Shire's open for business approach to support sustainable growth through active marketing and engagement with emerging business opportunities, as reported to Council by end 2021.

Theme 2: Enhanced infrastructure to meet community needs

Planning Priority 4: Support the improvement of road and rail infrastructure to respond to local and regional transport and freight needs

Road and rail infrastructure is critical to the proper functioning and wellbeing of the community both now and in the future. As Temora Shire continues to increase in population, it is important to provide infrastructure in the right place at the right time.

Action 4.2 Protect the freight corridor from encroachment from incompatible land uses, and ensure final mile access to freight infrastructure, as considered within Council's Development Control Plan review, by the end of 2021.

Action 4.3 Identify and protect future transport corridors to support the movement of people within Temora Shire, including improving road safety, as reported to Council by the end of 2023.

In addition to the above themes, priorities and actions, the following themes and priorities are addressed by separate studies and sections of this Statement. These themes do not contain actions that affect or impact on the proposed development.

Theme 3: A thriving place to live

Planning Priority 8: Protect important heritage buildings and streetscapes that contribute to local character

Theme 4: A natural environment that is valued and protected by the community

Planning Priority 11: Protect important areas of biodiversity and Aboriginal cultural heritage

Planning Priority 12: Manage the impacts of natural hazards

4.5.3 Annual Community Strategic Plan Report

Temora Shire Council's *Annual Community Strategic Plan Report* contains actions to be carried out by Council. A key theme is to *Strengthen the Temora Shire Economy*. An economic development action beneath this theme is *diversify the economy and provide employment by attracting non agriculture based industry*. The Temora Solar Farm would contribute to economic diversity by providing utilising rural land to generate renewable energy for use by local households and business, and by creating direct and indirect employment opportunities during the construction phase.

4.5.4 NSW Renewable Energy Action Plan

The *NSW Renewable Energy Action Plan* supports the achievement of the national target of 20% renewable energy by 2020. It aims to position NSW to increase the use of energy from renewable sources at least cost to the energy customer and with maximum benefits to NSW. The plan is predicated on the following three goals:

- Attract renewable energy investment and projects
- Build community support for renewable energy
- Attract and grow expertise in renewable energy technology

These goals are supported by 24 actions which include considering a more strategic and integrated approach to assessment of renewable energy projects and promoting NSW as a leader of research and innovation in renewable energy.

The plan notes that the NSW Government is in the process of streamlining the state planning system and advocates new planning legislation founded on the principle of sustainable development that meets the needs of the current generation without compromising the ability of future generations to meet their needs. Renewable energy projects are a good example of sustainable development in action. Streamlining will focus public participation on strategic planning in order to provide greater certainty for applications and the community in development assessment.

5. ENVIRONMENTAL EFFECTS

5.1 Biodiversity

5.1.1 Methodology

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* dated 5 February 2021 and that is submitted with the development application for further information or clarification of any matter concerning the assessment and recommendations. This report is supplemented by information sourced from:

- SIX Maps aerial imagery,
- *Temora LEP 2010*,
- NSW BioNet Species Sightings records,
- Biodiversity Values Map,
- Schedules to the *Biodiversity Conservation Act 2016*, and
- Protected Matters Report of the *Environment Protection and Biodiversity Act 1999*.

5.1.2 Desktop analysis

Temora LEP 2010 is the local environmental planning instrument that applies to the development site. Clause 6.1 Biodiversity applies to the site as areas of land at the north-western corner and along the southern boundary are mapped as sensitive on the *Natural Resources Sensitivity – Biodiversity Map* as shown in Figure 6.

The objectives of clause 6.1 are to protect, maintain or improve the diversity of native vegetation, including:

- (a) protecting biological diversity of native flora and fauna, and
- (b) protecting the ecological processes necessary for their continued existence, and
- (c) encouraging the recovery of threatened species, communities or populations and their habitats.

Consideration must be given to the impacts of development on the native vegetation community, the habitat of any threatened species, population or ecological community, a regionally significant species of plant, animal or habitat, a habitat corridor, wetland and the biodiversity

values within the road reserve. The development must be designed and sited to avoid, minimise or mitigate any adverse impact.

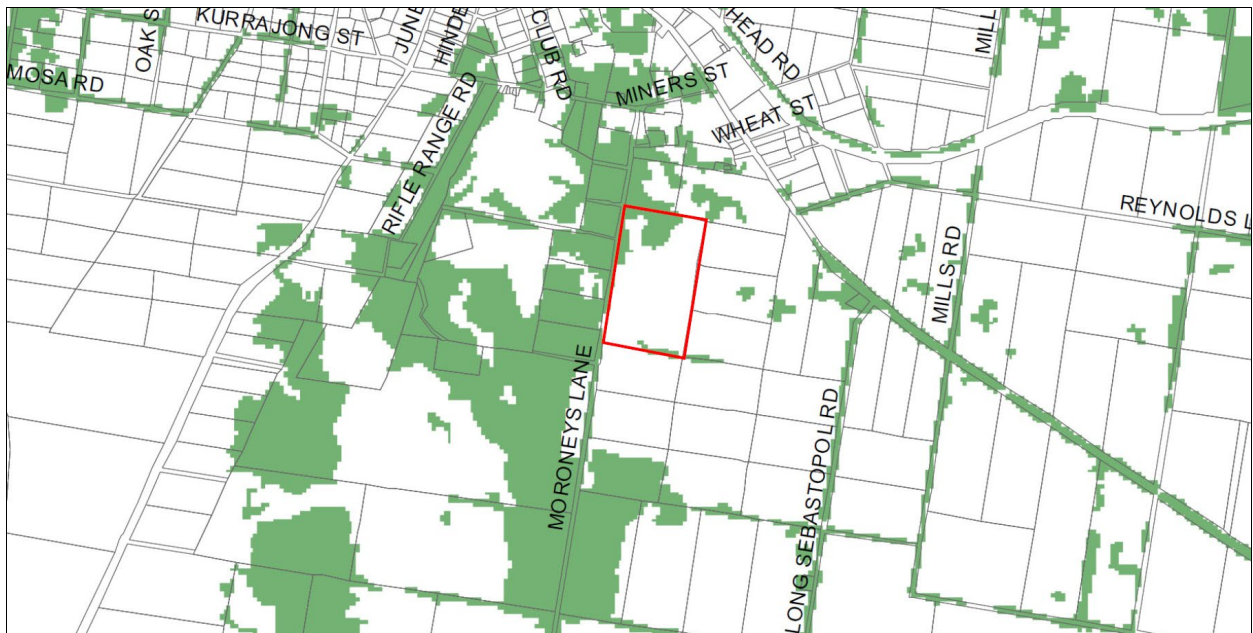


Figure 6: Extract from Natural Resources Sensitivity Map Sheet NRB_004. Source: Temora LEP 2010

Database searches concluded that the likely Plant Community Type (PCT) adjacent to the area is either PCT 435, White Box-White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion or PCT 544 Rough-barked Apple-White Cypress Pine-Blakely's Red Gum riparian open forest woodland of the Nandewar Bioregion and New England Tableland Bioregion.

Aerial photography confirmed that as at 11 January 2021 the entire site is likely cleared of native shrubs and trees, but native grasses may persist under a likely grazing regime. A review of the proposed development indicates that native vegetation removal is to be minimised through a design which avoids all native trees on the site.

The EPBC Protected Matters Online Search Tool for flora and vegetation communities returned 8 threatened species and 4 threatened communities, of which there were 3 Vulnerable, 1 Critically Endangered and 8 Endangered species whose habitat may occur within the specified geographic range. The database for threatened fauna returned 12 Vulnerable, 21 Migratory, 7 Endangered and 8 Critically Endangered species.

The NSW BioNet (The Atlas of NSW Wildlife) for listed flora considered threatened in NSW, returned 1 Vulnerable species recorded within a 10 kilometre by 10 kilometre radius of the site. Spiny Peppercress (*Lepidum aschersonii*) is commonly found on ridges of *gilgai* clays dominated by Brigalow, Belah, Buloke and Grey Box. In the south this plant has been recorded growing in

Bull Mallee where the understorey is often dominated by introduced plants. It was not recorded on site during the inspection and is considered not present due to a lack of suitable habitat and structure. The BioNet database for threatened fauna returned 9 species records, 8 Vulnerable and 1 Migratory species.

Figure 7 below shows species sightings that have been recorded on or near the development site. Of the species recorded only the superb parrot is listed as vulnerable in the *Biodiversity Conservation Act 2016* and the *Environment Protection and Biodiversity Conservation Act 1999*. The superb parrot has been sighted amongst native vegetation to the south west of the development site and near Reynolds Lane to the east.

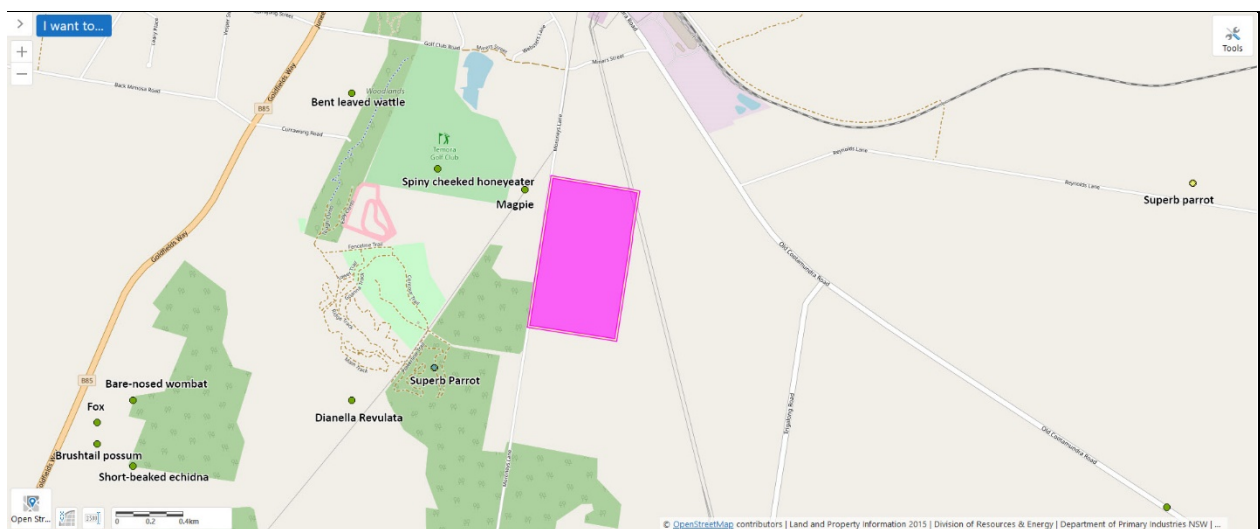


Figure 7: Species sightings. Source: SEED, NSW Government

5.1.3 Site inspection

A site inspection carried out on 4 February 2021 confirmed that the proposed area for development will not see the loss of greater than 1 hectare of native grass or any dead or alive remnant trees.

The following observations were made at the time of inspection:

- If any threatened native fauna (birds) are present in the surrounding connected native vegetation, in particular the Grey-crowned Babbler and Superb Parrot, they were not recorded during the site survey. The nesting period for these species is closed as both typically breed between June and December, meaning that the possibility of harming a fledgling is unlikely,

- The site is a highly modified grazing paddock with some native grasses present and an obvious history of disturbance due to pastoralism and/or cultivation,
- The development will not impact on the strip of remnant vegetation to the south of the site which could be defined as part of the Endangered Ecological Community (EEC) - Box-Gum Woodland, and
- No threatened species, scats or other evidence of the use of this zone or the development site were recorded during the survey.

5.1.4 Findings

The project requires less than 1 hectare clearance of native grass and zero remnant native trees. The proposed works 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.

The small amount of native grass that will be impacted by the development will not endanger or have a significant effect on any existing native vegetation, habitats within the site, or fauna species that may be using the site.

The small sections of remnant EEC Box Gum Woodland on the southern boundary of the lot are unlikely to be impacted by the development given that the nearest edge of the works is over 100 metres north. This project will not displace any rare or threatened species, however, it is likely that a number of threatened and declining bird species may be using the area to the south and along the heavily wooded road reserve on the western boundary, hence the construction activities may prove to disturb foraging activities for a short period.

The area assessed largely comprised exotic species 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 development site has the potential to introduce such impacts. Wherever possible, removal of weeds should be undertaken prior to seed developing, which for most species occurs during summer months.

It is concluded that the proposed works will not have a significant effect on any threatened species and ecological communities and/or their conservation.

The biodiversity Values Map given in Figure 8 indicates that the development site has not been mapped as possessing biodiversity value for the purposes of applying the Biodiversity Assessment Method.

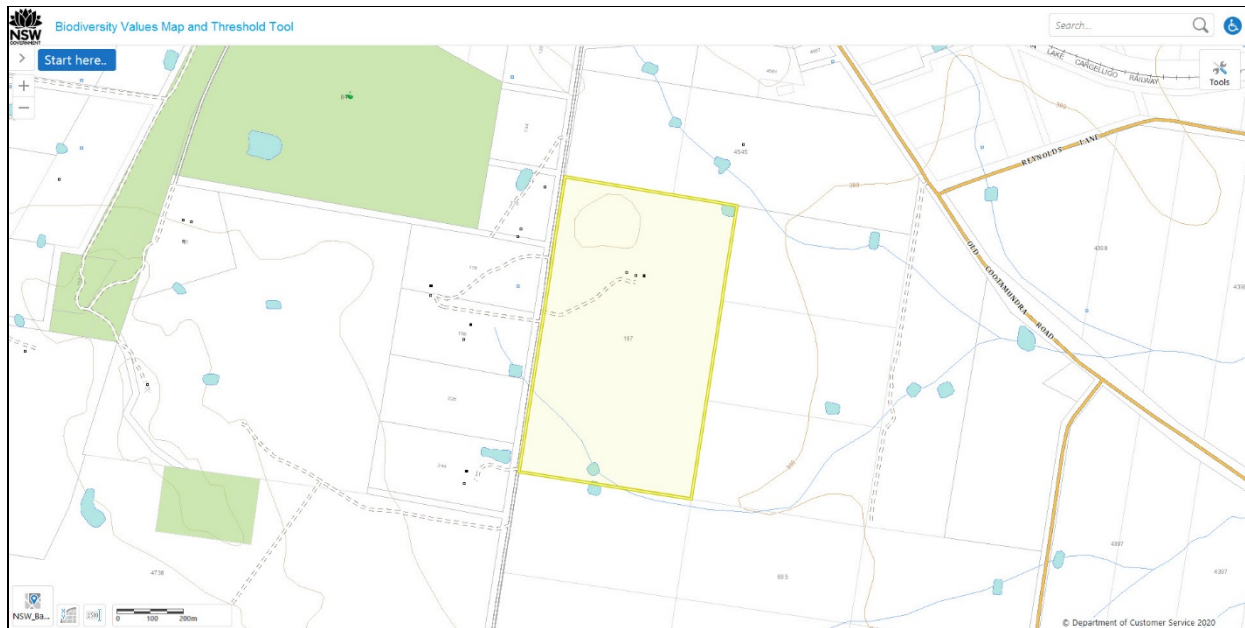


Figure 8: Biodiversity Values Map. Source: NSW Government

5.1.5 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 clearly identified prior to work;
- II. A visual inspection is conducted by environmental staff before construction commences to identify any areas of 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 planted 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.
- 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 being flood prone in *Temora LEP 2010*. Flood mitigation measures and stormwater management have been considered in section 5.3 *Water resources* of this Statement.

5.2.2 Bushfire

A small area at the south-western corner of the development site is mapped as being a bushfire buffer on the bushfire prone land map. 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*. The development footprint is not mapped as bushfire prone land and is over 250 metres from the mapped bushfire buffer.

Defendable space is available within the 8 metre setback between the array and the security fence. 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

The development site is not identified as contaminated land and is not listed on a register of contaminated land.

5.2.4 Mitigation measures

There are no mitigation measures recommended in relation to flooding or land contamination.

Prepare a fire emergency management plan and include that plan in the environmental management plan

5.3 Water resources

5.3.1 Assessment of impacts

A *Water Assessment* of potential impacts on groundwater and surface water flows has been carried out by Golder Associates Pty Ltd, dated 28 October 2020. 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.

The Water Assessment examines:

- Local hydrology and catchment and water quality data,
- Surface and groundwater quality data,

- Flood-risk potential of the site,
- Hydraulic modelling,
- Impacts of the development against NSW policies and industry standards, and
- Management procedures and mitigation measures for construction and operation.

The development site is located in the Temora local government area, to the south-east of the town of Temora. The proposed development is located 5 kilometres west of Narraburra Creek and 4 kilometres east of Trigalong Creek. A watercourse flows through the south-west corner of the site towards Trigalong Dam then discharges to Narraburra Creek. The development site is relatively flat with the land sloping approximately 8 metres from north-west to south-east, falling from 318 metres AHD to 309 metres AHD.

The *Temora Shire Council Urban Stormwater Management Plan 2015* aims to minimize the impact of development on the water quality of receiving waterways in order to protect the ecological and social values of these waterways. The *Temora Flood Study 2019* aims to reduce the impacts of flooding and flood liability on land within a defined area that excludes the development site.

5.3.2 Summary of impacts

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.

The site is not mapped as a flood planning area on maps accompanying *Temora LEP 2010*. However, heavy rainfall storm events or flash flooding may cause disruption during construction activities or for access to deliver materials and equipment. There is the potential for overland flows towards the 1st order watercourse located at the south-west of the development site, thence into the dam with any overflows directed towards Narraburra Creek.

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.

Furthermore, as the site has been historically used for farming there is very little natural ground cover vegetation. There is the potential that site runoff will contain sediments and increase

turbidity or other water quality parameters in downstream water ways. The existing farm dam should capture surface flows from the site and reduce sedimentation downstream.

5.3.3 Mitigation measures

The following mitigation measures given in Table 3 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 3: Proposed mitigation measures to manage downstream sedimentation

Stage	Measure	Activities/approach
Design	Site drainage and water quality controls	Design Basis - Undertake hydrological assessment of the site's catchment in accordance with relevant methods outlined in Australian Rainfall and Runoff - Determine sediment management targets and drainage control standards in accordance with Managing Urban Stormwater: Soils and Construction Vol 1 (Blue Book) (DECC, 2008). - Develop a site erosion and sediment control plan in accordance with the Blue Book. - Develop site drainage design incorporating detention basins and sedimentation management structures where relevant. - Permanent site drainage should coincide with temporary arrangements where possible
Construction and/or demolition	Site drainage and water quality controls	General site works: - Catch drains to be located downslope of any proposed road works. - 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.

Stage	Measure	Activities/approach
		• All stormwater collection points need to have appropriate sedimentation and erosion controls. • Undertake ongoing inspections of stormwater facilities and water control measures to assess their effectiveness. • Vibration grids or wash bays at all construction exits. • Level spreaders at locations where concentrated flow is discharged offsite to ensure sheet flow like conditions are maintained. • Flat land erosion control options include erosion control blankets, gravelling, mulching, soil binder, turfing and revegetation
Construction and/or Demolition	Stormwater point source control	In the event of concrete works: • Do not undertake works if chance of heavy rain. • Store rinsate water, if applicable, separately to other water on site and dispose of offsite as appropriate. • Block on site drains in the area of the works and remove any contaminated runoff. In the event that dewatering practices are required: • 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. • Limit direct discharge off site (consistent with the design requirements for sediment pond discharge). • 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. • Material and waste storage areas should be designed and

Stage	Measure	Activities/approach
		operated to minimise interaction with surface waters. Vehicle washdown areas should be located away from water courses

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 nearest monitoring station to the development site is located at Temora. 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 measured at this station. 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 in the climate of Temora and can cause poor air quality. The pollutants measured by the Department are nitrogen dioxide, sulphur dioxide and ammonia.

Total suspended particles measured 9 on 27 January 2021 between 1pm and 2pm. Particles are also measured as PM₁₀ and PM_{2.5}. PM₁₀ are particles less than 10 micrometres in diameter. Sources include crushing or grinding operations and dust stirred up by vehicles on roads. Particles less than 10 micrometres in diameter were measured as an hourly average reading of 6 at Temora on Wednesday 27 January 2021 between 1pm and 2pm.

PM_{2.5} 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. Particles less than 2.5 micrometres in diameter are also measured as an hourly average reading at Temora. Total suspended particles had an average hourly reading of 1 on 27 January 2021 between 1pm and 2pm.

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 and only 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.

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 conditions
- Ensure ground disturbance is limited to areas necessary to place footings or to be used for access
- Ensure minimal handling of excavated materials
- Ensure stockpiles of excavated material is bunded and protected from wind and vehicle movements

During operation:

- Grade and add road base to internal accessways
- Revegetate the site with suitable endemic native groundcover immediately construction works are completed
- Ensure all plant and equipment 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, dated 8 October 2020. 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.

The assessment includes the following key tasks:

- review construction and operating activities to identify key noise generating plant, equipment, machinery or activities proposed to be undertaken as part of the project;
- identify the closest and/or potentially most affected receptors situated within the area of influence to the project;
- establish existing noise levels to determine project-specific construction Noise Management Levels (NMLs), and operational noise criteria;
- undertake 3D noise modelling to predict levels that may occur as a result of the construction and operation of the project at the closest and/or potentially most affected receptors;
- provide a comparison of predicted noise levels against relevant construction NMLs and operational criteria;
- assess the potential noise impacts associated with construction and operational aspects of the project; and
- provide feasible and reasonable noise mitigation and management measures, and monitoring options, where NMLs or operational criteria may be exceeded.

The assessment has been conducted in accordance with the following key policy and guidelines where relevant:

- NSW Department of Environment and Climate Change, NSW Interim Construction Noise Guideline (ICNG), 2009,
- Environment Protection Authority's (EPA's), Noise Policy for Industry (NPI), 2017,
- NSW Department of Environment, Climate Change and Water (DECCW), NSW Road Noise Policy (RNP), 2011.
- Australian Standard AS 2436-2010 (R2016) (AS 2436) – Guide to Noise and Vibration Control on Construction, Demolition and Maintenance sites,
- Australian Standard AS 1055:2018 – Description and Measurement of Environmental Noise,
- Australian Standard AS IEC 61672.1-2004 (AS 61672) – Electro Acoustics - Sound Level Meters Specifications Monitoring, and
- Australian Standard AS IEC 60942-2004 (AS 60942) – Electroacoustics – Sound Calibrators.

Several potential noise sensitive receptors were identified as shown in Figure 9 below. These receptors comprise residential properties. Construction and operational noise levels were predicted to each assessed receptor assuming receiver heights of 1.5m above ground level for typical construction activities and allowing for road traffic noise.

Predicted construction noise levels are expected to exceed the NMLs at four receivers when works are nearest to those locations. These receivers are R1 at 198 Moroneys Lane, R2 at 244 Moroneys Lane, R4 at 170 Moroneys Lane and R5 at 178 Moroneys Lane. The exceedances would be temporary and of short duration. Note that R3 is the land owners residence. The exceedances would be due primarily to piling and earthworks. Operational noise levels satisfy the management levels for all assessed receivers. However, recommendations to ensure noise levels are verified have been provided in this report. Additionally, the noise assessment demonstrates that road noise criteria will be satisfied at all receivers on the proposed transport route during the construction phase.



Figure 9: Location of noise sensitive receptors and construction noise affectation area. Source: Muller Acoustic Consulting

5.5.2 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 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,
- avoidance of noisy 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 close 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.

5.6 Electromagnetic radiation

5.6.1 Potential radiation sources

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 (μ 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.

5.6.2 Mitigation measures

The location of the proposed solar farm and the distance separation between nearby dwellings and the site mean that any potential impacts on health are mitigated. No additional mitigation measures are proposed.

5.7 Traffic and access

A *Traffic Impact Assessment Report* of the impacts on traffic and the adequacy of access arrangements has been carried out by Price Merrett Consulting, dated 15 January 2021. 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 establishment, construction and operation. Site access arrangements and intersection capacity are also considered.

The assessment is based on:

- An estimated 6 to 8 light vehicle trips per day and 10 to 15 trucks and trailers during the site establishment phase,
- an expected 45 B-double trucks, light vehicles carrying up to 50 workers and potentially a bus service for workers during the construction phase,
- light or 12 metre heavy rigid vehicles for the commissioning phase, and
- one light vehicle every 2 to 3 months to carry out maintenance.

5.7.1 Site access

Access to the site is currently off Moroneys Lane via a gravel driveway located midway along the western boundary of the development site. Moroneys Lane is approximately 6.7 metres long and is a sealed two way road with 0.5 metre gravel shoulders. The existing access is within the 100 km/hr zone and should have a safe intersection sight distance of 248 metres. A ridge exists to the north of the existing access which limits site distances to approximately 250 metres which is considered sufficient for the short-term construction traffic and long-term vehicle movements after the facility is made operational. The existing access will need to be widened with drainage and fencing improvements to accommodate B-double entry to the site as shown in Figure 10 below.

5.7.2 Traffic volumes

There is expected to be a daily maximum of 4 heavy vehicles accessing the site during the construction phase. Heavy vehicles would only access the site between 10.00am and 2.00pm and would not contribute to the morning or afternoon peak hour traffic periods.

There is likely to be 20 to 30 vehicles transporting construction workers to the site in the morning between 6:30am to 8:00am and leaving at the afternoon peak around 4:00pm to 5:00pm. These will be light vehicles and possibly a shuttle bus service. 90% of these movements are expected to be between Temora township and the site, with a predominantly left turn entering the site during the morning peak and a right turn exiting the site in the afternoon.

B-Double trucks are currently approved to use Burley Griffin Way and Old Cootamundra Road, however, approval would be required for heavy vehicles to utilize Gallipoli Street and on to Moroneys Lane to access the site.

5.7.3 Mitigation measures

It is recommended that:

- The existing access point be upgraded to accommodate B-Double access with a new culvert under the proposed widening of the access with a trafficable headwall.
- Obtain permits for B-Double access to the site along Gallopoli Street and Moroneys Lane
- Undertake a dilapidation survey of Moroneys Lane prior to construction works
- Truck entering signs (W5-22) to be erected either side of the access during the construction phase to notify motorists of trucks accessing the site

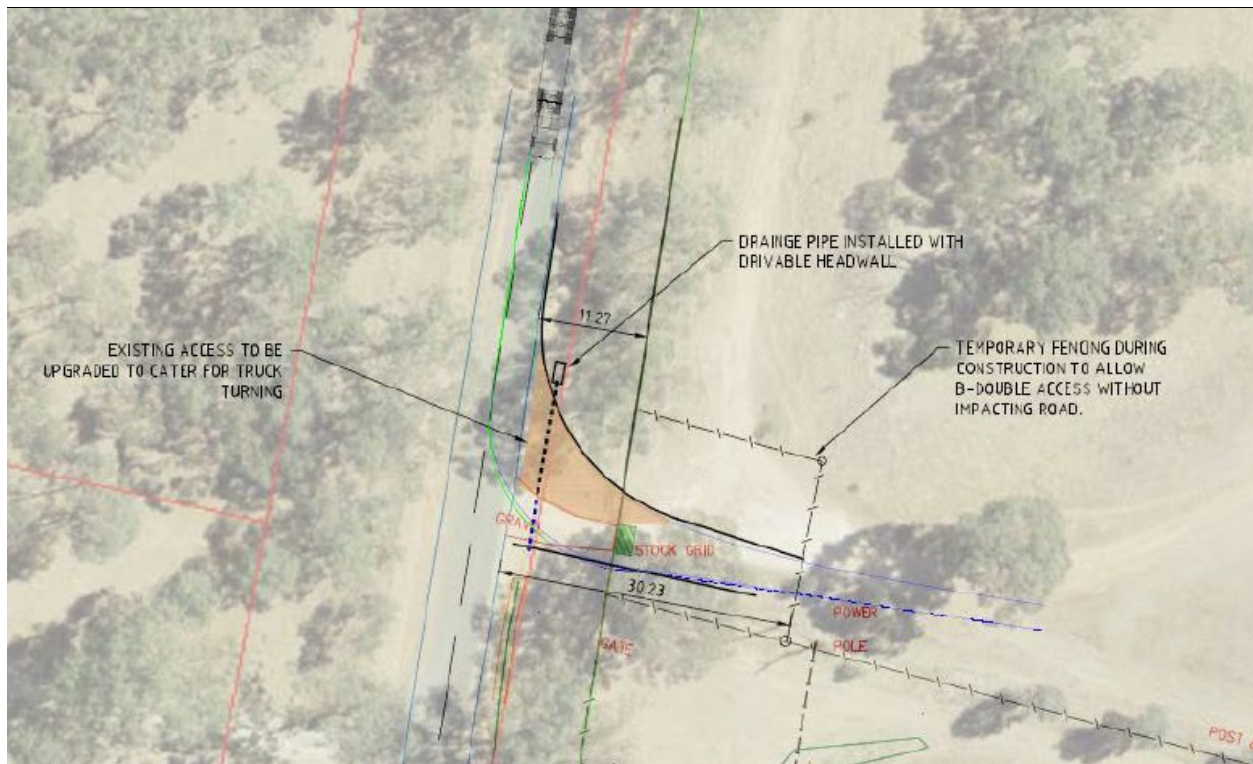


Figure 10: Proposed access improvements. Source Price Merrett Consulting

5.8 The community and economy

5.8.1 The population

The population of Temora state suburb in 2016, as defined by the Australian Bureau of Statistics and which includes the development site, the village of Temora and rural land surrounding the settlement, was 4,693 persons of which over 88% were born in Australia. The total population of Temora local government area in 2016 was 6,110 persons.

The median age of people in Temora state suburb in 2016 was 47 years with children aged 0 to 14 years making up 18.3% of the population and those aged over 65 years making up 26.0% of

the population. Australia was listed as the country of birth for 88.5% of the population with Germans representing the ancestry of 7% of people in Temora.

5.8.2 Employment

Unemployment at the time of the 2016 Census of Population and Housing was 5.4% of the labour force comprising persons aged 15 years and over in Temora state suburb. 1,982 persons were in the labour force in 2016 giving a labour force participation rate of 42.2%. Around one-third of the labour force were technicians, trade workers and labourers, followed by one-quarter employed as professionals and managers.

The top industries of employment were supermarket and grocery stores, local government administration, and aged care in that order. Employment in the agriculture, forestry and fishing sector was 19.1% for Temora state suburb and 29.8% for the whole LGA.

Employment in industry sectors in 2016 for Temora state suburb and Temora LGA is listed in Table 4 below.

Table 4: Industry of Employment. Source: ABS Census of Population & Housing 2016

Industry sector	Temora state suburb		Temora LGA	
	Persons employed	% of total employment	Persons employed	% of total employment
Agriculture, Forestry and Fishing	188	19.1	400	29.8
Mining	16	1.6	14	1.0
Manufacturing	58	5.9	59	4.3
Electricity, Gas, Water and Waste Services	39	4.0	42	3.1
Construction	117	11.9	129	9.6
Wholesale Trade	46	4.7	58	4.3
Retail Trade	95	9.7	103	7.7
Accommodation and Food Services	47	4.8	58	4.3
Transport, Postal and Warehousing	82	8.3	96	7.2
Information Media and Telecommunications	5	0.5	6	0.4
Financial and Insurance Services	3	0.3	6	0.4

Industry sector	Temora state suburb		Temora LGA	
	Persons employed	% of total employment	Persons employed	% of total employment
Rental, Hiring and Real Estate Services	7	0.7	7	0.5
Professional, Scientific and Technical Services	32	3.3	36	2.7
Administrative and Support Services	13	1.3	18	1.3
Public Administration and Safety	62	6.3	78	5.8
Education and Training	36	3.7	45	3.4
Health Care and Social Assistance	28	2.8	37	2.8
Arts and Recreation Services	8	0.8	10	0.7
Other Services	58	5.9	65	4.8
Not stated	48	4.9	61	4.5
Total	984	100	1,342	100

5.8.3 Accommodation

Occupied private dwellings accounted for 88.1% of dwellings in Temora state suburb and 11.9% or 253 dwellings were unoccupied. 90% of dwellings were separate houses and 8% were medium density dwellings.

There are 19 establishments offering accommodation for visitors to the Temora district listed on the NSW Government's VisitNSW website. These include holiday parks, motor inns, bed and breakfasts, serviced apartments and hotels. In addition to these establishments there are 253 unoccupied private dwellings some of which may be available as short term rentals, and unregulated accommodation places such as AirBnB and Stayz.

5.8.4 Agriculture and land capability

Temora is located in the Riverina region of NSW. According to the Commonwealth Department of Agriculture the gross value of agricultural production in the region in 2018-2019 was \$2.5 billion, which was 21 per cent of the total gross value of agricultural production in New South Wales of \$11.7 billion. Agricultural land in the region occupies 44,600 square kilometres, or 78 per cent of the region. The most common land use by area is grazing modified pastures, which occupies 22,100 square kilometres or 39 per cent of the Riverina region (<https://www.agriculture.gov.au/abares/research-topics/aboutmyregion/nsw->

5.8.5 Potential socio-economic impacts

The benefit 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. Similarly, the clustering of solar power generation would bring regional economic development benefits to the Riverina and South West Slopes region as the area gains a reputation as a suitable location for renewable energy and linked industries.

It is anticipated that there will be 50 personnel directly involved in construction on site which 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 is to be sourced locally. Once operational the site will be unmanned, however, two to three personnel will be necessary to carry out maintenance every quarter or as required.

The skills required to be involved in the construction and ongoing maintenance of the Temora Solar Farm may require some personnel to undergo further training and education, leading to an upskilling of the local workforce and enhanced employment opportunities generally.

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 custom this will bring.

During the initial planning phase ITP (Development) Pty Ltd commissioned local professionals to carry out the land survey of the development site. This initial expenditure generates flow on effects throughout the local economy through income and employment. If necessary, sites officers employed by Young 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 that there are 19 establishments in the Temora area plus short term rentals and unregulated accommodation providers. It is understood that approximately 100 workers associated with construction of the Inland Rail will also require accommodation. The Inland Rail project is being undertaken by the Australian Rail Track Corporation and is to provide a rail connection between Brisbane and Melbourne for the freight of produce and goods. If necessary and should the majority of construction workers for the solar farm be sourced from outside the local area, consultation would occur with ARTC to arrange construction of the solar farm to be

carried out at alternate periods to that of the Inland Rail should there be a shortage of accommodation.

There is 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 development site has not been used for cropping for over 5 years and is currently used to graze a small number of alpacas. The loss of agricultural land due to the development of Temora Solar Farm would be minimal – less than a quarter of the entire property and a little over 0.02% of agricultural land in the Riverina region. The loss of agricultural land would be offset by the contribution that the solar farm will make to the local economy through direct and indirect employment and expenditure over the short term and through the benefits that renewable energy power supply will bring to the region. The landowner may also choose to continue to graze livestock within and around the array, activities that do not require consent, and the additional lease income may be put to improvements elsewhere on the property.

If necessary and practical in terms of security, the land surrounding panel arrays can continue to be used for farming purposes such as the cultivation of vegetables or flowers, or potentially livestock grazing during the operation of the solar farm. The arrays of panels can be removed once the facility is decommissioned and the land can be returned to agricultural use. It is considered that the impact in terms of loss of productive agricultural land should be seen in the context of the impacts on farmland of other forms of power generation, for example, fracking for coal seam gas, and mining for coal and uranium as well as the infrastructure to support the processing of coal and gas. The loss of agricultural land would be offset by the contribution that the solar farm will make to the local economy through direct and indirect employment and expenditure over the short term and through the benefits that renewable energy power 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 land holder
- The loss of productive agricultural land is minimal and temporary. The array of panels can be removed once the facility is decommissioned and the land can be fully returned to agricultural use

- If necessary and practical in terms of security, the land can continue to be used for farming purposes such as the cultivation of vegetables or flowers, or the grazing of sheep during the operation of the solar farm



Plate 2: Sheep grazing amongst a PV array. Source: Sydney Morning Herald 17 February 2021

5.8.6 Mitigation measures

It is recommended that labour to construct the solar farm and for ongoing maintenance be sourced from within Temora 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 recommended that advertising be placed in local media and to approach local businesses to determine whether there is the capacity and expertise available in Temora and surrounding districts to participate in the construction and ongoing maintenance activities.

5.9 Heritage

Information concerning the Indigenous and Non-Indigenous history of the South Western Slopes Bioregion given below is sourced from the NSW Department of Planning, Industry and Environment at <https://www.environment.nsw.gov.au/bioregions/SouthWesternSlopes->

[RegionalHistory.htm](#). Information concerning the Non-Indigenous history is also sourced from the *Temora Shire Local Strategic Planning Statement*.

5.9.1 Indigenous heritage

Temora is located at the centre of the South Western Slopes Bioregion. The Wiradjuri people are the traditional custodians of the land in the Temora area. There were 141 Aboriginal and Torres Strait Islander persons in the Temora local government area at the time of the 2016 Census of Population and Housing. This represented about 2.3% of the total population of the LGA. The proportion was similar at 2.2% for the state suburb of Temora.

For the Wiradjuri people, the Macquarie, Lachlan and Murrumbidgee rivers were their livelihood and supplied a variety of consistent and abundant food provisions supplemented with kangaroos and emus as well as fresh food gathered from the land between the rivers. Evidence of the presence of the Wiradjuri people is common along the Macquarie and Lachlan Rivers in the northern half of the bioregion, but less so along the Murrumbidgee in the south. Surviving carved trees are numerous with one surviving near Gidginbung, north-west of Temora. The Wiradjuri people generally moved around in small groups, using the river flats, open land and waterways with regularity through the seasons.

Conflict between European settlers and the local Aboriginal people was common around the Murrumbidgee and further north, particularly between 1839 and 1841, subsiding during the 1840s. The identity of the Wiradjuri people of the South Western Slopes Bioregion remains robust to the present day, a high degree of marriage within the Wiradjuri community contributing to this strength of identity.

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?

Earthworks will involve trenching which is required for 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. 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 1 DP 1110693 was performed on 27 January 2021. 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.

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

Not applicable as 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

The desktop assessment found that no known Aboriginal objects are listed in *AHIMS*. A site inspection was made on 12 November 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

An extensive search of *AHIMS* records, is not necessary given that there are no recorded sites or places at Lot 1 DP 1110693 No 197 Moroneys Lane, Temora.

Temora lies within the area managed by Young Local Aboriginal Lands Council. The 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.

The LALC has not responded at the time of lodgement of the development application. Temora Shire Council may recommend that a condition of consent be imposed to require a site inspection 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.

5.9.2 Non-indigenous heritage

European pastoralists began settling the south west slopes of NSW during the 1820s and grazing cattle initially along the river frontages of the Murrumbidgee River then spreading to the north and south. The Temora area was rich in gold and experienced a minor gold rush in 1869. The mining population increased rapidly from 1,500 persons in October of that year to 3,000 a month later, and by April 1870 Temora supported a population of 10,000 miners. Temora was proclaimed a gold field on June 4, 1880. It is said that by 1881, despite the drought conditions, Temora was producing half of the state's gold.

Temora has contributed significantly to the state's agricultural production and remains a major grain growing area. Temora is one of the largest wheat, canola, other cereals and wool producers in NSW.

There are three properties located south-east of the town of Temora that are listed as heritage items in Schedule 5 Environmental heritage of *Temora LEP 2010*. Each of these properties is listed as being of local heritage significance. These properties are described in Table 5 below.

Table 5: Heritage items south-east of Temora. Source: Schedule 5 Temora Regional LEP 2010

Item	Description	Address	Proximity to edge of development footprint
51	Mother Shipton Mine Site	Moroneys Lane (Lot 7003, DP 94439; Part Lots 268 and 1182, DP 750587)	Approximately 1.2 kilometres north
151	Temora Bulk Wheat Terminal	4646 Old Cootamundra Road (Lot 10, DP 819658)	Approximately 1.5 kilometres north
105	Tewkesbury Brewery Site	Tewkesbury Street (Lot 994, DP 750587)	Approximately 1.8 kilometres north

The details below for these heritage properties has been sourced from the State Heritage Inventory maintained by Heritage NSW and available on the website <https://www.heritage.nsw.gov.au/search-for-heritage/search-for-nsw-heritage/>. There are no details available about item 151 the Temora Bulk Wheat Terminal on the State Heritage Inventory.

Item 51 Mother Shipton Mine Site

The Mother Shipton Mine took its name from a well-known lady fortune-teller of England. It became famous for the unearthing of the Mother Shipton Nugget, the largest found on the Temora field in 1882. The nugget consisted of three main pieces - the largest weighing 258oz of gold and two smaller nuggets weighing 415oz and 9oz all with a value of £4,300. The smallest specimen was presented to Queen Victoria, while the other two pieces were exhibited at exhibitions, one notably in Chicago in 1893, and then in London, where it was in a window display in the offices of the Orient Royal Main Steamship Navigation Company and stolen on the night of 30 August 1906 and never recovered. During the 1950's many of the shafts were filled in for safety reasons. The Cootamundra Brick Works occupied the site for a period, removing white clay for brickmaking which exposed some of the shafts. The site has been filled and has revegetated.

Statement of significance

Historically significant in Temora's gold field history, being the site of the most successful mining venture of the time, where the Mother Shipton Nuggett was found.

Item 105 Tewkesbury Brewery Site

The historically significant Tewkesbury Brewery was located on the southern side of Delaven St in Temora. The brewery was established by A R Tewksbury, a very prominent citizen and mayor of Temora from 1899 to 1902. He was a pioneer of the Temora trotting industry with his nearby Delaven Stud. The site is of national significance as it relates to the history of the Australian brewing industry through its connection to the Tooths and Resch's brewing companies. Tewksbury opened the brewery on this site in Temora without a water supply, producing quality beers and cordials for the district market. He sold off the brewing side of the business to Tooths and Co and continued to brew soft drinks on the site. Later the business relocated to the corner of Parkes and Crowley Streets. The horse pictured on the bottles as the business logo was the horse "Invicta" which was used by both the brewing company Tooths and Co. and by the continuing soft drink business.

The remains of the factory and its associated structures are clearly visible. A delapidated shed and factory dam which was used as the water supply remain. Archaeological elements remain amongst the ruins.

Statement of significance

Contributing. The site is historically significant, as the site of the original brewery and soft drink factory established by A. R Tewksbury, a very prominent citizen and mayor (1899-1902) of the early days of Temora, He was a pioneer of the Temora trotting industry with his nearby Delaven Stud. It is also of national significance, relating to the history of the Australian brewing industry, with its connection to Tooths and Resch's companies.

Clause 5.10 Heritage conservation of *Temora LEP 2010* applies to these items, buildings and structures within the conservation area and to development within the vicinity of a heritage item. The relevant objective of clause 5.10 is *to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views*. Clause 5.10 (5) enables a consent authority to require that a heritage management document be prepared for development in the vicinity of a heritage item or heritage conservation area, that assesses the extent of effects on heritage significance.

The development site is not located in the vicinity of any of these three heritage items. The nearest heritage-listed property to the development footprint is the Mother Shipton Mine Site (item 51) which is located about 1.2 kilometres to the north. It is considered that the solar farm will not cause adverse impacts on the heritage values of these properties as there are no shared boundaries or visual connections between any of the heritage items and the development site. Therefore, a heritage management document is not considered necessary.

5.10.3 Mitigation measures

Council may recommend that a condition of consent be imposed to require a site inspection 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.

5.10 Glare and glint

5.10.1 Potential glare and glint

Glare is defined as a continuous source of excessive brightness relative to ambient lighting. Glint is defined as a momentary flash of bright light. Solar photovoltaic (PV) panels are constructed of dark, light-absorbing material and covered with anti-reflective coating. In order to maximise the efficiency, the panels are designed to limit reflection and to absorb around 98% of the light received. The glare generated from solar panels is significantly lower than many other surfaces, including water, however, the glass panels and metal frames have the potential to generate glare and glint. An assessment of the potential glare and glint generated by the proposed solar farm is necessary to ensure visual receptors such as road users, air traffic control towers and pilots are not impacted by the development of solar farms.

In a fixed PV solar array, the angle of incidence varies as the sun moves across the sky, that is, the angle of incidence is at its lowest around noon where the sun is directly overhead and increases in the early mornings and late evenings as the incidence angles increase. The variation of the angle is reduced where the PV array is mounted on a single axis tracking system whereby the panels rotate to remain perpendicular to the sun as proposed in the Temora Solar Farm. Therefore, an array mounted on a tracking system has less potential to cause glare whilst it tracks the sun.

A *Glint and Glare Assessment* has been carried out using the Solar Glare Hazard Analysis Tool by ITP Renewables, dated 23 September 2020. 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 and then assessing the potential glare and glint hazard and impacts on those receptors using the tool. Glare resulting from PV solar farms is analysed at different viewpoints based on the location, orientation and specifications of the solar panels. Mitigation measures are recommended to reduce potential impacts to an acceptable level. This tool is used by the United States Federal Aviation Administration for glare hazard analysis near airports and is also recognised by the Australian Government Civil Aviation Safety Authority (CASA).

The analysis estimates green glare and yellow glare received at each identified potential receptor. Green glare is glare with low potential to cause an after-image when observed prior to typical blink response time, and yellow glare has a higher potential to cause an after-image when observed prior to a typical blink response time. The analysis is on a minute-by-minute basis

because sun reflections from solar panels are likely to last at least one minute. Glint is a short-term flash which lasts for less than a minute is therefore unlikely to occur from the sun, due to the pace at which the sun and panels move. Glint is not considered to be a factor affecting motorists or pilots and is not considered further in this assessment.

Potential visual receptors within 2 kilometres of the development site were identified and are shown in Figure 9 below. A 2 kilometre radius from the site was considered appropriate based on it being highly unlikely for glint and glare impacts at distances greater than this. The heights of the observation points were assumed to be 1.5 m for a motorist and 1.65 m for a standing person. Existing vegetation or structures can affect visual connectivity with solar panels. Similarly, atmospheric conditions such as cloud cover can influence light reflection and the resulting impact on visual receptors. Varying atmospheric conditions have not been accounted for in the analysis.

As a result 17 residential premises, four commercial premises, one infrastructure item and 11 road routes were identified as potential visual receptors. Observation points were identified as follows:

- Considering the elevation of the site relative to surrounding land to determine land potentially affected,
- Including residential properties, commercial properties and public roads within a 2 km radius of the site. Properties located at greater distances are unlikely to be affected, and
- Excluding any properties where existing structures would act as visual barriers.

The results of the analysis indicate that persons occupying the selected properties are unlikely to be affected by either green or yellow glare as a result of the proposed solar farm. Many residences will also not have direct view of the solar farm due to visual obstruction from trees and other structures.

Existing roadside vegetation and structures are expected to provide a physical obstruction between the solar farm and road users on the roads most at risk of glare (Moroneys Lane, Trigalong Road and Old Cootamundra Road), further minimising the visual impact of the project. Road users approaching the solar farm along other roads surrounding the site are also not expected to experience any glare.

5.10.2 Mitigation measures

No mitigation measures are necessary in relation to glare and glint.

5.11 Landscape character and visual amenity

5.11.1 Methodology

Impacts on landscape character and visual amenity of the proposed Temora Solar Farm have been assessed by Zenith Town Planning Pty Ltd using the RMS guideline *Environmental Impact Assessment Practice Note – Guideline for Landscape Character and Visual Impact Assessment* (EIA-N04 Version 2-0 released on 14 December 2018). The findings of the assessment are summarized below. Reference should be made to the *Landscape Character and Visual Amenity 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 a site inspection of the location of the proposed works and the surrounding area to identify observation points and the visual catchment, land uses and characteristics of the surrounding area.

The assessment estimates the likely impacts on landscape character and viewpoints based on the sensitivity to physical change and the magnitude, or relative size and scale, of the works. The impacts are calculated and ranked according to negligible, low, moderate or high impact based on the RMS guideline.

5.11.2 Description of the landscape

The character of the landscape near the site of the Temora Solar Farm is predominantly an open modified agricultural landscape. The land is flat to gently undulating with some remnant native vegetation along road reserves and property boundaries and within private properties.

The site is rural and located 2.8 kilometres directly south-east of the township of Temora, or about 3.5 kilometres by road. Structures within the vicinity of the site comprise rural lifestyle dwellings set amongst scattered native vegetation.

The nearest urban residential area is about 2 kilometres from the development site and separated by intervening small acreages. The Temora golf course is located to the west and the bulk grain terminal and Temora Essential Energy sub-station are located to the north-east.

5.11.3 The visual catchment

The visual catchment of the site of the proposed Temora Solar Farm is defined by an area within 2 kilometres of the development site from which the works may be visible. This area is the same

as that considered in the glare and glint analysis. The greater the distance from the development site the less clear is the view of the solar farm. The ability to distinguish the type of land use and the actual composition of materials diminishes with distance. There are 17 dwellings and 11 public roads within 2 kilometres of the development site. Commercial premises are not considered sensitive receivers and are excluded from the assessment.

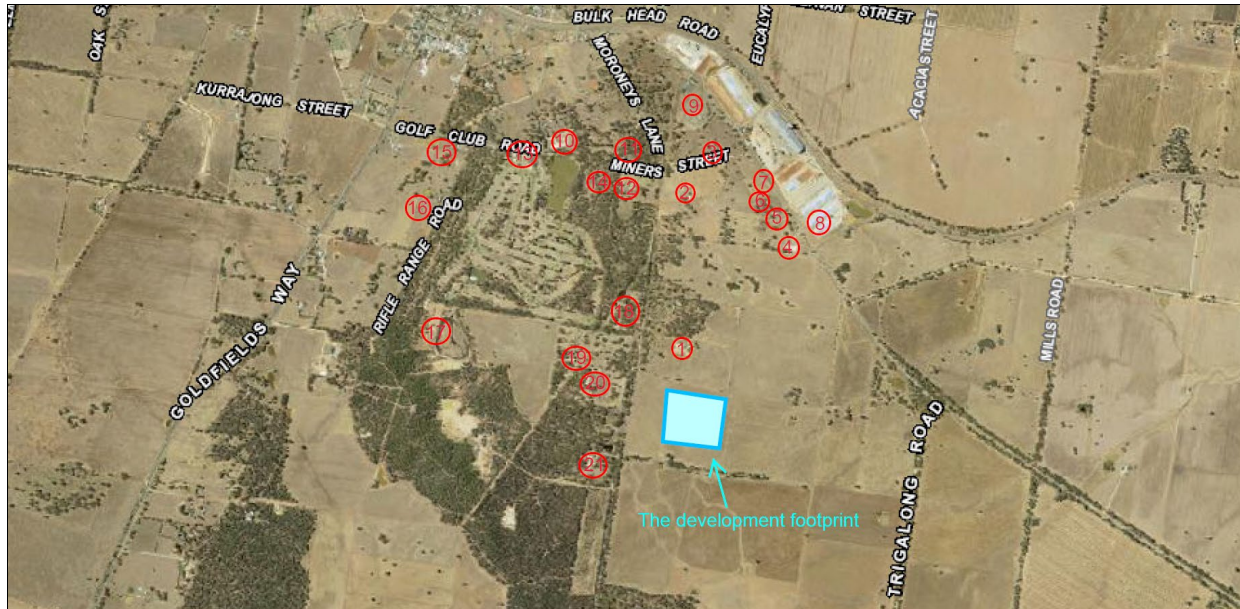


Figure 12: Observation points in the visual catchment. Source: SIX Maps

5.11.4 Summary of impacts

The overall impact on landscape character in relation to private property is assessed to be moderate-high. The overall impact on landscape character in relation to the public domain is assessed to range from low to moderate to moderate-high depending upon proximity to the development site. The large sub-station and bulk grain terminal serve to mitigate the impact of the size and scale of the facility on the rural landscape visible from Old Cootamundra Road.

There are 17 dwellings and 11 public roads within the 2 kilometre visual catchment measured from the centre of the array. The development footprint is fully cleared, however, existing vegetation in the Moroneys Lane road reserve, within adjoining rural properties and along property boundaries as well as substantial building line setbacks to dwellings would partially screen the site from the most sensitive receivers located to the immediate west of the development site. The fall of the land to the south and intervening vegetation along roadsides and property boundaries provides interference with direct views over the property from all directions except from the east.

The development would be visible to motorists using Moroneys Lane, Old Cootamundra Road including the intersection with Reynolds Lane, and Trigalong Road. Significantly, it would be visible from Moroneys Lane only from the immediate adjoining section of road and no more than 200 metres on approach from either direction although partly obscured by existing roadside vegetation. It would be clearly visible across farmland from Old Cootamundra from the north near the bulk grain terminal as far south as the intersection with Trigalong Road.

On balance and having regard to other matters for consideration under section 4.15 *Evaluation of the Environmental Planning and Assessment Act 1979*, the 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,
- It will also generate employment opportunities during the construction phase and once operational will provide employment for maintenance crews,
- The placement of the array in a section of the property downslope and close to the eastern boundary ensures as much distance separation as possible from neighbouring dwellings,
- Existing vegetation along road reserves and boundaries is to be maintained, and
- The proposed landscaping surrounding all sides of the array will grow to a height that will screen the facility from observation points including public roads that are on level ground with the development site and elsewhere will soften the visual impact from land to the east and north-east that is slightly elevated above the development site.

5.11.5 Mitigation measures

To mitigate impacts on the landscape and visual amenity, it is recommended that a vegetation screen be planted around all four sides of the array. Native plants that grow to a maximum height of 2.5 metres should be selected for all boundaries. *Temora Development Control Plan 2012* contains a list of species suitable for planting in the vicinity of Temora Airport. Council should be consulted to determine appropriate plant species for the Moroneys Lane location.

5.12 Waste management

5.12.1 Waste materials and management

Life Cycle Analysis considers the total energy input and annual energy output of the project. This is termed the energy payback time and varies depending upon the project's design and geographic location. For solar projects the general timeframe for energy payback is achieved in

less than four years for projects with a 25 to 30 year operating period (Bhandari et al., 2015; Department of Industry, Resources and Energy NSW, 2016). Alsema et al (2006) found that PV modules have an energy payback of 1.5 to 2 years in southern Europe and 2.7 to 3.5 years for central Europe. Due to the greater solar resource in Australia the energy payback for this project is expected to be at the lower end of these ranges.

The Fraunhofer Institute for Solar Energy Systems (2015) considered the ratio of energy produced by a solar photovoltaic module compared to the energy used to create the module. It was estimated that the PV modules would provide more than 10 times the amount of energy used to make the system.

A *Waste Assessment* of the waste generated during construction and operation of the proposed Temora Solar Farm has been carried out by ITP Renewables, dated 11 September 2020, 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 Assessment* that is submitted with the development application for further information or clarification of any matter concerning the assessment and recommendations.

The *Waste Assessment* takes into account the requirements of relevant legislation and policy including the Protection of the Environment Operations (POEO) Act 1997, POEO (Waste) Regulation 2014 and the Waste Avoidance and Resource Recovery Act 2001.

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.

It is expected that the solar farm will be operational for 35 years. Upon decommissioning all infrastructure, including cabling and panels and mounting frames including footings and inverters would be disassembled and removed from the site. The bulk of materials that are used in solar panel manufacturing include glass (75%), aluminum (8%), silicon (5%) and copper (1%). There are also small amounts of silver, tin and lead. These materials are recoverable.

There are currently limited opportunities to recycle the components of solar panels, however, it is anticipated that the waste recycling industry will expand and develop new technologies and uses for those components by the time decommissioning occurs. A company called Reclaim PV Recycling has set up in South Australia to collect end-of-life or damaged photovoltaic panels

from solar farm sites. The company separates panels components and recycles materials for reuse.

Temora waste management facility is located at Teal Street, Temora, approximately 7.5 kilometres from the development site. The waste management facility is a landfill site. Paper and cardboard recycling is available at Teal Street which also operates as a community recycling centre. The centre also supports recycling of domestic paint, motor oils, batteries and fluorescent light. Scrap metal recycling services are available at a scrap metal merchant located on Twynam Street in Temora.

Estimates of waste materials and proposed management arrangements for each phase of the development project are provided in Table 6 below.

Table 6: Estimated waste materials and waste management arrangements

Phase	Waste material	Proposed management
Construction	• Packaging waste such as cardboard, wood pallets, plastic wrap, scrap metal, general waste including approximately 810 wooden pallets and cardboard packing boxes • Concrete waste during setting of footings and mounts • Electric cable waste and cable reels • Plastic pipe offcuts/scrap • Empty drums and containers (minimal quantities) • Minimal used lubricating oil and filters • Unused or spent chemicals	Waste products will be sorted and stored separately in skip bins located in the materials laydown area in accordance with EPA Waste Classification Guidelines. This will facilitate disposal through appropriate waste streams as follows: Recycling: • Steel and scrap metal (recycled) • Timber/cardboard (recycled) • Recyclable plastics Landfill: • General wastes and plastic (other than where recyclable) All recycling and general waste would be collected and taken to off-site waste management facilities for disposal Fluids would be recycled where possible or taken to off-site waste management facilities for disposal

Phase	Waste material	Proposed management
Operational	- Minimal volumes of domestic wastes such as office consumables, paper, plastics and glass - Waste resulting from maintenance or replacement of equipment	All waste materials would be taken to off-site waste management facilities for recycling or disposal
Decommissioning	- PV modules (12,100 panels) and supporting poles and mounts - Glass for panels (250 tonnes) - Silicon for wafers (40 tonnes) - Inverters / transformers / batteries - PV boxes, skids, scrap metal (410 tonnes) - Electrical cables - Fencing - Storage containers (two 20-foot containers)	The solar farm infrastructure would be dismantled into separate waste products such as metals, glass, plastics and concrete. All products would be sorted on site into recyclable and general waste streams in accordance with the EPA Waste Classification Fencing and storage containers would be removed from the site and reused

It is recommended that a waste management plan be prepared following approval and prior to construction to specify precise volumes of each waste material, classify that waste material and identify appropriate management procedures including means of transport and the destination. 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.

5.12.2 Mitigation measures

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.

6. CONCLUSION

6.1 Findings

The site is considered suitable for the proposed development of the Temora Solar Farm. An 11kV feeder is available to connect to the Essential Energy Temora 66/11 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 utility vehicles for ongoing maintenance.

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, waste management, 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.

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.

The Temora Solar Farm is designed to generate in excess of 12.71GWh of energy annually which will offset almost 8.5 thousand tonnes of CO² equivalent emissions (Sources: *National Greenhouse and Energy Reporting (Measurement) Determination 2008 (Schedule 1)* and Department of the Environment and Energy) and providing enough energy to power about 2,150 NSW homes.

Electricity generated by the system will be directed to the settlement via existing electrical infrastructure to contribute to the supply of electricity for use by households and businesses in Temora. 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, Temora will benefit through the ability to power the township with clean energy that is generated adjacent the settlement.

The proposed development of the Temora Solar Farm is permissible with consent under provisions of *SEPP (Infrastructure) 2007* and *Temora LEP 2010*. The cumulative impacts of the

proposed development are minor. There are no other electricity generating works in the immediate area, other than an electrical sub-station on Old Cootamundra Road that is approximately 2 kilometres from the site, and the use is suited to a rural location due to the need for a large land area. The addition of a solar farm to that rural area would not detract unreasonably from local amenity or the natural environment.

The development of Temora 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 and addressing climate change.

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

6.2 Summary of mitigation measures

Table 7 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 7 includes a recommendation as to whether the mitigation measure should be included in the management plan.

Table 7: Summary of mitigation measures

Consideration	Mitigation measures	Environmental Management Plan
Biodiversity	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 clearly identified prior to work; II. A visual inspection is conducted by environmental staff before construction commences to identify any areas of 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 planted 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. V. Any weeds removed (particularly those bearing seeds) are to be disposed of appropriately at the nearest waste management facility.	Yes, with reference to ongoing site access during both construction and operational phases, and to the storage of materials within the site

Natural hazards	Prepare a fire emergency management plan and include that plan in the environmental management plan	Yes, for construction and operational phases
Water resources	Design – site drainage and water quality controls: • Undertake hydrological assessment of the sites catchment in accordance with relevant methods outlined in Australian Rainfall and Runoff. • Determine sediment management targets and drainage control standards in accordance with Managing Urban Stormwater: Soils and Construction Vol 1 (Blue Book) (DECC, 2008). • Develop a site erosion and sediment control plan in accordance with the Blue Book. • Develop site drainage design incorporating detention basins and sedimentation management structures where relevant. • Permanent site drainage should coincide with temporary arrangements where possible	Yes, for construction and operational phases. Include an erosion & sediment control plan or soil and water management plan
	Construction and/or demolition – site drainage and water quality controls: • Catch drains to be located downslope of any proposed road works. • 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. • All stormwater collection points need to have appropriate sedimentation and erosion controls. • Undertake ongoing inspections of stormwater facilities and water control measures to assess their effectiveness. • Vibration grids or wash bays at all construction exits. • Level spreaders at locations where concentrated flow is discharged offsite to ensure sheet flow like conditions are maintained. • Flat land erosion control options include erosion control blankets, gravelling, mulching, soil binder, turfing and revegetation	
	Construction and/or demolition – stormwater point source control: In the event of concrete works: • Do not undertake works if chance of heavy rain. • Store rinsate5 water, if applicable, separately to other water on site and dispose of offsite as appropriate. • Block on site drains in the area of the works and remove any contaminated runoff. In the event that dewatering practices are required: • 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. • Limit direct discharge off site (consistent with the design requirements for sediment pond discharge). • 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. • Material and waste storage areas should be designed and operated to minimise interaction with surface waters. • Vehicle washdown areas should be located away from water courses	
Air quality	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 conditions • Ensure ground disturbance is limited to areas necessary to place footings or to be used for access • Ensure minimal handling of excavated materials • Ensure stockpiles of excavated material is bunded and protected from wind and vehicle movements During operation: • Grade and add road base to internal accessways • Revegetate the site with suitable groundcover immediately construction works are completed • Ensure all plant and equipment operates in accordance with specifications	Yes, for construction and operational phases
Noise	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 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, • avoidance of noisy plant/machinery working simultaneously where practicable, • minimise impact noise wherever possible,	Yes, for construction and operational phases

	• 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 close proximity of the site with project progress, proposed/upcoming potentially noise generating works, its duration and nature and complaint procedure. 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.	
Electromagnetic radiation	No mitigation measures are proposed.	n/a
Traffic	It is recommended that: • The existing access point be upgraded to accommodate B-Double access with a new culvert under the proposed widening of the access with a trafficable headwall. • Obtain permits for B-Double access to the site along Gallopoli Street and Moroneys Lane • Undertake a dilapidation survey of Moroneys Lane prior to construction works • Truck entering signs (W5-22) to be erected either side of the access during the construction phase to notify motorists of trucks accessing the site	Yes, with reference to site access during the establishment and construction phases
The community & local economy	• labour to construct and maintain the solar farm be sourced from within Temora LGA wherever possible • advertising be placed in local media and local businesses contacted to determine whether there is the capacity and expertise available in Temora and surrounding districts to participate in the construction and ongoing maintenance activities	n/a
Heritage	Council may recommend that a condition of consent be imposed to require a site inspection 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 <i>National Parks and Wildlife Act 1974</i> should any evidence of Aboriginal occupation be	n/a

	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. There are no recommendations in relation to non-Indigenous heritage.	
Visual & scenic amenity	It is recommended that a vegetation screen be planted around all four sides of the array. Native plants that grow to a maximum height of 2.5 metres should be selected for all boundaries. <i>Temora Development Control Plan 2012</i> contains a list of species suitable for planting in the vicinity of Temora Airport. Council should be consulted to determine appropriate plant species for the Moroneys Lane location.	n/a
Glare and glint	No mitigation measures are proposed.	n/a
Waste management	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, • 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 occur.	Yes, for construction phase

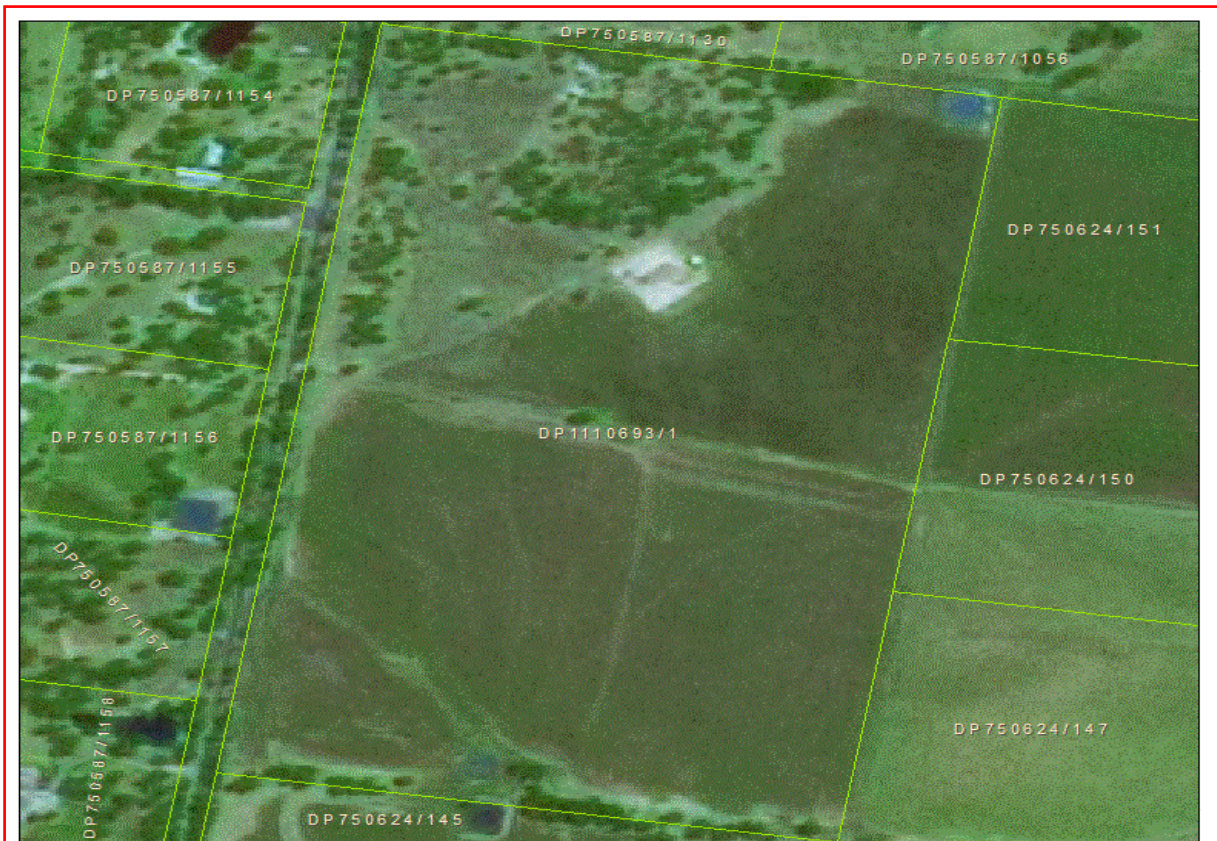
Zenith Town Planning
P O Box 591
Moruya New South Wales 2537
Attention: Allen Grimwood
Email: zenithplan@bigpond.com

Date: 27 January 2021

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 1, DP:DP1110693 with a Buffer of 0 meters, conducted by Allen Grimwood on 27 January 2021.

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



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

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

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

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

Important information about your AHIMS search

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