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STATEMENT OF ENVIRONMENTAL EFFECTS

APPLICATION FOR SOLAR FARM DEVELOPMENT

"Eugowra Solar Farm" 255 Casuarina Drive, Eugowra NSW 2806
Lot 85 in Deposited Plan 870963

July 2022

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DOCUMENT CONTROL

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Proponent	Cabonne Shire Council
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Revision History			
Version Number	Date	Authority	Details
0	July 2022	Peter Taylor (SMK Consultants)	Initial Issue

EXECUTIVE SUMMARY

Applicant:	Cabonne Shire Council PO Box 17 Molong, NSW 2866
Subject Land:	255 Casuarina Drive Eugowra NSW 2806 Lot 85 in Deposited Plan 870963 Owners: Cabonne Council Zoning: SP2 – Sewage Treatment Plant
Proposed Development:	Construction and Operation of a 4 MW Solar Farm at Eugowra
Permissibility:	The proposed development is permissible with consent under the State Environmental Planning Policy (Transport and Infrastructure) 2021
Type of Development:	Local Development under the *Cabonne Local Environmental Plan 2012*
Capital Investment Value:	$4 Million
Consent Authority:	The consent authority is the Cabonne Shire Council

Proposal Summary

The development encompasses the construction and operation of a solar farm with a maximum transfer capacity of 4 MW AC. The development will consist of:

- PEG EW structures. Each structure is comprised of 20 PV modules east/west by 12 PV modules north/south. The PV module will be sourced from a Global Tier 1 supplier.
- 1 combined inverter/transformer station, sourced from a Global Tier 1 supplier (Sungrow);
- Cabling and switchgear;
- Power connection into electricity mains;
- Surrounding chain link fence with 2 x 6m double gates;
- 2nd stage option for two (2) energy storage units.

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1 Introduction

SMK Consultants has been engaged by Cabonne Shire Council to prepare this Statement of Environmental Effects (SoEE). This report will accompany a Development Application (DA) to construct and operate of a 4-megawatt Solar Farm to be located at 255 Casuarina Drive, Eugowra. The real property description of the land is Lot 85 in Deposited Plan 870963.

Council is the applicant for this development proposal.

This statement has been prepared to address the proposed development in accordance with the *Cabonne Local Environment Plan 2012* (Cabonne LEP). This SoEE addresses the matters for consideration outlined in Section 4.15 (1) (previously 79C) of the EP&A Act. This SoEE focuses on the key assessment requirements and recommends mitigation measures where possible to reduce potential environmental impacts.

1.1 Applicant Details

The applicant's contact details are summarised in Table 1.

Table 1: Applicant Details

Organisation	**Cabonne Shire Council**
Address	PO Box 17
	Molong NSW 2866
Phone Number	0429 151 324
Contact Name	Nathan Stubberfield
Email	Nathan.Stubberfield@cabonne.nsw.gov.au

1.2 Authors

This Statement of Environmental Effects has been prepared by SMK Consultants. SMK Consultants is a well-established company operating out of Moree, NSW, and is a key player in providing for continued economic growth for many of NSW'S North-West Government areas. SMK Consultants has been actively involved in many developments in the commercial, industrial, and retail sectors.

Persons involved in the preparation of this Statement of Environmental Effects and its appendices are:

- **Marie Duffy** B.Sc. Hons, M.Sc.
- **Peter Taylor** BSc MEIANZ CIAg LAA

2 Site Analysis

2.1 Site Location

The proposed development site is 255 Casuarina Drive in Eugowra. The site is located approximately 2-kilometres south of Eugowra in central New South Wales. A locality plan showing the site relative to the township of Eugowra has been included as Figure 1.

Figure 1: Solar Farm Site Location

2.2 Property Description

The real property description of the land is Lot 85 in Deposited Plan 870963. The subject lot is located within the Cabonne Local Government Area and covers an area of approximately 18 hectares. The subject land is currently zoned 'SP2 Infrastructure' under the *Cabonne Local Environmental Plan 2012*. The property is owned by the Cabonne Council.

The subject lot contains a small number of trees along the northern and western boundaries as well as the Eugowra sewage treatment ponds in the north-eastern corner of the lot. The remainder of the property has been cleared and is presently utilised for production of dryland cereal crops. The surrounding locality is characterised by cropland with some patches of remnant vegetation, notably along the riparian zone of the Mandagery Creek to the west and on Round Hill to the south-east. A first order watercourse flows in an east-west direction north of the site, with Leaders Lagoon present approximately 160m north of the boundary of the subject lot. The Mandagery Creek is also present approximately 60m west of the property boundary. The site slopes gently towards the west. The development footprint will cover approximately 2.4 hectares and will be restricted to land which is currently used as cropland.

A plan showing the location of the solar farm and nearby waterbodies is included as Figure 2, this is also included in Appendix 1.

The site has a frontage to the Casuarina Drive. The proposed development will utilise an existing site access to the Eugowra sewage treatment plant.

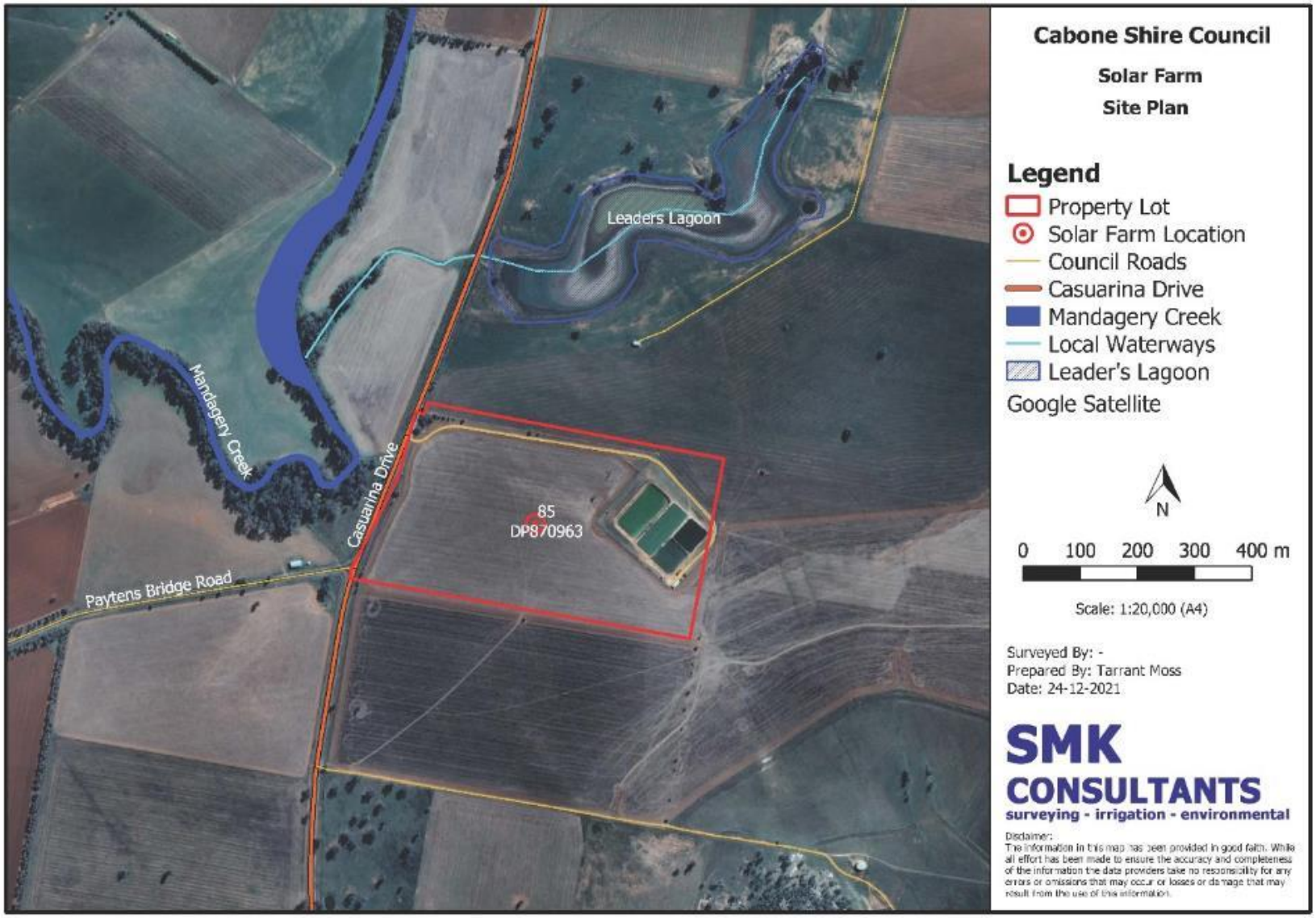


Figure 2: Proposed Development Site

2.3 Site Constraints

There is existing Essential Energy infrastructure located in the vicinity of the site, including an 11kV distribution power line along the Casuarina Drive. The proximity of this infrastructure is important with respect to reducing the resources required to deliver power from the solar farm to the grid. There is an existing power pole and overhead line providing electricity to the sewage plant within the subject lot, however a new connection will need to be made for the solar farm.

There is also a Central Tablelands Water (CTW) water pipe (shown in Figure 3) and a sewer pipe traversing the site. These will need to be located prior during the pre-construction phase and should be protected from disturbance throughout the construction phase of the proposal.

Figure 3: Map of existing infrastructure within and adjacent to the subject site

The subject site is not identified as bushfire prone or as flood prone within the Council mapping. This is further discussed in Section 5.14 of this report.

No other constraints were identified.

2.4 Adjoining Properties

The development land is bordered on all sides by land zoned RU1 Primary production, which is utilised for a combination of cropping and grazing. There is no concern regarding these

adjoining properties in respect to land use conflict. The nearest sensitive receptor (rural dwelling) to the proposal is located approximately 1,040 metres north of the subject site.

2.5 Site Suitability

The subject site is zoned SP2 – Infrastructure and 'Electricity Generating Works' are permitted with consent under State Environmental Planning Policy (Infrastructure).

The site has on-site infrastructure providing a connection to Essential Energy's 11kV network, although a new connection will need to be made for the solar farm. Council also deemed that it would be preferable to utilise infrastructure zoned land for the proposed development over rural or residential zoned land in order to minimise potential adverse impacts on land use and the population.

The site is on gently sloping ground, with an approximate average slope of 1.7% and an average northerly slope of 2.5%. The gentle slopes will not pose an issue during the construction process or during operation and maintenance activities.

The area and region in general are also extremely well suited for solar farms due to the very high solar resource which increases PV electricity generation. The site also benefits from historical clearing which negates the need for disturbance to any areas with high biodiversity value.

2.6 Climate

Global solar exposure is described on the Bureau of Meteorology website as being the total amount of solar energy falling on a horizontal surface. The daily global solar exposure is the total solar energy for a day. Typical values for daily global solar exposure range from 1 to 35 MJ/m^2 (megajoules per square metre). The values are usually highest in clear sun conditions during the summer, and lowest during winter or very cloudy days.

Figure 4 below shows average daily solar exposure for the 12-month period between the 1st of May 2019 and the 30th of April 2020. Cabonne LGA has received on average between 18 and 20 MJ/m^2 each day, placing it within the second highest area receiving solar radiation in New South Wales.

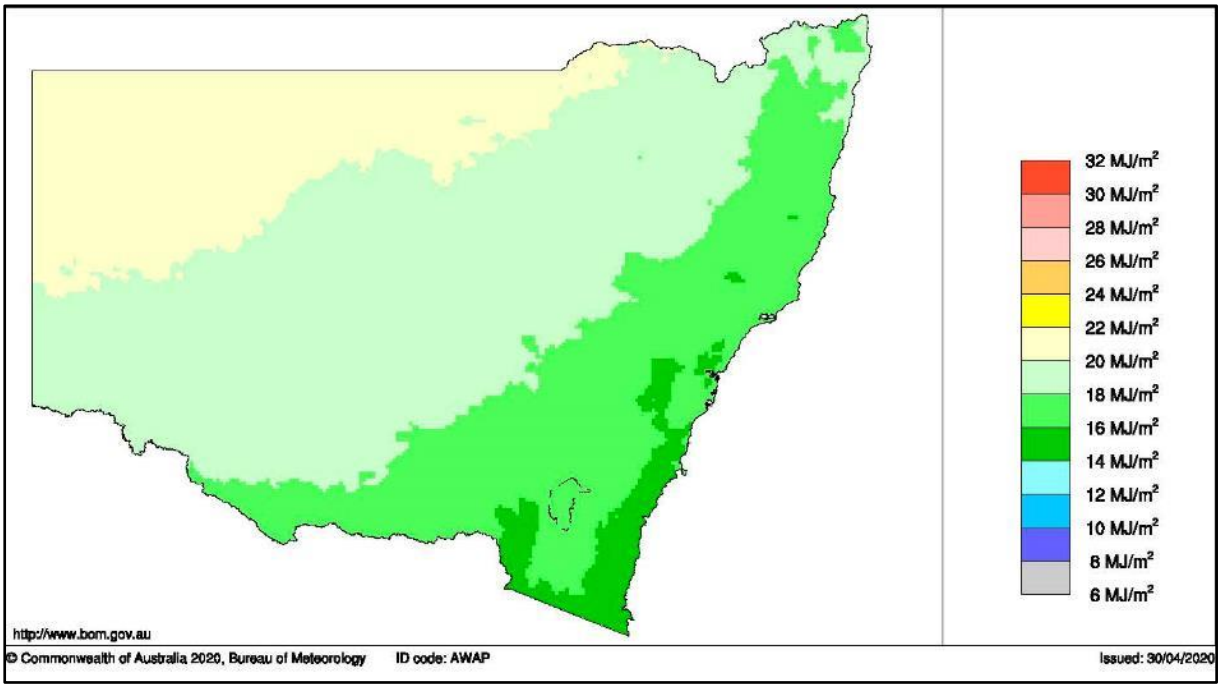


Figure 4: Average Daily Solar Exposure. Source: Australian Bureau of Meteorology (2021)

Table 2 provides the mean daily solar exposure measured at Parkes Airport (Station number 065068), the closest measuring station to the proposed Eugowra Solar Farm site. The annual average is 18.2MJ/m^2 (1990-2022).

Table 2: Mean Daily Solar Exposure (MJ/m^2) at Parkes Airport BOM Site

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
26.8	23.5	19.9	15.1	11.1	8.8	9.7	12.8	17.3	21.8	24.2	**27.1**

Source: Climate Statistics, BOM (February 2022).

The map below (Figure 5) shows the average daily hours of sunshine across Australia. Cabonne LGA receives an average of 7 to 8 hours of sunshine each day.

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 as a result, 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 an 11kV power lines in the vicinity of the development site.

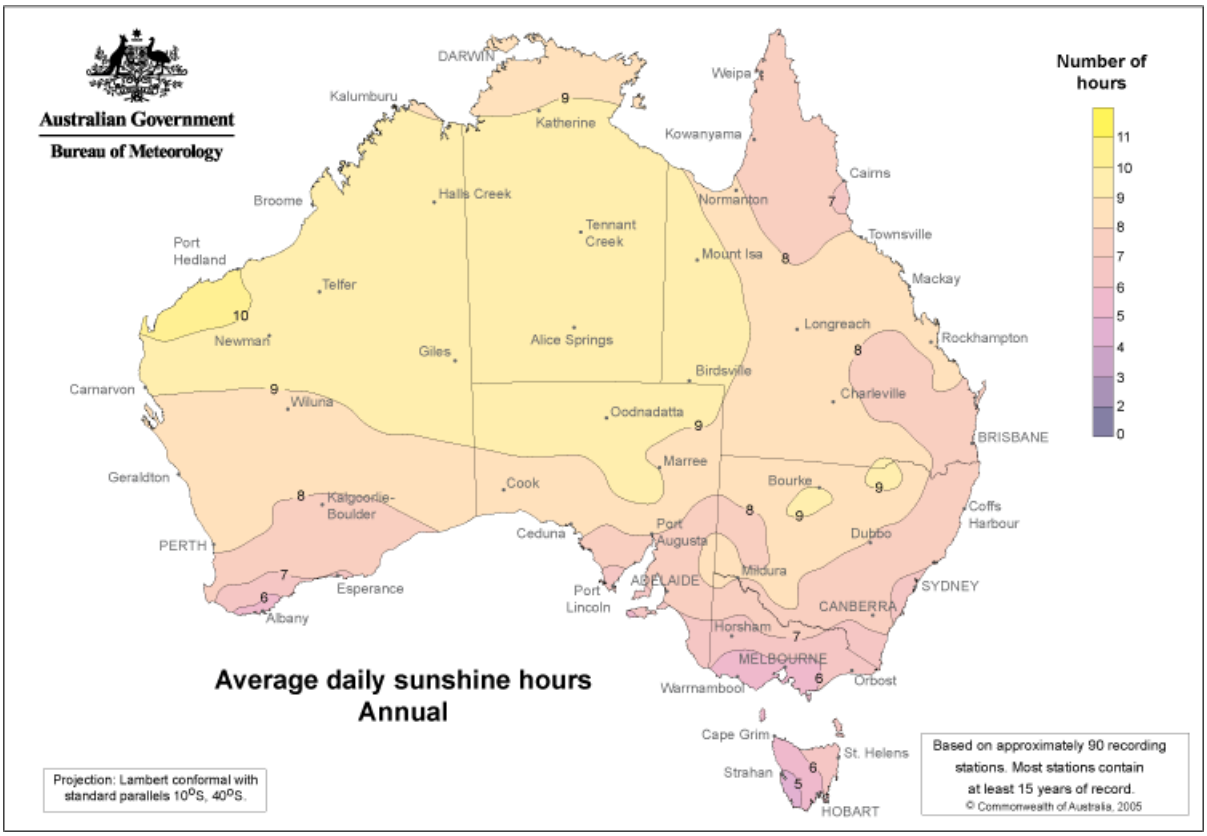


Figure 5: Average Daily Sunshine Hours. Source: Australian Bureau of Meteorology

3 Development Details

3.1 Proposal Description

The proposal forms part of Council's strategy to reduce their carbon footprint, and will contribute to increasing Council's financial stability, demonstrate leadership and position Cabonne Shire for economic growth in the renewable energy sector.

This application includes a proposal for a 2nd phase of the development involving an Energy Storage Unit. The storage unit system would provide an option to store power for electricity use at night.

It is intended that the solar farm will connect to the grid after securing approval from Essential Energy, with a maximum transfer capacity of 4 MW AC. The grid connection process is governed by the National Electricity Rules and analysed by Essential Energy in relation to their system capacity, local demand and network distribution options adjoining the solar farm. In this case, the link would be to the 11kV line adjoining the subject lot.

The development encompasses the construction and operation of a solar farm with a maximum transfer capacity of 4 MW AC. The development will consist of:

- PEG EW structures. Each structure is comprised of 20 PV modules east/west by 12 PV modules north/south. The PV module will be sourced from a Global Tier 1 supplier.
- 1 combined inverter/transformer station, sourced from a Global Tier 1 supplier (Sungrow);
- Cabling and switchgear;
- Power connection into electricity mains;
- Surrounding chain link fence with 2 x 6m double leaf gate.

Phase 2 is currently being analysed but will form a natural progressive step to fully utilise the power generated by the solar farm. Phase 2 would consist of two (2) power storage units. This may be in various forms such as a battery or alternative energy storage systems such as hydrogen.

The proposal will utilise the existing site access to the property from Casuarina Drive; this will need to be upgraded to meet the Austroad standard for a rural intersection (refer Section 3.3.5.2).

Adequate erosion and sediment control devices will be established on site prior to, during and post construction works in accordance with standard sediment and erosion control requirements.

The site plan included as Figure 6 and Appendix 1 show the proposed layout of infrastructure associated with the solar farm.

Figure 6: Site Plan

3.2 Infrastructure

The solar farm will utilise crystalline solar photovoltaic (PV) panel technology and have a dual East/West fixed configuration to assist in maximising higher yields in the morning and afternoon. This is in contrast to a single angle fixed-tilt alternative that can only maximise yields in the middle of the day and also in contrast to single and multi-axis trackers which can result in higher running costs.

The power conversion from direct-current (DC) to alternating-current (AC) will be through central inverters which will immediately step up to 11 kV and will connect to the existing 11kV line along the Casuarina Drive. A new connection will need to be made to the power line for the solar farm.

The farm will be designed in accordance with all applicable standards as well as the requirements of Essential Energy and the National Electricity Rules (NER).
Key infrastructure associated with the solar farm includes:

- Photovoltaic (PV) panels mounted in a dual east-west static configuration.
- Inverters and step-up transformers to convert direct current (DC) electricity produced by the solar PV panels into alternating current (AC) capable of being connected to the electrical grid.
- Above-ground and underground electrical conduits and cabling to connect the solar PV panels to the inverters and transformer.
- Internal access tracks to allow for on-going site maintenance will be formed on an as-required basis.
- Perimeter security fencing.

A site layout has been included as Appendix 1.

3.2.1 Photovoltaic Panels

The solar farm will utilise the latest solar panel and inverter technologies to ensure maximum efficiency and energy generation. The solar farm will utilise Global Tier 1 photovoltaic (PV) panels made of tempered glass with an anti-reflective coating.

3.2.1.1 Foundations and Structure Height

The PV modules will be mounted on piers which is described as a PEG system. The PEG system consists of steel rods driven into the ground. A frame is attached to the steel rods. The solar panels are then fixed to the frame. The frame will result in a minimum panel height above ground level of approximately 800mm and a maximum height of 950mm. A site-specific structural certificate will be prepared and included as part of the application for a Construction Certificate if approval is granted.

The following image presents a cross section of the PEG system and solar panels.

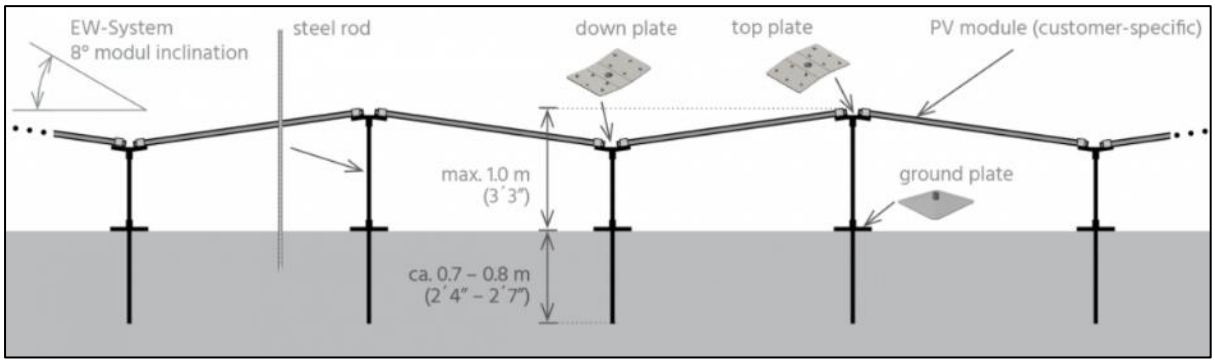


Figure 7: Detailed Cross Section of Solar Array

3.2.2 Combined Inverter and Transformer Stations

The inverter station converts DC power into AC power and will feed into the local Essential Energy HV network. The solar arrays will be connected via multiple strings of PV panels into Direct Current (DC) combiner boxes which are then connected to the inverter at the required DC input voltage. The inverter converts the power from Direct Current to Alternating Current (AC) suitable for the consumer.

(Alternating current (AC) is an electric current which periodically reverses direction and changes its magnitude continuously with time in contrast to direct current (DC) which flows only in one direction. Alternating current is the form in which electric power is the form of electrical energy that consumers use when they plug kitchen appliances, televisions, fans and electric lamps into a wall socket.)

One inverter station is required for the proposed 4 MW AC solar farm. The inverter station incorporates a step-up transformer which will increase the output voltage to 11 kV. The proposed inverter and transformer station will be similar to that displayed in Figure 8.

Figure 8: Inverter Station

With Essential Energy approval, the solar farm's high voltage infrastructure will interface with Essential Energy's 11kV distribution network. The infrastructure will include protection equipment (such as circuit breakers).

The high voltage switch gear will be controlled through a data communications and monitoring network allowing the farm to be managed remotely.

3.2.3 Security Fence

All infrastructure associated with the solar farm will be enclosed within a security fence. This fence will be a chain link fence. An indicative security fence is displayed in Figure 9.

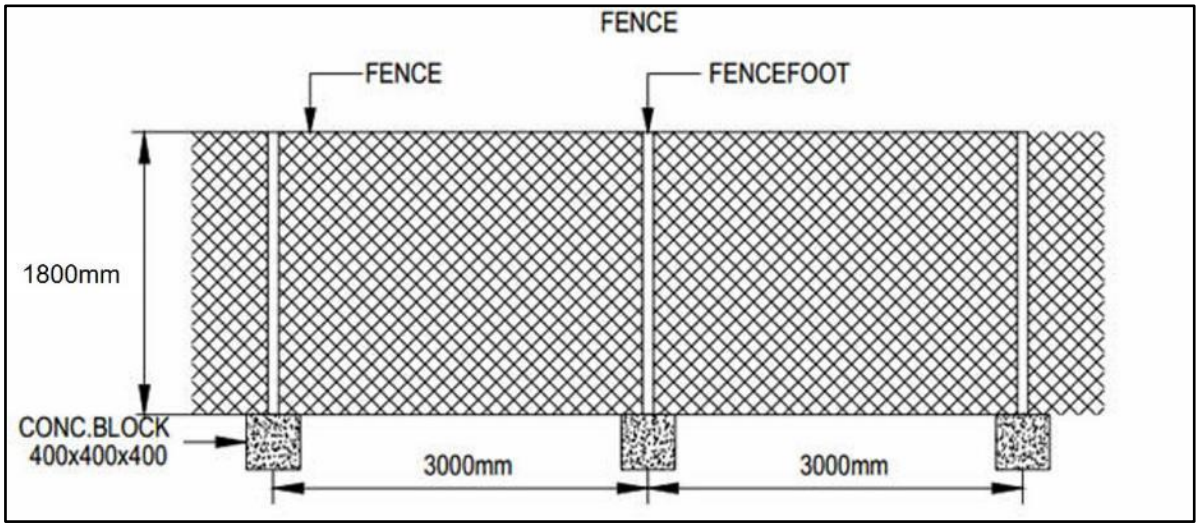


Figure 9: Indicative Security Fence

3.2.4 Phase 2 Power Storage Unit

The feasibility assessment of the project to date has identified that a power storage unit is not economically feasible for the scale of this site and the purpose of the power generation. Power storage units are evolving rapidly. The current form of power storage units typically used for a solar farm include batteries storage units. These have evolved from a unit that was unreliable and prone to overheating and burning. Such units have been replaced for with efficient units with no risk of fire.

Other potential power storage units evolving at present include conversion of the power into other forms for storage. This may include hydrogen storage. The technology is evolving at a rapid pace and therefore this project will delay the installation of a power storage unit until a feasible and highly efficient and cost-effective method becomes available.

3.3 Construction

3.3.1 Installation Philosophy

The solar farm installation philosophy will feature cascading activities to construct each PEG EW structure comprised of mounting frame and PV modules. The intention is to roll-out the

installation of structures in waves to maximise efficiency of installation activities, i.e. PEG EW uprights will be driven into the ground by one team and other teams will follow to install base and top plates, followed by PV modules.

3.3.2 Construction Timeline

Construction is estimated to take up to 10 weeks. The intention is to maximise the use of local employment in various aspects of the construction subject to the required work health and safety (WHS) standards and skill requirements.

The key stages of the construction of the farm will include:

- Mobilisation/site establishment
- Construction
- Commissioning
- Site remediation/demobilisation

Site establishment activities will be required to prepare the site before the phases commence. Site establishment activities include establishment of the construction compound and laydown area, perimeter fencing, formation of internal roads and the installation of erosion and sediment controls.

The construction works will be phased according to the construction of each of the structures. The construction of each structure requires repetitive activities during rollout, such as the driving of PEG piers; the installation of base and top plates and PV modules; and cable tray installation. LV, MV and HV electrical works will be completed by specialist electricians.

The inverter and power storage containers are preassembled prior to delivery. Their installation will include foundations, electrical interconnection and commissioning.

3.3.3 Construction Workforce

Teams will be rotate through the following activities to construct each structure:

- The framing team will install the PEG piers or PEG screws where they are required in accordance with standards and a design certified by a structural engineer.
- The assembly team will install the components that connect to the PEG piers or PEG screws, as well as the mounting of the PV modules.
- The electrical team requires qualified electricians to manage low, medium and high voltage activities as well as labourers to support with cable installation and electrical terminations and connections.

A separate civil team will be required for the construction of the cable trenches and foundational requirements for the inverters and transformer.

It is expected that the construction workforce at its peak will be around eighteen workers on-site.

3.3.4 Construction Hours

Construction activity will be restricted to the Interim Construction Noise Guideline (DECC, 2009) recommended standard hours. That is, works would be limited to 7:00 am to 6:00 pm Monday to Friday and 8:00 am to 1:00 pm Saturday: with no works on Sundays or Public Holidays.

3.3.5 Traffic and Access

3.3.5.1 Construction Traffic

The construction traffic will consist of both light vehicles (such as 4WD) to transport construction workers to and from the site. Bulk materials will general be delivered in shipping containers. For this site, the large trucks would consist of a standard semi-trailer. They would be self-unloaded or a small crane will be brought to the site. No over-mass or over-dimensional vehicle delivery will be required. Deliveries will generate approximately 20-trucks to the site. Additional detail regarding traffic data is contained within Section 5.17.

3.3.5.2 Access

The development will utilise the existing access to Lot 85 in DP870963. An existing internal access road will then be utilised to provide direct access to the site. Neither the site access nor access road are gravelled.

Figures 10 to 12 show the existing property access. Road geometry of the property access is not considered to meet the current Austroads standard for a rural intersection and will need to be upgraded. Upgrade works would involve the removal of existing fencing at each entrance and widening the shoulder in the intersection to create a paved, tapered area and a minimum of a 12m turning radius. Figure 13 shows an example of a rural intersection shown in the Austroads standard.

Figure 10: Existing property access from the Casuarina Drive

Figure 11: Sight Distance – View south along the Casuarina Drive from existing site access. Sight distance of over 1 kilometre.

Figure 12: Sight Distance – View north along the Casuarina Drive from existing site access. Sight distance of over 1km.

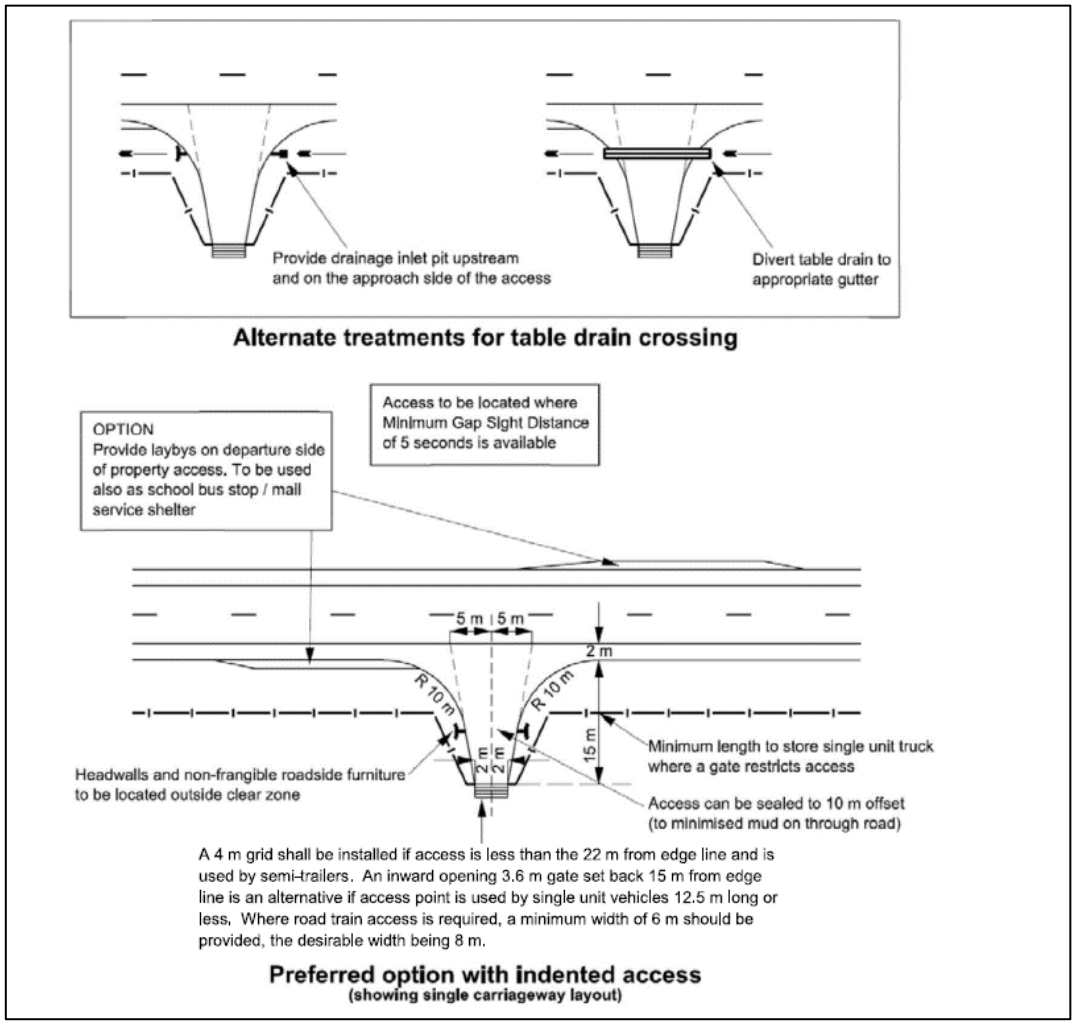


Figure 13: Example of a layout of a rural property access – dual carriageway (Source: Figure 7.2 in 'Guide to Road Design Part 4: Intersections and Crossings – General)

3.3.5.3 Parking

There is no demand for parking facilities during construction as each vehicle will move around the site with tools and equipment. The vehicles will park adjacent to their work sites. Once operational, the light vehicles inspecting the site will also park adjacent to their work site.

No office facility will be present and therefore no permanent parking area is required.

Visitors will generally park outside of the security fence. There is available space for several vehicles if more than one visitor is present at any time.

3.3.6 Site Preparation

Minor earthworks will be required. The solar farm is to be located on a northwest sloping paddock, with the steepest sloping ground on the eastern section of the lot. The footprint of the subject site is gently sloping overall and is suitable for the installation of solar without the requirement for levelling works.

Additional preparation work proposed for the site includes placement of a geotextile strip beneath the PEGs on the lower side of the panels. There is a gap between panels and therefore water running off the panels will drop between the arrays. The geotextile strip will stabilise the soil where this water runs off.

3.4 Solar Array Construction

Once site preparation is completed, the PEG system will be installed to the required depths. The frames for the solar panels will be fitted and then the solar panels can be attached to the frame. During this process, the wiring will be installed to carry the power from the panels to the inverter station.

The inverter will be installed on a mound of soil with a gravel cap. This will ensure that it is not affected by surface runoff and remains stable.

The connection to the existing 11kV line west of the site will be via a below ground cable to be installed in accordance with Australian Standards.

3.5 Final Land Management

The site currently supports wheat stubble. Site preparation will involve sowing grass within the site footprint to encourage vegetation growth prior to the installation of the solar farm infrastructure.

The ground cover will be encouraged to grow beneath and around the panels to stabilise the soil surface. Sufficient light passes through the joins in the panels to allow vegetation to grow.

The proposal for long-term management of this vegetation beneath the solar array involves robotic mowers under the panels and a normal slasher/mower around the panels. The ground cover needs to be maintained as a low cover to ensure it does not impact the panels or infrastructure and does not present a potential fire risk. The area between the surrounding security fence and the panels will be maintained as short ground cover for the purpose of providing a fire break and asset protection zone.

3.6 Maintenance of Solar Farm

Once constructed and operational, the solar farm will be monitored remotely. Site inspections will occur once or twice per year. The panels are not cleaned as it has been determined that the slope of the panels is sufficient to allow rainfall to wash any accumulated dust off the panels. Mowing and maintenance of ground cover and drains will occur on an as required basis.

4 Planning Considerations

4.1 Required Approvals

Pursuant to Schedule 6 of the *State Environmental Planning Policy (Planning Systems) 2021,* electricity generating works with a capital investment value of more than $5 million are considered 'Regional Development' and are a development category for which a Joint Regional Planning Panel (JRPP) may be authorised to exercise the consent authority functions of Council.

The development as proposed has an estimated capital investment value of approximately $4 million and thus does not trigger the criteria for regional development. It is thus considered "Local Development" and the application can therefore be dealt with by Local Council without a requirement to forward the application to a Joint Regional Planning Panel for consideration.

4.2 Commonwealth Legislation

4.2.1 Environment Protection and Biodiversity Conservation Act

The Commonwealth Environment Protection and Biodiversity Conservation Act, 1999 (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for actions on Commonwealth land or those that may have a significant impact on matters of national environmental significance. An Assessment of Significance on the Matters of National Environmental Significance has been included as Appendix 6. The conclusion of the assessment is that the proposal will have no significant impact on any listed Matters of National Environmental Significance.

4.3 State Legislation

4.3.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and associated *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) outline the overarching regulatory structure of environmental legislation within NSW. The EP&A Act and Regulation define development magnitude thresholds and outline assessment requirements for developments undertaken within the State. The following identifies the relevant consent and assessment requirements for the proposed development in accordance with this Act.

4.3.1.1 Designated Development

Schedule 3 of the EP&A Regulation indicates "Electricity generating stations" such as solar farms are considered designated development under the EP&A Act and associated regulations where the development generates more than 30 Megawatts of electrical power.

The proposed development is predicted to generate a maximum of 4 MW AC. Therefore, the proposal is not considered designated development.

4.3.1.2 Integrated Development

The solar farm is not considered integrated development under Division 4.8 of the EP&A Act because the solar farm does not require any additional approval/permit/licence/ authorisation under the:

- Fisheries Management Act 1994;
- Heritage Act 1977;
- Mine Subsidence Act Compensation Act 1961;
- Mining Act 1992;
- National Parks and Wildlife Act 1974
- Petroleum (Onshore) Act 1991;
- Protection of the Environment Operations Act 1997;
- Roads Act 1993;
- Rural Fires Act 1997; or
- Water Management Act 2000.

4.3.1.3 Assessment Requirements

Clause 4.15 of Division 4.3 of the EP&A Act outlines matters for consideration which require assessment for developments requiring consent. These matters include the provisions of:

a) any environmental planning instrument, and
   i. any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and
   ii. any development control plan, and
   iii. any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and
   iv. the regulations (to the extent that they prescribe matters for the purposes of this paragraph), and
   v. any coastal zone management plan (within the meaning of the Coastal Protection Act 1979), that apply to the land to which the development application relates,
b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,
c) the suitability of the site for the development,
d) any submissions made in accordance with this Act or the regulations,
e) the public interest.

This Statement of Environmental Effects is considered to satisfy the requirements outlined in the above matters for consideration.

4.3.2 Biodiversity Conservation Act

The *Biodiversity Conservation Act* came into effect in August 2017 and replaced the *Threatened Species Conservation Act 1995*. The BC Act outlines requirements in relation to the listing of threatened species, biodiversity impact assessment, offsetting and related offences. The assessment of biodiversity values on land and the impacts of activities on those biodiversity values are to be carried out in accordance with the Biodiversity Assessment Method (BAM). The objective of the BAM is to adopt a standard approach that will result in no net loss of biodiversity in NSW.

The Act also outlined the Biodiversity Offset Scheme (BOS). Development that is subject to the BOS scheme includes development needing consent under Part 4 of the EP&A Act (excluding complying development), activities under Part 5 of the EP&A Act, State significant development and State significant infrastructure.

Where development or an activity is, "likely to significantly affect threatened species", a Biodiversity Development Assessment Report (BDAR) must be prepared and consent authorities are required to consider the likely impact of the proposed development on biodiversity values before granting approval.

The threshold test of whether development or an activity is "likely to significantly affect threatened species" (and therefore whether a BDAR is required) is reached if:

- the test in section 7.3 of the BC Act is met;
- the BOS Threshold is met; and
- the development is carried out in a declared area of outstanding biodiversity value.

The subject lot was assessed using the online Biodiversity Offsets Scheme Entry Tool, which determines whether any proposed clearing would be above or below the area thresholds or lies within an area mapped as having high biodiversity value. According to BOS, the area clearing threshold for the subject site would be 0.5 Hectare of clearing of native vegetation. The site does not support native vegetation as per the available mapping (SEED Mapping), which was confirmed by the site assessment carried out in January 2022. The clearing threshold will therefore not be exceeded.

The proposed development site is not located within a declared area of outstanding biodiversity value.

Proponents are also required to carry out a 'test of significance' for all development proposals that do not exceed the Biodiversity Offset Scheme Threshold. The required test of significance (as outlined in Section 7.3 of the BC Act) has also been included in Appendix 5. It was

determined that the proposal is not likely to significantly affect threatened species, and that further assessment under the BAM and the preparation of a BDAR is not required.

4.4 State Environmental Planning Policies

Table 3 presents a summary and comment on current State Environmental Planning Policies and identifies their relevance to the proposed development.

Table 3: List of State Environmental Planning Policies

SEPP Title	Relevance
State Environmental Planning Policy (Planning Systems) 2021	Review provided below
State Environmental Planning Policy (Biodiversity and Conservation) 2021	Review provided below
State Environmental Planning Policy (Resilience and Hazards) 2021	Review provided below
State Environmental Planning Policy (Transport and Infrastructure) 2021	Review provided below
State Environmental Planning Policy (Industry and Employment) 2021	Not Relevant
State Environmental Planning Policy (Resources and Energy) 2021	Not Relevant
State Environmental Planning Policy (Primary Production) 2021	Not Relevant
State Environmental Planning Policy (Precincts – Eastern Harbour City) 2021	Not Relevant
State Environmental Planning Policy (Precincts – Central River City) 2021	Not Relevant
State Environmental Planning Policy (Precincts – Western Parkland City) 2021	Not Relevant
State Environmental Planning Policy (Precincts – Regional) 2021	Not Relevant

4.4.1 State Environmental Planning Policy (Planning Systems) 2021

Pursuant to Schedule 6 of the State Environmental Planning Policy (Planning Systems) 2021, electricity generating works with a capital investment value of more than $5 million are considered as Regional Development, a development category for which a Joint Regional Planning Panel (JRPP) may be authorised to exercise the consent authority functions of Council.

The development as proposed has an estimated capital investment value of $4 million and is thus considered local development which may be assessed by the Cabonne Shire Council.

4.4.2 State Environmental Planning Policy (Biodiversity and Conservation) 2021

4.4.2.1 Vegetation Clearance in Non-Rural Areas

Chapter 2 of the SEPP covers the clearance of vegetation in non-rural areas. Clause 2.6(2) in Chapter 2 states that '*A person must not clear native vegetation in a non-rural area of the*

State that exceeds the biodiversity offsets scheme threshold without the authority conferred by an approval granted by the Native Vegetation Panel under Part 2.4.' The proposal does not entail the clearance of native vegetation that would exceed the biodiversity offsets scheme threshold; further detail is provided in Section 4.3.2.

4.4.2.2 Koala Habitat

Chapter 4 of the *SEPP (Biodiversity and Conservation) 2021* applies to land within each local government area listed in Schedule 2 of the SEPP, with certain exceptions such as land zoned RU1 – Primary Production or land dedicated or reserved under the *National Parks and Wildlife Act 1974*, for example. The Eugowra LGA is included in this schedule, and none of the exceptions listed apply to the site. The proposal is therefore to be assessed pursuant to Chapter 4.

Clause 4.9 of the SEPP sets out the development assessment process where the proposal has an area of more than 1 Hectare and no approved Koala plan of management has been prepared for the land, as is the case for the current proposal. An excerpt is provided below:

3) *If the council is satisfied that the development is likely to have low or no impact on koalas or koala habitat, the council may grant consent to the development application*
4) *If the council is satisfied that the development is likely to have a higher level of impact on koalas or koala habitat, the council must, in deciding whether to grant consent to the development application, take into account a koala assessment report for the development.*
5) *However, despite subsections (3) and (4), the council may grant development consent if the applicant provides to the council—*

   (a) information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application—

      (i) does not include any trees belonging to the koala use tree species listed in Schedule 2 for the relevant koala management area, or

      (ii) is not core koala habitat, or

   (b) information the council is satisfied demonstrates that the land subject of the development application—

      (i) does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or

      (ii) includes only horticultural or agricultural plantations.

The SEPP provides the following definitions:

- ***Core Koala Habitat*** *means*:
  a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or

b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.

- ***Koala Habitat*** means koala habitat however described in a plan of management under this Chapter or a former Koala SEPP and includes core koala habitat

Comment

The proposal is required to be assessed for its potential impact on Koala and Koala Habitat as the site is within the Cabonne LGA, listed within Schedule 2, and the proposal has an area of more than 1 Ha.

The proposed development footprint is dominated by cropland, with a small number of planted White Cedar and Kurrajong trees along the northern and western boundaries of the lot. None of the feed tree species listed in Schedule 3 of the *Biodiversity and Conservation SEPP* are present within the proposed development footprint. Riparian vegetation west of the lot consists of River Red Gum woodland, a Koala feed tree species. This woodland therefore constitutes potential Koala habitat; however this woodland is over 100m west of the proposal site and will not be altered or disturbed by the proposed development. No mature trees will be cleared or modified in association with the proposed development.

Figure 14 includes a map of all the recorded koala sightings within the Cabonne Shire. The red triangles indicate recorded sightings. No recent or historical records (within 18 years) of a "resident population" exist for the project area (within 5km of the proposal). The closest record is approximately 15km east of the proposal site in the Nangar National Park.

In summary, the proposal is considered unlikely to have adverse impacts on Koala or Koala habitat, due to the following:

- The majority of the subject lot has been cleared, with only a small number of trees present along the northern and western boundaries of the lot. None of these trees are Koala feed trees and there will be no native vegetation clearance as part of the proposal;
- No Koalas were observed on-site during the site inspection;
- There are no historical records of the species in the locality;
- No Koala scats or scratches that would indicate the presence of Koala within the site were observed during the site survey.

Chapter 4 of the SEPP therefore does not require any further consideration.

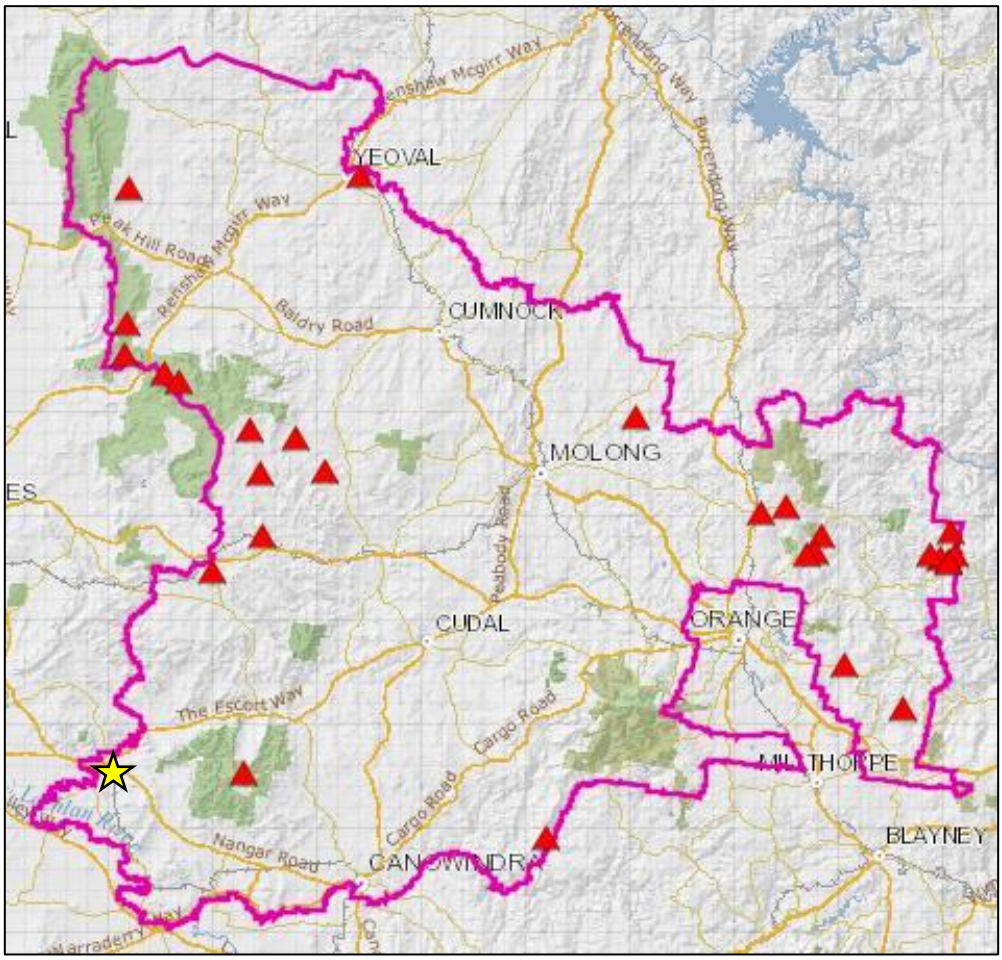


Figure 14: Distribution of Koala records within the Cabonne Shire (Bionet, 2022). Proposed development site indicated by a yellow star.

4.4.3 State Environmental Planning Policy (Resilience and Hazards) 2021

Chapter 4 of the *Resilience and Hazards SEPP 2021* covers remediation of land and aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or other aspects of the environment.

Under this SEPP, a consent authority must not consent to the carrying out of any development on land unless:

i. It has considered whether the land is contaminated, and
ii. If the land is contaminated, it is satisfied that the land is suitable in its contaminated state (or will be suitable, after remediation) for the purpose for which the development is proposed to be carried out, and
iii. If the land requires remediation to be made suitable for the purpose for which the development is proposed to be carried out, it is satisfied that the land will be remediated before the land is used for that purpose.

The subject property is not listed as a contaminated site on the NSW EPA Contaminated Lands Record for the Cabonne Shire. The proposed development site is not considered as contaminated land as it has not historically been subjected to any contaminating activities. A preliminary site contamination assessment was nevertheless undertaken at the site and this has been included within Appendix 3. The assessment concludes that the site is considered suitable for the proposed development of a solar farm.

4.4.4 State Environmental Planning Policy (Transport and Infrastructure) 2021

The Transport and Infrastructure SEPP provides development controls for infrastructure and services.

4.4.4.1 Permissibility of Electricity generating works or solar energy systems

Chapter 2.2, Division 4 covers development controls for electricity generating works / solar energy systems.

The SEPP details the applicable criteria for a solar energy system to be considered a development permitted without consent, as well as complying, prohibited and exempt development. The proposal does not meet any of the above criteria.

Clause 2.36 (9) of the SEPP states "D*evelopment for the purpose of a solar energy system may be carried out by any person with consent on any land*."

Accordingly, the proposed solar farm is permissible with development consent.

4.4.4.2 Grid Connection

Clause 2.48 of the SEPP relates to the determination of a Development Application that has the potential to affect electricity transmission lines. Before determining a Development Application which meets the relevant criteria provided by cl. 2.48, the consent authority must first notify the relevant electricity supply authority and take into consideration any comments made by the authority within 21 days of the notice.

The necessary infrastructure to achieve grid connection will be installed as part of this development but cannot be connected until authority to energise and connect to the grid is given by Essential Energy. This is a separate process to this DA which is being undertaken at present. The grid connection process is governed by the National Electricity Rules and analysed by Essential Energy in relation to their system capacity, local demand and network distribution options adjoining the solar farm. In this case, the link would be to the network along Casuarina Drive.

4.4.4.3 Traffic Generating Development

The subject proposal is not identified in Schedule 3 of the SEPP as a traffic generating development to be referred to Transport for NSW as the proposal is defined as 'any other purpose' and will not generate 200 or more motor vehicle movements during its operational phase.

4.5 Regional Plan

The Central West and Orana Regional Plan 2036 (the Plan) recognises the potential for the growth of the renewable energy industry within the Cabonne Shire and the surrounding region.

The Plan outlines a total of twenty-nine (29) Strategic Directions for the Central West and Orana region in NSW. Strategic Direction Number 9 is to 'Increase renewable energy generation'. The Plan encourages the following actions be taken to achieve this goal:

1) *Facilitate small-scale renewable energy projects using bioenergy, solar, wind, small-scale hydro, geothermal or other innovative storage technologies through local environment plans; and*
2) *Identify locations with renewable energy generation potential and access to the electricity network.*

The proposed development is considered to contribute to achieving the outcomes of Strategic Direction Number 9 of the Plan, as it will enable diversification and expansion of energy generation within the region by capitalising on high rates of regional solar penetration.

4.6 Strategic Plan

The NSW Renewable Energy Action Plan (REAP), prepared by the NSW Government in 2013 guides NSW's renewable energy development and supports the achievement of national renewable energy targets. The NSW Government's vision is for a secure, reliable, affordable and clean energy future for the State. The REAP positions NSW to increase the use of energy from renewable sources.

The REAP sets out a number of actions to achieve its vision, under the following three goals:

- Goal 1 – attract renewable energy investment;
- Goal 2 – build community support; and
- Goal 3 – attract and grow renewable energy expertise.

The proposed development will assist in achieving the NSW Government's goals of increasing renewable energy generation in NSW to help achieve renewable energy targets. Through creating new solar employment opportunities, the proposal will contribute to growing expertise in renewable energy technologies.

It is noted that the Cabonne Shire Council have prepared the Cabonne Shire Council Renewable Energy Action Plan (refer Section 4.9).

4.7 Local Environmental Plan

The development site is zoned SP2 Infrastructure under the *Cabonne Local Environmental Plan 2012* (Cabonne LEP). Under this local planning instrument, the development as an 'electricity generating works', is not specifically identified as a type of development that is either permissible with or without development consent.

Notwithstanding, pursuant to cl.34(7) of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP), development for the purpose of a solar energy system may be carried out by any person with consent on any land.

Accordingly, the proposed solar farm (which is a photovoltaic electricity generating system) is permissible subject to securing development consent.

The proposal meets all objectives as prescribed by the Cabonne LEP for SP2 - Infrastructure which are:

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

Comment: The proposal consists of electrical infrastructure will not detract from the provision of existing infrastructure on the subject lot, namely water pipes, sewage pipes and the Eugowra sewage treatment plant. The proposal therefore meets the objectives for the zone.

4.8 Development Control Plan

There are twelve (12) development control plans (DCPs) which are in force in the Cabonne Shire. These provide more detailed controls for specific development types and places that are suited to Cabonne and the community's desired development outcomes. None of the DCPs are considered relevant to the proposed development.

4.9 Cabonne Council Renewable Energy Action Plan 2020

The Renewable Energy Action Plan (REAP) was developed after a detailed analysis of current electricity consumption and generation opportunities was conducted including a review of factors relating to installation and management of renewable energy infrastructure.

Cabonne Shire Council has developed this Renewable Energy Action Plan with the following objectives:

- *To reduce the cost and uncertainty of future energy supply to Council infrastructure*

- *"To strengthen our towns and villages, retain our social and physical infrastructure, create new jobs and use technology to spread the word about the advantages of living and working in Cabonne Country" (Cabonne 2025 Community strategic plan)*
- *To attract and retain people and businesses to Cabonne country living.*
- *To support local businesses and residents suffering financial stress or discomfort due to energy affordability.*

Comment: The proposal will reduce the cost of Council's energy consumption and will increase their financial stability and energy supply security in the long-term. The solar farm will also 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. Overall, the proposed is considered to align with the Cabonne Council Renewable Energy Action Plan.

4.10 Local Planning Strategies

4.10.1 Cabonne Local Strategic Planning Statement

The Cabonne Local Strategic Planning Statement (LSPS) sets out the 20-year vision for land use planning across the Cabonne Shire, outlining how growth and change will be managed. The LSPS identifies the unique characteristics of Cabonne and sets the economic, social and environmental land use direction over the next 20 years.

To achieve the vision statement, Cabonne Shire Council has identified nine key priorities to achieve over the next 20 years. One of these priorities is to "mitigate and adapt to climate change", with the strategic direction of this priority stating, "Council supports renewable energy developments that is suitably located and is sympathetic to the landscape whilst ensuring that agriculture and industry can continue to play a major role in Cabonne's economy."

The Project directly aligns and contributes to the achievement of this priority. While the development would reduce the availability of land for agricultural purposes, the significance of this issue is very low given the project scale and local aspirations for increased renewable energy development.

4.10.2 Cabonne 2025 Community Strategic Plan

Cabonne 2025 represents the vision, aspirations and priorities of the community for their preferred future. The plan has five (5) future directions which guide the community towards its preferred future. Future direction 5 is entitled 'Manage our natural resources' and one of the strategic outcomes for this future direction is the consideration and use of alternative energy development where appropriate. The proposal therefore aligns with the Plan and directly contributes to one of its strategic outcomes.

4.11 Draft planning instruments

No draft environmental planning instruments are known to affect the site.

5 Environmental Considerations

Items considered include matters set out under Clause 4.15 of Division 4.3 of the *Environmental Planning and Assessment Act 1979.* A summary of the major points of that consideration follows.

5.1 Land Use Conflict

The development poses no potential land use conflict as it is permissible within the current zoning. The land use will change from primary production (cultivation) to electricity generation but due to the unobtrusive nature of solar power generation there are no land use conflict concerns.

5.2 Services

The solar farm does not require connection to reticulated water, telephone or sewerage infrastructure. Accommodation for construction workers will be off-site in Eugowra. Post construction there will not be a permanent on-site presence or office building for amenities.

5.3 Land Contamination

An assessment of the site has been carried out by SMK Consultants in accordance with *SEPP (Resilience and Hazards) 2021*. This assessment in attached to this report as Appendix 3. As a result of the preliminary contamination assessment, SMK Consultants have concluded that the presence of any potential contamination residue would not impact on the proposed development of a solar farm, as it is not considered a sensitive land use. Accordingly, no further investigation is required.

5.4 Acoustic Amenity

The site has been subjected to the use of large farm machinery in the past, and there are several farming operations, including a feedlot, in the locality. This has established the acoustic amenity of the area. Construction of the facility will involve large machinery such as cranes for delivery and installation of the inverters, but will no longer be required once the site is operational. No large machinery will be active on the site once the solar farm is in operation. The solar farm will generate minor noise emissions from inverter/transformer stations. The remainder of the property will continue to be utilised as a sewage treatment plant. This source of noise is considered as seasonal.

5.4.1 Construction Noise

During the construction phase, the operation of earthmoving machinery will be a source of noise. This type of noise is considered consistent with the noise levels produced by existing farming activity on the land. The equipment proposed for use during the works is similar to the types of plant commonly used for civil construction projects; and assumptions regarding plant Sound Power Levels (SWL) were obtained from *AS 2436 – 2010, Guide to noise and vibration control on construction, demolition and maintenance sites*, which is commonly used

in assessment and management of noise from construction type works. This guidance presents a range of potential noise levels for plant commonly used in civil and construction activities, in recognition that not all items of plant will possess the same SWL; variations in equipment SWL will exist based on make, model, size and age of plant. Plant operating at the upper bound of the guidance range would typically include larger (or older) plant, while the lower band would represent smaller (or well maintained, or otherwise mitigated) plant. Equipment which would be used at the Eugowra Solar Farm consists of smaller equipment which has been regularly maintained; this equipment would therefore be in lower band. However, mid-range values were selected as a conservative estimate of sound power levels likely to be generated by the proposed development.

Table 4: Typical Sound Levels of Construction Plant and Equipment

Plant Description	A-weighted sound power levels L_{wA} dB ref: 10^{-12} W		A-weighted sound pressure levels L_{pA} (mid-point) dB at 10m
	Typical Range	Typical (midpoint)	
Crane (mobile)	95-113	104	76
Generator (diesel)	84-=113	99	71
Grader	105-115	110	82
Hand tools (electric)	95-110	102	74
Loader (wheeled)	99-111	105	77
Truck (>20 tonne)	107	107	79
Vehicle (light commercial e.g. 4WD)	100-111	106	78

The magnitude of off-site noise impacts associated with construction would be dependent upon a number of factors:

- The intensity and location of construction activities
- The type of equipment used
- Existing local noise sources
- Intervening terrain
- The prevailing weather conditions

During any given period, the machinery items to be used in the study area would operate at maximum sound power levels for only brief stages. At other times, the machinery may produce lower sound levels while carrying out activities not requiring full power. It is highly unlikely that all construction equipment would be operating at their maximum sound power levels at any one time and certain types of construction machinery would be present in the study area for only brief periods during construction.

Furthermore, all construction and operation of machinery would only occur during work hours and not during the evening or night periods, where sound can be potentially increased as a result of various factors, including inversion layers. Accordingly, the predictions should be considered as conservative estimates.

The NSW Noise Policy for Industry 2017 (NPI) presents a methodology for determining Project Noise Trigger Levels (PNTL) for industrial development. Ambient and background noise measurements are used to determine PNTL relevant to the proposed development. Table 5 provides the NPI minimum RBL for each period of the day, which were adopted for the site.

Table 5: Rating Background Noise Levels

Period	RBL dB(A)
Day	35
Evening	30
Night	30

Note: Day is defined as the period from 7am to 6pm (Monday to Saturday) and 8am to 6pm (Sundays and public holidays). Evening is defined as the period from 6pm to 10pm. Night is defined as the period from 10pm to 7am (Monday to Saturday), and 10pm to 8am (Sundays and public holidays).

Table 6 provides an analysis of both the intrusiveness and amenity noise levels for the purposes of establishing a PNTL for the proposed development.

Table 6: Assessment of PNTL in adjacent receiving environment

Metric	Day dB(A)	Evening dB(A)	Night dB(A)
Rating Background Level	35	30	30
Project Intrusiveness Criteria	40	35	35
Recommended Amenity Level	50	45	40
Project Amenity Level	45	40	35
Project Noise Trigger Level	**40**	**35**	**35**

These levels of 40, 35 and 35 dB(A) for the respective noise periods are considered acceptable guideline ambient noise levels that can received by sensitive receptors whilst being considered to protect environmental values, including health and well-being, for outside a dwelling.

Noise impacts associated with the project were estimated using the distance attenuation relationship described in the following equation:

$$L_2 = L_1 - 20\text{Log}(d_1/d_2)$$

(source: Noise Guide for Local Government - epa.nsw.gov.au)

Where: d_1 = distance (m) between source and receiver

d_2 = distance (m) at which Sound Pressure (L_{pa}) measured

L_2 = sound pressure level at the distance d_1 from the source

L_1 = sound pressure level at distance d_2 from the source

Propagation calculations consider sound intensity losses due to hemispherical spreading, with additional losses such as atmospheric absorption, directivity, ground absorption and shielding ignored in the calculations.

5.4.1.1 Predicted Construction Noise Levels at Receptors

The closest receptor is approximately 1,040 metres to the west of the project site. At this distance, the loudest activity (grader) is predicted to be:

L_2 = 82 - 20log(1,040/10)

= 41.7 dB

Construction works will be confined to daytime hours, in which the acceptable noise threshold criteria is 40dB. The predicted maximum noise generated by the development therefore exceeds the PNTL. It is noted, however, that a compacter will most likely not be required. It has been used in this calculation as a 'worst-case scenario'.

5.4.1.2 Noise Mitigation Measures and Residual Noise Impact

The NPI notes that the PNTL should not be considered to be a mandatory threshold, yet rather a planning tool. The PNTL should be considered in conjunction with feasible and reasonable noise mitigation measures, and residual noise impacts. Residual noise impacts are defined as the best achievable noise level from a development, when the development noise emissions still exceed the PNTL (following implementation of noise mitigation measures).

It is noted that there are limited feasible and reasonable noise mitigation measures which may be adopted during the construction period which would result in lowering the PNTL. Therefore, the residual noise impact is equivalent to 1.9dB.

5.4.1.3 Determination of Significance of Residual Noise Impact

The proposed development has a residual noise impact of 1.7dB. The NPI identifies the significance of a residual noise impact of ≤2dB as 'Negligible'. It is therefore considered that construction works associated with the proposed development will have minimal impact upon the amenity of the surrounding location. It is noted that the specific construction works (grader) associated with the proposed development will be temporary in nature (2-3 days) and will not result in a lasting alteration to local amenity values.

Furthermore, while heavy machinery operating on the site will be audible at the closest residences (to the north and west), these residences would also be subject to noise from the nearby Casuarina Drive and Paytens Bridge Road and farm machinery noise in the area which would be similar in characteristic.

Overall, it is considered that the potential noise related impacts of construction work upon the community is within an acceptable threshold, in particular given the existing noise levels in the area and the brevity of the proposed construction works.

5.4.2 Operational Noise

Sources of plant noise associated with the operation of the solar farm stem from the inverter stations . It is noted that the inverter stations would be operated during daytime and night-time hours.

Ongoing maintenance requirements would be negligible and is likely to require no more than one or two technicians in a light utility occasionally using hand tools.

The inverter will be obtained from Sungrow and whilst no inverter model has yet been selected, typical manufacturer noise specifications (based on sound power level test results) for the Sungrow SC3450 PCS Inverter Station is available and is presented below. Typical manufacturer noise specifications for energy storage units have also been include in Table 7, however the type of energy storage which may be used onsite has not yet been determined. Specifications included below are therefore considered approximative representations of potential future noise emissions from energy storage units.

Table 7: Typical Operational Sound Power Levels

Equipment	L_{Aeq}SWL (dB(A)	Source
Sungrow SC3450 PCS Inverter Station	80.5	SC3450 PCS (measured at 1m)
Battery Storage (BESS)	61.9	ST3727KWH(L) (measured at 1m)

5.4.2.1 Predicted Noise Levels at Receptors

The closest receptor is approximately 1,040 metres to the north of the project site. At this distance, the loudest activity (Sungrow Inverter Transformer Station) associated with the operation of the solar farm is predicted to be:

L_2 = 80.5 – 20 log(1,040/1)
= 20.2 dB

The acceptable noise threshold criteria is 40dB during the daytime period and 35dB during the night period. The predicted maximum noise generated by the operation of the solar farm is therefore below the PNTL during both periods.

5.4.3 Conclusion

Construction of the proposed development would result in negligible residual noise impacts at the closest sensitive receptor. Construction works will be temporary in nature (up to 10 weeks) and will not result in a lasting or significant alteration to local amenity values.

Additionally, during construction, the proponent shall implement the following noise mitigation measures:

- Only using machinery fitted with compliant mufflers during the construction of the solar farm;
- Requesting that truck drivers do not use engine brakes when entering / exiting the property;
- Select plant and equipment where practical on acoustic performance; and
- Use plant and equipment in a manner which minimises noise impacts.

Provided the above-mentioned mitigation measures are implemented, the proposed development is considered to have minimal potential impact on the acoustic amenity of any nearby receptors.

During the operation of the proposed development, sound pressure generated at the project site is considered compliant with a 40dB daytime noise limit. The level of attenuation available over the distance between the source and the receptor is considered more than sufficient to ensure that the amenity of the receptor is not disturbed. The assessment would therefore suggest that the environmental value associated with the sensitive receptors will be adequately protected from potential noise impacts generated by the development. The intensity and frequency of noise emissions from the site are not considered to be sufficiently significant to create additional impact above acceptable criteria.

5.5 Visual Amenity

5.5.1 Landscape Setting

The properties surrounding the solar farm site are working agricultural properties. The topography of the locality is relatively flat with some remnant vegetation, mostly on the banks of the Mandagery Creek. 'Round Hill', a knoll located south-west of the site, also supports woodland vegetation. The site itself is zoned SP2 – Infrastructure (Sewage Treatment Plant) within a rural area and is located south of the township of Eugowra. The lot is mostly cleared, containing planted trees (White Cedar and Kurrajong) in the north-western corner. Infrastructure present on the lot includes the Eugowra Sewage Treatment Plant to the east of the lot, as well as underground water and sewer pipes, fence lines and an internal access road. The following images show the existing sewage pond in the eastern section of the lot, as well as the existing views towards the proposed development from Casuarina Drive.

Figure 15: Existing sewage pond on the eastern section of the lot, looking south-east

Figure 16: Looking east from Casuarina Drive along the northern boundary of the Lot

Figure 17: Looking from the bend in Casuarina Drive southwards towards the northern boundary of the site

5.5.2 Landscape Values

Landscape value is concerned with the relative value that is attached to different landscapes. In a policy context the basis for recognising highly valued landscapes is through either registration or listing in a local, State or Commonwealth heritage register. Neither the development site nor any surrounding landscape is recognised through registration or listing as significant landscape value.

Notwithstanding, a landscape may be valued by different communities for many different reasons without any formal listing. There are intangible and emotive values associated with judgements about what makes the landscape important for different people and how sensitive it is to change. Whether the impact is considered acceptable or desirable is ultimately a subjective issue and opinions would differ between individuals. The values people place on the landscape varies, as will their opinions as to the significance of the visual impacts associated with the solar farm.

It is assumed that neighbours and landowners in the immediate locality undoubtedly value the landscape.

5.5.3 Visual catchment

A variety of visual receptors can reasonably be anticipated to see the solar farm. This includes local residents, those working outdoors on adjoining properties and motorists along the Casuarina Drive. The facility as proposed, would be the only solar farm in the local area and therefore be considered as a change to the current visual amenity.

5.5.3.1 Residents

It is generally accepted that local residents have a high level of sensitivity to changes in their landscape and visual environment. The most important views are those available from their own homes. Views from their own homes, whilst private, are judged to be the most sensitive as these are views which are consistently available and they may be views that resident's dwell upon for longer periods of time and defines their home in terms of personal appeal.

There are two (2) rural dwellings within 1.5km of the proposed development. These are shown in Figure 18 and are listed below:

- Gundadoo, located 1km north of the proposed solar farm off Casuarina Drive
- Gundamain, situated 1.1km west of the proposal off the Paytens Bridge Road.

The rural dwelling 'Gundadoo' has a direct line of site from the property to the proposed solar farm location, however the dwelling on Gundadoo is surrounded by vegetation including along the southern section of the dwelling. This vegetation has been planted as a linear row of trees and is likely intended to act as a visual screen blocking the view of the dwelling from the Casuarina Drive and it would also block the view of the solar farm from the dwelling.

Eugowra Solar Farm would not be visible from 'Gundamain' due to the topography and existing vegetation on the landscape between the farm and the receptor. Riparian vegetation along the Mandagery Creek and a low rise (8m higher than the receptor elevation) at this location would block the view of the solar farm from this receptor.

The development would not be visible from residences within the township of Eugowra due to the presence of a strip woodland vegetation with a width of up to 200m along the southern boundary of the town.

Figure 18: Sensitive receptors within 1.5km of the proposed solar farm

5.5.3.2 Travelling Public

Users of roads would vary in their level of sensitivity to the development, depending primarily upon the purpose for which they are travelling. For example, local residents may be more preoccupied with achieving their destination than in enjoying the scenery along their trip. In contrast, day trippers and longer-term visitors to the area are likely to be more concerned with the views they enjoy as they travel.

The solar farm will be visible for motorists travelling along the Casuarina Drive, and those travelling eastward along the Paytens Bridge Road towards the Casuarina Drive intersection. The solar farm would be visible as a dark blanket over a width of 150m on the subject lot. The metal on the site may be visible for a short while until it is weathered. The solar panels are dark in colour and absorb light and do not reflect light. Overall, the solar farm will not be considered as an imposing structure and the potential impacts to motorists are considered minimal.

5.6 Glare

5.6.1 Introduction

The issue of reflectivity from solar panels and associated potential safety and/or nuisance impacts for neighbours, motorists or pilots is consistently identified as an issue warranting consideration.

5.6.2 Reflectivity

The amount of light reflected by a PV panel depends on the amount of light hitting the surface, the time of year, amount of cloud cover, the surface reflectivity, and whether the array is fixed or tracking.

When the sun is at a right angle to a fixed PV array, the angle of incidence (AOI) is the lowest but increases as the angle of rays from the sun increase relative to the fixed panel angle.

The percentage of sunlight reflected by PV solar panels is similar to that of water and less than most other materials, as illustrated in Figure 19 and 20. The low reflectivity design of the solar PV panels maximises the absorption of solar energy and therefore minimises the extent of solar energy reflected.

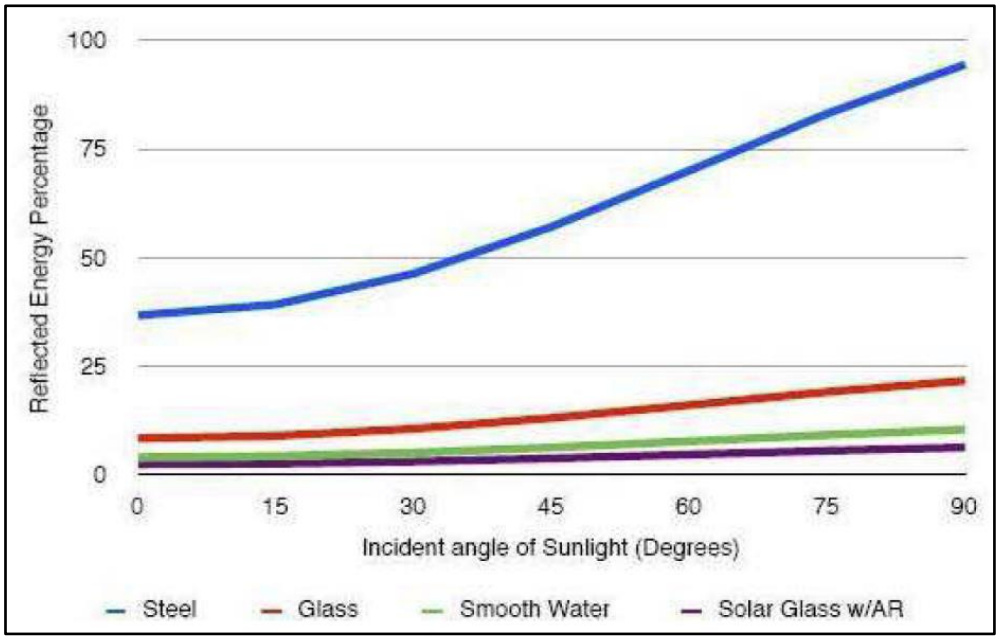


Figure 19: Typical Material Reflectivity with Sunlight Angle[1]

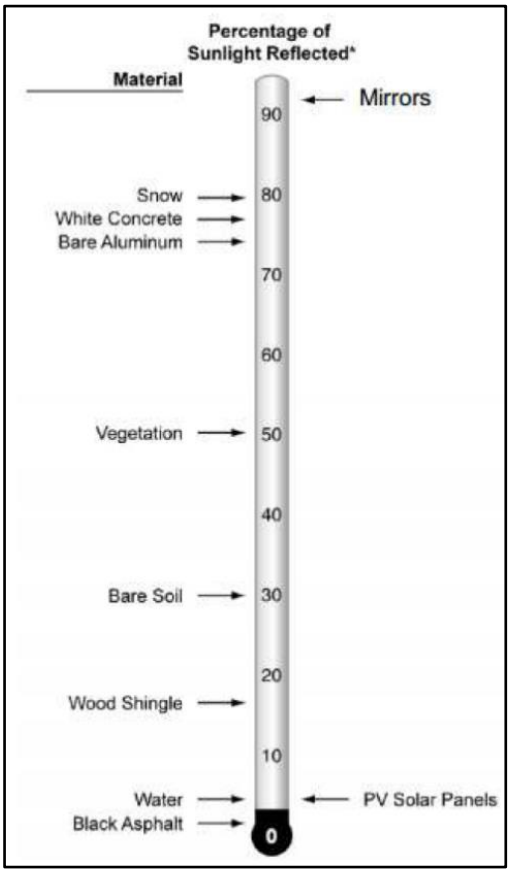


Figure 20: Comparative Reflection of PV Solar Panels[2]

[1] Spaven Consultating, 2012. *Proposed Solar Energy Facility, Manston, Kent: Manston Airport 'Glint and Glare' Study*

[2] Sandia National Laboratories (Clifford K. Ho), n.d. *Overview Presentation of the Solar Glare Analysis Tool (SGHAT)* [ONLINE] Available at: http://share.sandia.gov/phlux/static/reference/glint-glare/SGHAT_Ho.pdf

5.6.3 Potential Impacts

Glare and glint are a potential hazard/nuisance generated by solar panels. Ho[3] defines glint as a momentary flash of light, and glare as a more continuous source of excessive brightness relative to ambient lighting.

Glint is produced as a direct reflection of the sun in the surface of a PV solar panel. Glare is not a direct reflection of the sun, but rather a reflection of the bright sky around the sun. Glare is significantly less intense than glint[4]. The difference between glint and glare is depicted in Figure 21.

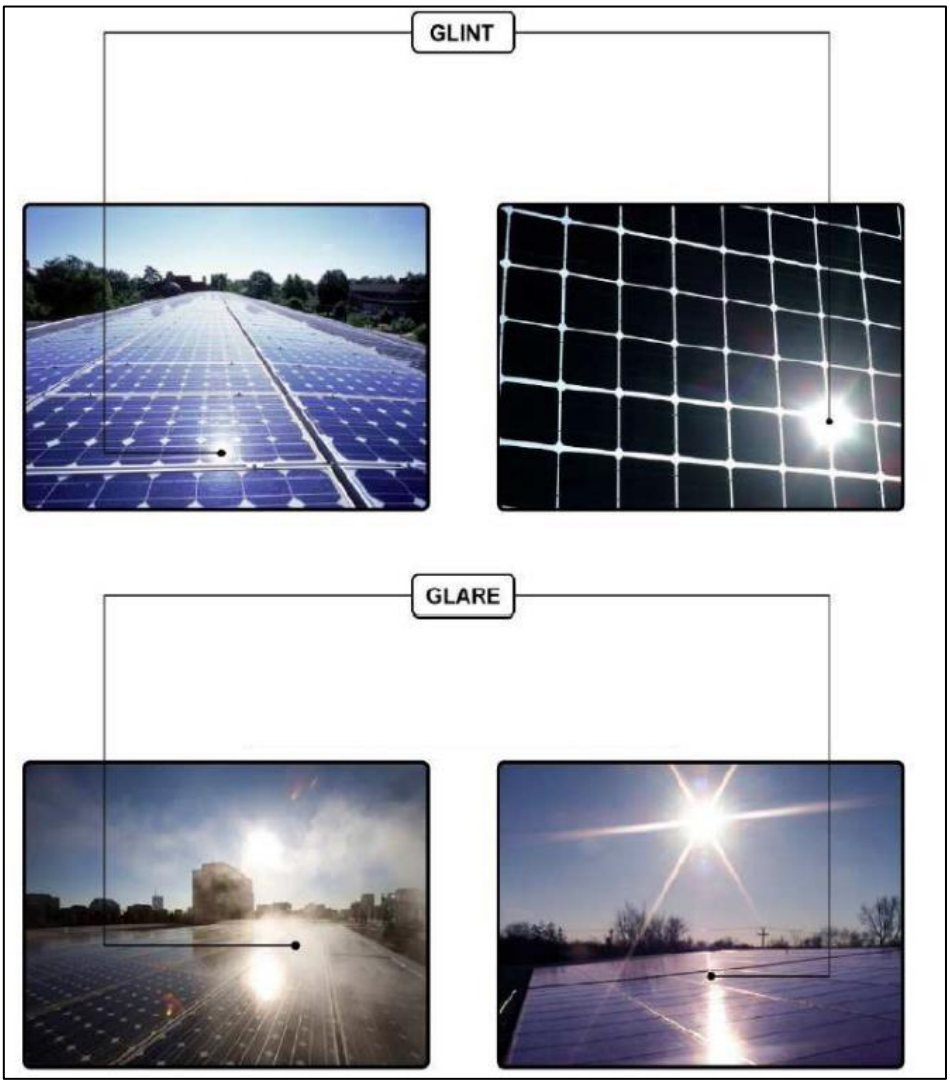


Figure 21: Visual Comparison of Glint and Glare[5]

[3] Ho, C.K., 2013, *Solar Glare Hazard Analysis Tool (SGHAT).* Sandia National Laboratories, Albuquerque, NM.

[4] Power Engineers, 2010, *Panoche Valley Solar Farm Project Glint and Glare Study,* SolarGen Energy, May 21 2010

[5] Power Engineers, 2010, *Panoche Valley Solar Farm Project Glint and Glare Study,* SolarGen Energy, May 21 2010

5.6.4 Glare Hazard Analysis

Based on the results of previous assessments for PV solar power projects and studies carried out in the USA and Europe, the potential for sun glint and glare would not be expected to have a significant impact.

SMK Consultants find it unlikely that sun glint or glare reflection from components of the project will have any significant impact on people residing in or travelling through the landscape. The potential for reflectivity of sunlight from the PV panels is less than a number of commonly established materials in the surrounding rural landscape including steel and standard window glass.

5.6.5 Civil Aviation Safety Authority

Following consultation with the Civil Aviation Safety Authority (CASA) in 2021 with regards to a different project, CASA indicated that due to recent guideline changes, CASA no longer assess approach paths to and from airports and now concentrates their concerns on impact to Air Traffic Control towers. As no airports in the vicinity of the proposal have an ATC tower, consultation with CASA is not required.

5.7 Air Quality

5.7.1 Construction Impacts

The construction of the solar farm will not involve extensive earthworks and only pile driving for footings for the array framework and excavation for ancillary structures and the property access will be carried out. Along with the delivery of materials using heavy vehicles, the construction works may generate dust.

The intent of the proposal is to create and maintain a vegetation cover across the site prior and post construction. The intended earthworks will have minimal impact on this vegetation and therefore groundcover will limit the potential dust emissions generated by either vehicular traffic or wind-borne dust.

Internal dust management is a key construction measure to maintain good health of workers and maintenance of equipment and therefore dust emission control will occur by visual monitoring of dust emissions and the implementation of suitable mitigation measures. Such measures will include:

- Restricting vehicle movements and ground disturbance to the minimum areas that is safely practicable.
- Undertaking dust suppression through strategic watering or other means of suppression will form a key component in daily operations.
- Ensure minimal handling of any excavated materials.
- Temporary cessation of works during excessively dry and windy conditions.

- Re-establishing a groundcover vegetation on areas disturbed by construction but not needed post-construction, as soon as practicable.

It should be noted that the solar farm can be built without significant earthworks. No bulk earthworks of landform modifications are required.

5.7.2 Operational Impacts

If the solar farm is not approved, the site would continue to be used for cultivation. The change in land use from rural production to electricity generation will reduce the potential for dust emissions from this land, as the principal source of dust is ground disturbance and wind exposure to un-vegetated ground surfaces.

As indicated above, the intent is to maintain a short groundcover beneath the panels to protect the ground from rainfall runoff. This will also minimise the risk of wind erosion.

As a source of particulates and localised dust emissions, the solar farm will, in comparative terms, be a land use that has the potential to improve local air quality.

The solar farm will also contribute to reduce greenhouse (GHG) emissions.

5.8 Electromagnetic Fields

5.8.1 Potential Radiation Sources

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 (µT), gauss (G) or milligauss (mG).

ELF EMFs are present in a variety of natural and human-made sources. Naturally occurring ELF EMF is associated with atmospheric processes such as ionospheric currents, thunderstorms and lightning. Typical human-made equipment or appliance EMF sources include computers, refrigerators, mobile phones and televisions. The EMF strength varies according to the relative strength of both the voltage and current present in the source and degrades exponentially as the distance from the source increases. 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 EMF in the home, in the environment and in the workplace.

According to the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), which maintains continual oversight of emerging research into the potential health effects of 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.

5.8.2 Mitigation Measures

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

5.9 Soil Resources

The subject site consists of clay loam soils consistent with Dermosols as classified by the Australian Soil Classification. These soils generally have low sodium content (i.e. non-sodic) and as a result are likely to be nondispersive. However, these soils may be susceptible to rill and sheet erosion when left exposed to heavy rainfall and/or stream bank erosion when located adjacent to watercourses.

The land and soil capability class of the surrounding area is Class 3 and 4 and is typically considered as having moderate to high limitation for high-impact land uses such as cropping. The subject site is not considered to have any existing salinity issues and the development proposal, as designed, will not increase the risk of salinity on the property. There are no known acid sulphate soils present within the region and the area is not identified on acid sulfate soil risk mapping (eSPADE v2.1, 2021).

5.9.1 Geotechnical Investigation

The results of a geotechnical investigation will be delivered to council as part of an application for a construction certificate. The Geotechnical report will inform certification of designs by structural engineers and will provide detailed recommendations to ensure construction occurs in accordance with the soil requirements.

5.9.2 Dust Generation

There is potential for dust nuisance from earthmoving equipment during construction. This has been discussed in Section 5.7.1. Construction management will include visual monitoring of dust emissions and appropriate actions to mitigate potential issues. Internal dust management is a key construction measure to maintain good health of workers and maintenance of equipment and therefore dust emission control through watering or other means of suppression will form a key component in daily operations.

5.9.3 Erosion and Sediment Control

Land slope on the property varies across the site but is essentially located on gently sloping land which drains towards the west, as the site is at the foot of ‘Round Hill’. There is minimal physical alteration as result of this proposal and hence there is no chance of subsidence, slip

or mass movement of the soil on site. Dermosols, the soil type present onsite, may be susceptible to rill and sheet erosion when left exposed to heavy rainfall.

Given the nature of the proposed development, best practice drainage and sediment controls will be implemented on site. The following erosion control measures are recommended:

- For the mounds used as a base for inverter and power storages:
  - Fill materials are appropriately compacted (at least 98%), moisture conditioned, and slopes battered at a maximum of 3H:1V;
  - Permanent batter slopes should be vegetated as soon as possible, to reduce the risk of significant soil erosion occurring;
- Throughout the construction period:
  - Short term erosion measures such as silt fencing, hay bales etc., where required during construction.
- For the management of Dermosols:
  - Maintain cover to the greatest possible extent to reduce sheet erosion.
  - Place a geotextile strip beneath the PEGs on the lower side of the panels. There is a gap between panels and therefore water running off the panels will drop between the arrays. The geotextile strip will stabilise the soil where this water runs off and will reduce rill erosion.

5.10 Water Resources

5.10.1 Potential Surface Water Impacts

No major water features intersect or traverse the site. The proposed development site is located approximately 145m east of the Mandagery Creek and 270m south of the Leaders Lagoon. The site is within the Lachlan River catchment and no surface water sharing plan covers the site. No surface water extraction is proposed therefore the proposal will not directly impact this resource.

Stormwater runoff at the site will be largely unchanged as a result of the proposed development. Although the water pattern hitting the ground will be altered slightly as each solar panel will divert the water into small channels running in-between each row, the volume of water hitting the existing footprint will remain unchanged.

5.10.2 Potential Groundwater Impacts

The site is located within the area covered by the *Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2020*. Given the largely passive nature of the solar energy system, impacts to groundwater environments in relation to ongoing operations is considered limited. No water is proposed to be extracted from groundwater sources for construction purposes for any project element. Accordingly, construction would not impact groundwater and the WSP is not relevant to the proposed development.

The southernmost section of the subject lot is mapped as 'Groundwater Vulnerable', as shown in Figure 22. However the proposal is not considered to have the potential for any groundwater impacts. The footings will be rammed into the ground to a maximum depth of up to 1m, depending on the conditions. No deeper excavations are required.

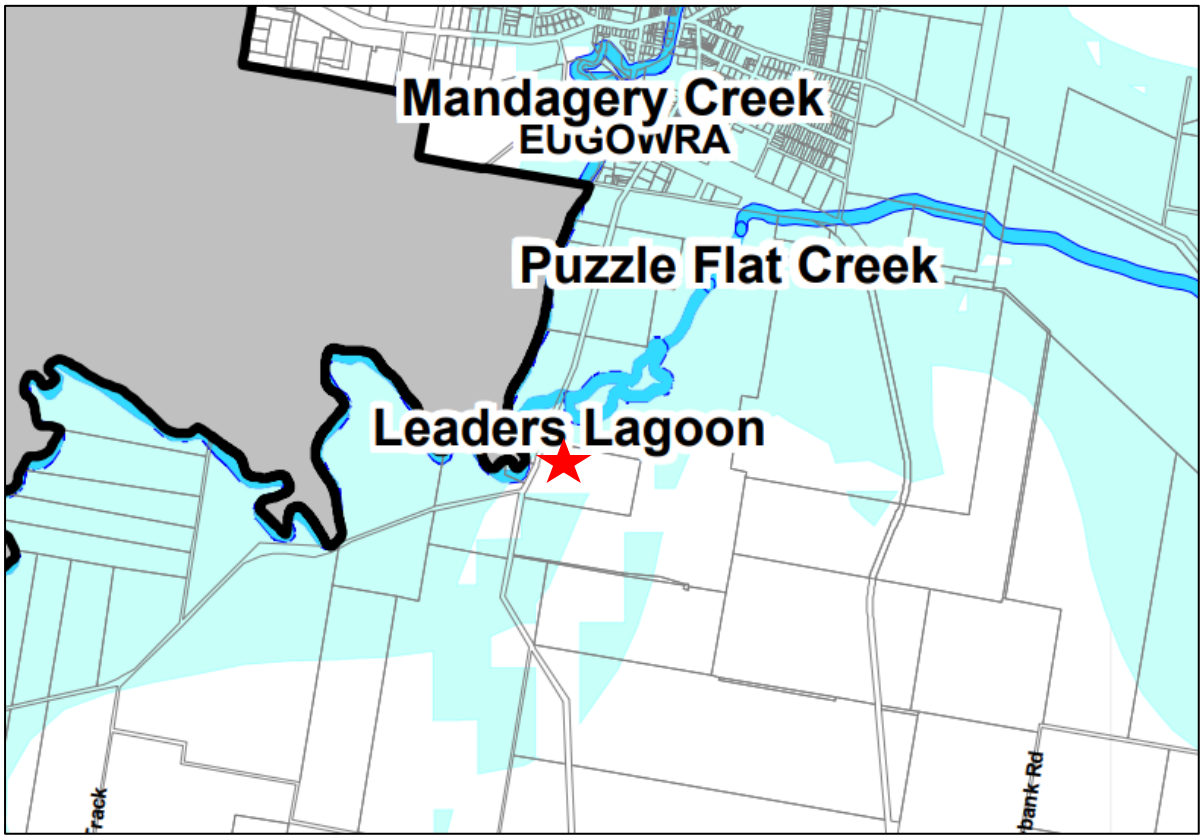


Figure 22: Groundwater vulnerability map of the site and its surrounds (extract from Groundwater Vulnerability Map of Blay LEP)

The subject site is not mapped as supporting a Groundwater Dependent Ecosystem (GDE) however a number of GDEs are mapped as being present in the vicinity of the proposal, namely Riparian Blakely's Red Gum open forest and River Red Gum herbaceous-grassy very tall open forest wetland on the banks of the Mandagery River to the west of the proposal. Additional GDEs are mapped in association with the Leaders Lagoon. Given the implementation of best practice management methods and erosion and sediment control measures as part of the proposal, the construction and operation of the solar farm is considered unlikely to have an adverse impact any GDEs in the locality.

5.10.3 Mitigation Measures

The proposed works should not result in the pollution of land/waters so long as best management practices for erosion and sediment control are undertaken during construction, and appropriate remediation measures are implemented on a progressive basis. Priority will

be given to achieving a high standard of erosion and sediment control and general site housekeeping throughout the construction period.

5.11 Waste Management

A waste management plan for the construction, operation and decommissioning of the proposed solar farm has been prepared and is included in Appendix 7. This includes a desktop assessment of the waste generated during construction and operation of the proposed Eugowra Solar Farm and a determination of the appropriate means of waste disposal and recycling. The 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 and module assembly phase and be classified as general solid waste (non-putrescible). Wastes would predominantly include wooden pallets, cardboard, plastics, green waste and domestic waste. Construction of a solar farm would not generate any putrescible waste products. Overall, waste management will 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 throughout the project lifecycle.

5.12 Flora and Fauna

5.12.1 Desktop Assessment

Initially, examination is required of the various threatened species databases to identify any known locations of threatened species, populations and ecological communities inside, or within close proximity to, the proposed impact area. This desktop assessment included searches of databases and a review of literature relevant to the site and local area, particularly:

- Office of Environment and Heritage (OEH) Atlas of NSW Wildlife database for records of threatened species and endangered ecological communities which have been recorded within a 10-kilometre radius (locality) of the subject site (accessed June 2020);
- Department of the Environment and Energy (DoEE) Protected Matters Search Tool for Matters of National Environmental Significance (MNES) listed under the EPBC Act within a 20 km radius from the site (accessed June 2020); and
- NSW Vegetation Information System (VIS) classification database (OEH, accessed June 2020).
- NSW Sharing and Enabling Environmental Data (SEED) portal (NSW Government, accessed June 2020).

Figure 23 includes the modelled plant community types expected to occur within the area based on desktop information available on the SEED portal for vegetation mapping. The desktop assessment indicated that the majority of the property, including the subject site, is likely to contain vegetation consistent with Plant Community Type (PCT) 0 “Non-native”, with a thin strip of vegetation along the western boundary likely to be consistent with PCT 796 “Derived Grasslands of the NSW South Western Slopes”. The distribution of the PCTs within the lot is shown as aerial imagery in Figure 23.

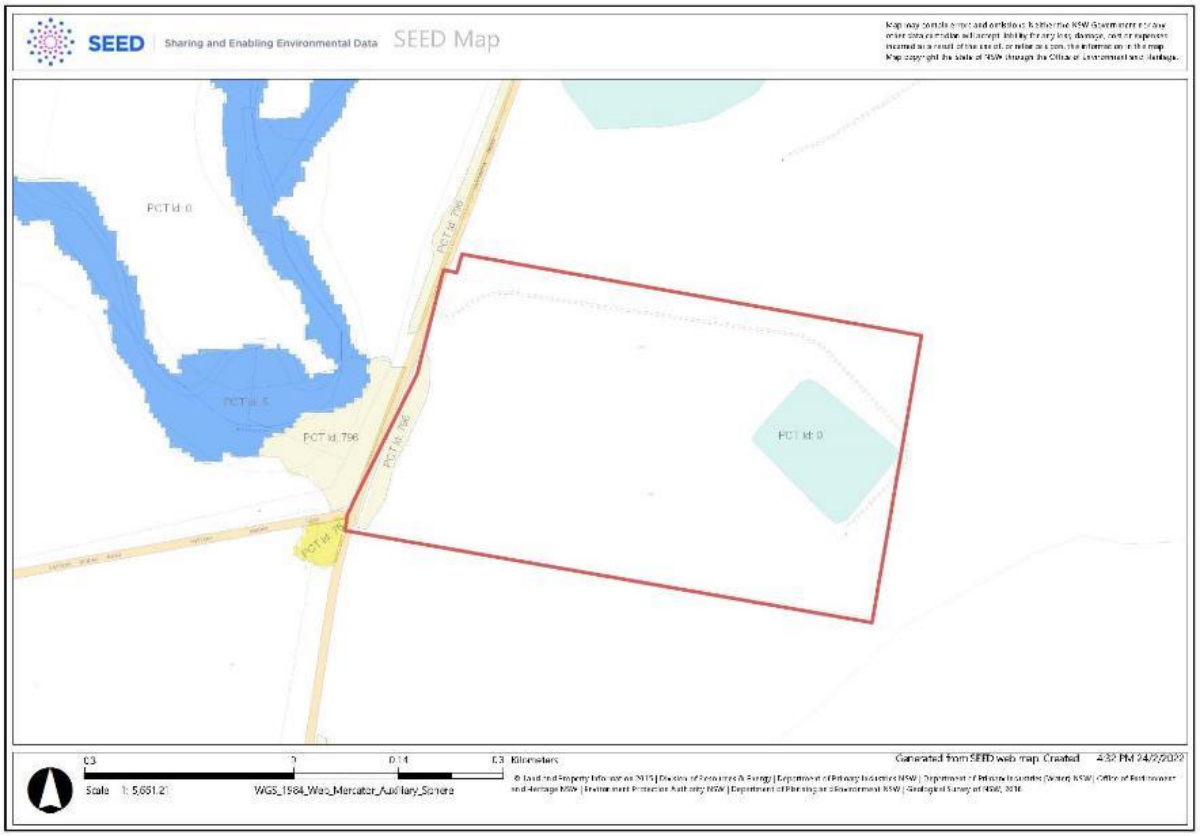


Figure 23: SEED Plant Community Types modelled for the area. (Source: SEED, 2022)

5.12.2 Field Assessment

The site was historically cleared and is currently used as cropland. At the time of the site assessment, the site contained wheat stubble. This is consistent with the mapping which predict ‘PCT 0 – Non-native Vegetation’ within the site. Figure 24 shows the vegetation present within the proposed development site.

Figure 24: Non-native vegetation (wheat stubble) within the subject site

5.12.3 Potential Impacts

A Test of Significance was undertaken to determine the potential impact of the proposal on threatened or endangered species, populations and habitat communities. The assessment is presented in Appendix 5. This assessment concluded that the proposal would be unlikely to have a significant impact on any threatened or endangered species and communities given the preferred siting of the development within a previously cleared and disturbed site.

An Assessment of Significance on the Matters of National Environmental Significance has also been included as Appendix 6. The conclusion of the assessment is that the proposal will have no significant impact on any listed Matters of National Environmental Significance.

5.13 Weed Management

Weeds will be therefore controlled in accordance with the following principles:

- Prior to construction, the site will be prepared with an application of a knockdown herbicide with residual action to prevent the growth of any seeds that may germinate under the array. This application of a residual chemical is expected to inhibit growth over several seasons in the early life of the solar farm.
- All machinery, equipment and vehicles brought onto a property must be free of soil, seed or plant material. All soil and organic matter should be removed, including under the vehicle and in the cabin or trays.
- In areas outside of the immediate solar array footprint, stabilisation measures must be planned to optimise establishment of a healthy groundcover devoid of weeds.
- Spot spraying will also be used to control any weed species that emerge in the access lanes between the banks of panels.

During the operational phase, the area under the solar panels will be permanently shaded. The reduced daytime temperatures and limited available sunlight will impede plant growth under the array. Reduced insolation and the wind protection offered by the solar panels is likely to result in retained soil moisture. The environment created underneath the solar panels would therefore not favour vegetation growth once the solar farm is operational.

5.14 Natural Hazards

The land is not subject to geological hazard such as volcanism, earthquake, or soil instability such as subsidence slip or mass movement.

5.14.1 Bushfire

Bushfire Prone Land is land that has been identified by local council as capable of supporting a bushfire or being subject to bush fire attack. The NSW Planning Portal was accessed in February 2022 to assess whether the proposal is located in Bushfire Prone Land. Results of bush fire mapping indicates that the subject property, including the proposed development footprint, is not classified as 'Bushfire Prone Land'. The land surrounding the property has been subject to extensive clearing and is used for grazing and cropping, with the main associated risk of fire being a grass or stubble fire that could extend into the subject property.

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*.

Fire protection objectives considered with regards to the development site are outlined in the Rural Fire Service (RFS) guideline "Planning for Bush Fire Protection" (PBP) (RFS 2019). While no site-specific bushfire measures are required and the PBP is not applicable to the proposal in the absence of bushfire prone land within the subject site, the proposal is nevertheless assessed in accordance with the PBP in order to provide a thorough assessment.

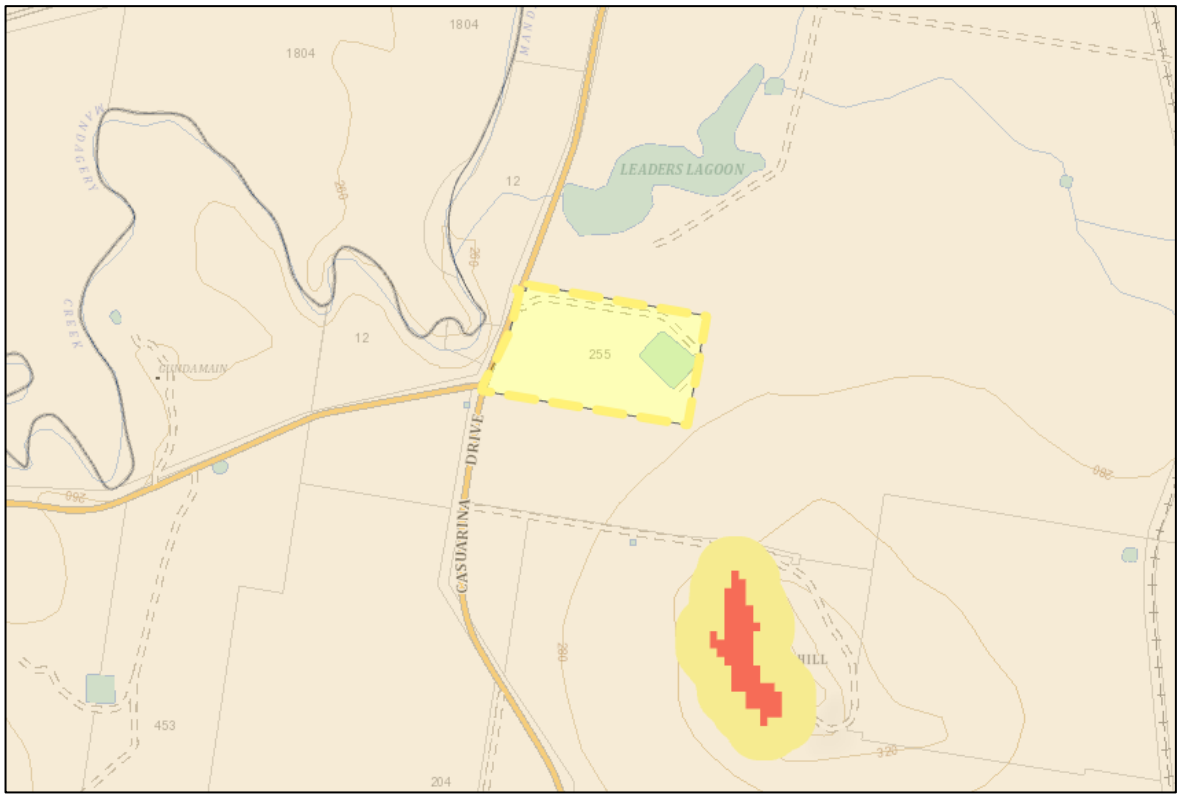


Figure 25: Bushfire Prone Land within and around Lot 2 DP773266 (Category 1 land is mapped in red)

5.14.1.1 RFS Bushfire Planning Objectives

The proposed solar farm is considered as "Other Development – Solar Farms" per the PBP.

In order to comply with the PBP, the following conditions must be met:

- Satisfy the aims and objectives outlined in Chapter 1 of the PBP;
- Consider any issues listed for the specific purpose;
- Propose an appropriate combination of Bushfire Protection Measures (BPM).

Aims and Objectives of the PBP

The aims and objectives of PBP, as outlined in Chapter 1, are as listed and addressed below.

- **Afford occupants of any building adequate protection from exposure to a bushfire;**

A buffer of 10m will be maintained between any structures present or erected onsite and the security fence around the perimeter of the proposal. Workers and employees are not expected to defend the facility from fire and would be evacuated should a bushfire threaten the site. Given the extensively cleared nature of the landscape around the proposal and the open structure of vegetation present in the surrounds, the development is not considered to be at risk from bushfires.

This objective is satisfied.

- **Provide for a defendable space to be located around buildings;**

The proposal does not involve the construction of any buildings, however an Asset Protection Zone (APZ) of 10m will be established and maintained around the solar farm which will act as defendable space for the development. Access to the development is by an existing wide access route suitable for heavy vehicles. This road can be used by fire services to attend to fire at the facility.

This objective is satisfied.

- **Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;**

A minimum APZ of 10m will be maintained between all potential fire hazards and the proposed development. It is noted that the solar farm will be kept clear of vegetative growth and therefore the majority of the subject site will not support flammable materials.

This objective is satisfied.

- **Ensure that safe operational access and egress for emergency service personnel and residents is available;**

There will be adequate access to the proposed solar farm for firefighting operations. There will be no residents within the solar farm site.

The solar farm will have a security perimeter fence. In emergency conditions, all emergency services will carry bolt-cutters to enter the site. This would only occur in an emergency. As the property is a solar farm and would continue to generate electricity, access by emergency services would be subject to special training and an ability to control the emergency without risk of electrocution. This is a common issue as Australia builds more solar energy facilities.
This objective is satisfied.

- **Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the Asset Protection Zone (APZ); and**

A minimum APZ of 10m will be observed between fire supporting vegetation adjacent to the proposed development and flammable materials associated with the solar farm. The majority of the site will remain free of vegetation.

This objective is satisfied.

- **Ensure that utility services are adequate to meet the needs of fire fighters (and others assisting is bushfire fighting).**

All-weather access roads will provide suitable access for fire-fighting vehicles. Given the low risk of bushfire at the proposed development location, this is considered sufficient.

This objective is satisfied.

5.14.1.2 Solar Farms

Wind and solar farms require special consideration and should be provided with adequate clearances to combustible vegetation as well as firefighting access and water.

The PBP states that:

"the following should be provided for solar farms:

- *a minimum 10m APZ for the for the structures and associated buildings/infrastructure; and*
- *the APZ must be maintained to the standard of an IPA for the life of the development.*

Infrastructure for the purposes of requiring APZ excludes:

- *road access to the site; and*
- *power or other services to the site and associated fencing."*

The PBP also states that a Bush Fire Emergency Management and Operations Plan should identify all relevant risks and mitigation measures associated with the construction and operation of the wind or solar farm.

Comment

The proposed development will incorporate the establishment and maintenance of a minimum 10m APZ around the perimeter of the solar farm; this will be maintained between the solar farm infrastructure (PEG infrastructure, inverters) and the perimeter fence. This will be maintained to the standard of an Inner Protection Area (IPA) for the lifetime of the proposal. It is also noted that an additional 27m of cleared land is available between the perimeter fence and the closest vegetation (trees). The requirements for the establishment and maintained of an IPA, in accordance with the PBP 2019, are set out below:

Trees:

- tree canopy cover should be less than 15% at maturity;
- trees at maturity should not touch or overhang the building;
- lower limbs should be removed up to a height of 2m above the ground;
- tree canopies should be separated by 2 to 5m;
- and preference should be given to smooth barked and evergreen trees.

Shrubs:

- create large discontinuities or gaps in the vegetation to slow down or break the progress of fire towards buildings should be provided;
- shrubs should not be located under trees;
- shrubs should not form more than 10% ground cover; and
- clumps of shrubs should be separated from exposed windows and doors by a distance of at least twice the height of the vegetation.

Grass:

- grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and
- leaves and vegetation debris should be removed.

5.14.1.3 Proposed Bushfire Protection Measures

The Applicant has prepared a Draft Bushfire Management Plan for the proposal; this is included as Appendix 2. The Draft Plan includes an assessment of the potential risks in relation to bushfire at the site, and the proposed bushfire mitigation measures which would be implemented as part of the construction and operation of the solar farm. If development consent is issued for the solar farm, the Plan would be finalised and implemented as part of the proposed development.

5.14.2 Flooding

No flood mapping is available for the subject site. A levee has been built on the Puzzleflat Creek south of the township of Eugowra and this has the potential to increase the likelihood of flooding in the area south of Eugowra where the solar farm is proposed. Leaders Lagoon, a natural drainage channel, is also located approximately 180m north of the proposed solar farm.

Based on anecdotal evidence provided by Council, historical floods have reached as far as the fenceline on the northern boundary of the property but have never entered the property itself. Given the lack of flood mapping for the area, it is considered acceptable to rely on local, historical knowledge.

The natural surface level of the proposed development site is 1m – 1.5m higher than the highest known flood level, and it is noted that the solar panels will be a further 800mm-900mm above ground level. The inverters will be built on mounds to ensure that they are not affected by flooding or surface runoff and remain stable.

No flood mitigation measures are therefore considered necessary, and the proposal will not have any impact on the movement of floodwaters or on floodplain connectivity in the locality.

5.15 European Heritage

No heritage sites are present within the boundaries of the development.

5.16 Indigenous Heritage

The proposed development and subject site were assessed in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010). In order to follow the guidelines, a due diligence assessment process was undertaken. This process involved the following steps:

- AHIMS Register Search – a search of the AHIMS to ascertain if there are any known sites within or adjacent to the subject area;
- Assessment of Landscape – assess the study area for the presence, nature and level of disturbance of landscape features that may contain heritage sites;
- Desktop Assessment and Visual Inspection – Physically inspect the proposed development site for artefacts or signs of aboriginal presence;
- If any aboriginal objects are located, further assessment required in conjunction with an archaeologist and the Local Aboriginal community representatives; and
- If disturbance to the area is considerable and no presence of aboriginal artefacts or other signs, a standard summary of the work is to be prepared and the development can proceed subject to approvals.

A search of the AHIMS was conducted to identify registered (known) Aboriginal sites or declared Aboriginal places within the subject lot with a buffer of 200 metres around the lot. The search revealed zero (0) recorded Aboriginal sites, objects or places to have been recorded for the site. A copy of the search results has been included in Appendix 4.

The proposed development site does not contain landscape features such as caves, rock shelters and/or rock overhangs, waterholes and/or wetlands that are considered likely to contain Aboriginal objects. The site has been highly disturbed by native vegetation clearance and the cultivation of crops. Remnant woodland and riparian zones in the locality may contain some artefacts, however these areas will not be disturbed by the proposed development.

During the site inspection, traverses carried out on foot across the area to be disturbed by earthworks for the proposal did not identify any objects of aboriginal origin such as artefacts. Give the site's history of disturbance, the proposal is unlikely to disturb any items of heritage significance.

The following presents a summary of the site investigation:

- An AHIMS search did not identify any objects or places of Aboriginal heritage significance within or adjacent to the site;

- Previous agricultural development activities (i.e. tilling) would have affected the integrity of any deposit based archaeological sites within the proposed development site, if they had been present;
- No cultural features or artefacts were noted within the development site;
- There are no landscape features which are likely to indicate the presence of Aboriginal objects (i.e. waterways or caves); and
- The potential for this site to contain sites of significance involves random scatters of artefacts that may have been dropped or discarded during hunting expeditions or whilst travelling and remains around the base of older trees. No such artefacts were identified, and no mature trees will be disturbed by the proposal.

The conclusion of this investigation is therefore that the likelihood of disturbing sites or objects of aboriginal cultural significance is relatively low on the area identified for the proposed development. It is recommended that the project proceed on the basis that if items or sites of cultural heritage are identified during the work to be undertaken, this work should cease until further investigation is undertaken in accordance with the recommendations of traditional owners. However, appropriate protocols should be adopted on the site. NSW OEH recommend that the following procedure is adopted:

> *If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking the proposed development activities, the proponent must:*
>
> - *Not further harm the object*
> - *Immediately cease all work at the particular location*
> - *Secure the area so as to avoid further harm to the Aboriginal object*
> - *Notify OEH as soon as possible on 131555, providing any detailed of the Aboriginal object and its location*
> - *Not recommence any work at the particular location unless authorised in writing by OEH.*

5.17 Traffic

All project related traffic will utilise the Casuarina Drive to access the site. Traffic will include light vehicles carrying workers who will be accommodated in Eugowra, B-double or semi-trailers carrying shipping containers which will be trucked from either Sydney, Melbourne or Brisbane. Locally sourced construction equipment and materials will come from the surrounding region. This would include fencing materials and some gravel materials.

The intended site construction hours are between 7:00 am to 6:00 pm Monday to Friday and 8:00 am to 1:00 pm Saturday: with no works on Sundays or Public Holidays. The peak hourly traffic volumes are expected in the hour before and after the intended construction hours.

Due to the relatively small scale of the development, traffic expected to be generated by the proposal is minor.

There will be a team of two or four people initially onsite to install the rod foundations. Once this progresses, the second team of two to four people will be onsite for a period of up to ten (10) weeks to install the framework, panels and wiring. Once this is completed, the final connection of the solar farm can be undertaken by either Essential Energy or private electrical tradespeople.

Accommodation will be sourced in Eugowra and there will be some carpooling when personnel travel to site. Amenities will be available on site and workers will not need to leave during the day. The workforce will generate a maximum of six (6) light-vehicle movements per day.

Over the construction period, the development will require around 20 heavy vehicles delivering shipping containers with the equipment. This will generate approximately 2-trucks per week for delivery of materials.

No over-mass or over-dimensional vehicle delivery will be required.

Once operational, traffic would be limited to service personnel attending the site, with an average traffic volume of less than 1 light utility vehicle per day.

The entrance to the property currently consists of a single gate on the boundary fence. No set-back is present. This is a simple rural entry as per the following image.

Figure 26: Entry point to Sewage Farm

The left turn into the site from Eugowra has a widened shoulder area to allow larger vehicles to turn into the site. This widened shoulder it present in the following image.

Figure 27: Widened shoulder for left turn into the site

The right turn into the site has no BAR or other form of road widening. Based on tyre marking, trucks can enter the site without issue in relation to turning angles. However, an issue will arise if a truck is entering the site when the gate is closed. For a right turning truck to enter the site with the gate closed, it would need to stop on the road, open the gate and then enter the site. This would be a similar issue for trucks turning left into the site and trucks exiting the site if the gate remains in place.

On this basis, it would be preferable to set the gate back from the road by a distance of 26m to allow a B-double to turn into the site and stop to open the gate without any part of the truck on Casuarina Road. The following provides a typical layout recommended by Austroads – Guide to Road Design Part 4 – Intersections and Crossings: General (Austroads 2021) (page 41)

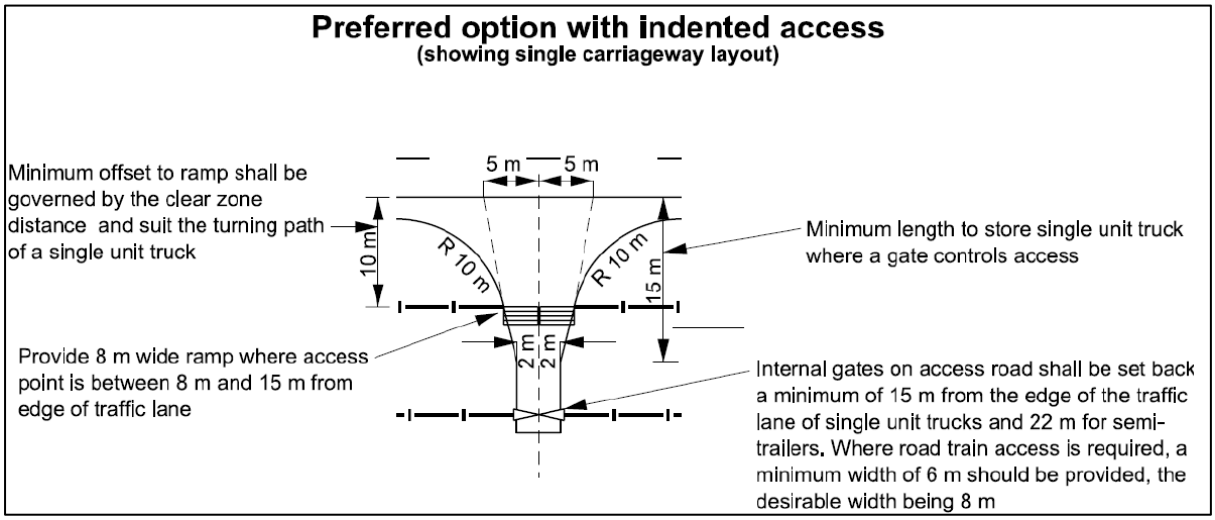


Figure 28: Typical Rural Intersection to allow trucks to exit or enter the site with the gate closed.

Construction of this type of intersection for the solar farm development would be considered as a minimum treatment to enable safe entry and exit from the site. This is suggested on the basis that the gate will need to remain locked as this is a secure site due to the presence of the sewage farm. The above proposal does not include culverts or a causeway crossing of the table drain. This would be optional as the use of this intersection under normal operating conditions may involve one or two light vehicles per day for Council vehicles.

Sight distance available to the south is in excess of 280m. Sight distance to the north toward Eugowra is in excess of 500m. No sight distance issues are present once a vehicle approaches the edge of the pavement.

This volume of traffic is not expected to put any adverse stress on any local road network or traffic flows. Furthermore, Council (the proponent) will limit the timing of transport deliveries to the site to the hours between 9:30 AM and 3:00PM to avoid conflict with school buses and other school-related traffic utilising the delivery route and to further minimise the impact of the proposal on local traffic. As such, a Traffic Impact Assessment is not considered to be required.

5.18 Social and Economic Impacts

5.18.1 Social Impact

The proposal will not have any adverse social impact on Cabonne Shire. Overall, positive social benefits will result through the developments' innovation advantages and the long-term adoption of clean-energy policy by Council.

5.18.2 Economic Impact

Positive economic benefits for the community will result from employment opportunities generated during the construction and operational phase. During the initial planning phase Cabonne Shire commissioned local and regional professionals to carry out the land survey and environmental reports. This initial expenditure generates flow on effects through the local economy through income and employment.

It is anticipated that there will be 18 personnel directly involved in construction on site which is expected to take up to 10 weeks. Varying levels of expertise will be required ranging from labourers to qualified electricians and project managers. In addition, personnel will be involved in transport and delivery of materials to the site. Some of this employment is to be sourced locally. This 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.

Once operational the site will be unmanned, however, one to two personnel will be necessary to carry out maintenance every quarter or as required.

5.18.3 Summary and Positive Impacts

- Once connected to the grid, the proposed 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;
- The solar farm will assist Commonwealth and NSW Governments to achieve targets and objectives relating to emissions and addressing climate change;
- 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; and
- The land surrounding panel arrays can continue to be utilised for cropping during the operation of the solar farm.

5.19 Decommissioning

The solar farm is intended to operate for up to 30 years. A Decommissioning Environmental Management Plan (DEMP) would be prepared by Council two (2) years before decommissioning (if that is to occur). In broad principle, if decommissioning rather than upgrading is to occur in the future, the intention would be to remove all solar-farm infrastructure and return the land to agricultural production.

5.20 Cumulative Impacts

The potential environmental impacts from the establishment and operation of the proposed solar farm have been detailed in their relevant sections throughout this report.

Potential cumulative impacts are those which are generated by the combined impacts on the local environment as a consequence of the project, together with other developments of a similar nature (both existing and proposed). For the purposes of this SoEE, the assessment of cumulative impacts considers the impacts of existing and proposed solar farm developments in the local area. There are no known existing or proposed solar farms in the immediate locality of the proposal, therefore no cumulative impacts are predicted for the local area.
The region supports several larger solar farms. Several new farms are subject to investigation and development within 300km or more of this site. The development of solar farms in addition to wind farms as a green energy source is an industry supported and encouraged by Government policy.

The potential noise impacts associated with the construction of the proposed solar farm are considered similar to existing noise levels in the locality which would be produced by the operation of a nearby feedlot, the road corridor and other farming activities such as cropping. Activities associated with the solar farm operation would be limited to light vehicle movements and equipment maintenance. Potential noise levels produced by these activities are considered insignificant.

The development will change the landscape. The site to be occupied by the solar farm has been utilised for hay production and grazing. The solar farm will change this to be landscape with a dark blanket type coverage across the site. As no other solar farms are identified in the local area of this scale, the cumulative impact of 2.4 Ha of solar farm is considered minor.

The development will provide beneficial impacts to the environment by providing renewable energy as an alternative to energy sources reliant upon fossil fuels. The development is part of the Councils strategy to reduce their annual energy consumption cost and carbon footprint, which will benefit all residents within the Shire.

6 Suitability of Site for Development and Report Summary

- The proposed development involves the construction of a solar farm on Lot 85 DP 870963.
- The site is zoned SP2 Infrastructure under the provisions of *Cabonne Local Environmental Plan 2012* (CLEP 2012).
- The proposed solar farm has been preferentially sited on a previously cleared and heavily disturbed site that is considered suitable for the redevelopment to a renewable energy precinct.
- The site is rectangular in shape and maintains a total site area of approximately 18 hectares.
- No native vegetation removal is required to accommodate the proposal.
- As-required vehicle access and parking to the site will be adequate throughout the construction phase and during operation.
- A preliminary contamination assessment concluded the risk of site contamination is assessed to be low and the site is suitable for the proposed development.
- A Traffic Impact Assessment is not required due to the brief and modest expected vehicle requirements.
- The development as proposed is considered to address the requirements of Sustainable Development being a key consideration under the provisions of the *Environmental Planning & Assessment Act 1979*.

6.1 Any submissions made in accordance with this Act or the Regulations

Public participation is addressed under Section 79A of the Environmental Planning and Assessment Act, 1979 for advertised development and other notifiable development. The consent authority must ensure a development application is advertised/notified in accordance with this clause and any relevant environmental planning instrument and/or development control plan.

6.2 Public and Public Authority Submissions

Where necessary for Integrated Development, Council must notify the appropriate authorities of the proposal, under the EP&A Act 1979. General Terms of Approval from notified government authorities should be included in the conditions of consent issued by the Council.

The proposed development is not identified as Integrated Development.

The public's interest will not be compromised by the proposed development, and it is understood the application will be appropriately notified in accordance with Clause 4.13 of the *Environmental Planning and Assessment Act 1979*, any relevant environmental planning instrument and development control plan to ensure the public are notified accordingly and given their right to be heard.

6.3 Justification for Approving the Proposal

The Commonwealth Government has recognised that Australia's reliance on carbon-based fuels is not a viable means of securing energy production into the future and that renewable energy alternatives can play a significant role. These renewable energy alternatives may include solar PV, solar concentrated thermal, geo-thermal and wind.

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. 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.

Renewable electricity generation options including solar PV are already influencing the electricity market. The emergence of battery storage options will become more prevalent in the next decade as technology development improves, opening up the possibility to transition from reliance on centralised electricity generation to distributed energy generation and storage. Private infrastructure projects such as the proposed solar farm are required to provide reliable energy to Australian consumers, while at the same time helping to meet Australia's emission reduction targets.

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 100MW. The proposed Eugowra Solar Farm aims to fill the gap in the mid-sized plants. It will generate 4MW of AC power and contribute to renewable energy supply to supplement electricity generation from coal, oil and gas and assist to reduce reliance on these unsustainable means of supply.

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 Eugowra Solar Farm will further the goals of sustainability, and the orderly and economic use of land. In conclusion, the proposed development will result in minimal environmental or amenity impacts and accordingly justifies a favourable determination by the consent authority.

Appendix 1 – Site Plans

SMK CONSULTANTS
surveying - irrigation - environmental

Disclaimer:
The information in this map has been provided in good faith. While all effort has been made to ensure the accuracy and completeness of the information the data providers take no responsibility for any errors or omissions that may occur or losses or damage that may result from the use of this information.

Surveyed By: -
Prepared By: Tarrant Moss
Date: 24-12-2021

Cabonne Shire Council
Solar Farm

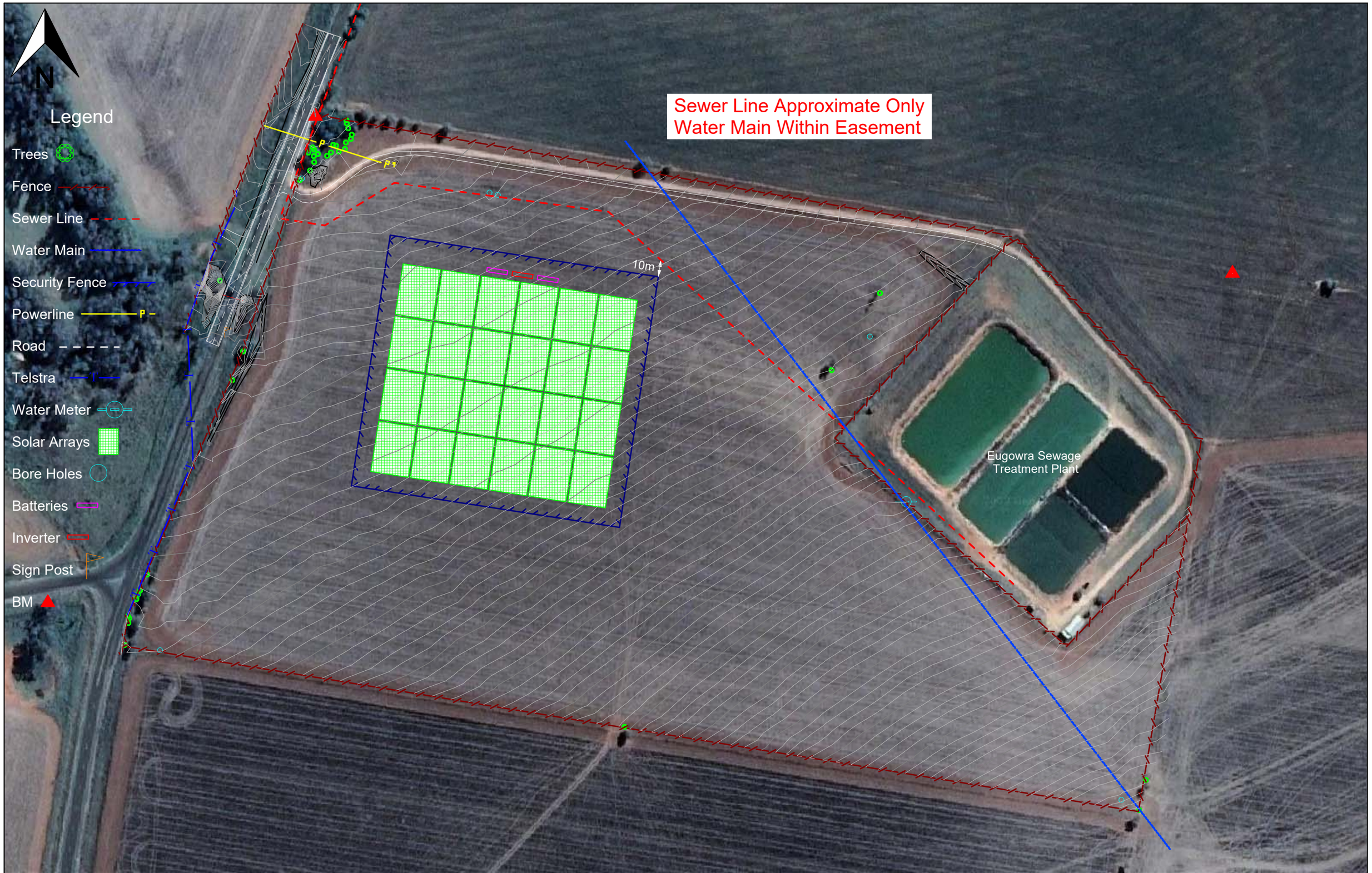
Legend

- Solar Farm Location
- Lot 85 DP 870963
- Google Satellite

N

0 250 500 750 1,000 1,250 m

Scale: 1:20,000 (A4)



SCALES: HORIZ 1:2000 VERT 1:50 DATUM: LOCAL AHD MGA ZONE 55	A3	SMK CONSULTANTS surveying - irrigation - environmental PO BOX 774 MOREE 2400 PHONE (02) 67 521021	CLIENT: Cabonne Shire Council PROJECT: Eugowra Solar Farm	DESCRIPTION: Eugowra Solar Farm Site Plan	PLAN REVISION:	DATE	21-490 SHEET No. Site Plan JOB No. 21-490
SURVEYED Sam Byrnes DESIGNED Zach Muggleton CHECKED PAUL COVELL	Contours Design Existing Major: 1.0 m Minor: 0.2 m				A FIRST ISSUE B REVISED LAYOUT C	20/05/22 25/05/22	COMPUTER FILE (MJO): Eugowra Survey 18.05.22 - Eugow

Appendix 2 – Draft Bushfire Management Plan

Eugowra Solar Farm

255 Casuarina Drive, Eugowra NSW 2806

Draft Fire Risk Management Plan

REV A 2022

1. Existing Site Conditions

1.1. Location

The proposed development site is 255 Casuarina Drive in Eugowra. The site is located approximately 2-kilometres south of Eugowra in north-west New South Wales. A locality plan showing the site relative to the township of Eugowra has been included as Figure 1.

Figure 1: Solar Farm Site Location

1.2. Adjoining Land Use

The subject site is zoned SP2 - Infrastructure and is surrounded by RU1 – Primary production zoned land in all directions. There will be a little concern regarding these adjoining properties with respect to land use.

1.3. Topography

There are very minor variations in elevation across the site. The site can be described as gently sloping towards the west. In the context of a bushfire risk, it is gently sloping.

1.1. Fire Suppression Assets

CO2 and ABE fire extinguishers are to be located at the inverter. The fire extinguishers will be inspected and serviced at regular intervals.

2. Fire Risk Management

The Rural Fire Service of NSW publication "Planning for Bushfire Protection" (2019) provides specific guidelines for solar farms which are addressed in the following sections.

2.1. Asset Protection Zone

The proposal does not involve the construction of any buildings, however an Asset Protection Zone (APZ) of 10m will be established and maintained around the solar farm which will act as defendable space for the development. Further, the majority of the site will remain free of vegetation, effectively extending the APZ.

2.2. Design

Critical equipment is designed and housed in such a way as to minimise the ingress or egress of fire during an emergency. Key design features are:

- Maintenance of a short grass in the surrounding APZ;
- Mowing of vegetation beneath solar array to minimise the fuel load;
- The housing for major electrical equipment is non-combustible;
- The steel structure supporting the PV array is non-combustible.

2.3. Fire Risk Management - Construction

Key strategies to mitigate fire risk during construction are:

- Adhere to restrictions on Total Fire Ban or days of high fire danger;
- Ensure that appropriate permits have been issued for work during the Fire Danger Period, and that any conditions on permits are adhered to;
- Carry fire extinguishers on pegging trailers and at the storage container;
- Keep to a minimum the storage of fuel or other flammable material. Only quantities that are required for a day (less than 10L of petrol and 20L of diesel) are stored on site. Fuel is kept in

jerry cans in a 40 ft service container which only stores tools and other non-flammable materials. When on site, fuels and oils are only used in a well ventilated area outdoors.
- Carry telephones for emergency communications;
- Ensure vehicles keep to tracks whenever possible; and
- Restrict smoking to prescribed areas and provide suitable ash and butt disposal facilities.

2.4. Fire Risk Management - Operations Phase

Fire risk management is addressed during the operations phase in accordance with Table 1:

Table 1 - Fire Risk Management Strategies

Clearances	Wherever possible, HV cabling is underground. Where there are overhead electrical lines, vegetation is managed in accordance with the ISSC3 Guideline for Managing Vegetation Near Power Lines.
Asset Protection Zones	The Asset Protection Zones around the solar farm are maintained with short vegetation.
Lightweight construction materials	The construction materials used at the site are lightweight materials with low combustion potential, such as metal and glass.
Access	There is sufficient available area/width around the solar farm to allow firefighting appliances and two-wheel drive vehicles to travel in the event of a fire.
Fire extinguishers	CO_2 and ABE fire extinguishers are installed and serviced by an appropriately qualified vendor. Fire extinguishers are located at the inverter. Fire extinguishers are inspected and serviced at regular intervals.
Warning signs	Warning and operational signs located around the facility are checked periodically for signs of deterioration or damage.
Waste Disposal	Waste is disposed of correctly to ensure that no combustible materials are left on site.
Fuel management	Routine and remedial inspection and treatment tasks is employed to manage the growth of vegetation beneath the solar array.
High Risk Activities	Total fire bans will be observed when scheduling any high-risk work. Vehicles are not to be driven through any grassland outside the site.

2.5. Fire Prevention

Prevention measures reduce the potential for fires to ignite on the site and to also reduce the impact of a fire impacting on the site from elsewhere. Good housekeeping is required in all work areas to prevent fires occurring (i.e. removing rubbish, removing oils and greases from surfaces, using and storing welding and cutting equipment and flammable liquids properly). All visitors to site must

understand the location and use of all firefighting equipment and must know fire assembly points and evacuation procedures.

2.6. Firefighting and Fire Suppression Equipment

Fire-fighting equipment will be available at the site and will be regularly serviced. The use of fire extinguishers for any other purpose than to fight a fire is strictly prohibited. The use of fire-fighting equipment must be reported to the supervisor immediately. Used extinguishers must be returned for filling and servicing immediately, regardless of whether the extinguisher is empty.

2.7. Access

Access to the site is available from the Casuarina Drive through the existing entrance. The access shall be upgraded to the Austroads standards for a rural intersection and will be all-weather and capable of accommodating firefighting trucks of 30-tonne or more.

2.8. Firefighting and Bushfire Response Procedures

There are two choices in response to the impending threat of fire, and they are to stay and defend or evacuate. Under worst cases scenarios, the most severe fire is envisaged to be a fire in the adjoining cropland areas. The solar farm would be exposed to embers. This is not considered to create a risk of the solar panels catching on fire. Under such circumstances, it would be preferable to leave the site to ensure that if someone or a fire unit, was not trapped within the security fence perimeter and potentially cut-off from exiting the security gates.

2.8.1. Evacuation

Protection of human life is the most important consideration in the event of a fire emergency. For this reason, evacuation is always the preferred response where there is time to do so and the route is clear.

Evacuation always starts with gathering at the designated emergency assembly area. The supervisor will provide further evacuation instructions. Evacuation routes are via the main entrance and then travelling north to Eugowra along Casuarina Drive.

2.8.2. Shelter in place and protect the facility

Given the characteristics of the surrounding land, the most likely fire threat is a fast-moving grass or stubble fire approaching from the south, north and east. In this situation, the security gates are located on the western side of the site and therefore an exit will remain available.

The following procedures are to be followed during any firefighting activities:

- Only attempt to extinguish a fire if it is safe to do so.
- If there is a chance of chemicals or explosives being involved in the fire, evacuate the area.
- Do not aim the extinguisher or hose output nozzle at the centre of the fire as it may only serve to spread it. Work from the near edge and, with a sweeping motion, drive the fire to the far edge.

- Do not stand downwind of a fire - the smoke and flames can be dangerous. Machinery fires burn with great intensity. The air downwind may be superheated and could cause damage to lung tissue.

2.9. Training

During construction, the following toolbox talks and training should be undertaken on a regular basis or as required:

- Induction programs should address firefighting and bushfire response procedures and the location and use of firefighting equipment; and
- Fostering of basic bushfire awareness, particularly calling attention to the manner in which fire behaviour is affected by weather conditions.

2.10. Bushfire Danger Periods

During a bush fire danger period, the Solar Farm will notify the local NSW RFS Fire Control Centre in Eugowra about any works that have the potential to ignite surrounding vegetation, and to confirm that weather conditions are appropriate.

The potential for such works is considered minimal.

No stored materials of any kind should obstruct the fire break areas.

2.11. Total Fire Bans

The Total Fire Ban Rules issued by the NSW Rural Fire Service will be adhered to. These are published at www.rfs.nsw.gov.au.

2.12. Bushfire Mitigation – Site Features

Table 2 - Fire Risk Management Strategies

	North	East	South	West
Vegetation structure	Cropland	Cropland	Cropland	Grassland/Trees
Hazard slope	< 5 degrees	< 5 degrees	< 5 degrees	< 5 degrees
Asset protection zone	>10m	>10m	10m	>10m
Significant environmental features	Cropland Access Road	Cropland Sewage Plant	Cropland	Road Grassland/Trees
Bushfire attack level	Low	Low	Low	Low

2.13. Hazards specific to electricity-related fire

When considering fire risk, the key components of the site are:

- PV arrays
- The inverter station (with a transformer delivering energy at 11,000 V AC)
- Underground electrical connection to existing 11kV line along Casuarina Drive.

2.13.1. PV Arrays

The predominant risk with the low-voltage component of the site is electrical arcing resulting from the misdirected flow of DC current which may cause a localised power discharge. Any potential fire risk because of DC arcing will as such be located directly around the PV array infrastructure. A wide exclusion zone exists around the PV array with no vegetation growth and vegetation is eliminated under the PV arrays through moving and occasional herbicide application.

2.13.2. Inverters

The inverter stations could potentially lead to a fire hazard in the event of a short-circuit that ignites flammable oil inside the transformer. There is a vegetation exclusion zone in all directions around the inverter stations for at least 10m, covered in crushed rock and gravel. The vegetation exclusion zones prevent a fire from reaching any flammable material.

2.14. Bushfire Risk Management and the Private HV Network

According to the New South Wales Rural Fire Service, the land on which the solar farm is located is not classified as bushfire prone. During the operations phase, the Eugowra Solar Farm will undertake an annual risk assessment in relation to bushfire. Any defects found upon inspection must be rectified at the earliest opportunity.

The electrical assets pose a low potential bushfire ignition risk, based on the following key factors:

- Combustible materials on site are extremely limited. The ground surface of the asset protection zone is mown grass.
- The array framing is made of steel and other components are fire resistant.
- Eugowra Solar Farm will have a Vegetation Management Plan involving routine and remedial inspection and treatment tasks.
- Eugowra Solar Farm will have an Operations and Maintenance Program which involves routine and remedial inspection and maintenance tasks, including the fire extinguishers.

3. Bushfire risk assessment and management

An assessment of the potential risks in relation to bushfire at the site is set out below:

Table 3 - Bushfire Risk Assessment and Management

Risk	Impact	Initial risk rating	Risk management strategies	Residual risk
Power infrastructure collapses due to natural events	Private electrical infrastructure connected to Essential Energy assets fall or collapse. - Could occur during a storm or other extreme weather event - Contact of live electrical assets with vegetation may cause fire - Considering the relevant infrastructure is designed as per Australian and Essential Energy standards to last decades, this would only occur in exceptional circumstances	Consequence: **Severe** Likelihood: **Rare** Risk rating: **Medium**	Vegetation growth will be restricted under the arrays and around the solar farm: - Monitor Vegetation growth as part of the Operations and Maintenance Plan and Vegetation Management Plan. - Mitigate vegetation growth as necessary to comply with the ISSC3, including through mowing, tree removal and herbicide use	Consequence: **Moderate** Likelihood: **Rare** Risk rating: **Low**
Power infrastructure collapses due to collision (especially with a vehicle)	Private electrical infrastructure connected to Essential Energy assets fall or collapse due to collision with an external object - Contact of live electrical assets with vegetation may potentially cause fire	Consequence: **Severe** Likelihood: **Rare** Risk rating: **Medium**	Vegetation growth will be restricted under the arrays and around the solar farm in accordance with the ISSC3 The steel fence around the site reduces the likelihood of vehicle collisions All operations on the site involving earth moving equipment, vehicles, slashers, and hot works are to be in accordance with RFS directives.	Consequence: **Minor** Likelihood: **Rare** Risk rating: **Low**

Risk	Impact	Initial risk rating	Risk management strategies	Residual risk
Catastrophic failure of electrical equipment – general, including pole / wire failure due to ineffective maintenance program	High voltage equipment fails, in the worst case resulting in explosion or fire	Consequence: **Severe** Likelihood: **Rare** Risk rating: **Medium**	A wide (>10m) vegetation management and exclusion zone is applied around the inverter stations, reducing the likelihood any fire within the site will come into contact with flammable material. Operations and Maintenance Plan is to be followed to ensure the integrity and safe operation of all electrical equipment through regular inspection and maintenance. Firefighting equipment is placed around the site in relevant locations. Protection systems are in place to avoid faults, including Connection Point Circuit Breakers, Generator Circuit Breakers and Inverter Energy Systems. Incident reporting is undertaken in the event of a failure to mitigate any future failures.	Consequence: **Moderate** Likelihood: **Rare** Risk rating: **Low**

Risk	Impact	Initial risk rating	Risk management strategies	Residual risk
Ignition of transformer oil in the Inverter Station	Transformer in inverter stations short circuit, igniting flammable oil in transformers	Consequence: **Severe** Likelihood: **Rare** Risk rating: **Medium**	A wide (>10m) vegetation management and exclusion zone is applied around the inverter stations, reducing the likelihood any fire within the site will come into contact with flammable material. Firefighting equipment is placed around the site in relevant locations.	Consequence: **Moderate** Likelihood: **Rare** Risk rating: **Low**
Electrical arcs forming in the DC portion of the site	DC current flowing from PV arrays causes electrical arcing	Consequence: **Moderate** Likelihood: **Rare** Risk rating: **Low**	The entire array field will be covered in short grass and kept mown. In addition, a wide exclusion zone is applied around the array and substations, reducing the likelihood any fire within the site will encounter flammable material. Vegetation growth (predominantly weeds) will be restricted under the arrays through the application of herbicides	Consequence: **Minor** Likelihood: **Rare** Risk rating: **Low**

4. Key to Risk Assessment Matrices

4.1. Likelihood of risks

Category	Example of Qualitative Measures
Almost Certain	The event is expected to occur in most circumstances
Likely	The event will probably occur in most circumstances
Possible	The event might occur at some time
Unlikely	The event is not expected to occur in most circumstances
Rare	The event will only occur in exceptional circumstances

4.2. Risk rating

		Consequences				
		Insignificant	Minor	Moderate	Major	Severe
Likelihood	Almost Certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	High	Extreme
	Possible	Low	Medium	Medium	High	High
	Unlikely	Low	Low	Medium	Medium	High
	Rare	Low	Low	Low	Medium	Medium

4.3. Guide to consequence in risk rating

Description	Financial Impact	Safety	Business Interruption	Corporate Objectives
Insignificant	Minimal financial loss; Less than $30,000	No or only minor personal injury; First Aid needed but no days lost	Negligible; Critical systems unavailable for less than one hour	Resolved in day-to-day management
Minor	$30,000 to $100,000	Minor injury; Medical treatment & some days lost	Inconvenient; Critical systems unavailable for less than one day	Minor impact
Moderate	$100,000 to $300,000	Injury; Possible hospitalisation & numerous days lost	Critical systems unavailable for less than 3 days	Significant impact
Major	$300,000 to $1M	Long-term impairment or disability, long-term illness or multiple serious injuries Any notifiable incident; Investigation by regulatory authorities	Critical systems unavailable for 7 days or more or a series of prolonged outages	Major impact
Severe	Above $1M	Fatality(ies) or permanent disability or ill-health	Long-term cessation of core activities	Disastrous impact

Appendix 3 – Resilience & Hazards SEPP 2021 – Preliminary Site Investigation

Contamination Assessment

SEPP Resilience and Hazards 2021 - Preliminary Site Investigation

Introduction

The scope of this assessment involves a contamination assessment for the proposed construction and operation of a solar farm on Lot 85 in Deposited Plan 870963, off Casuarina Drive in the Cabonne Shire.

The proposal for the investigation was to initially carry out a 'Preliminary Site Investigation' to determine if any contamination existed on the subject site. If contamination was found to exist at a level that was considered unsuitable for the intended land use, the study should include recommendations for remediation and validation of the site to ensure the site is acceptable if the proposal is approved.

The proposed development site is zoned as SP2 - Infrastructure and the proposed use is the construction and operation of a solar farm. Aside from minor earthworks for the construction of the solar farm, the contact with soil on site is limited as a permanent fence is to be constructed around the site. Other potential risks associated with surface spillage of hazardous compounds would include contamination from raised dust during dry conditions and workers during any demolition or reconstruction work on the site.

Past and Present Potentially Contaminating Activities

The subject site has historically been cleared and used for agricultural activities (i.e. grazing and cropping). At present, the eastern section of the site supports Eugowra's sewage treatment facility. This area is fenced off and the remainder of the site has continued to be used for crop cultivation since the establishment of the sewage treatment plant. A narrow strip along the westernmost section of the property, which runs along the Casuarina Drive, also supports some grassland vegetation with scattered trees.

As part of this investigation, historical aerial images have been used to identify landuse history on this site. Based on available imagery, the site has been farmed since at least 1965 and there has been very little disturbance to the site over time. Since that time the site appears to have been predominantly used for grazing and cropping, with the exception of the sewage treatment plant, which was built in the early 2000's. Historical and anecdotal evidence indicates that the site has not been used for indiscriminate disposal of waste or other potentially hazardous materials or dip sites.

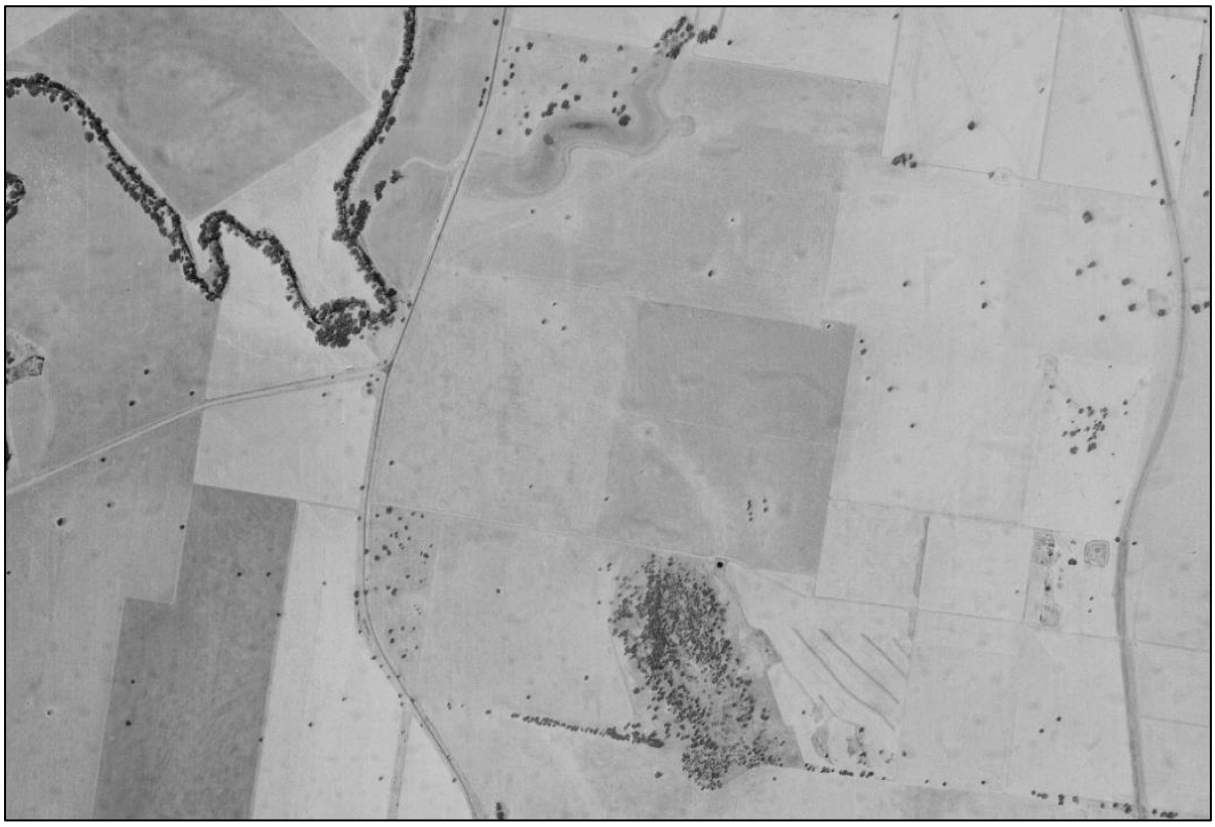


Figure 1: 1965 aerial image of the site (Source: NSW Historical Imagery Spatial Viewer)

The property is owned by Blayney Shire Council and is the only lot in the locality to be zoned SP2 – Infrastructure. The site is located in a rural primary production zone about 2km south of the town of Eugowra and the locality is dominated by cropland. A feedlot is present approximately 1.4km from the site; this is the closest commercial development to the proposal. Some small areas of remnant vegetation are also present in the area, notably on Round Hill, located approximately 600m to the south-east of the proposal, and along the Mandagery Creek, approximately 90m to the west.

Potential Contamination Types

Within the subject site, potential contamination activities are limited to normal agricultural activities. Certain agricultural practices such as cultivation, typically include the use of some chemicals such as herbicides. These chemicals are generally unstable and biodegrade. If present, the current concentration of these potential residues would be low. The site has most recently been used for the storage of cotton modules, which would not involve the use of chemicals or other materials which would potentially cause contamination.

There is also a sewage treatment plant within the study area, located approximately 130m east of the proposed solar farm. 'Water and sewage treatment plants' are listed as a 'potentially contaminating' land use in Appendix 1 of the *Draft Contaminated Land Planning Guidelines* (2018). Associated metals of concern are listed as aluminium, arsenic, cadmium, chromium, cobalt, lead, nickel, fluoride, lime and zinc.

Site Condition and Adjoining Land Use

The subject site and the remainder of the subject lot has been extensively cleared with little remnant vegetation remaining. The subject site has recently been utilised for cropping and contained wheat stubble at the time of the site inspection. The surrounding land on the property has been similarly utilised for cultivation, as well as for the operation of Eugowra's sewage treatment plant.

Surrounding properties are extensively cleared and have been developed for farming, primarily cultivation. One feedlot is present within approximately 1km of the proposal, no other commercial developments were observed based on current aerial imagery. No industries of concern are located within a potential contaminating range of the subject land.

Assessment of Site Contamination

The site investigation indicated that the property has been utilised for mainly cultivation, grazing and the operation of a sewage treatment plant. Some chemicals such as pesticides and herbicides are utilised as part of normal farming activities on land in the vicinity of the proposed development area and would also have historically been utilised on the subject land. Minor residues of these chemicals may remain in soil for a period of 12-18 months after application. Some of these residues tend to remain bound in the soil or biodegrade over time.

No dip sites or historical dip or sheep spray yards were noted on the property.

The sewage treatment plant on the same lot is located approximately 130m away from the proposed solar farm. The sewage treatment farm consists of four settling ponds within a surrounding high earth bank. The ponds are located over a heavy clay material and no seepage was observed around the outside of the site. An emergency overflow pipe is located on the northwest side of the facility. If this overflows, it will not contaminate the solar farm area. If settled sewage water has been discharged previously, it would contain elevated nutrient levels and possibly some bacteria. The discharge is highly unlikely to contain any contaminants of concern to the construction and operation of the solar farm.

In conclusion, the contamination that may be present on the land is considered as minor. The potential for impact on the local populace or the environment of low-level soil residues is considered minor. The contamination that may be present on the land is considered to relate to organic materials and not chemical or other hazardous materials.

On this basis, the results of this assessment indicate that contamination issues on the site should not impact the potential to construct and operate a solar farm.

Further Investigation Requirements

The investigation of the site has been carried out in accordance with the requirements of the *Resilience and Hazards SEPP 2021* and Guidelines published by the Environment Protection Authority. As a result of the preliminary contamination assessment, SMK Consultants have concluded that the presence of any potential contamination residue would not impact on the proposed development of a solar farm, as it is not considered a sensitive land use. Accordingly, no further investigation is required. If contamination or suspected contaminants are encountered on the site during the proposed works, it is recommended that the site should be appropriately restricted and advice sought from a suitably qualified and experienced consultant/supervisor to assess the material to determine appropriate action for its management and removal prior to any further work on the site.

Appendix 4 – Aboriginal Heritage Information Management System Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 21-490

Client Service ID : 658460

SMK Consultants Pty Ltd - Moree

P O Box 774

Moree New South Wales 2400

Attention: Marie Duffy

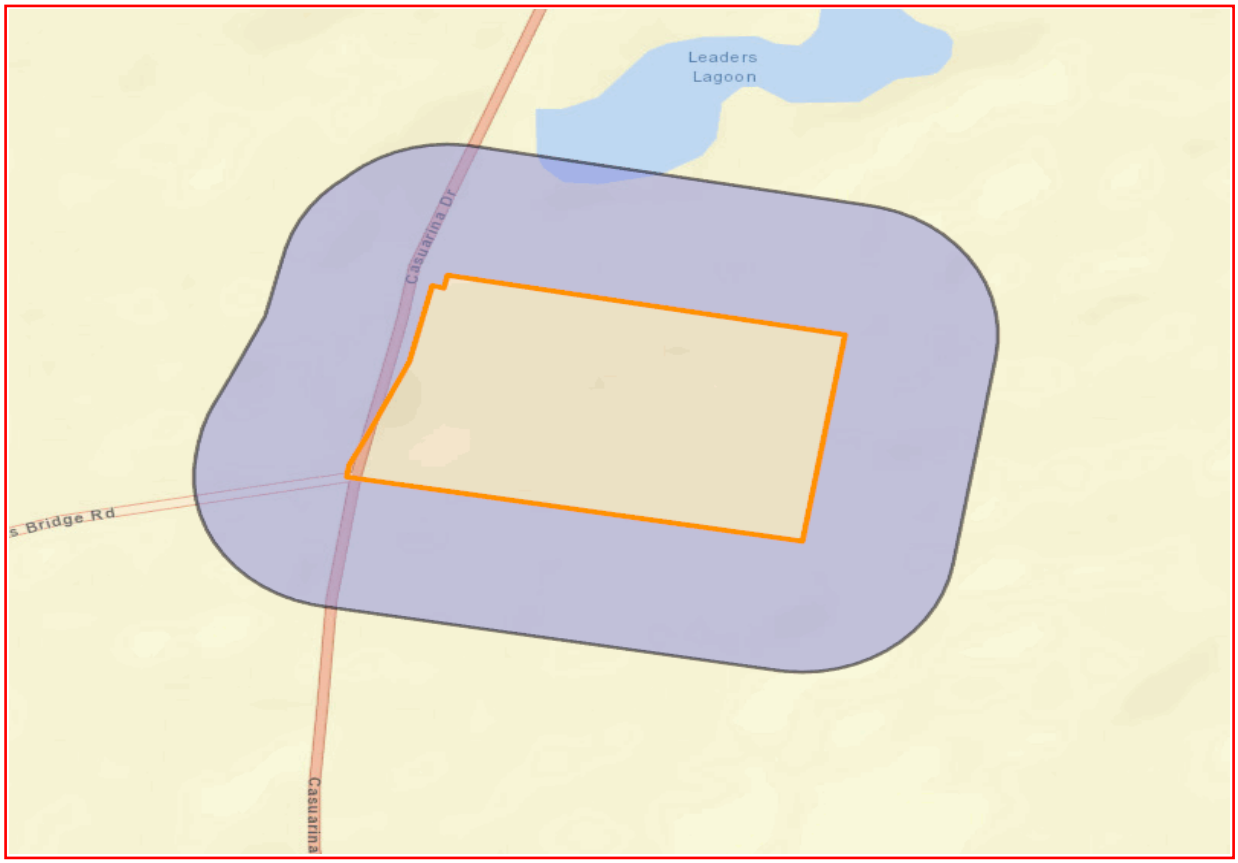
Email: marie@smk.com.au

Date: 10 February 2022

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 85, DP:DP870963, Section : - with a Buffer of 200 meters, conducted by Marie Duffy on 10 February 2022.

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



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

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 (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

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

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

Appendix 5 – Biodiversity Act 2016 – Test of Significance

Introduction

Endangered Ecological Communities and threatened species that have the potential to be impacted by the proposed road upgrade have been assessed under the guidelines of Section 7.3 of the *Biodiversity Conservation Act 2016* and this is provided below in the form of a Test of Significance. The Test of Significance includes the assessment of the development against five parameters to determine whether there is likely to be a significant effect on the threatened species recorded at or likely to occur at the site. The assessment has been conducted in accordance with the Threatened Species Test of Significance Guidelines (OEH 2018).

The proposed development involves the construction of a solar farm within the Cabonne Shire local government area. The subject site is located in Lot 85 on Deposited Plan 870963, approximately 2 kilometres south of the township of Eugowra. The site is zoned for infrastructure use.

The subject site has been historically cleared and disturbed as a result of previous agricultural activities on the site. The site is currently cultivated, and the proposal will result in the modification of approximately 2.4 hectares of this habitat type. It is noted that there are a small number of trees along the western and northern boundaries of the subject lot, however these will not be removed or modified as part of the proposal.

The works will involve the clearing of groundcover to facilitate construction, allowing for site establishment activities. Site establishment activities include levelling of the site, perimeter fencing, formation of internal roads and the installation of erosion and sediment controls. The proposal will require minor grading to provide a level surface for the installation of the solar arrays.

The development, once operational, will not pose an environmental risk to the locality as it will not act as a source of pollutants. A weed management program will be implemented, such that the site does not become a source of weed populations which may propagate out from the development site. Overall, the development is not predicted to interfere with habitat values adjacent to the subject site.

Assessment of Potential Presence of Threatened Species

A search of the National Parks and Wildlife Atlas of NSW Wildlife (BioNet) identified nine (9) species with recorded sightings within a 5km radius of the proposed development site. The complete search result for listed species is presented in Appendix A.

The project site is located within the Inland Slopes subregion of the NSW South Western Slopes Bioregion. A broader search for species, populations and communities that may occur within the locality of the development site was therefore conducted through investigating

known and predicted species' distributions within the NSW South Western Slopes Bioregion (Inland Slopes subregion). A copy of the search results for listed species is presented in Appendix B.

Species were considered with regards to their known distribution and habitat requirements, to assess whether the subject site is likely to serve as suitable habitat, and subsequently whether/how the development is likely to impact upon the species.

The availability of habitat on site was assessed using a number of factors including:

- Structural and floral diversity;
- Occurrence and extent of habitat types in the general vicinity;
- Continuity with similar habitat adjacent to the site, or connection with similar habitat off site by way of corridors;
- Key habitat features such as tree hollows, water bodies, crevices and rocky areas;
- Degree of disturbance and degradation; and
- Topographic features such as aspect and slope.

This information was used to evaluate the site as potential habitat for each of the threatened species considered and assign each species with a rating based on their likelihood to occur within the subject site. The 'likelihood of occurrence' categories are detailed in Table 1. The habitat assessment is provided in Appendix B. Species assigned with a rating of 'Moderate' or higher and are considered potentially impacted by the proposed works have been considered further under relevant legislation within the assessment of significance provided below.

Table 1: Likelihood of Occurrence Criteria

Likelihood Rating	Criteria
Known	The species was recorded within the study area during site surveys.
High	It is likely that a species would inhabit or utilise habitat within the subject site. Criteria for this category may include: • Species recently and/or regularly recorded in contiguous or nearby habitat; • High quality habitat types or resources present within study area; • Species is known or likely to maintain a resident population surrounding the study area; and • Species is known or likely to visit during migration or seasonal availability of resources.
Moderate	Potential habitat for a species occurs within the subject site. Criteria for this category may include: • Species previously recorded in contiguous habitat albeit not recently (>10 years); • Poor quality, depauperate or modified habitat types and/or resources present within study area;

Likelihood Rating	Criteria
	• Species has potential to utilise habitat during migration or seasonal availability of resources; and • Cryptic flora species with potential habitat available within the subject site that have not been seasonally targeted by surveys.
Low	It is unlikely that the species inhabits the area and would likely be considered a transient visitor if ever encountered. Criteria for this category may include: • The subject site or study area lacks specific habitat types or resources required by the species; • Non-cryptic flora species that were found to be absent during targeted surveys.
Unlikely	The habitat within subject site and study area is unsuitable for the species.

Only species that have the potential to be present within the available habitat are listed in Table 2 and assessed in this test of significance.

Table 2: Listed Species to be Assessed under the Test of Significance

Scientific Name	Common Name	Legal Status	Records [1]
Freckled Duck	*Stictonetta naevosa*	V, P	7
Australian Bustard	*Ardeotis australis*	E, P	1
Barking Owl	*Ninox connivens*	V,P,3	55
Powerful Owl	*Ninox strenua*	V, P	15
Yellow-bellied Sheathtail-bat	*Saccolaimus flavirentris*	V,P	18

Test of Significance - Assessment of Criteria and Discussion

The following is to be considered for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

A viable local population of a threatened terrestrial flora or fauna species in this assessment is defined as a population that occurs within the study area and the connected habitat within the area.

Megachiropteran Bats

Yellow-bellied Sheath-tail Bat

The species may use the project area for foraging on occasion, however the foraging habitat within the subject site is not considered optimal, due to historical clearing and the effects of disturbance from previous land use. Higher quality habitat is available in the area, including in riparian woodland on the banks of the Mandagery Creek to the west of the proposal and woodland vegetation on Round Hill to the south-east. It is therefore considered that the subject site is unlikely to be regularly or heavily utilised by the Yellow-bellied Sheath-tail Bat. Additionally, no roosting and/or breeding habitat was identified within the proposed development footprint.

The risk to this species from the development is therefore limited to the loss of sub-optimal foraging habitat. It is therefore considered that no viable local population of any threatened species would be placed at risk of extinction due to the proposed development.

Birds of Prey

Barking Owl, Powerful Owl

These highly mobile species have relatively large home ranges (generally >200 Ha). The removal of a small habitat area is therefore insignificant at a landscape scale and it is considered that the proposal is unlikely to have a significant impact on birds of prey. Furthermore, the subject site comprises sub-optimal foraging habitat for these species, and it does not contain breeding habitat.

The proposal is therefore not deemed to pose a risk to viable local populations of the above-mentioned species.

Ground-dwelling Birds

Australian Bustard

The preferred habitat of this species is native tussock grassland, shrubland or low open grass ywoodland however it is occasionally seen on cropping country. It breeds in ecotones between grassland and shrubland and roosts in shrubs. The proposal site therefore does not contain any breeding or roosting habitat, and is unlikely to provide important habitat for the species in its current state. The removal of cropland over a small area will therefore not have a significant impact on the local occurrence of this species. It is noted that there is more suitable habitat for this species on Round Hill, to the south-east of the proposal.

Waterfowl

Freckled Duck

This species utilises sewage ponds during dry periods. The construction and operation of a solar farm on a paddock adjoining the existing sewage pond is unlikely to have adverse impacts on this species, as a 50m buffer will be observed around the sewage pond. While noise may result in disturbance of this species during the construction period, construction

activities will take place over a short period of time and potential adverse impacts are therefore not considered significant.

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

The subject site does not support an endangered ecological community or critically endangered ecological community.

Best practice management and the implementation of mitigation measures including sediment and erosion control and weed control measures will minimise the potential for the proposed development to result in modification (through processes such as the introduction or proliferation of weed species) of ecological communities which may occur in the locality.

The development proposal is therefore considered unlikely to impact on the extent or composition of any of the listed endangered or critically endangered ecological communities.

c) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The proposal will result I the removal of 2.4 Ha of cropland. No Endangered Ecological Community would be subject to vegetation removal or modification as part of the proposed development.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

The subject site has been heavily cleared and disturbed as a result of historic land clearing and development of the site for existing agricultural activities. The site is currently managed as cropland. Given the existing site conditions, the proposed small-scale solar farm will not cause or promote any fragmentation of species or habitat within the area. Fauna species which may periodically utilise the subject site would disperse into adjoining areas of similar quality habitat and/or into higher quality habitat which is widespread in the locality. Therefore, the small-scale removal of cropping land (which only provides seasonal, sub-optimal habitat) would not result in the fragmentation or isolation of these mobile species.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

The entire subject site was historically cleared and is maintained for cultivation. This is considered as sub-optimal habitat and is not key to the long-term survival of species, populations or ecological communities. No endangered ecological community will be removed, modified or fragmented as part of the proposed works.

Best practice management and the implementation of mitigation measures including sediment and erosion control and weed control measures will minimise the potential for the proposed development to result in adverse off-site impacts, such as weed encroachment, to ecological communities.

The proposed project is therefore not considered to remove, modify, fragment or isolate habitat essential for the survival of a threatened species within the area.

d) whether the proposed development is likely to have an adverse effect on critical any declared area of outstanding biodiversity value (either directly or indirectly),

The development proposal is not located in or near an area of outstanding biodiversity value. It is therefore considered that no areas of outstanding biodiversity value will not be adversely affected (either directly or indirectly) by the proposed development.

e) whether the proposed development or activity is or is part of a key threatening process or is likely or increase the impact of a key threatening process.

Invasion of Native Plant Communities by Exotic Perennial Grasses

Invasion of native plant communities by exotic species is listed as a key threatening process. Exotic perennial grasses have the capacity to invade native plant communities, competing with an excluding native species. The invasion of these grasses also reduces the habitat value for many native fauna species.

It is noted that no exotic grass species were identified during the site inspection, however the movement of vehicles in and out of the site could result in the introduction and proliferation of weeds species within and outside of the subject site.

Accordingly, pathogen control protocols should be developed and implemented in accordance with the requirements of the *Biosecurity Act 2015*. A list of measures for the management of weeds have been provided in Section 5.13 of the Statement of Environmental Effects for the proposal. Provided safeguards regarding weed management are implemented, the proposed works are unlikely to result in increased weed incursion. The proposed works

are therefore considered unlikely to increase the impact of this key threatening process.

Conclusion

Flora, fauna and habitat studies have been undertaken to identify and assess the potential impacts resulting from the proposed project. The proposed project involves the construction of a solar farm. It is estimated that the total development footprint would be 2.4 hectares.

The proposal was assessed using the Test of Significance in accordance with the BC Act for the site which determined that given the site has previously been heavily disturbed and that vegetation present on-site at present is non-native, the project is not likely to significantly affect threatened species, ecological communities, or their habitats.

This assessment has determined that the potential adverse impacts of the proposed development on threatened species, populations or communities is considered minimal and no further investigation in the form of a Biodiversity Development Assessment Report is required.

Appendix A: Bionet Threatened Species, Populations and Communities Search Results for a 5-kilometre radius from the Subject Site

Scientific Name	Common Name	Legal Status	Records
Falco subniger	Black Falcon	V,P	1
Calyptorhynchus lathami	Glossy Black-Cockatoo	V,P,2	1
Neophema pulchella	Turquoise Parrot	V,P,3	1
Polytelis swainsonii	Superb Parrot	V,P,3	3
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V,P	3
Chthonicola sagittata	Speckled Warbler	V,P	2
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V,P	1
Stagonopleura guttata	Diamond Firetail	V,P	1
Bettongia lesueur graii	Boodie, Burrowing Bettong (mainland)	E4,P	1

Appendix B: Bionet Threatened Species, Populations and Communities Search Results for NSW South Western Slopes Bioregion (Inland Slopes IBRA Subregion)

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		Aves			
Leipoa ocellata Malleefowl	BC Act - E	Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species.	4	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Anseranas semipalmata Magpie Goose	BC Act - V	Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes. Activities are centred on wetlands, mainly those on floodplains of rivers and large shallow wetlands formed by run-off; breeding can occur in both summer and winter.	3	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Oxyura australis Blue-billed Duck	BC Act - V	The Blue-billed Duck is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed, but prefers to dive if approached.	13	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Stictonetta naevosa Freckled Duck	BC Act - V	This species prefers permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	7	**Moderate** There is potential habitat for this species adjacent to the subject site in the sewage pond. The species is therefore considered in this assessment.	Yes
Ephippiorhynchus asiaticus Black-necked Stork	BC Act - E	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	K	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Botaurus poiciloptilus Australasian Bittern	BC Act - E	In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.).	3	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Ixobrychus flavicollis Black Bittern	BC Act - V	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	1	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Circus assimilis Spotted Harrier	BC Act - V	In New South Wales, this species is widespread from coast to inland, including the western slopes of the Great Dividing Range and farther west. It is sparsely scattered in, or largely absent from, much of the Upper Western region. Primarily inhabits woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist	31	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		forests or rainforests. Generally, the understorey is open with sparse eucalypt saplings, acacias and other shrubs, including heath.			
Haliaeetus leucogaster White-bellied Sea-Eagle	BC Act - V	The White-bellied Sea-eagle is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. In New South Wales it is widespread along the east coast, and along all major inland rivers and waterways. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea.	37	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Hamirostra melanosternon Black-breasted Buzzard	BC Act - V	The Black-breasted Buzzard is found sparsely in areas of less than 500mm rainfall, from north-western NSW and north-eastern South Australia to the east coast at about Rockhampton, then across northern Australia south almost to Perth, avoiding only the Western Australian deserts. Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Also hunts over grasslands and sparsely timbered woodlands.	2	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Hieraaetus morphnoides Little Eagle	BC Act - V	The Little Eagle is found throughout the Australian mainland. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	152	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Lophoictinia isura Square-tailed Kite	BC Act - V	In NSW, the species is a regular resident in the north, north-east and along the major west-flowing river systems. Found in a variety of timbered habitats including dry woodlands and open forests. Is a specialist hunter of	9	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. Appears to occupy large hunting ranges of more than 100km.			
Pandion cristatus Eastern Osprey	BC Act - V	Eastern Ospreys are found right around the Australian coast line, except for Victoria and Tasmania. There are a handful of records from inland areas. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes.	1	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Falco hypoleucos Grey Falcon	BC Act - E	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	3	**Low** The site is not considered important for this species due to the paucity of suitable habitat.	No
Falco subniger Black Falcon	BC Act - V	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres. In the NSW South-Western Slopes Bioregion, the species is found in shrubland and dry sclerophyll forest and woodland as well as wetlands.	53	**Low** The site is not considered important for this species due to the paucity of suitable habitat.	No
Grus rubicunda Brolga	BC Act - V	The Brolga was formerly found across Australia, except for the south-east corner, Tasmania and the south-western third of the country. It is still abundant in the northern tropics, but very sparse across the southern part of its	7	**Low** The site is not considered important for this species due to the paucity of suitable habitat. Although the species	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		range. Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they will forage with their head entirely submerged.		can be found in ploughed paddocks, the species is also dependent on wetlands, and this habitat is not present in the locality.	
Ardeotis australis Australian Bustard	BC Act - E	The Australian Bustard mainly occurs in inland Australia and is now scarce or absent from southern and south-eastern Australia. In NSW, they are mainly found in the north-west corner and less often recorded in the lower western and central west plains regions. Breeding now only occurs in the north-west region of NSW. Mainly inhabits tussock and hummock grasslands, though prefers tussock grasses to hummock grasses; also occurs in low shrublands and low open grassy woodlands; occasionally seen in pastoral and cropping country, golf courses and near dams.	1	**Moderate** The species may utilise habitat within the subject site, given its broad habitat use.	Yes
Burhinus grallarius Bush Stone-curlew	BC Act - E	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch.	15	**Low** The site is not considered important for this species due to the paucity of suitable habitat.	No
Rostratula australis Australian Painted Snipe	BC Act - E	In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	1	**Low** The site is not considered important for this species due to the paucity of suitable habitat.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Calidris ferruginea Curlew Sandpiper	BC Act - E	The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts.	3	**Low** The site is not considered important for this species due to the paucity of suitable habitat.	No
Limosa limosa Black-tailed Godwit	BC Act - V	In NSW, it is most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland. Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats.	P	**Low** The site is not considered important for this species due to the paucity of suitable habitat.	No
Callocephalon fimbriatum Gang-gang Cockatoo	BC Act - V	In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas.	268	**Low** The site is not considered important for this species due to the paucity of suitable habitat.	No
Calyptorhynchus lathami Glossy Black-Cockatoo	BC Act - V	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak and Forest Sheoak are important foods. Inland populations feed on a wide range of sheoak. Belah is also utilised and may be a critical food source for some populations. Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill.	91	**Low** The site is not considered important for this species due to the paucity of suitable habitat.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		Dependent on large hollow-bearing eucalypts for nest sites.			
Lophochroa leadbeateri Major Mitchell's Cockatoo	BC Act - V	Found across the arid and semi-arid inland. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines.	7	**Low** The subject site is not considered to have sufficient suitable foraging habitat/flora species to sustain individuals of this species.	No
Glossopsitta porphyrocephala Purple-crowned Lorikeet	BC Act - V	Found in open forests and woodlands, particularly where there are large flowering eucalypts. Also recorded from mallee habitats. Feed primarily on nectar and pollen of flowering Eucalypts, including planted trees in urban areas.	5	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Glossopsitta pusilla Little Lorikeet	BC Act - V	NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs. Forages primarily in the canopy of open *Eucalyptus* forest and woodland, yet also finds food in *Angophora, Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open	189	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species.			
Lathamus discolor Swift Parrot	BC Act - E	In NSW the species mostly occurs on the coast and south west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Forest Red Gum E. tereticornis, Mugga Ironbark E. *sideroxylon*, and White Box *E. albens*.	154	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Neophema pulchella Turquoise Parrot	BC Act - V	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Nests in tree hollows, logs or posts, from August to December.	262	**Unlikely** There is no suitable habitat for the species within the subject site. There is no woodland bordering the subject site.	No
Polytelis swainsonii Superb Parrot	BC Act - V	The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The species inhabits Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and	1845	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain.			
Ninox connivens Barking Owl	BC Act - V	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile riparian soils.	55	**Moderate** This species may hunt throughout the subject site as it hunts in open areas.	Yes
Ninox strenua Powerful Owl	BC Act - V	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats.	15	**Moderate** This species may hunt throughout the subject site as it hunts in open areas.	Yes
Tyto novaehollandiae Masked Owl	BC Act - V	Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.	3	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	BC Act - V	The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands	2975	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species. When foraging in trees and on the ground, they peck and probe for insects, mostly ants, amongst the litter, tussocks and fallen timber, and along trunks and lateral branches. Hollows in standing dead or live trees and tree stumps are essential for nesting.			
Chthonicola sagittata Speckled Warbler	BC Act - V	The Speckled Warbler has a patchy distribution throughout the eastern half of NSW. There has been a decline in population density throughout its range, with the decline exceeding 40% where no vegetation remnants larger than 100ha survive. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. The diet consists of seeds and insects, with most foraging taking place on the ground around tussocks and under bushes and trees. The rounded, domed, roughly built nest of dry grass and strips of bark is located in a slight hollow in the ground or the base of a low dense plant, often among fallen branches and other litter.	637	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Anthochaera phrygia Regent Honeyeater	BC Act - E	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. The species inhabits dry open	132	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species.			
Certhionyx variegatus Pied Honeyeater	BC Act - V	Widespread throughout acacia, mallee and spinifex scrubs of arid and semi-arid Australia. Occasionally occurs further east, on the slopes and plains and the Hunter Valley, typically during periods of drought. Inhabits wattle shrub, primarily Mulga (*Acacia aneura*), mallee, spinifex and eucalypt woodlands, usually when shrubs are flowering; feeds on nectar, predominantly from various species of emu-bushes (*Eremophila* spp.); also from mistletoes. Highly nomadic, following the erratic flowering of shrubs.	1	**Low** There is no suitable habitat for this species within the subject site.	No
Epthianura albifrons White-fronted Chat	BC Act - V	In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.	54	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Grantiella picta Painted Honeyeater	BC Act - V	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes	20	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*.			
Melithreptus gularis gularis Black-chinned Honeyeater	BC Act - V	The Black-chinned Honeyeater has two subspecies, with only the nominate (*gularis*) occurring in NSW where it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts. Feeding territories are large making the species locally nomadic. Recent studies have found that the Black-chinned Honeyeater tends to occur in the largest woodland patches in the landscape as birds forage over large home ranges of at least 5 hectares.	345	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Pomatostomus temporalis temporalis Grey-crowned Babbler (eastern subspecies)	BC Act - V	In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions. Feed on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses.	558	**Unlikely** There is no suitable habitat for the species within the subject site.	No
Daphoenositta chrysoptera Varied Sittella	BC Act - V	Inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or	250	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		decorticating bark, dead branches, standing dead trees, and from small branches and twigs in the tree canopy.			
Pachycephala inornata Gilbert's Whistler	BC Act - V	The Gilbert's Whistler is sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western slopes of NSW to the Western Australian wheatbelt. The Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests, though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers.	39	**Low** There is no suitable habitat for this species within the subject site.	No
Artamus cyanopterus cyanopterus Dusky Woodswallow	BC Act - V	Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. Primarily eats invertebrates, mainly insects, which are captured whilst hovering or sallying above the canopy or over water. Most breeding activity occurs on the western slopes of the Great Dividing Range.	914	**Low** There is no suitable habitat for this species within the subject site.	No
Melanodryas cucullata cucullata Hooded Robin (south-eastern form)	BC Act - V	The south-eastern form (subspecies *cucullata*) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies *picata*. Two other subspecies occur outside NSW. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	293	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Petroica boodang Scarlet Robin	BC Act - V	In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions.	397	**Low** There is no suitable habitat for this species within the subject site.	No
Petroica phoenicea Flame Robin	BC Act – V	In NSW, the Flame Robin breeds in upland areas and in winter, many birds move to the inland slopes and plains. It breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. The species prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense.	420	**Low** There is no suitable habitat for this species within the subject site.	No
Petroica rodinogaster Pink Robin	BC Act – V	Inhabits rainforest and tall, open eucalypt forest, particularly in densely vegetated gullies. Catches prey by the perch-and-pounce method, foraging more on the ground than the more flycatcher-like Rose Robin. Insects and spiders are the main dietary items.	2	**Low** There is no suitable habitat for this species within the subject site.	No
Stagonopleura guttata Diamond Firetail	BC Act - V	Found in grassy eucalypt woodlands, including Box-Gum Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Prefers clearings or areas with open understoreys. Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green	875	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		leaves, and on insects. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting.			
			Mammalia		
Dasyurus maculatus Spotted-tailed Quoll	BC Act - V	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Females occupy home ranges of 200-500 hectares, while males occupy very large home ranges from 500 to over 4000 hectares.	43	**Low** The species may travel through or rest within the site given its very large home range, however it is not considered important habitat for the species. No potential den sites were observed on site.	No
Phascogale tapoatafa Brush-tailed Phascogale	BC Act - V	In NSW it is mainly found east of the Great Dividing Range although there are occasional records west of the divide. Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest.	P	**Low** There is no suitable habitat for this species within the subject site.	No
Macrotis lagotis Bilby	BC Act - E	The species is extinct in NSW.	3	**Low** The species is extinct in NSW.	No
Phascolarctos cinereus Koala	BC Act - V	Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	87	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Cercartetus nanus Eastern Pygmy-possum	BC Act - V	Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. They may occupy small patches of vegetation in fragmented landscapes and although the species prefers habitat with a rich shrub understory, they are known to occur in grassy woodlands and the presence of Eucalypts alone is sufficient to support populations in low densities.	6	**Low** There is no suitable habitat for this species within the subject site.	No
Petaurus australis Yellow-bellied Glider	BC Act - V	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	2	**Low** There is no suitable habitat for this species within the subject site.	No
Petaurus norfolcensis Squirrel Glider in the Wagga Wagga Local Government Area	BC Act - E	Inhabits a wide range of open forest, woodland and riverine forest habitats. Utilise remnants of various sizes, including small remnants and even small stands of trees within Travelling Stock Reserves, roadside reserves or private land. Often utilise linear remnant vegetation along roadsides or rivers and streams.	526	**Low** There is no suitable habitat for this species within the subject site.	No
Petaurus norfolcensis Squirrel Glider	BC Act - V	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey.	1212	**Low** There is no suitable habitat for this species within the subject site.	No
Petauroides volans Greater Glider	BC Act – Not Listed	Greater Gliders are forest dependent and prefer older tree age classes in moist forest types. They use hollow-bearing trees for shelter and nesting, with each family group using multiple den trees within its home range.	97	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		They eat mainly young eucalypt leaves, with a preference for certain species.			
Bettongia lesueur graii Boodie, Burrowing Bettong (mainland)	BC Act - E	The Boodie once lived in a range of dry subtropical and tropical habitats, from open Eucalyptus and Acacia woodlands to arid spinifex grasslands. In its current range on the islands, it seems to prefer open Triodia (spinifex) and dune habitats, but will burrow anywhere except places with rocky substrate.	1	**Low** There is no suitable habitat for this species within the subject site.	No
Petrogale penicillata Brush-tailed Rock-wallaby	BC Act - E	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.	3	**Low** There is no suitable habitat for this species within the subject site.	No
Pteropus poliocephalus Grey-headed Flying-fox	BC Act - V	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	256	**Low** There is no suitable habitat for this species within the subject site.	No
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	BC Act - V	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	18	**Moderate** This species may forage within the open areas of the subject site.	Yes
Chalinolobus dwyeri Large-eared Pied Bat	BC Act - V	In NSW, the species has been recently recorded from only three disjunct locations: thirteen individuals from Gundabooka National Park, south of Bourke; one individual from Dhinnia Dthinawan Nature Reserve (formerly Bebo State Forest), north of Warialda two	11	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		individuals near Bonshaw. Appears to be extremely rare throughout its range. Nationally, it has been recorded from only 15 locations. Knowledge of the ecology of the Hairy-nosed Freetail Bat is limited, however evidence suggests that the species depends on hollows and tree fissures for roosting sites. In the Brigalow Belt South bioregion, the species mainly occurs in woodlands, forests and arid shrublands.			
Chalinolobus picatus Little Pied Bat	BC Act - V	Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress pine forest and mallee and Bimbil box woodlands. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings. Feeds on moths and possibly other flying invertebrates.	15	**Low** There is no suitable habitat for this species within the subject site.	No
Falsistrellus tasmaniensis Eastern False Pipistrelle	BC Act - V	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	19	**Low** There is no suitable habitat for this species within the subject site.	No
Myotis Macropus Southern Myotis	BC Act - V	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers.	14	**Low** There is no suitable habitat for the species within the subject site.	No
Nyctophilus corbeni Corben's Long-eared Bat	BC Act - V	Inhabits a variety of vegetation types, including mallee, bulloke and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation. Roosts in tree hollows, crevices, and under loose bark. Slow flying agile bat, utilising the understorey	9	**Unlikely** There is no suitable habitat for the species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		to hunt non-flying prey - especially caterpillars and beetles - and will even hunt on the ground.			
Miniopterus orianae oceanensis Large Bent-winged Bat	BC Act - V	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young.	83	**Low** There is no suitable habitat for this species within the subject site.	No
Pseudomys novaehollandiae New Holland Mouse	BC Act – Not Listed	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. It is a social animal, living predominantly in burrows shared with other individuals	8	**Low** There is no suitable habitat for this species within the subject site.	No
		Reptilia			
Aprasia parapulchella Pink-tailed Legless Lizard	BC Act - V	Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (Themeda australis). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks.	150	**Low** There is no suitable habitat for this species within the subject site.	No
Delma impar Striped Legless Lizard	BC Act - V	Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland.	4	**Low** There is no suitable habitat for this species within the subject site.	No
Varanus rosenbergi Rosenberg's Goanna	BC Act - V	Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component.	6	**Low** There is no suitable habitat for this species within the subject site.	No
Hoplocephalus bitorquatus Pale-headed Snake	BC Act - V	A patchy distribution from north-east Queensland to the north-eastern quarter of NSW. In NSW it has historically been recorded from as far west as Mungindi and	P	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		Quambone on the Darling Riverine Plains, across the north west slopes, and from the north coast from Queensland to Sydney. Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest. In drier environments, it appears to favour habitats close to riparian areas.			
		Insecta			
Synemon plana Golden Sun Moth	BC Act – E	Occurs in Natural Temperate Grasslands and grassy Box-Gum Woodlands in which groundlayer is dominated by wallaby grasses Austrodanthonia spp. Grasslands dominated by wallaby grasses are typically low and open - the bare ground between the tussocks is thought to be an important microhabitat feature for the Golden Sun Moth, as it is typically these areas on which the females are observed displaying to attract males.	50	**Low** The subject site is not considered important for this species due to the lack of suitable habitat.	No
		Amphibia			
Crinia sloanei Sloane's Froglet	BC Act – V	Sloane's Froglet has been recorded from widely scattered sites in the floodplains of the Murray-Darling Basin, with the majority of records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales. It has not been recorded recently in the northern part of its range and has only been recorded infrequently in the southern part of its range in NSW. It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats.	100	**Low** There is no suitable habitat for this species within the subject site.	No
Litoria booroolongensis Booroolong Frog	BC Act – E	The Booroolong Frog is restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It has	33	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		disappeared from much of the Northern Tablelands; however, several populations have recently been recorded in the Namoi catchment. The species is rare throughout most of the remainder of its range. It lives along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.			
Litoria raniformis Southern Bell Frog	BC Act – E	Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat.	12	**Low** There is no suitable habitat for this species within the subject site.	No
		Flora			
Caesia parviflora var. minor Small Pale Grass-lily	BC Act – E	Found in damp places in open forest on sandstone.	1	**Low** There is no suitable habitat for this species within the subject site.	No
Tylophora linearis	BC Act – V	Grows in dry scrubland that may have a eucalypt, *Callitris glaucophylla* and/or *Allocasuarina luehmannii* overtopping the scrub, in the Barraba, Mendooran, Temora and West Wyalong districts.	25	**Low** There is no suitable habitat for this species within the subject site.	No
Ammobium craspedioides Yass Daisy	BC Act – V	Found in moist or dry forest communities, Box-Gum Woodland and secondary grassland derived from clearing of these communities.	794	**Low** There is no suitable habitat for this species within the subject site.	No
Brachyscome muelleroides Claypan Daisy	BC Act – V	Grows in damp areas on the margins of claypans in moist grassland with Pycnosorus globosus, Agrostis avenacea and Austrodanthonia duttoniana. Also recorded from the margins of lagoons in mud or water, and in association with Calotis anthemoides.	1	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Leucochrysum albicans var. tricolor Hoary Sunray	BC Act – V	Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Can occur in modified habitats such as semi-urban areas and roadsides.	33	**Unlikely** The subject site has a long history of cultivation and extensive modification, and the site is unlikely to constitute important habitat for the species.	No
Senecio garlandii Woolly Ragwort	BC Act – V	Woolly Ragwort occurs on sheltered slopes of rocky outcrops.	71	**Low** There is no suitable habitat for this species within the subject site.	No
Carex raleighii Raleigh Sedge	BC Act – E	Grows in sphagnum bogs and high mountain wetlands, as well as damp grasslands and stream-edges of sub-alpine plains.	1	**Low** There is no suitable habitat for this species within the subject site.	No
Bossiaea fragrans	BC Act – E	Occurs on spilite, rhyolite or slate and volcanic substrates and is often associated with Red Stringybark (Eucalyptus macrorhyncha) - Red Box (Eucalyptus polyanthemos) woodland +/- White Box (Eucalyptus albens).	31	**Low** There is no suitable habitat for this species within the subject site.	No
Cullen parvum Small Scurf-pea	BC Act – E	In known populations in Victoria and NSW, plants are found in grassland, River Red Gum (Eucalyptus camaldulensis) Woodland or Box-Gum Woodland, sometimes on grazed land and usually on table drains or adjacent to drainage lines or watercourses, in areas with rainfall of between 450 and 700 mm.	7	**Low** There is no suitable habitat for this species within the subject site.	No
Indigofera efoliata Leafless Indigo	BC Act – E	Very rare and was presumed extinct with the last known collection made in 1955 with three unvouchered reports from Goonoo State Forest in 1963. In spring 2021 the species was rediscovered near Geurie. Indigofera efoliata was only known only from a few collections in the Dubbo area. Known sites were located	3	**Low** The species is not known to occur in the locality of the subject site and has an extremely limited distribution. Further, the site is cultivated and is not predicted to support any	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		along the Dubbo to Minore railway line and road, on Wallaringa and Geurie properties and in Goonoo State Forest.		endangered species due to intensive management practices.	
Pultenaea humilis Dwarf Bush-pea	BC Act – V	Pultenaea humilis is found in isolated remnants of native woodland and forest communities that occur in extensively cleared agricultural landscapes.	7	**Low** There is no suitable habitat for this species within the subject site.	No
Swainsona recta Small Purple-pea	BC Act – E	Small Purple-pea was recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas. Over 80% of the southern population grows on a railway easement. It is also known from the ACT and a single population of four plants near Chiltern in Victoria. Before European settlement Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum, Yellow Box, Candlebark Gum and Long-leaf Box.	609	**Low** The subject site is not considered important for this species due to a paucity of suitable habitat. Further the species is not know to occur in the locality of the subject site.	No
Swainsona sericea Silky Swainson-pea	BC Act – V	Found in Natural Temperate Grassland and Snow Gum Eucalyptus pauciflora Woodland on the Monaro. Habitat on plains unknown.	176	**Unlikely** The habitat of this species on the plains is unknown, however the subject site has a long history of cultivation and extensive modification, and the site is unlikely to constitute important habitat for the species.	No
Acacia ausfeldii Ausfeld's Wattle	BC Act – V	Associated species include Eucalyptus albens, E. blakelyi and Callitris spp., with an understorey dominated by Cassinia spp. and grasses.	3919	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Acacia meiantha	BC Act – E	It is only known from three disjunct locations, all within the Central Tablelands and each separated by more than 60 kms. These disjunct populations include Clarence, which covers an area of approximately 1 hectare; Mullions Range State Forest north of Orange; and Carcalgong, which is confined to 2.5km of road easements. Of the three populations, the majority (96%) are known to occur in Mullions Range State Forest occurring both within remnant native forest and in plantation forests.	P	**Low** The species is only known to occur in 3 locations, all at distance from the subject site.	No
Acacia phasmoides Phantom Wattle	BC Act – V	Grows in shrubby woodland on sandy, granitic soil near creeks or in rocky crevices.	91	**Low** There is no suitable habitat for this species within the subject site.	No
Pilularia novae-hollandiae Austral Pillwort	BC Act – E	Austral Pillwort grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous.	5	**Low** There is no suitable habitat for this species within the subject site.	No
Eucalyptus aggregate Black Gum	BC Act – V	Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Often grows with other cold-adapted eucalypts, such as Snow Gum or White Sallee (Eucalyptus pauciflora), Manna or Ribbon Gum (E. viminalis).	1	**Low** There are no trees within the subject site.	No
Eucalyptus alligatrix subsp. alligatrix	BC Act – V	Only known from a single location south-west of Rylstone; however, the species has reportedly been widely propagated and planted in the Rylstone area.	2	**Low** The species is only known to occur in Rylstone, which is at distance from the subject site.	No
Eucalyptus cannonii Capertee Stringybark	BC Act – V	The Capertee Stringybark is predominantly restricted to the central tablelands and slopes of NSW between the Golden Highway in the north, and the Mitchell Highway in the south.	5	**Low** There are no trees within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Eucalyptus robertsonii subsp. hemisphaerica Robertson's Peppermint	BC Act – V	Known only from the central tablelands of NSW, at small disjunct localities from north of Orange to Burraga. Locally frequent in grassy or dry sclerophyll woodland or forest, on lighter soils and often on granite. Usually found in closed grassy woodlands in locally sheltered sites. Habitats include quartzite ridges, upper slopes and a slight rise of shallow clay over volcanics.	P	**Low** There is no suitable habitat for this species within the subject site.	No
Homoranthus darwinioides Fairy Bells	BC Act – V	Grows in in various woodland habitats with shrubby understoreys, usually in gravely sandy soils. Landforms the species has been recorded growing on include flat sunny ridge tops with scrubby woodland, sloping ridges, gentle south-facing slopes, and a slight depression on a roadside with loamy sand.	P	**Low** There is no suitable habitat for this species within the subject site.	No
Caladenia arenaria Sand-hill Spider Orchid	BC Act – E	Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (Callitris glaucophylla).	6	**Low** There is no suitable habitat for this species within the subject site.	No
Caladenia concolor Crimson Spider Orchid	BC Act – E	Habitat is regrowth woodland on granite ridge country that has retained a high diversity of plant species, including other orchids.	504	**Low** There is no suitable habitat for this species within the subject site.	No
Caladenia rosella Rosella Spider Orchid	BC Act – E	The species is extinct in NSW.	1	**Low** The species is extinct in NSW.	No
Caladenia tessellate Thick Lip Spider Orchid	BC Act – E	Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.	1	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
Diuris tricolor Pine Donkey Orchid	BC Act – V	The Pine Donkey Orchid grows in sclerophyll forest among grass, often with native Cypress Pine (Callitris spp.). It is found in sandy soils, either on flats or small rises. Also recorded from a red earth soil in a Bimble Box community in western NSW.	20	**Low** There is no suitable habitat for this species within the subject site.	No
Prasophyllum petilum Tarengo Leek Orchid	BC Act – E	Grows in open sites within Natural Temperate Grassland at the Boorowa and Delegate sites. It grows in grassy woodland in association with River Tussock Poa labillardieri, Black Gum Eucalyptus aggregata and tea-trees Leptospermum spp. near Queanbeyan and within the grassy groundlayer dominated by Kangaroo Grass under Box-Gum Woodland at Ilford (and Hall, ACT).	24	**Low** There is no suitable habitat for this species within the subject site.	No
Prasophyllum sp. Wybong	BC Act – Not Listed	Endemic to NSW, it is known from near Ilford, Premer, Muswellbrook, Wybong, Yeoval, Inverell, Tenterfield, Currabubula and the Pilliga area. Most populations are small, although the Wybong population contains by far the largest number of individuals. Known to occur in open eucalypt woodland and grassland.	P	**Low** There is no suitable habitat for this species within the subject site.	No
Euphrasia arguta	BC Act – E	Euphrasia arguta was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008. Plants from the Nundle area have been reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance.	1	**Low** There is no suitable habitat for this species within the subject site.	No
Euphrasia collina subsp. muelleri Mueller's Eyebright	BC Act – E	The only NSW collections in the past 50 years were made in the vicinity of the Tinderry Range between Canberra and Cooma (1970) and between Uralla and Tamorth (1987). Little is known about the habitat this species	P	**Low** There is no suitable habitat for this species within the subject site. Further	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		preferred, although there is a reference to "damp places" in an early von Mueller collection. Extant populations in Victoria occur in heathy woodland.		the species is not known to occur in the locality of the subject site.	
Amphibromus fluitans Floating Swamp Wallaby-grass	BC Act – V	Amphibromus fluitans grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels.	30	**Low** There is no suitable habitat for this species within the subject site.	No
Austrostipa wakoolica A spear-grass	BC Act – E	Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise.	P	**Low** There is no suitable habitat for this species within the subject site.	No
Dichanthium setosum Bluegrass	BC Act – V	Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture.	3	**Low** While the species may be found in disturbed pasture, the subject site consists of highly modified cultivated land, which is unlikely to provide suitable habitat for the species. Furthermore, the grass was not observed during the site assessment.	No
Grevillea wilkinsonii Tumut Grevillea	BC Act – E	The Tumut Grevillea has a highly restricted distribution in the NSW South-west Slopes region. Its main occurrence is along a 6 km stretch of the Goobarragandra River approximately 20 km east of Tumut where about 1,000 plants are known. The other occurrence is a small population that straddles the boundary of two private	17	**Low** The species has an extremely restricted distribution and is not known to occur in the locality of the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		properties at Gundagai where only eight mature plants survive.			
Persoonia marginata Clandulla Geebung	BC Act – V	Grows in dry sclerophyll forest and woodland communities on sandstone.	P	**Low** There is no suitable habitat for this species within the subject site.	No
Pomaderris cotoneaster Cotoneaster Pomaderris	BC Act – E	Cotoneaster Pomaderris has been recorded in a range of habitats in predominantly forested country. The habitats include forest with deep, friable soil, amongst rock beside a creek, on rocky forested slopes and in steep gullies between sandstone cliffs.	P	**Low** There is no suitable habitat for this species within the subject site.	No
Pomaderris queenslandica Scant Pomaderris	BC Act – E	Found in moist eucalypt forest or sheltered woodlands with a shrubby understorey, and occasionally along creeks.	4	**Low** There is no suitable habitat for this species within the subject site.	No
Zieria ingramii Keith's Zieria	BC Act – E	Grows in dry sclerophyll forest on light sandy soils. All known populations have been recorded in Eucalyptus-Callitris woodland or open forest with a shrubby to heathy understorey. Eucalyptus dwyeri appears to be a key predictor of Z. ingramii distribution.	2	**Low** There is no suitable habitat for this species within the subject site.	No
Zieria obcordate Granite Zieria	BC Act – E	Grows in eucalypt woodland or shrubland dominated by species of Acacia on rocky hillsides. Also occurs in Eucalyptus and Callitris dominated woodland with an open, low shrub understorey, on moderately steep, mainly west to north-facing slopes in sandy loam amongst granite boulders. The altitude range of sites is 500 to 830 metres.	26	**Low** There is no suitable habitat for this species within the subject site.	No
Pimelea bracteata	BC Act – E	Pimelea bracteata occurs in wetlands and along waterways and stream edges in high altitude treeless	1	**Low** There is no suitable habitat for this species within the subject site.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		subalpine valleys. It can also occur in wet heathland and closed heath.			
Communities					
Coolac-Tumut Serpentinite Shrubby Woodland in the NSW South Western Slopes and South Eastern Highlands Bioregions	BC Act – EEC	Serpentinite Shrybby Woodland is restricted to soils derived from serpentinite in the Tumut-Coolac-Gundagai area. The largest occurrence is on the Honeysuckle range to the east of Tumut which extends from Argalong to the Murrumbidgee River. There are other smaller areas near Coolac and Gundagai.		**Low** This EEC does not occur on the subject site, and the site is thus not considered important habitat.	No
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	BC Act – EEC	This EEC occurs on alluvial soils of the South West Slopes, Brigalow Belt South and Darling Riverine Plains Bioregions. Mainly in the Dubbo-Narromine-Parkes-Forbes area. Tall woodland or open forest dominated by Fuzzy Box, often with Grey Box, Yellow Box, or Kurrajong.		**Low** This EEC does not occur on the subject site, and the site is thus not considered important habitat.	No
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	BC Act – EEC	Inland Grey Box Woodland occurs predominately within the Riverina and South West Slopes regions of NSW down to the Victorian border. It includes Albury to the east and may extend out west towards Hay. This community also extends across the slopes and plains in Central and Northern NSW up to the Queensland Border. This includes Yetman and Inverell in the North, Molong to the east of the Central Slopes and plains and out towards Nymagee to the west.		**Low** This EEC does not occur on the subject site, and the site is thus not considered important habitat.	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	BC Act – EEC	Characterised by the presence or prior occurrence of White Box, Yellow Box and/or Blakely's Red Gum and a generally grassy understorey.		**Low** This EEC does not occur on the subject site, and the site is thus not considered important habitat.	No

Appendix 6 – Environmental Protection and Biodiversity Conservation Act 1999 – Assessment of Significance

EPBC Protected Matters Assessment

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on the Commonwealth land are required to be considered to assist in determining whether the proposal should be referred to the Australian Government Department of Agriculture, Water and Environment.

Factor	Impact
a) Any impact on a World Heritage property? No impact. There are no World Heritage properties in the study area.	Nil
b) Any impact on a National Heritage place? No impact. There are no National Heritage properties in the study area.	Nil
c) Any impact on a wetland of international importance? No impact. There are no wetlands of international importance in the study area.	Nil
d) Any impact on a listed threatened species or communities? The proposal entails the minor clearance of non-native vegetation which consists of grasses and crops. Given the small impact zone, the prior disturbance from previous cultivation activities in the impact zone, and the presence of alternative habitat in the locality, the proposal is not considered likely to have a significant impact on threatened species and ecological communities which occur, or may occur, in the locality of the Eugowra Solar Farm.	Minor
e) Any impacts on listed migratory species? The proposal is unlikely to have a significant impact to listed migratory species.	Nil
f) Any impact on a Commonwealth marine area? No impact. There are no Commonwealth marine areas in the study area.	Nil
g) Does the proposal involve a nuclear action (including uranium mining)? No impact. The proposal does not involve a nuclear action.	Nil
h) Additionally, any impact (direct or indirect) on the environment of Commonwealth land? No impact. There are no Commonwealth lands in the study area.	Nil

Based on the above assessment, the proposal does not require a referral to the Australian Government Department of Agriculture, Water and Environment, due to a lack of potential significant adverse impacts on the above listed matters of national environmental significance.

Appendix 7 – Waste Management Plan

SMK

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EUGOWRA SOLAR FARM

Waste Management Plan

July 2022

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1 Introduction

The purpose of the Waste Management Plan is to describe the principles, procedures and management of the waste generated by Cabonne Shire Council during the construction, operation and decommissioning of the Eugowra Solar Farm. This Plan has been prepared to ensure wastes are reduced, reused and recycled wherever possible.

The Waste Management Plan outlines measures to manage and mitigate waste generation and resource consumption during the operation of the development. The Plan includes details on the following:

- The types of waste generated during the project lifecycle;
- Procedures to collect and dispose of waste;
- Measures that will be implemented to minimise waste generation associated with the development; and
- Measures to monitor the effectiveness of these measures.

The Waste Management Plan is designed to support a sustainably based management approach underpinned by adaptive management principles to encourage increased diversion of waste from landfill.

2 Legal Context

The following Acts, Regulations and Standards are applicable to this Project:
Legislation relevant to waste and resource management for this project includes:

- Protection of the Environment Operations Act 1997;
- Protection of the Environment Operations (Waste) Regulation 2014;
- Waste Avoidance and Resource Recovery Act 2001; and
- Work Health and Safety Act 2011

3 Objectives

The environmental objectives with regard to waste and energy management during the project lifecycle are:

- Minimise and manage the generation of waste from construction activities of the Project by reducing waste streams and recycling material where possible
- Dispose of waste in an environmentally acceptable manner and consistent with the requirements of the relevant regulatory authority
- All waste contractors are to be certified
- Reduce energy consumption.

4 Identification and Assessment

4.1 Waste Management Hierarchy

In all cases, the employee and contractors responsible for the construction, operation and decommissioning of the site will be expected to adhere to the legislation above to minimise the

amount of waste generated on site, and consequently, achieve the best environmental outcomes.

The Waste Management Hierarchy (WMH) describes the approach to waste management, to ensure the most efficient use of resources to reduce environmental harm, and to provide for the continual reduction in waste generation in line with the principles of ecologically sustainable development.

The WMH, from most preferable to least preferable, is presented below:

- Reduce: Avoid waste by reducing the quantity of waste being generated. This is the simplest and most cost-effective way to minimise waste. It is the most preferred option in the WMH.
- Reuse: Reuse is when a product is used again for the same or similar use, without reprocessing. Reusing a product more than once in its original form reduces the waste generation and energy consumption associated with recycling.
- Recycle/Recover: Recycling involves processing waste into a similar non-waste product, which consumes less energy than production from raw materials. Recycling prevents further environmental degradation and saves landfill space and resources.
- Treat Waste/Dispose: Removing waste from worksites, compounds and offices, and discarding the material in a licensed landfill site, or other appropriately licensed facility.

The following figure presents the hierarchy that should be followed.

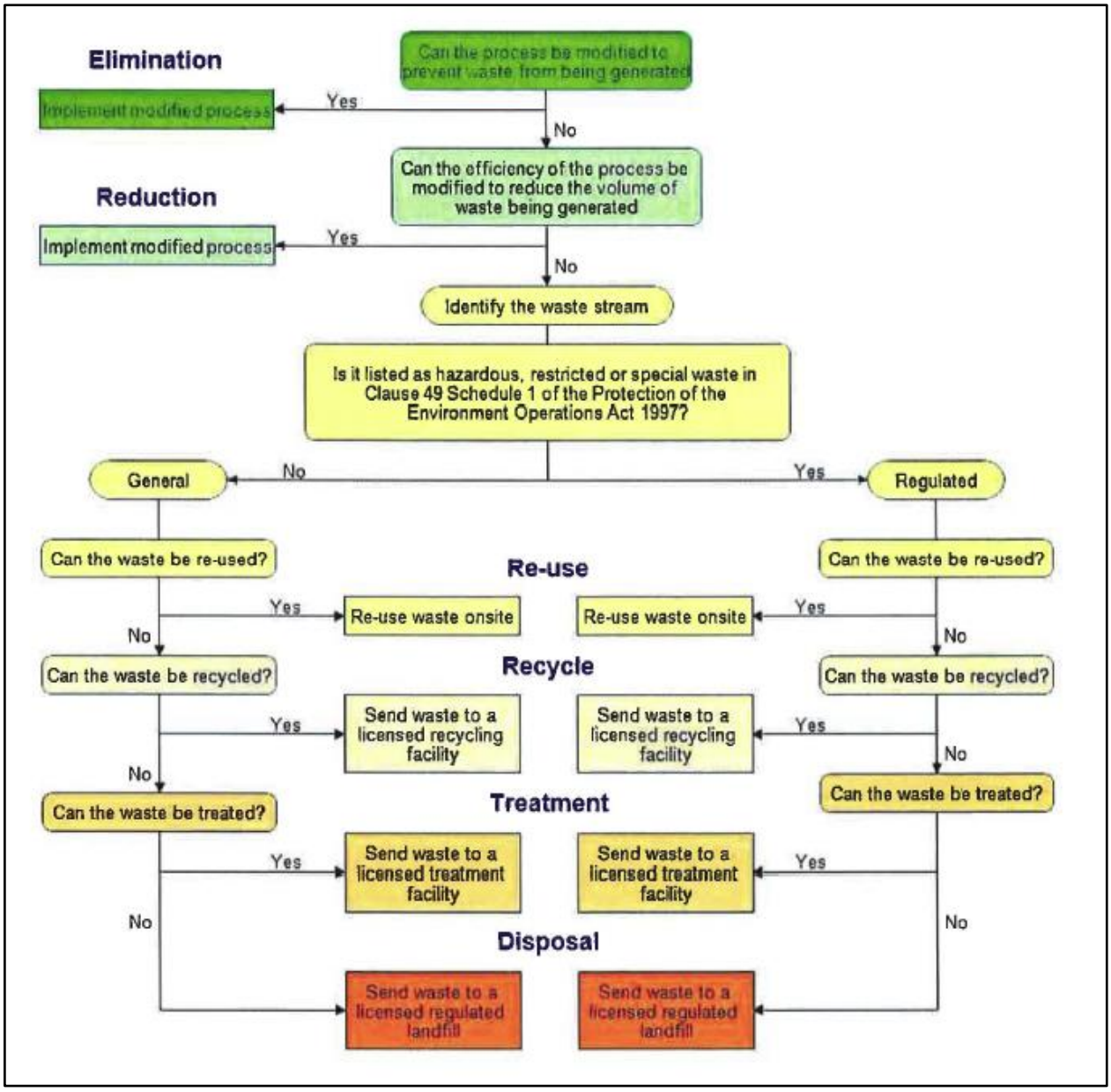

Figure 1: Waste Management Flow Chart

4.2 Waste Classification

Where waste cannot be avoided, reused or recycled it will be classified in accordance with the DECCW Guidelines "Waste Classification Guidelines" (DECC, 2009). These guidelines outline how to assess and classify waste and set out management options for the disposal of classified waste. A brief outline of the waste classification steps, as summarised in the Waste Classification Guidelines, is as follows:

- Establish if the waste should be classified as special waste.
- If not special waste, establish whether the waste should be classified as liquid waste.
- If not special waste or liquid waste, establish whether the waste is of a type that has already been classified under guidelines. To simplify this classification process, DECCW has 'pre-classified' commonly generated wastes.

- If the waste is not special waste, liquid waste, or pre-classified, establish if it has certain hazardous characteristics and can therefore be classified as hazardous waste.
- If the waste does not possess hazardous characteristics, it needs to be chemically assessed to determine what class of waste it is. If the waste is not chemically assessed, it should be treated as hazardous waste.
- If the waste is chemically assessed as general solid waste, a further test is available to determine whether the waste is putrescible or non-putrescible. This test determines whether the waste is capable of significant biological transformation. If the waste is not tested, it should be managed as general solid waste (putrescible).

Once the waste is classified, its appropriate management, transport and disposal shall be conducted in accordance with the relevant Waste Management Legislation.

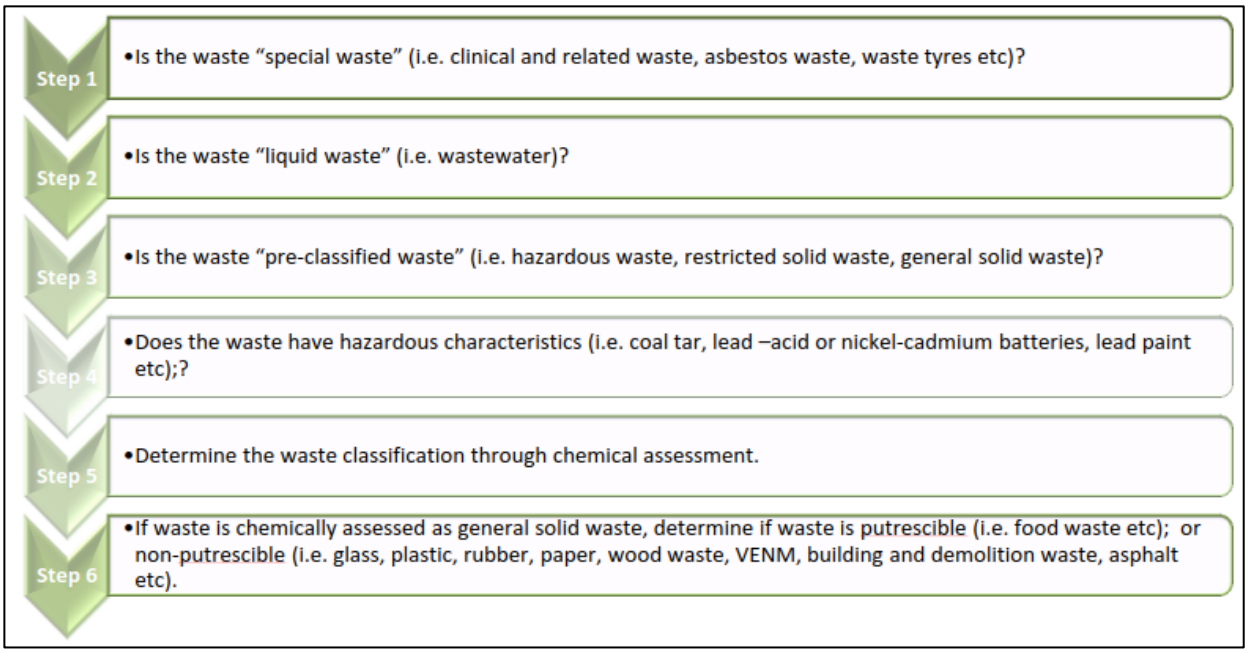

Figure 2: Waste Classification

5 Waste Types

5.1 Construction

Avoiding the generation of waste remains of highest importance to (project) when considering waste minimisation and management measures. Waste management and reuse strategies will be considered and implemented where practical and cost-effective as outlined in Table 1 (below). On-site reuse opportunities will be maximised, with efforts made to implement reuse and recycling initiatives.

Table 1: Potential Waste Streams

Activity / Waste	Types	Classification	Proposed Reuse / Recycling / Disposal Method
Site Clearing	Vegetation / weeds	General Solid (non-putrescible)	Weeds – Offsite disposal Crop Stubble - Reuse as compost for topsoil or soil conditioner
Excavation	Soils	General Solid (non-putrescible)	Balance cut and fill earthworks, where possible, to optimise reuse on the Project. Beneficial reuse onsite (such as noise mounds).
Building / Construction Waste	Steel reinforcing	General Solid (non-putrescible)	Off-site recycling
	Timber	General Solid (non-putrescible)	Chip & Compost or off-site recycling
	Conduits and pipes	General Solid (non-putrescible)	Off-site recycling
	Concrete (solids and washouts) and asphalt	General Solid (non-putrescible)	Crushed and used as backfill or as road base (intersection)
	Packaging materials, including wood, plastic, cardboard and metals	General Solid (non-putrescible)	Off-site disposal at an approved facility
	Empty oil and other Drums	General Solid (non-putrescible)	Off-site recycling
	Pesticides, herbicides, spill clean ups, paints and other chemicals	Hazardous waste	Off-site disposal at an approved facility
	Metals and bulk electrical cabling	General Solid (non-putrescible)	Off-site recycling
General Waste	Tyres	Special waste	Off-site disposal at an approved facility
	Waste generated by the maintenance of equipment including air and oil filters, worn components and rags	General Solid (non-putrescible)	Off-site disposal at an approved facility
	Oil, grease, fuel, chemicals and other fluids	Liquid	Off-site disposal at an approved facility
	Batteries	Hazardous Waste	Off-site disposal at an approved facility
	Domestic waste generated by workers	General solid (putrescibles)	Off-site disposal at an approved facility
	Sewage	General solid (putrescibles)	Off-site disposal at an approved facility
	Domestic waste generated by workers	General Solid (putrescible)	Off-site disposal at an approved facility

5.2 Operation

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. This would be treated in the same manner as construction waste, as detailed above.

5.3 Decommissioning

It is expected that the solar farm will be operational for at least 25 to 30 years. Upon decommissioning all infrastructure, including cabling and panels and mounting frames including footings and inverters would be disassembled and removed from the site. 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.

6 Potential Impacts

In the absence of waste control measures, the potential adverse impacts that could be caused as a result of the proposal include:

- Excessive waste to landfill
- Not meeting environmental objectives
- Additional risks associated with inadequately controlling the process of classifying, storing and finally disposing of wastes, causing pollution and possibly requiring future action to recover deposited materials, repatriate to an appropriate receiving location and remediate lands.

7 Waste Disposal Facility

All wastes generated by the proposal shall be removed to the Eugowra Waste Management Facility. Additional details regarding waste types accepted and recycled at the facility are provided below.

Table 2: Local Waste Facility

Name	Service Details	Address	Waste Accepted	Waste Recycled
Eugowra Waste Management Facility	Waste and recycling services	The Escort Way, Eugowra, NSW	General, construction, industrial, motor oils, tyres, scrap metal, green waste	Glass, plastic, steel and aluminium cans, paper and cardboard

8 Waste Control Measures

Project mitigation and management measures for waste and energy impacts during construction are outlined below:

- Identification of opportunities to avoid, reuse and recycle, in accordance with the waste hierarchy.
- Purchasing procedures are to be developed to ensure:
    - Items have minimal packaging
    - Less hazardous products selected wherever possible
- Provision for recycling management onsite
- Bins or skips will be used as temporary storage for waste generated
- Waste collection will be arranged at regular intervals to ensure no adverse impacts on the environment and community (such as overfilling of receptacles and subsequent littering, odour, pests or other disturbances)

- Waste storage areas will be clearly labelled and adequately bunded and located away from sensitive receptors/areas, drainage lines and watercourses
- Waste streams will be appropriately segregated and stored as either General waste, Recyclables waste or Regulated wastes within appropriate vessels
- Cement or concrete water in solution will be contained in an impervious concrete washout pit or receptacle whereby it cannot be released to waters, if required
- All waste hauled from site shall be covered
- Conduct inspections/audits to ensure waste is separated if required
- Follow manufacturer's instructions for disposal of chemicals (Material Safety Data Sheet) along with local waste disposal facility direct
- No Littering policy will be implemented. All litter will be picked up immediately and disposed of in appropriate receptacle
- Materials contaminated by leaks (such as fuel or oils) will be stored in a sealed container and transported to a suitable waste facility
- All products that are considered of concern in relation to the waste being generated will be replaced were possible for products that are less wasteful and/or considered to be environmentally friendly
- A Waste Register will be maintained to capture details of all waste collected for disposal and/or recycling; including amounts, date and time and details, and location of disposal.

8.1 Spills Management Procedure

Fuel kept onsite will be kept to a minimum. Only quantities that are required for a day (less than 10L of petrol and 20L of diesel) will be stored on-site. Fuel will be kept in jerry cans in a 40 ft service container which will only store tools and other non-flammable materials. When on site, fuels and oils will only be used in a well-ventilated area outdoors.

In the event of a hydrocarbon leak or spill, the Applicant would implement the following spill management procedure:

1. Source Control: isolate the source of spill or leak and stop the leak by either maintenance or placing the item within or over the fuel/oil storage area.
2. Recovery: recover as much as possible at the source by pumping free hydrocarbon from the surface and excavating hydrocarbon-contaminated materials. Contaminated materials would be stockpiled on site under cover and on an impermeable surface, e.g. a high-density polyethylene sheet. This material would later be bioremediated onsite and/or transported to an approved waste facility.
3. Remediation: transport the contaminated materials to a facility licensed to accept and treat hydrocarbon contaminated material.

9 Waste Transport

The following measures will be implemented to ensure that any waste leaving the site is transported and disposed of lawfully and in a way that does not pose a risk to human health or the environment:

- Waste transported to a lawful facility will be adequately covered to ensure that it does not fall or spill onto the road, and create dust or litter, or damage to other vehicles.

- The vehicle used to transport the waste must be maintained so as to avoid the waste spilling, leaking or otherwise escaping from the vehicle;
- Containers used to transport waste should be checked to ensure they are safely secured to the vehicle.

10 Record Keeping

10.1 Waste Tracking

The following wastes are subject to special monitoring and reporting requirements by DECCW under the waste tracking system:

- hazardous non-liquid waste (e.g. batteries)
- industrial non-liquid waste
- liquid wastes including non-recyclable oils, fuels, chemicals and paint

The Project has two options in order to comply with its waste tracking requirements, as follows:

- to deal directly with a licensed waste facility (located in Eugowra)
- to enter into an agreement with an authorised contractor who can make the arrangements on behalf of the project (principally located in Orange)

10.2 Waste Monitoring

All waste storage containers will be inspected weekly to ensure that they are maintained in a condition appropriate for their use and containment of the specific waste.
Skips and/or bins will need to be monitored regularly to ensure that cross contamination does not occur. All waste removed from site including products for reuse will also be monitored to ensure no cross contamination.

Records of classified waste generated at the site, treatment and disposal methods, approved contractors used for transporting and disposing of waste and the location of the facility for accepting the waste will be documented and retained.

Written records of waste sampling and classification results shall also be retained, in accordance with EPA's Waste Classification Guidelines (2014).

Records will include details such as information on the nature of the waste (classification, name and address of its origin and quantity), and copies of waste dockets/receipts for the waste facility (date, time of delivery, name and address of the facility, its ABN and a contact person). Records will be retained onsite so that regular reviews can be undertaken.