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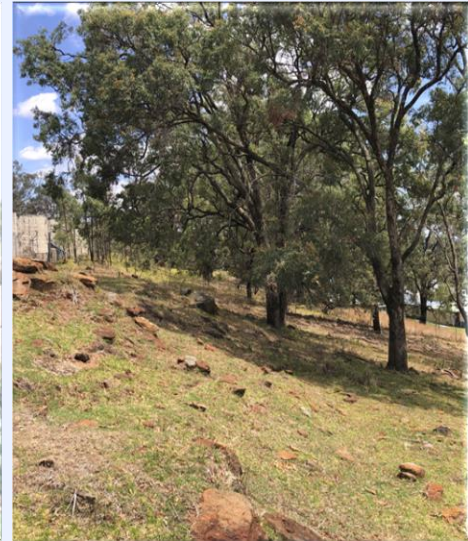
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STATEMENT OF ENVIRONMENTAL EFFECTS

APPLICATION FOR SOLAR FARM DEVELOPMENT

Agile Energy
L16/9 Castlereagh Street,
Sydney NSW 2000

March 2024

SMK Consultants Pty Ltd has prepared and published this document.

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DOCUMENT CONTROL

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0	December 2023	P. Taylor	Initial Issue
1	February 2024	P. Taylor	Issued to Client
2	March 2024	P. Taylor	Final issue

EXECUTIVE SUMMARY

Applicant:	Agile Energy Pty Ltd L16/9 Castlereagh Street Sydney NSW 2000
Subject Land:	7307 Gwydir Highway Inverell NSW 2360 Lot 2 DP 1028323, Lot 1 DP 1028323, Lot 83 DP 753638, and Lot 1 DP 373572
Zoning:	RU 1 - Primary Production
Proposed Development:	Application for approval of solar farm development
Permissibility:	The proposed development is permissible with consent under the Inverell Local Environmental Plan 2012 through the SEPP (Transport and Infrastructure) 2021
Type of Development:	Electricity Generating Works – Solar Energy System
Capital Investment Value:	\$4.8 Million.
Consent Authority:	The consent authority is Inverell Shire Council.

Proposal Summary

The development involves construction of a 3 Megawatt (DC) Solar Farm for the purpose of supplying renewable energy to the Bindaree Beef Group Abattoir. The development will consist of:

- 5520 x 550W Solar Modules (Panels);
- 24 x Low Voltage inverters (400V);
- 1 x 3MVA Transformer;
- Single Axis Tracker system on piers;
- Cabling and switchgear to transfer the electricity to the Abattoir;
- Surrounding chain link fence:

Total estimated cost of the development is \$4.8 M.

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1 Introduction

SMK Consultants has been engaged by Agile Energy Pty Ltd to prepare this Statement of Environmental Effects (SoEE). This report will accompany a Development Application to be submitted to the Inverell Shire Council for assessment of a proposed 3 Megawatt Solar Farm to provide a source of renewable energy to the Bindaree Beef Group's Inverell Abattoir.

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	Agile Energy Pty Ltd
ABN	18 638 064 856
Address of development site	7307 Gwydir Highway Inverell NSW 2360
Phone Number	1800 512 194
Contact Names	Nicholas Stavroulakis
Emails	nicholas.stavroulakis@agileenergy.com.au
Local Contact	Chris Edwards, Bindaree Beef, Ph. 6721 1411

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 Local Government areas. SMK Consultants has actively participated in many commercial, industrial, and retail developments.

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

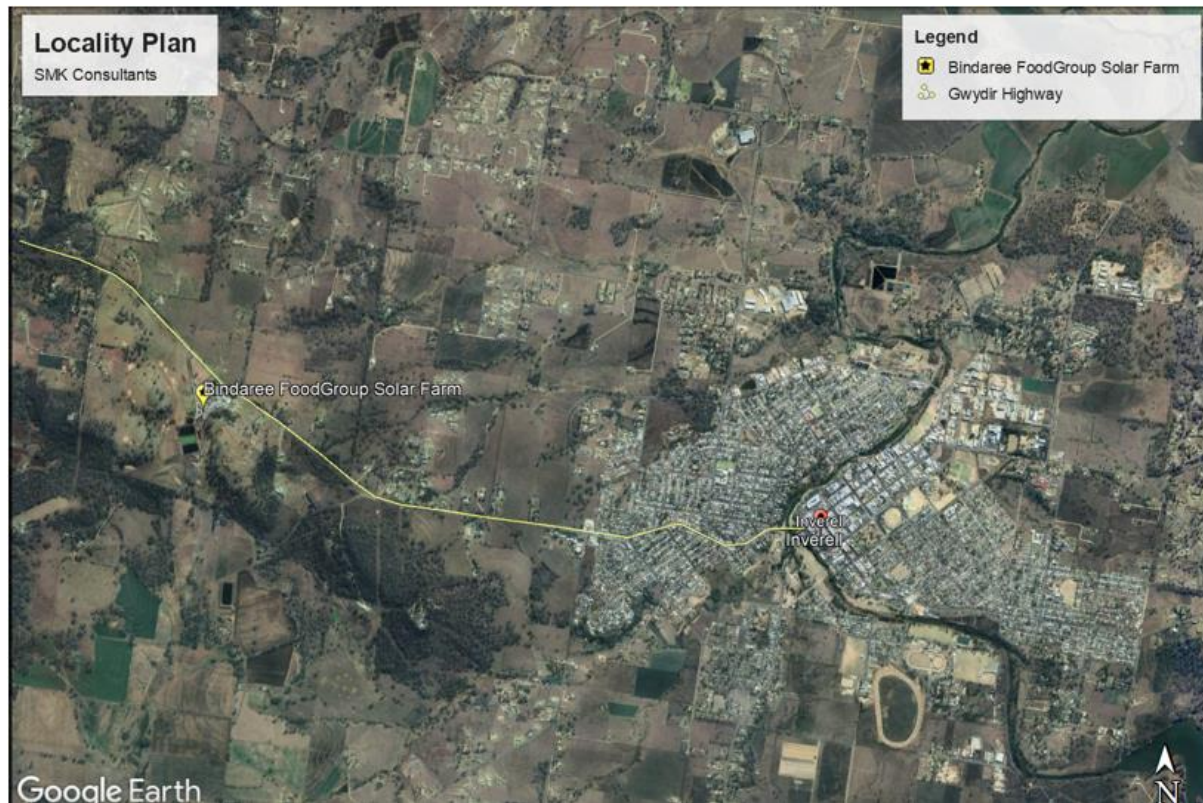
- **Biyomi Palkadapela** B.Sc. Hons, M.Sc.
- **Peter Taylor** BSc MEIANZ CIAg LAA

2 Site Analysis

2.1 Site Location

The proposed development site is at 7307 Gwydir Highway, Inverell. The site is located approximately 4 kilometres west of Inverell on the Gwydir Highway. A locality plan showing the site in relation to the township of Inverell is presented below.

Figure 1: Locality Plan



The Abattoir facility has been operating for more than 40-years. It is a well-established facility and one of the largest employers in Inverell.

2.2 Property Description

The land, known as Bindaree Abattoir incorporates an area of approximately 130 hectares. The property is zoned under the Inverell Local Environmental Plan 2013 as RU1 'Primary Production,' and are collectively owned by Yolarno Pty Ltd.

The property has undergone significant vegetation clearing for the development of the Abattoir facility. The Abattoir was established by North West Exports in the 1950's and has since expanded on numerous occasions to increase processing capacity and infrastructure improvements, including the disposal of wastewater and larger holding pens. Consequently, a substantial portion of the land has been cleared to accommodate the expanding operations, cultivation paddocks and cattle holding paddocks.

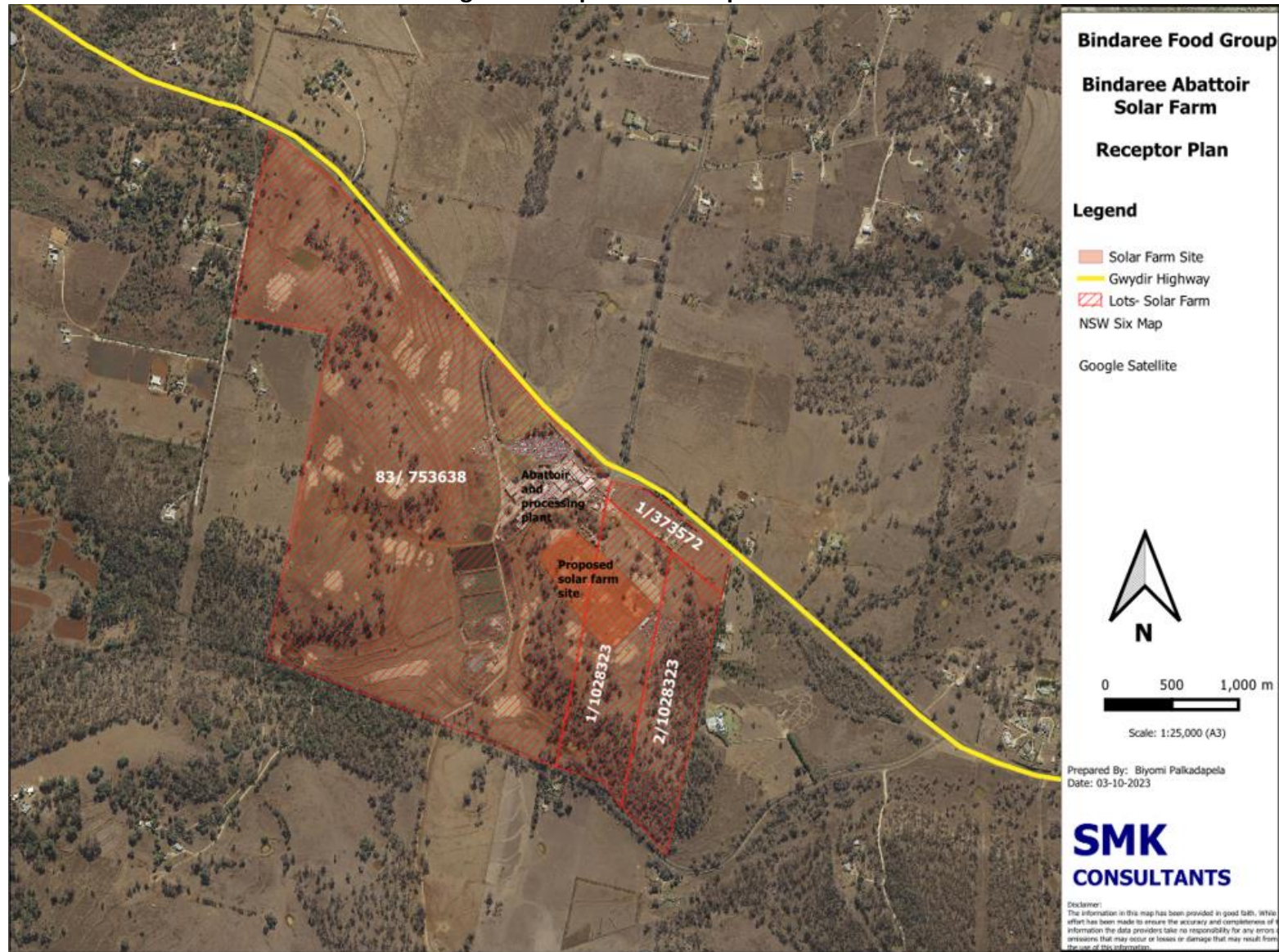
The solar farm will be constructed on two Lots. These Lots include Lot 1 DP 1028323 and Lot 83 DP 753638. The Solar farm will be constructed on an area which has traditionally been utilised as a holding yard for cattle to be processed through the Abattoir. The cattle yards consist of multiple pens surrounded by fencing. Concrete feed bunks were constructed through the centre of the yards. Water troughs are included in the yards.

The cattle yards were in full use in 2010. The number of cattle held in the yards has gradually declined since 2010 as the Abattoir has become more dependent on daily deliveries of cattle for processing. Less cattle are being held at the Abattoir for extended periods to avoid the requirement for holding extensive amounts of feed onsite.

Whilst being used for cattle feeding, ground cover on the proposed solar farm site was completely eaten out by the cattle. The area to be developed for the Solar Farm supports isolated trees and some dead trees with a ground cover of mainly Kikuyu grass. The remnant woodlands remaining on the property are consisted with Grassy White Box Yellow Box Woodland. This is consistent with 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 which is listed as a Critically Endangered Ecological community is provided for by Part 4 of the Biodiversity Conservation Act 2016.

The following aerial image provides the primary area of the Abattoir based on Lots, to be serviced by the Solar Farm.

Figure 2: Proposed Development Site



3 Development Details

3.1 Proposal Description

The proposal forms part of Bindaree Beef's strategy to reduce its annual energy consumption costs and carbon footprint, which will contribute to increasing the Company's financial stability. It demonstrates the leadership and positions of the company for economic growth in the renewable energy sector.

Agile Energy Pty Ltd, located at Level 16, 9 Castlereagh Street in Sydney, has been engaged to construct a solar farm at Bindaree site. Agile Energy aims to deliver the solar farm installation that will cater to the specific needs of the Bindaree Beef and make a valuable contribution to the energy landscape.

The solar farm development consists of following components:

- 5,520 Trina Vertex 550W Solar Panel Modules;
- 24 x Sungrow SG110CX Low Voltage inverters (400V);
- 1 x 3 MVA Tyree Ground Mounted Transformer;
- Single Axis Tracker system with pile driven piers;
- Surrounding chain link fence with 2 x 6m double gates;
- Below ground DC Cable connecting from Solar Farm inverters to the edge of the cleared Abattoir site;
- Above ground pole for over-head connection to a Ground Mounted transformer to be located adjacent to Abattoir buildings.

The following figure and Appendix 1 include the proposed development layout of the infrastructure associated with the solar farm. The prime purpose of the solar farm is to provide electricity to the Abattoir. This will be connected to the existing system from the electricity grid which is supplying electricity to the Abattoir at present.

The solar farm is intended to connect to the grid after securing approval from Essential Energy, with a maximum transfer capacity of 3 Megawatt (DC) for any excess power generated from the solar farm. 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.

The project intends to utilise the current site access, which connects to the property from the eastern side via Gwydir Highway through Lot 1 DP 373572. Existing internal roads will be used to access the solar farm site.

The installation work will retain the existing ground cover. This consists of grass which will be used to stabilise the soil during the installation of piers and posts. Minimal earthworks will be required for the installation and therefore ground disturbance will be minimised.

Figure 3: Layout of Bindaree Solar Farm



DRAWING NUMBER 151-30		TITLE CIVIL LAYOUT	CLIENT BINDAREE BEEF	 E: info@asvsolar.com.au W: www.asvsolar.com.au	 E: support@agileenergy.com.au W: www.agileenergy.com.au	REVISION SCHEDULE			
SHEET NO. 47	REV. NO. 1	REVISIONS	APPROVAL STAGE PRELIMINARY			PROJECT BINDAREE BEEF INVERELL 1307 GARDIF HIGHWAY, INVERELL NSW 2340	REV.	DATE	DESCRIPTION
DRAWN BY: GEV	CHECKED BY: NLS								
DATE: 15/11/23	SCALE: 1:500								

3.2 Infrastructure

The solar farm will consist of five (5) rows of solar panels. The rows will be aligned in a north-south direction and the panels will align in an east-west direction. The system will have electrical motors to tilt the panels. The tilting system will allow the panels to automatically tilt to an angle of 50 degrees to the north and then tilt to 50 degrees toward the horizontal in the middle of the day.

The rows of panels have been designed to fit within the cleared holding paddocks which were once used to hold cattle prior to processing through the Abattoir.

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).

All structures will be pre-fabricated offsite and delivered to the site in shipping containers.

3.2.1.1 Foundations and Structure Height

Each row of panels will be mounted on a steel frame. Piers to support this frame will be drilled to a design depth of 2.2m below ground level. The piers are to be concreted into the ground for stability. The site condition includes exposed rocks. As part of the foundation construction works, rocks located at the site of a pier will be excavated and placed to the side of the solar farm area. Where the rocks are too big for removal, the option of moving the piers and the potential of installing additional piers will be available to the installation contractor. The installation of a stable pier platform will be essential to the structural integrity of the solar panel frame.

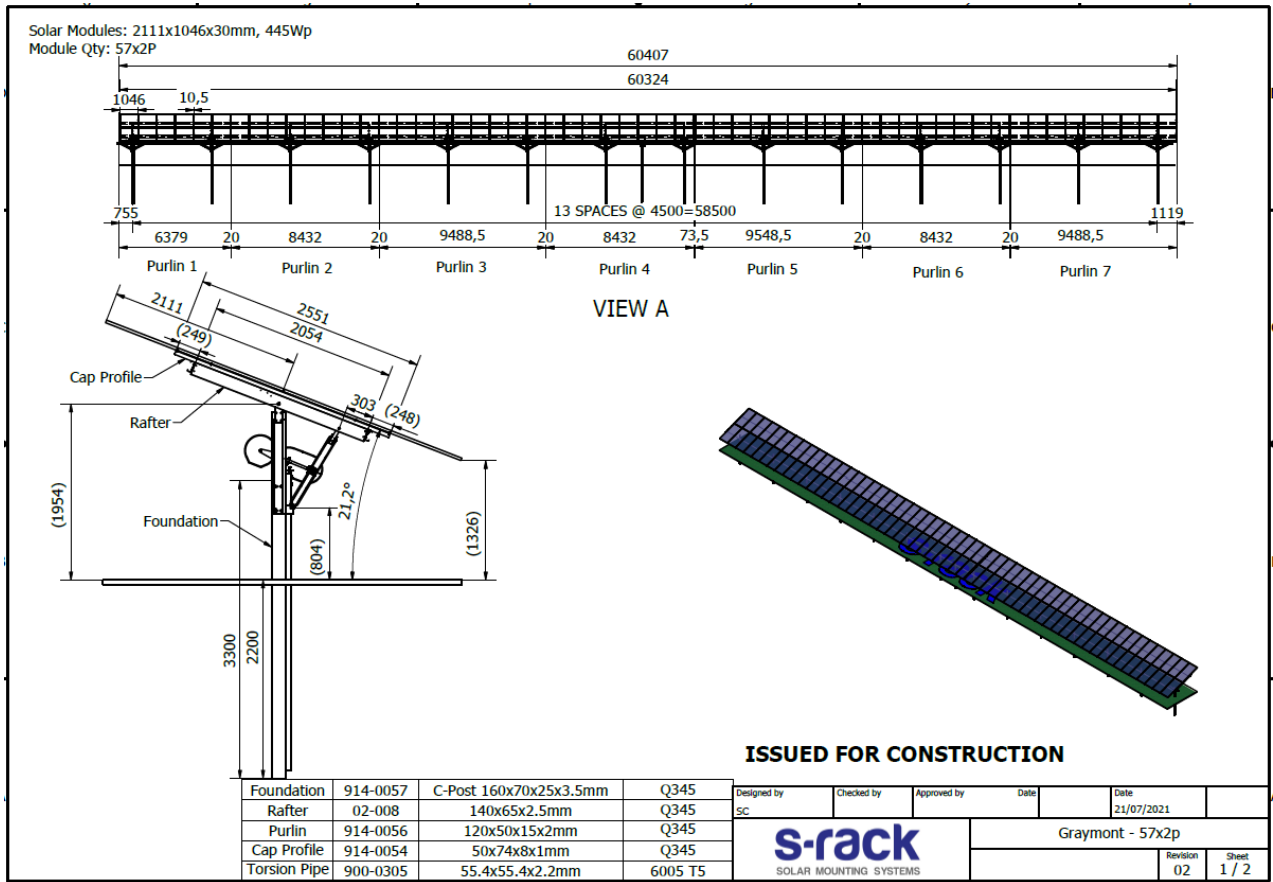
Once the piers are drilled and set, the motor frame and support frame will be installed. Each individual row of panels will have one electric motor to tilt the panels. This will be fitted to a chain drive on the torsion tube which will tilt the panels. The motor is fitted below the solar panels and therefore the solar panels will deflect any noise generated from the motor.

Once the motor and torsion bar is fitted to operate the tilt mechanism, the solar panels will be fitted onto an aluminium frame. The panels are approximately 4.22m long and 1.12m wide. This solar panel frame is centralised on the piers and has a support width of 2.551m. The framing is designed to withstand wind speeds of up to 260 km/h but the machine is normally fitted with a wind sensor which flattens the solar panels at wind speeds in excess of 160 km/h.

The centre access of the tilting frame will be approximately 1.954m above ground level. At maximum tilt, the top of the solar panels will be at a height of up to approximately 3.55m. This may occur for a short period of time to capture the early morning sun.

The following plan provides details of the solar panel array and foundations.

Figure 4: Detailed Cross Section of Solar Array



The following photo is provided from the Brochure for the producer of these solar panel systems. The photo shows a typical layout when the panels are close to level.

Figure 5: Example of tilted solar panel frame when flat.



3.2.2 Combined Inverter and Transformer Stations

The inverter stations convert DC power into AC power and feed into the transformer to be located adjacent to the Abattoir. The converted electricity will feed into the Abattoir's High Voltage feed line into the building to supply the local load into the Abattoir. Subject to obtaining a network connection approval, the system can feed back into the existing Essential Energy's 22kV distribution network which is connected to the Abattoir from overhead transmission lines along the Gwydir Highway.

Within the solar farm, multiple strings of PV panels connect to DC combiner boxes which are then connected to the inverter at the required DC input voltage.

(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 of electrical energy that consumers use.)

The 24 inverter stations will convert the electricity and send this to the transformer to generate an output voltage of 22 kV. The proposed combined inverter and transformer station will be similar to the one displayed in the figure below. The inverters will have dimensions of approximately 1.051m wide by 0.66m high by 0.36 in depth. The following provides an example of two inverters mounted on a solar frame structure.

Figure 6: Inverter SG110cx



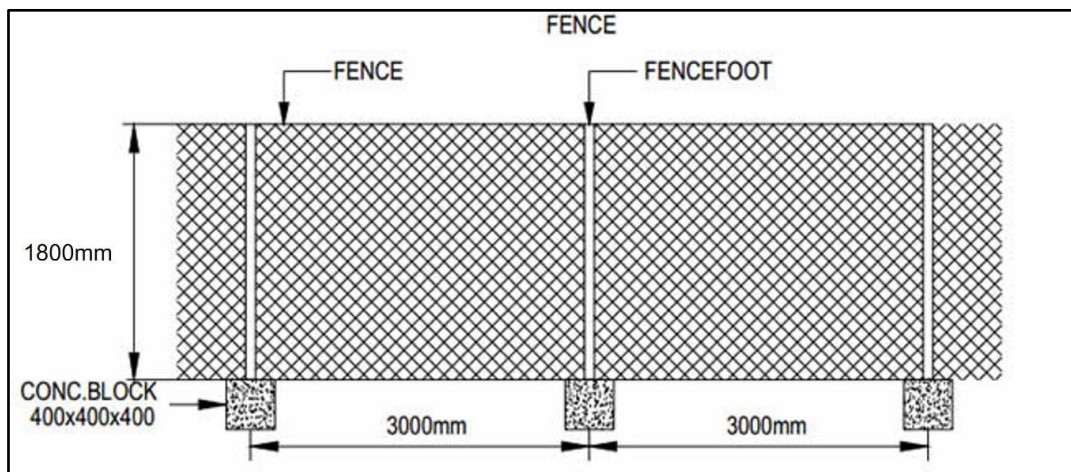
The solar farm will be monitored remotely through data communications and a monitoring network to manage the performance on the system, any faults, and will allow optimisation of grid network feed-in opportunities if any excess power is generated.

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 and it will be required to be man-proof and also prevent animals such as cows from entering the site and damaging the equipment. The fence will be located with a suitable buffer of 8m or more around the solar panels to allow machinery access around the site.

An indicative security fence is displayed in below.

Figure 7: Indicative Security Fence



3.3 Construction

3.3.1 Construction Timeline

Construction is estimated to take approximately 6-months. 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 refer to the initial preparation work required before the actual construction work begins. This includes setting up the construction compound and laydown area, building perimeter fencing, creating internal roads, and installing erosion and sediment

controls. Within the subject lot, minor site preparation and earthworks will also be carried out. Due to safety concerns and the impact on the solar farm's efficiency, it has become necessary to remove two native trees, specifically two White Box (*Eucalyptus albens*), currently located within the construction site.

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

The system will be delivered in approximately 20-shipping containers. These will be delivered by semi-trailers. Several other truck movements will be generated. These will include a drilled rig to drill the foundation pier holes, concrete trucks for foundation construction and trucks associated with installation of the overhead power lines.

3.3.2 Construction Workforce

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

- The framing team will install the piers or solar frames;
- The assembly team will mount 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 inverter and transformer.

It is expected that the construction workforce at its peak will be approximately 20 staff members on-site.

The workforce will generate up to 10-light vehicles per working day.

3.3.3 Construction Hours

Construction activity will be restricted to the Interim Construction Noise Guideline (DECC, 2009) recommended standard hours. The recommended standard hours for the construction works are shown in the table below.

Table 2: Recommended standard hours for construction work

Work Type	Recommended standard hours of works
Normal construction	Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays

3.3.4 Site Preparation

Minimal earthworks will be required. The solar farm is to be located on a southerly sloping ground. The site is gently sloping and is suitable for the installation of solar without the requirement for levelling works other than removal of old fences and fence lines in addition to several boulders which may impede the foundations.

Two isolated White box trees and potentially one planted Kurrajong tree will need to be removed prior to construction.

The grass will be mown short prior to installation but it will be retained as a protective layer during installation of the works. No specific sediment and erosion controls are required if the grass is retained. The grass will be the receiving body for rainfall runoff from the panels. Rain will immediately drain from the panels onto the grass. The grass will absorb the rainfall the same as it is at present and therefore no change will occur to the runoff characteristics of the site.

The site drains towards the southwest and eventually captured by an existing farm dam situated within the western end of the Abattoir cattle receival area. The dam serves as a sediment pond that collects the runoff originating from within the site.

3.4 Final Land Management

The site currently supports a range of ground cover vegetation consisting planted kikuyu grasses as the site was recently used for cattle grazing. Site preparation will involve mowing prior to the installation of modules if the grass is long.

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

To manage the vegetation beneath the solar panels in the long term, the proposed approach involves using a mower or slasher between the panels and along access roads. The aim is to maintain low groundcover levels to prevent any negative impact on the solar panels and associated infrastructure. This method also helps to reduce potential fire hazards. The solar farm site may utilize grazing animals such as sheep under limited circumstances as the potential for such animals to damage internal wiring structures is minor but significant. Subject to grass growth, the option of using selective herbicides is available. The potential to utilise robotic mowers is also available to manage and maintain the vegetation cover in areas which cannot be accessed by standard mowing equipment.

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.

3.5 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.

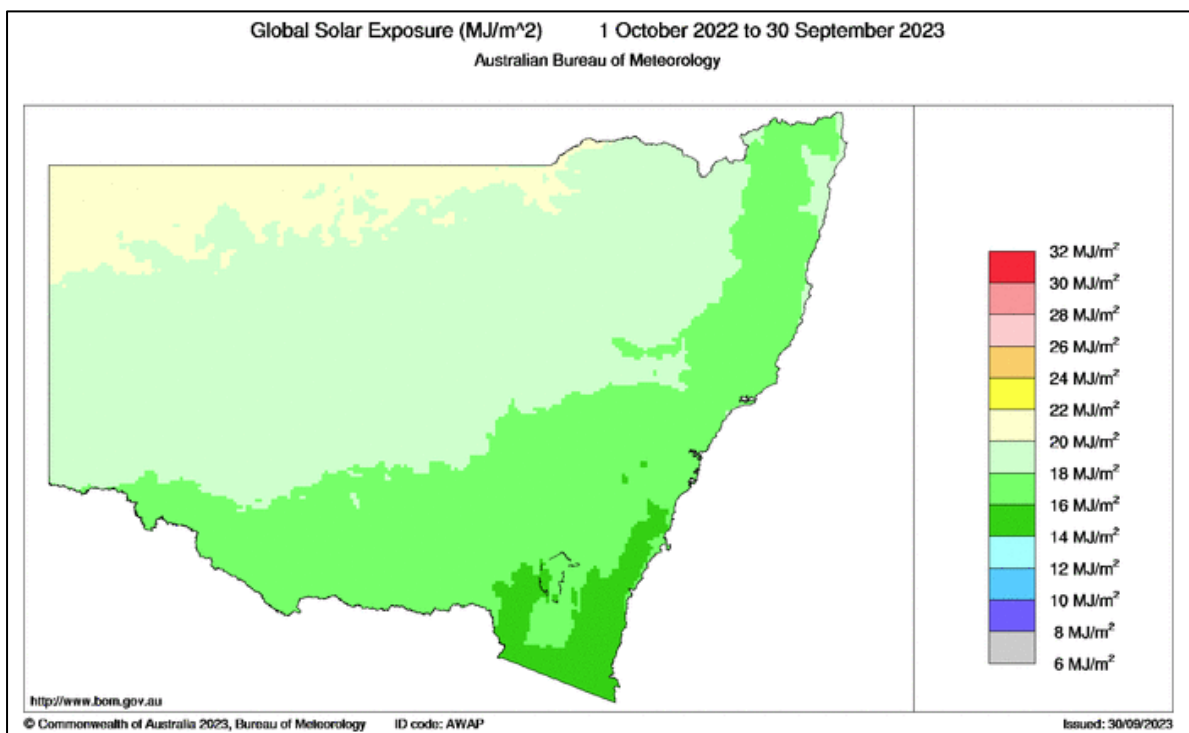
Site maintenance will also include replacement of any faulty wiring and parts of the solar frame structure. Multiple electrical components form part of the system including moving parts such as the tilt frames. These will be checked; however, the system is designed to be self-sealed and does not require constant lubrication of moving parts.

4 Climate for Solar Farms

Global solar exposure is described on the Bureau of Meteorology website as the total amount of solar energy falling on a horizontal surface. The daily global solar exposure is the total solar energy for a day. Typical values for daily global solar exposure range from 1 to 35 MJ/m² (megajoules per square metre). The values are usually highest in clear sun conditions during the summer and lowest during winter or very cloudy days.

The figure below shows the average daily solar exposure for the 12 months between the 1st of October 2022 and the 30th of September 2023. Inverell LGA has received, on average, between 16 and 20 MJ/m² daily, placing it within the second-highest area receiving solar radiation in New South Wales.

Figure 8: Average Daily Solar Exposure for NSW.



The following table provides the mean daily solar exposure measured at the Inverell Research Centre BOM Site (Station number 56018), the closest measuring station to the proposed Bindaree Solar Farm site. The annual average is 18.8 MJ/m² (1990-2023).

Table 3: Mean Daily Solar Exposure (MJ/m²) at Inverell BOM Site

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
25.6	22.8	20.0	16.2	12.8	10.8	11.8	15.1	18.9	22.1	24.0	25.5

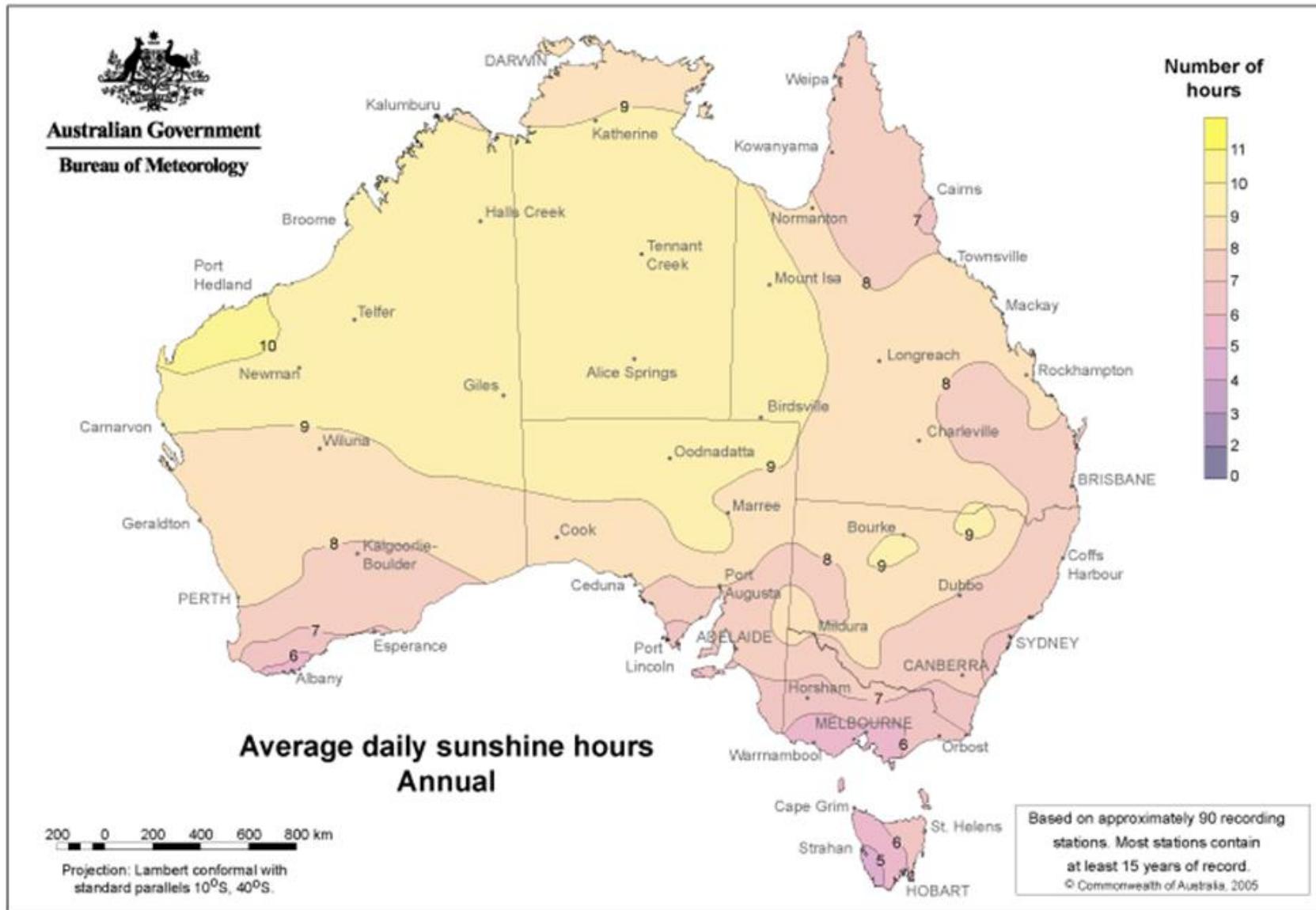
Source: Climate Statistics, BOM (February 2022).

The figure below shows the average daily hours of sunshine across Australia. Inverell LGA receives an average of 7 to 8 hours of sunshine daily.

Global solar exposure coincides with seasons – the longer the daylight hours, the greater the solar radiation due to the earth's tilt during summer. Rainfall is spread relatively evenly across the year and, as a result, does not appear to impact the level of solar radiation.

Solar exposure estimates are essential for various applications, including agriculture, power generation and solar heating system design and use. This climatic information from the Australian Bureau of Meteorology indicates that global solar exposure, or solar radiation, is sufficient to support power generation in the proposed location.

Figure 9: : Average Daily Sunshine Hours.



5 Planning Considerations

5.1 Required Approvals

The proposed development is not considered as regional development. Schedule 6 of the *State Environmental Planning Policy (Planning Systems) 2021, private infrastructure and community facilities* sets a capital investment threshold of \$5 million for projects that include electricity generating works. Exceedance of this threshold would mean that the proposal would be referred to the Joint Regional Planning Panel (JRPP) who would then be authorised to exercise the consent authority functions of the Council.

The proposed development has an estimated capital investment value of \$4.8 million, and therefore it is not classified as a "Regional Development."

The Inverell Shire Council is the consent authority for this development proposal.

5.2 Commonwealth Legislation

5.2.1 *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.

5.3 State Legislation

5.3.1 *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 planning and 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.

5.3.1.1 *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 (MW) of electrical power.

The proposed development is predicted to generate a maximum of 3 MW AC. The proposal is not considered designated development. The development is classified as non-designated.

5.3.1.2 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 other Acts and Regulations within NSW.

5.3.1.3 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.

5.3.2 Biodiversity Conservation Act

The *Biodiversity Conservation Act* (BC 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.

The proposed solar farm is being assessed under Part 4 of the EP& A Act. For this development, the BC Act asks three basic questions, mainly:

1. Is there native vegetation clearing or a prescribed biodiversity impact on land mapped on the Biodiversity Values Map;
2. Does the clearing of native vegetation exceed the area threshold;
3. Is it likely to significantly affect Threatened Species, ecological habitats or their habitats, according to the threatened species test of significance.

The subject site is not mapped on the biodiversity values map data base prepared by NSW DPE.

The subject Lot was assessed using the online Biodiversity Offsets Scheme Entry Tool, which is used to determine the area threshold. According to BOS, the area clearing threshold for the subject site would be 1 Ha of clearing of native vegetation. The solar farm is to be built on a site which previously supported intensive use cattle yards as part of the Abattoir operation. The intensive use of the site has removed the native ground cover and most of the trees. The site now supports mainly Kikuyu grass and a few isolated native trees including White box, Iron Bark and a Kurrajong. The presence of three trees does not make this a woodland area. A review of the native vegetation data base for NSW (SEED Mapping), confirmed that the site is not mapped to support native vegetation.

The solar farm is to be connected to the Abattoir site via a below ground electrical cable. Construction of this cable will involve a narrow pathway of disturbance along the route of other existing infrastructure. No trees are to be cleared. The work will disturb ground cover for a short period of time during construction. This ground cover is expected to regrow and return to the same species. This will include some native species. The temporary clearing of this line will consist of less land than the permissible 1 Ha and therefore the disturbance would not trigger the requirement to obtain a BDAR.

The third parameter to be assessed under the BC Act is 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) is included as Appendix

5. It was determined that the proposal is not likely to significantly affect Threatened Species, ecological habitats or their habitats and that further assessment under the BAM and the preparation of a BDAR is not required.

5.3.3 State Environmental Planning Policies

Table below 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

5.3.3.1 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 \$4.8 million and accordingly may be assessed by the Inverell Shire Council.

5.3.3.2 State Environmental Planning Policy (Biodiversity and Conservation) 2021

5.3.3.2.1 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.’ It is noted that 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. It is also noted that the development is located in a rural area.

5.3.3.2.2 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 Inverell 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, which 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 assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as present in the previous 18 years.
- **Koala Habitat** means koala habitat; however, it is described in a management plan 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 Inverell LGA, listed within Schedule 2, and the proposal has an area of more than 1 Ha.

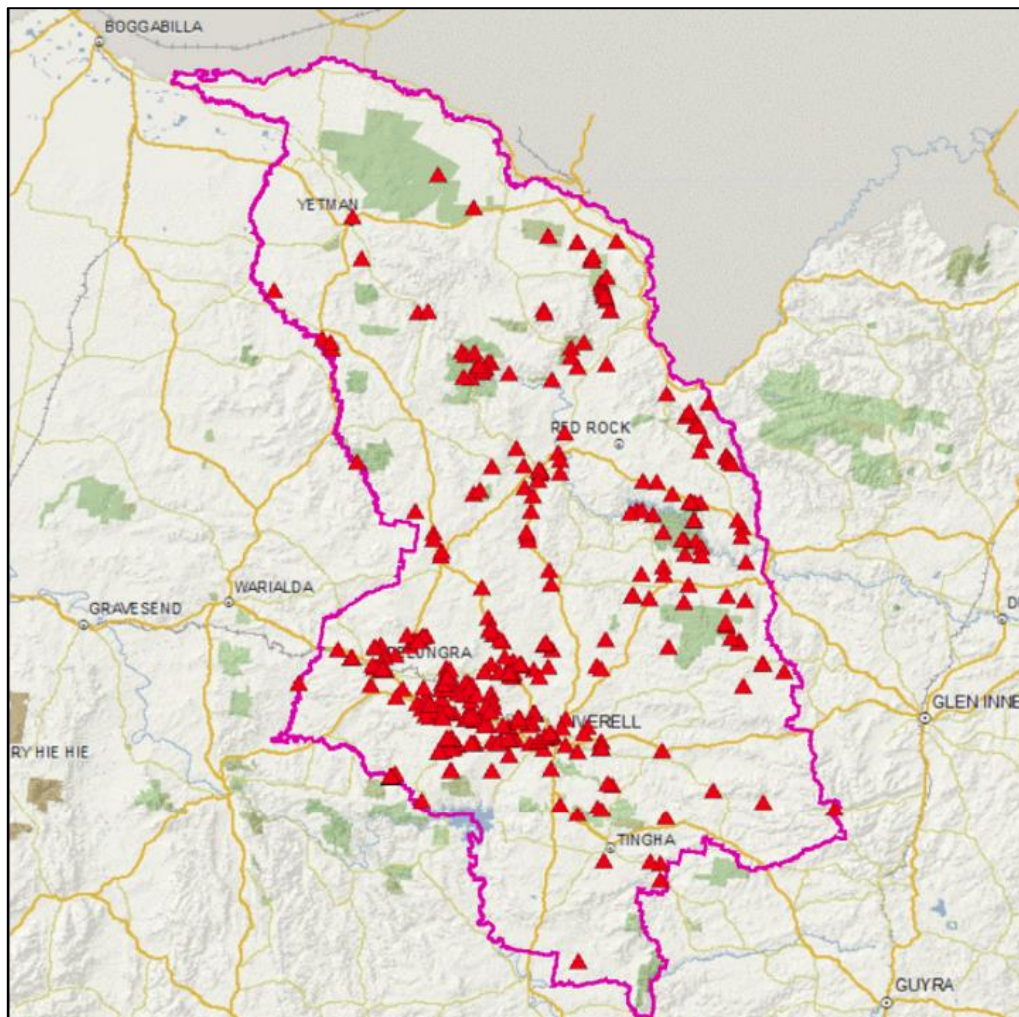
The proposed development area is predominantly covered by non-native grassland, with a three isolated trees. The white box and Ironbark are considered to be Koala use trees and therefore the presence of Koala and the impact on their habitat must be considered.

The site was inspected for signs of Koala such as tracks and scats. None were found. No Koala were observed and local knowledge from Abattoir employees noted that they had not observed Koalas in this part of the property. This is considered mostly an issue of a lack of trees and lack of continuous woodland within the old cattle yard area.

Given these facts, the habitat within the proposed development footprint is not suitable for supporting Koalas. It does not qualify as a core Koala habitat, as defined and does not meet the criteria for potential koala habitat outlined in the SEPP (Koala Habitat Protection) 2019.

For reference, the accompanying figure provides a map illustrating all recorded Koala sightings within the Inverell Shire. The red triangles on the map signify these recorded sightings, indicating several Koala sightings documented within the Inverell Local Government Area.

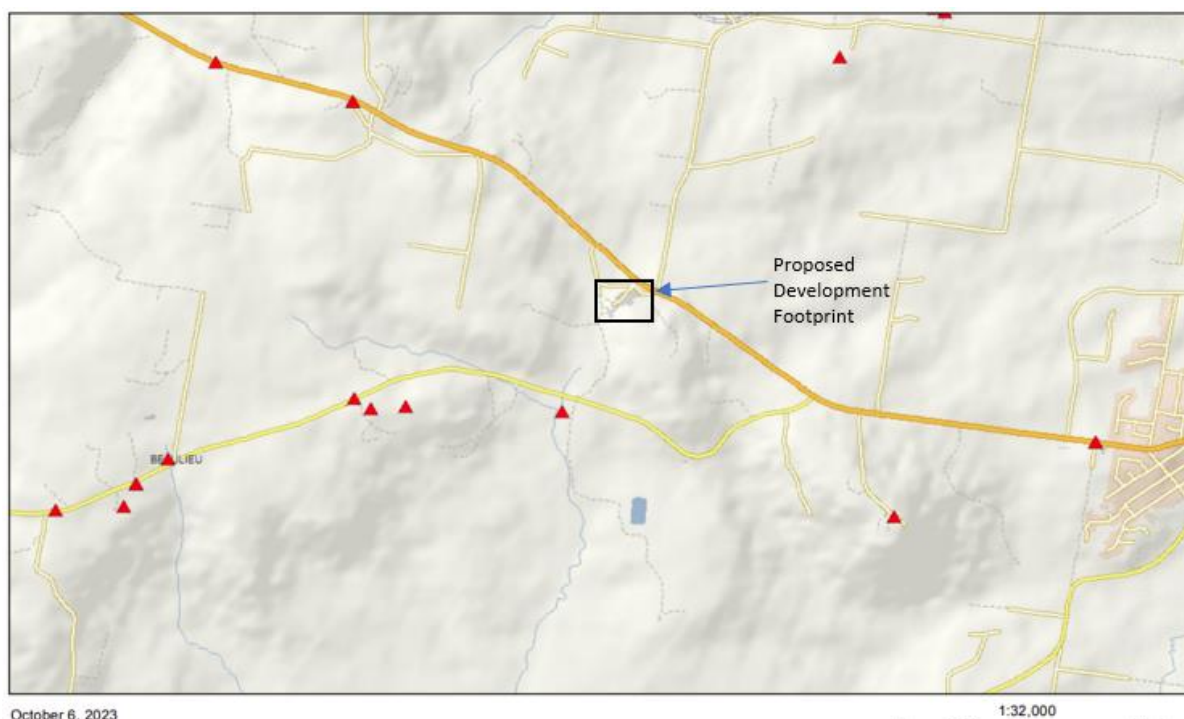
Figure 10: Distribution of Koala records within the Inverell LGA (Bionet, 2023).



The proposed development in Inverell LGA has been the site of multiple recorded Koala sightings. As a result, it is imperative to conduct a thorough assessment of the area. This was completed as part of the investigation.

The search focused on the proposed development site, including a buffer zone of 2 km as indicated in the figure below. It should be noted that a recorded sighting was reported approximately 635 meters southeast of the southern boundary of the proposed site, near Auburn Vale Creek. The Copeton dam road separates the development site and the recorded koala sighting.

Based on these factors, it can be concluded that the subject site is not considered potential or core Koala habitat.

Figure 11: Recorded Koala sightings near Bindaree Abattoir.

5.3.3.3 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 Inverell Shire. The proposed development site is not considered as contaminated land as it has not historically been subjected to any contaminating activities such as industry associated with the Abattoir or agricultural activity such as old spray or plunge dips. Historical use of the site includes cattle grazing and intensive feeding of cattle prior to processing through the Abattoir. At present, the land is not used.

A preliminary site contamination assessment was undertaken at the site, and this has been included within Appendix 3. The site is considered suitable for the proposed development of a solar farm.

5.3.3.4 State Environmental Planning Policy (Transport and Infrastructure) 2021

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

5.3.3.4.1 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 *“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 is permissible with development consent.

5.3.3.4.2 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 Bindaree Solar farm is isolated from existing electricity transmission lines and will not impact such. As a result, there will be no impact on any electricity transmission lines and Clause 2.48 will not be applicable.

At a later date, the solar system will be connected to local transmission lines subject to approval of electricity authorities. This is a separate application outside of the provisions of this SEPP and remains subject to a process reviewed by Essential Energy. This process does not require a separate or amended development application under the Environmental Planning and Assessment Act 1979 as the proposal is included as part of this application.

5.3.3.4.3 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 per day during its construction or operational phase.

5.4 New England Northwest Regional Plan 2041

The existing New England Northwest Regional Plan 2036 underwent its first 5-year review redefining its priorities and extending its scope to 2041. The updated draft of the New England Northwest Regional Plan 2041, following a period of public exhibition, was finalised and officially published in September 2022.

Within Part 3 of the regional plan, objective 09 focused on "Lead renewable energy technology and investment is the technical innovation is driving changes in energy generation and storage. The NSW government's Electricity Infrastructure Roadmap serves as a coordinated framework for a modern electricity system for NSW is expected to attract up to \$32 billion in private investment for regional energy infrastructure by 2030."

The Plan also address an important consideration: While wind farms have proven to be compatible with existing agricultural uses, there are concerns about the cumulative impacts of solar farms on agricultural land. To address this concern, the plan introduced the Large-Scale Solar Energy Guideline which aims to ensure that impacts are assessed with best practice methods and in a consistent manner, effective stakeholder engagement encouraging community input on solar energy development.

Land zoning should not prohibit environmental initiatives and infrastructure. To help support the growth of both the renewable energy and agriculture sectors, the Minister for Energy and the Minister for Agriculture and Western NSW announced in March 2022 a taskforce to review the framework for managing issues and opportunities from the forecast growth in the renewable energy and the agricultural sectors in NSW.

The site of the solar farm is part of the ongoing operations of the Bindaree Abattoir. The site forms part of this industrial development. Its agricultural purpose is limited to activities associated with the Abattoir facility. The use of the site for a solar farm is considered to be ancillary to the Abattoir operation and the aims of the Abattoir to improve the use of renewable energy for its operations.

5.5 Strategic Plan

The Department of Industry's 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 and projects;
- Goal 2 – build community support; and
- Goal 3 – attract and grow renewable energy expertise.

The proposed development is aimed at achieving the NSW Government's renewable energy targets. It will contribute to increasing renewable energy generation in NSW and create new employment opportunities in the solar industry.

5.6 Local Environmental Plan

The development site is zoned RU1 Primary Production under the *Inverell Local Environmental Plan 2012*. 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 Clause 2.36 (9) 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 *Inverell Local Environmental Plan 2012* for zone RU1 Primary Production which are:

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

Comment: The development serves to enhance current land use as it augments current agricultural operations. Accordingly, it increases sustainability and economic diversity, whilst not fragmenting any land or causing a conflict between neighbouring land uses. The site is contained within part of Bindaree Abattoir. Landuse will be restricted on this site whilst the Abattoir is in operation.

5.7 Development Control Plan

The *Inverell Development Control Plan 2013* (IDCP) prepared in accordance with Section 3.43 of the Environmental Planning and Assessment Act 1979 No 203 (EP&A Act), applies to this development. The proposal is considered under this IDCP as Commercial and Industrial

Development. This application would be assessed under chapter 4: Commercial and Industrial Development.

This development may be subject to the New development and Building Chapter of the IDCP. In accordance with this chapter Council Officers will use their discretion in determining if the proposed development requires notification and whom is to be notified.

Overall, the proposed development is considered to comply with the requirements included within the Commercial and Industrial Development chapter of the *Development Control Plan 2013*.

5.8 Local Strategic Plans

The future planning initiatives of the Inverell Shire Council are structured into three distinct documents, including Community strategic plan, delivery plan and operational plan. These documents collectively serve as a comprehensive framework to address and fulfill the evolving requirements of the future needs of the community.

5.8.1 Community Strategic Plan

Inverell Shire Council's Local Strategic Planning Statement (LSPS) builds on the community's aspirations expressed in the *Inverell Shire Community Strategic Plan 2009 – 2029* and is consistent with the NSW Government's *Integrated planning and reporting framework*.

This Statement identifies five (5) Planning Priorities to achieve Council's vision for Inverell Shire, along with actions and the means for monitoring and reporting. Planning Priority 2 of the Plan is to 'reduce the consumption of non-renewable resources', in order to support the development of an environmentally sustainable community.

The proposal is considered to align with Inverell Shire Council's LSPS, directly contributing to the achievement of one of its Planning Priorities. This Statement of Environmental Effects examines the suitability of the site for the development of a solar farm. Given the site's location within land controlled by and use for operation of the Bindaree Abattoir, the selected site is overall considered appropriate for the proposal, noting that Bindaree Beef is one of the largest employees in the Shire.

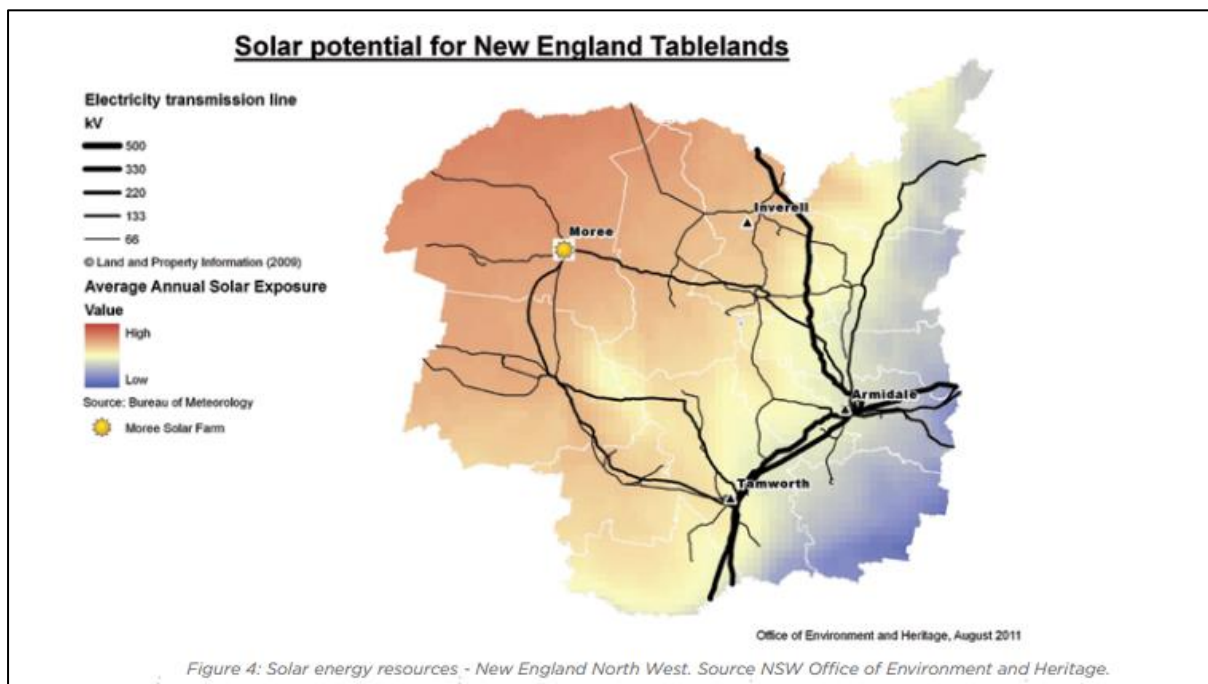
5.8.2 Strategic Regional Land Use Plan

The *Strategic Regional Land Use Plan- New England Northwest 2012* establishes guidance to balancing strong economic growth in regional NSW with the protection of our most valuable agricultural land and sustainable management of our natural resources in the New England North West region. The plan provides land use recommendations for agriculture, industry, residential and rural subdivision, natural and scenic environment and heritage and culture.

In the Chapter 9 of the plan, titled “Natural Hazards and climate change describe the New England North West region possesses considerable potential to help mitigate climate change impacts by leading the transition for NSW towards cleaner, renewable sources of energy that emit lower greenhouse emissions due to its natural and physical attributes for wind power on the Northern Tablelands and for solar power on the Northwest Slopes and Plains which provide an opportunity to contribute toward the 20% renewable energy target set in NSW 2021.

The region’s abundant resources that could be used to generate lower emissions energy that contributes to the mitigation of climate change. For example, the New England Tablelands has areas with conditions suitable for electricity generation from wind farms, while the Northwest Slopes and Plains has excellent conditions for solar power farms due to high solar radiation levels and a suitable average temperature range for photovoltaic systems. The plan provides a visual representation of potential solar energy usage, as shown in the figure below.

Figure 12: Solar potential for New England Table lands



5.9 Draft planning instruments

5.9.1 New England Northwest Regional Plan

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

6 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.

6.1 Land Use Conflict

The development poses no potential land use conflict as it is permissible within the current zoning, pursuant to cl.2.36 of Division 4 of State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP). The land use will transition from cattle pens to solar power generation, which poses no land use conflicts due to its unobtrusive nature.

Adjoining land uses include primary industries and residential housing within a primary industry area. Once construction of the solar farm is completed, minimal activity will occur on the site that may create noise or active nuisance to adjoining land uses.

6.2 Services

The solar farm does not require connection to reticulated water, telephone, or sewerage infrastructure. Accommodation for construction workers will be off-site. There will not be a permanent on-site presence or office building requiring amenities during the operational phase. Such facilities will be available at the Abattoir.

6.3 Land Contamination

A preliminary contaminated site assessment has been undertaken by SMK Consultants to assess whether contamination exists on the site and if it does, whether it may impact the proposed development. This assessment is attached to this report as Appendix 3. The conclusion presented in the report identifies that the site has not been impacted by contamination other than cattle manure. This does not present a contamination risk to the proposed development. Accordingly, no further investigation is required.

6.4 Acoustic Amenity

The site has been subjected to primary production activity in the past during the operation of the Bindaree Abattoir. The Abattoir operation is the only potential source of noise emissions in the immediate area other than rural residential generated noise and the Gwydir Highway. The Abattoir has established the acoustic amenity of the area for over 40-years.

Construction of the facility will involve short periods where trucks will be operated onsite such as cranes for delivery and installation of the inverter but will no longer be required once the site is operational. No large machinery will be active on the site during the operational phase.

The solar farm will generate minor noise emissions from inverter/transformer stations and battery enclosures. These will be shielded within the framework surrounding this infrastructure.

This solar farm will involve small electric motor to operate the tilt mechanism on the panels to optimise the capture of sunlight. These motors are small and will not operate continuously.

They will be beneath the cover of the solar panels. The panels will deflect the noise from these motors back onto the ground. There will be minimal if any direct noise emissions from the site from these motors. The drive mechanism onto the torsion bar is an enclosed chain system. As it is enclosed, minimal if any noise will be generated from movements of the chain. Routine maintenance of the site will include checking the chain and its lubrication. No noise is expected from the tilting of panels.

6.4.1 Construction Noise

During the construction phase, the operation of installation machinery will be a source of noise. This type of noise is considered consistent with the noise levels produced by existing industrial activity in the area. 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 Bindaree Abattoir 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. 5 provides the NPI minimum RBL for each period of the day, which were adopted for the site. This assumes that the surrounding area is more closely an urban area rather than a rural area. A rural area has higher RBL.

Table 4: Rating Background Noise Levels – Urban Environment

Period	RBL dB(A)
Day	45
Evening	40
Night	35

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).

The table below provides an analysis of both the intrusiveness and amenity noise levels for the purposes of establishing a PNTL for the proposed development, located in an urban environment.

Table 5: Assessment of PNTL in adjacent receiving environment

Metric	Day dB(A)	Evening dB(A)	Night dB(A)
Rating Background Level	45	40	35
Project Intrusiveness Criteria	50	45	40
Recommended Amenity Level	60	50	45
Project Amenity Level*	58	48	43
Project Noise Trigger Level	50	45	40

* Note: Project amenity level established as level equal to the Recommended Amenity Noise Levels minus 5dB(A) plus 3dB(A) to convert from a period level to a 15-minute level, in accordance with guidance established in Fact Sheet F of the NPfl.

The PNTL for the project is identified to be 50, 45 and 40 dB (A) for day, evening and night periods respectively. These noise thresholds are considered to provide a guideline for noise levels above which some noise impacts on the community may be experienced. They are not considered to be mandatory thresholds, yet rather noise levels which may 'trigger' a management response.

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.

6.4.1.1 Predicted Construction Noise Levels at Receptors

The closest receptor is approximately 230 metres to the south of the project site. At this distance, the loudest activity (grader) is predicted to be:

$$\begin{aligned} L_2 &= 82 - 20\log(230/10) \\ &= 57.8\text{dB} \end{aligned}$$

This will be mobile plant and therefore not a continuous noise impact on this closest residence. The noise would be intermittent for periods of several minutes only.

Construction works will be confined to daytime hours, in which the acceptable noise threshold criteria is 50dB. The predicted maximum noise generated by the development therefore may exceed the PNTL for potentially short periods when the engine is facing the closest receptor. The closest receptor is a residence located 230m off the Gwydir Highway and 688m from the Abattoir. This residence would therefore be exposed to traffic noise on a relatively constant basis and industrial noise on a regular basis. Such noise would likely be similar to the noise levels from the operation of a grader during daylight hours at the proposed solar farm.

6.4.1.2 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 refer to the noise level that can be achieved from a development, even when the development noise emissions remain above the PNTL, following the 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 16.4 dB for daytime periods only. No activity would occur outside of daytime periods and therefore evening and night-time PNTLs would not be impacted.

6.4.1.3 Determination of Significance of Residual Noise Impact

The NPI identifies the significance of a residual noise impact of >5dB as 'Significant'. It is therefore considered that construction works associated with the proposed development will have an impact upon the amenity of the surrounding location. Heavy machinery operating on the site will be audible at the closest residence. However, these closest residences would also be subject to noise from the nearby Gwydir Highway. It is further 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.

Overall, it is considered that the potential noise related impacts of construction work upon the community is within an acceptable threshold.

6.4.2 Operational Noise

Sources of plant noise associated with the operation of the solar farm stem from the inverter stations small electric motors to tilt the panels. This noise would only be generated during daytime (Sunlight 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 SG110cx low voltage inverters(400V), typical manufacturer noise specifications (based on sound power level test results) for the Inverter Station is presented below. Typical manufacturer noise specifications for energy storage units have also been include in the table below, 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 6: Typical Operational Sound Power Levels

Equipment	L _{Aeq} SWL (dB(A))	Source
Sungrow SC3450 PCS Inverter Station	80.5	SC3450 PCS (measured at 1m)

6.4.2.1 Predicted Noise Levels at Receptors

The closest receptor is approximately 230 metres south of the solar farm site. At this distance, the loudest activity associated with the operation of the solar farm is predicted to be:

$$L_2 = 80.5 - 20 \log (230/1) \\ = 33 \text{ dB}$$

The acceptable noise threshold criteria are 50 dB during the daytime period and 40dB during the night period. The predicted maximum noise generated by the operation of the solar farm is therefore below the PNTL during both periods. It is further noted that the solar farm is located on a plateau area. Direct noise from this plateau will not travel to the closest residence and therefore some deflection will occur to further reduce the noise impact. It is predicted that no noise impact will be audible at the closest residence during the operational phase of the solar farm.

6.4.3 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 (178 days) 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 50dB 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 to above existing levels of noise generated by normal traffic and farming operations in the surrounding area. Once operational, 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.

6.5 Visual Amenity

6.5.1 Landscape Setting

The properties surrounding the solar farm site are working agricultural properties and hobby farms. The site itself is zoned RU1 – Primary Production within a rural area and is located west of the township of Inverell. The solar farm will be located on a plateau area. The only visible structure from surrounding residences will be the outer solar panels.

The topography of the area is gently sloping with low hills present north of the subject lot. The slopes surrounding the solar farm support an open woodland to a height above the solar farm panels. The trees would provide a screen for the solar panels for most directions.

The following images shows the existing landscape views from the proposed development. Figure 13 shows the view toward residences to the north. The closest residence is approximately 1.2 km and the direct view is disrupted by trees which will be retained within the Bindaree property.

The view to the west towards residences along McNeils Road is shielded by woodland which is also under the control of Bindaree Beef.

Views of the solar farm from the east and south are screened by woodland as well as the location of the solar farm on an elevated plateau.

Figure 13: View to the north from the outer solar panel location.



Figure 14: View to the west toward McNeils Road.



Limited direct views are available from adjoining residences to the solar farm.

6.5.2 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. The presence of woodland on most sides of the solar farm and the proposal to locate the farm on an elevated plateau will limit the impact on local residents who may have a small view of the site. The Abattoir is a far more significant structure in addition to the water tank farm and sheds adjoining the solar farm site. This existing infrastructure is consistent with the industrial use of the land.

6.5.3 Visual catchment

A minor number of visual receptors can reasonably be anticipated to see the solar farm. This includes local residents and those working outdoors on adjoining properties.

6.5.3.1 Residents

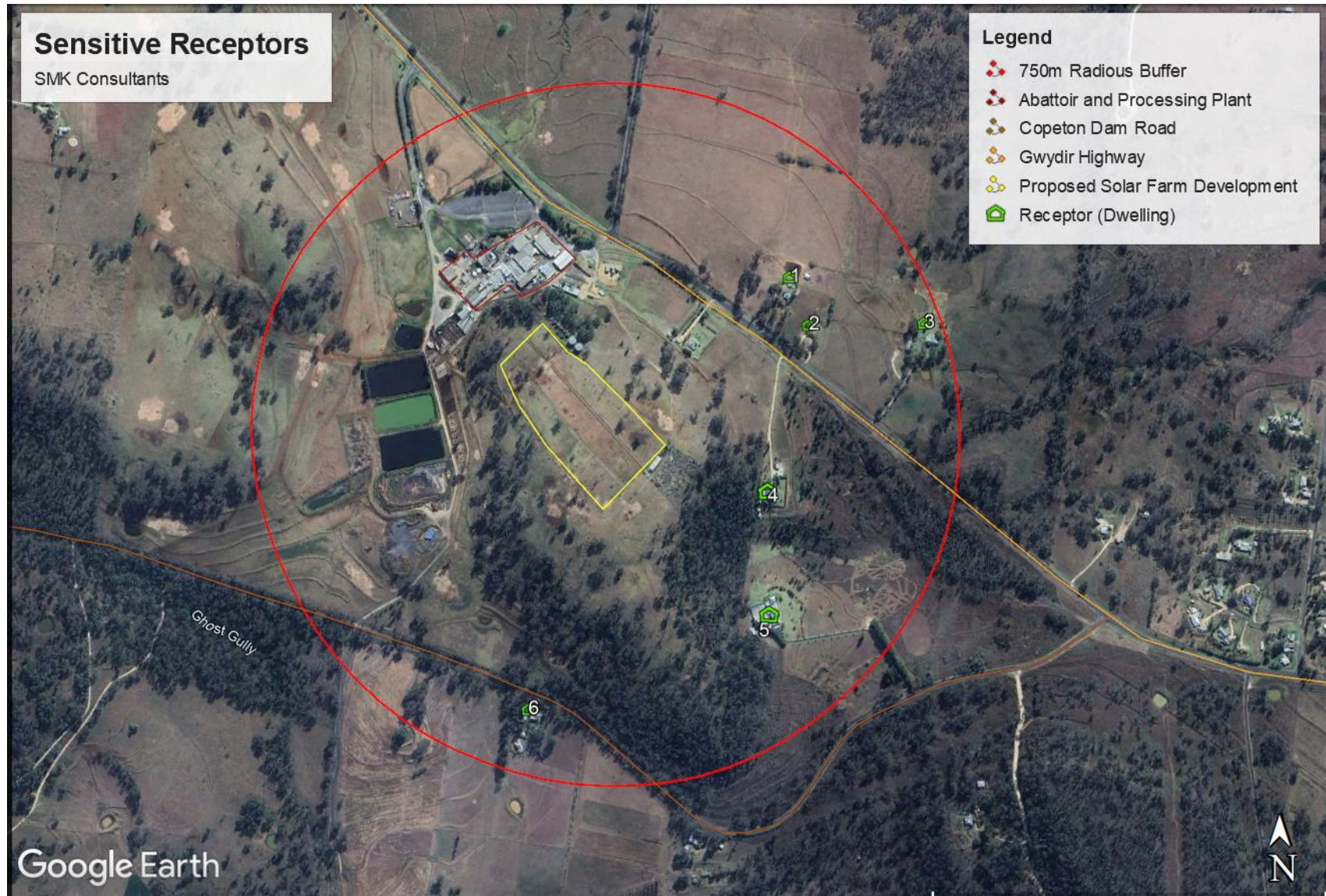
It is generally accepted that local residents have a high level of sensitivity to changes in their landscape and visual environment. The most important views are those available from their homes. Views from their own homes, whilst private, are judged to be the most sensitive as these are views which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

The following provides an assessment of the closest houses not associated with the Abattoir facility:

- Houses located on Lots 1 and 2 DP617431 have a woodland screen between their residences and the solar farm. The view of the outer panels would be limited by the woodland which forms part of the Bindaree Beef property and will be retained;
- A dwelling located on Lot 1 DP 373572, approximately 160m east of the proposed site and adjoining Gwydir Highway, is owned by Bindaree Food Group and is not considered as the closest receptor;
- Six residential properties are located within 750m radius buffer of the proposed solar farm. All six houses are screened by woodland which will be retained.

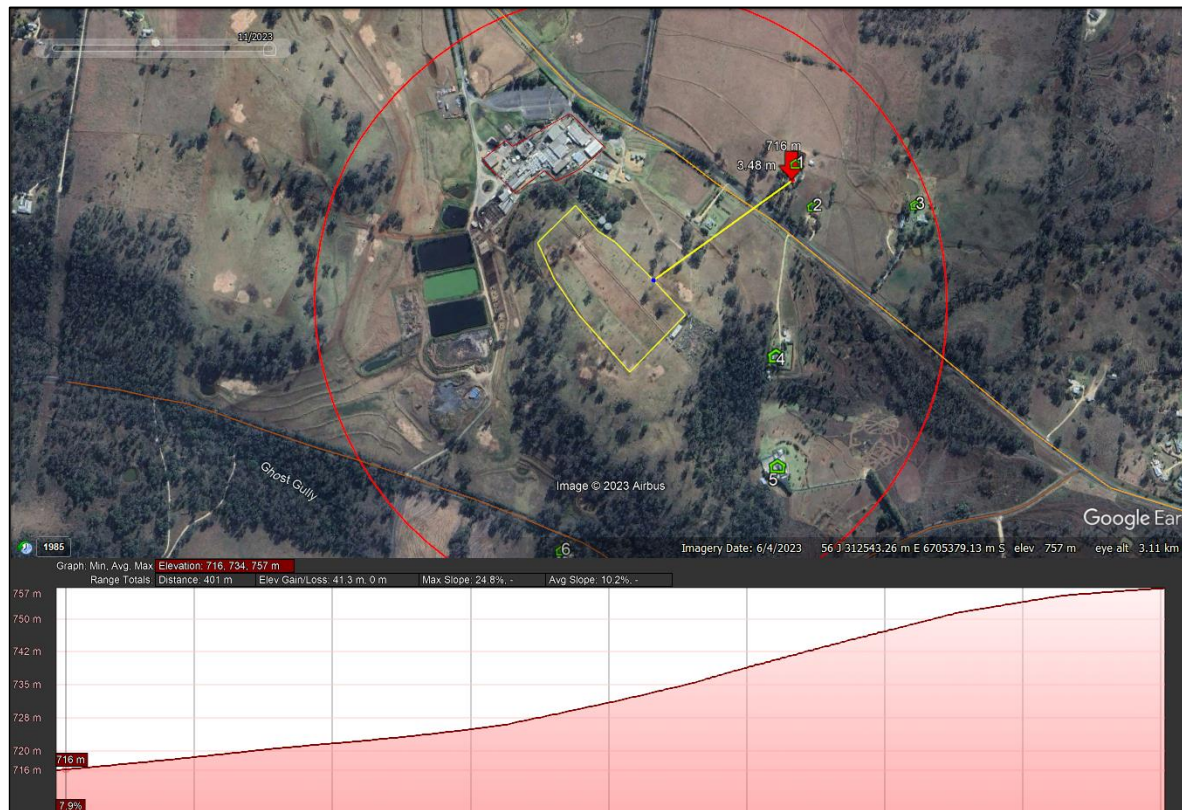
The following aerial image provides locations of these sensitive receptors in relation to the proposal.

Figure 15: Sensitive receptors relative to the proposed solar farm development.



The following figure illustrates the topography between the closest non-Abattoir residence and the solar farm. The elevation of the solar farm would limit the view from this residence. This profile does not include the trees. The aerial image shows the trees between the residence and the solar farm.

Figure 16: Comparing the elevation between Receptor 1 and the Solar Farm.



The remaining five houses have more topography and woodland between them and the solar farm to reduce or block any view of the solar farm.

Based on topography and the available woodland, the solar farm will be screened from local residences.

6.5.3.2 Public & Motorists

This category of visual receptor group includes both local residents and those who pass through the area along the Gwydir Highway.

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. Further, Bindaree Food Group deems the visibility of the solar farm as beneficial, showcasing private businesses initiative to increase the use of renewable energy sources in the Shire and thus contribute towards a more sustainable future.

6.5.4 Conclusion

The solar farm would have a minor visual impact and add a new feature to the landscape. No landscape feature associated with an area of local or regional conservation significance would be impacted. The solar farm would not obscure landscape features for any receptors, however it may be slightly visible through the wooded landscape.

Overall, the impacts to visual amenity of sensitive receptors within wider locality are considered acceptable, in particular given the zoning of the land.

6.6 Glare

6.6.1 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.

6.6.2 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 a 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 below. 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 17: Typical Material Reflectivity with Sunlight Angle²

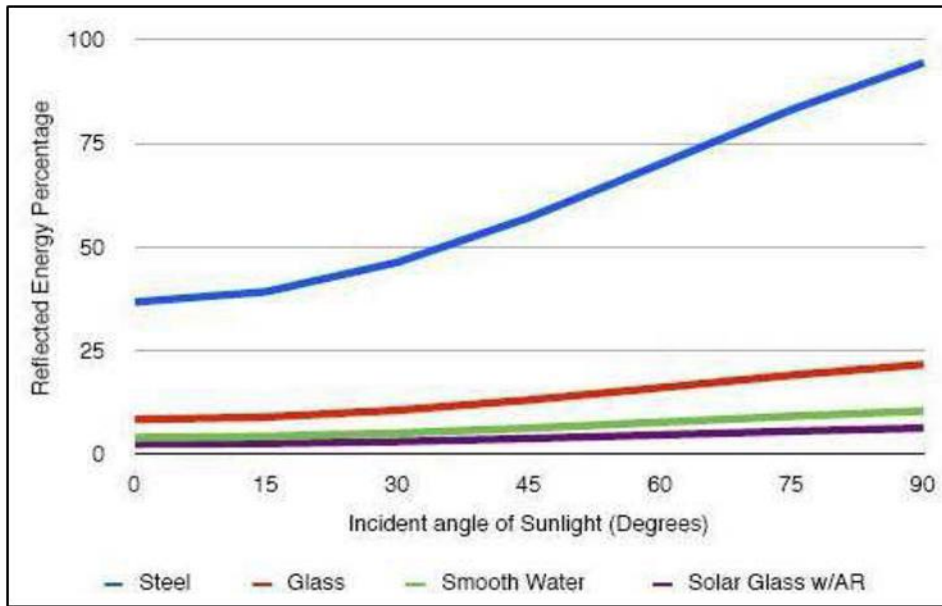
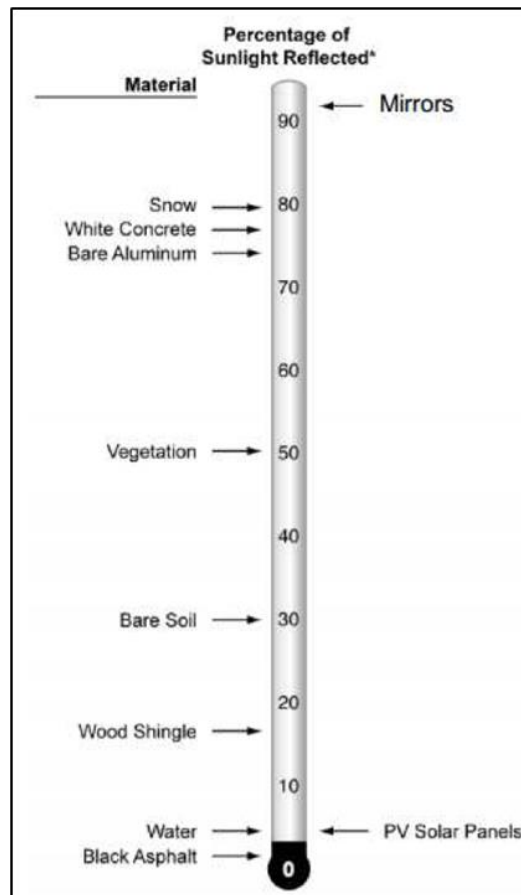


Figure 18: Comparative Reflection of PV Solar Panels⁴

² Spaven Consulting, 2012. *Proposed Solar Energy Facility, Manston, Kent: Manston Airport ‘Glint and Glare’ Study*

⁴ 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



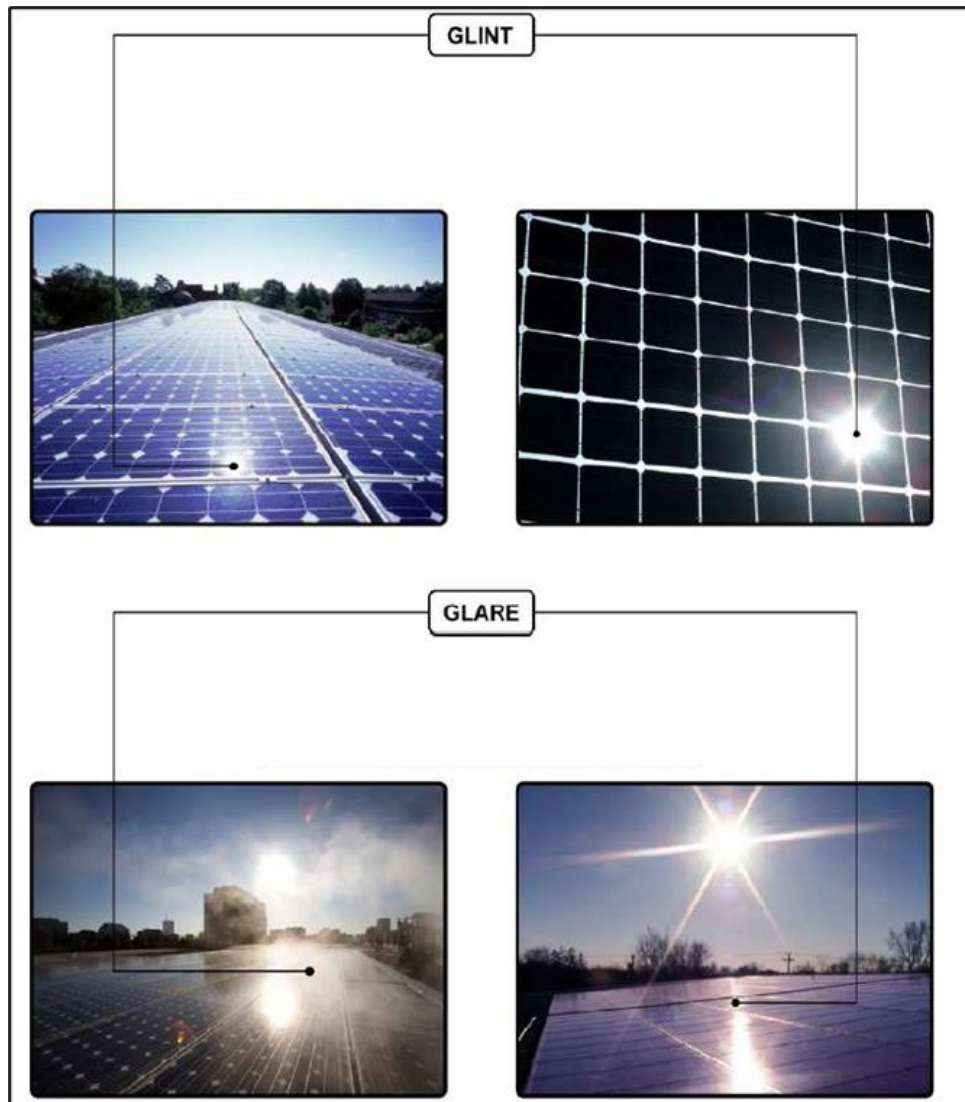
6.6.3 Potential Impacts

Glare and glint are a potential hazard/nuisance generated by solar panels. Ho⁵ 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 glint⁶. The difference between glint and glare is depicted in below.

⁵ Ho, C.K., 2013, *Solar Glare Hazard Analysis Tool (SGHAT)*. Sandia National Laboratories, Albuquerque, NM.

⁶ Power Engineers, 2010, *Panoche Valley Solar Farm Project Glint and Glare Study*, SolarGen Energy, May 21 2010

Figure 19: Visual Comparison of Glint and Glare⁸

6.6.4 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.

The site is elevated above the surrounding area. The system will have tilting panels to optimise the angle of the solar panels and the sun. This will mean that the majority of the time the panels will be relatively flat rather than angled to the north. When the panels are angled to the north, the sun is in the east and therefore glint or glare would be deflected west toward the woodland area.

⁸ Power Engineers, 2010, *Panoche Valley Solar Farm Project Glint and Glare Study*, SolarGen Energy, May 21 2010

6.6.5 *Civil Aviation Safety Authority.*

Following consultation with the Civil Aviation Safety Authority (CASA) in 2021 with regard to a different proposal, 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 air traffic control tower, consultation with CASA is not required.

6.7 Air Quality

6.7.1 *Construction Impacts*

The construction of the solar farm will not involve extensive earthworks. Earthworks will be limited to removal of some of the boulders on the site and drilling of the pier holes.

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 on an as required basis;
- Ensure minimal handling of any excavated materials;
- Temporary cessation of works during excessively dry and windy conditions where dust is generated from vehicle movements;
- 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 or landform modifications are required.

6.7.2 *Operational Impacts*

Presently, the site maintains a grass cover achieved through the cultivation of Kikuyu grasses to support cattle feeding. This will be maintained to ensure the ground surface remains stable.

The solar farm will require occasional maintenance which will involve one or two specialist staff to attend to the electrical infrastructure. Other maintenance will involve mowing around the solar farm which will be done by existing Bindaree Abattoir grounds staff.

Once the solar farm is operational, little or no impacts will occur as a result of site activity.

The solar farm will also contribute renewable energy to the electrical network and therefore reduce greenhouse (GHG) emissions associated with the Abattoir facility.

6.8 Electromagnetic Fields

6.8.1 *Potential Radiation Sources*

The generation, distribution and use of electricity can produce extremely low frequency (ELF) electromagnetic fields (EMFs) 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 EMFs are 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.

The proposal is therefore not considered a concern, and no additional mitigation measures are proposed.

6.9 Soil Resources

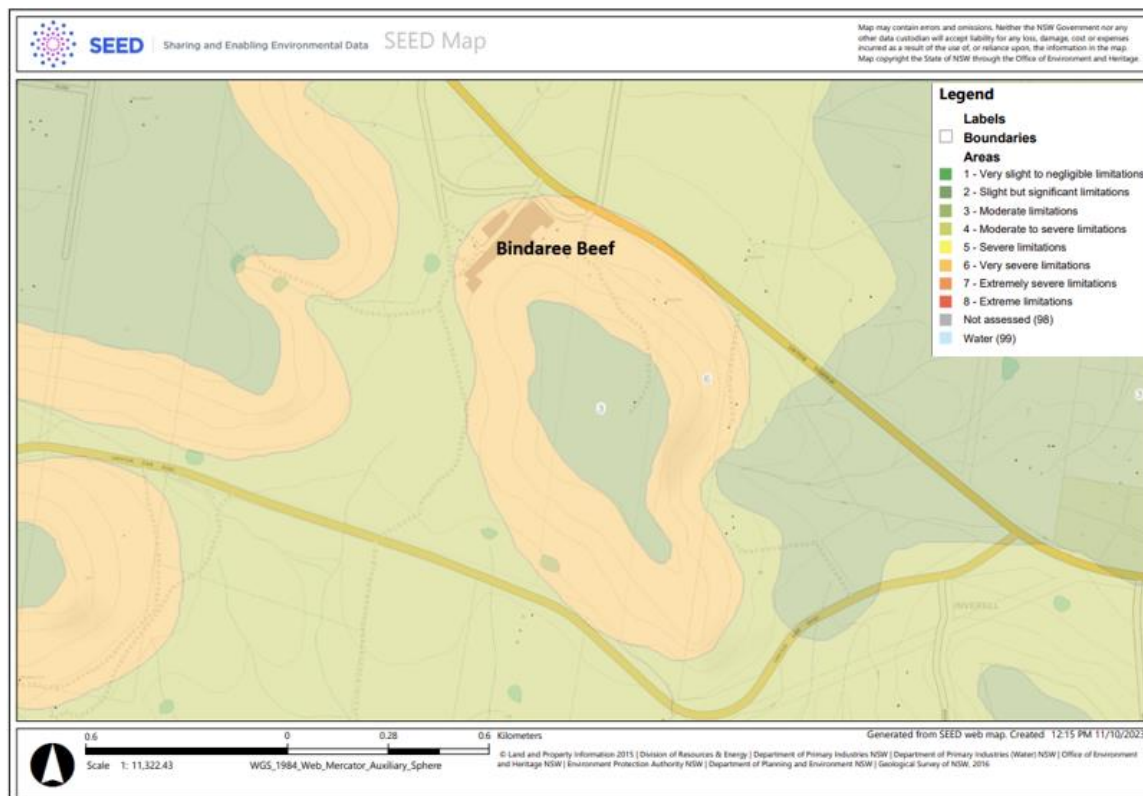
Soil mapping undertaken by NSW Environment and Heritage and available on the NSW Soil and Land Information Database eSPADE mapping indicates that the majority of the property consists of Dermosol. Soils are described as Dermosols do not have strong texture contrast. These clay and clay-loam soils generally have a dark to brownish black surface over brown to grey, brown subsoils. Textures are generally clay to clay loam throughout with moderate to well-structured surface and subsoils.

Subsoils have moderate to strong structure with texture ranging from clay loam to medium clay and gravelly clay. Where these soils are formed on weathered rock profiles may be

shallow (some rocky), while those developed on alluvium are deep. The subsoil of this soil type is generally suitable for most earthwork purposes.

The land and soil capability class of the surrounding area is Class 3 and 6. Most of the solar farm establishment is within the class 3. Class 3 land is generally suitable for all agricultural uses but with moderate restrictions for cultivation, because of erosion hazard, weak structure, salinity, acidification, shallowness of soils, climate, wetness, stoniness or a combination of these factors.

Figure 20: Soil Capability Class



The subject site is not considered to have any existing salinity issues and the development proposal, will not introduce additional 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 sulphate soil risk mapping (eSPADE v2.1, 2021).

6.9.1 Erosion and Sediment Control

Land slope on the property varies across the site but the solar farm is essentially located on gently sloping land with drainage to the southwest. Erosion is considered a low risk in the area following heavy rain events, as Dermosols, the soils present onsite, are susceptible to rill and sheet erosion. There is a low risk of wind erosion.

Given the nature of the proposed development, best practice drainage and sediment controls will be implemented on site. For the management of Dermsols, the following recommendation is provided:

- Maintain grass cover to the greatest possible extent to reduce sheet and rill erosion;

6.10 Water Resources

6.10.1 Potential Surface Water Impacts

Stormwater runoff at the site will be largely unchanged as a result of the proposal. Bindaree Abattoir operate the surrounding land as part of their farming operations. The property has an extensive network of contour banks and stormwater detention dams to manage runoff from their wastewater application areas.

The solar panels will have a 100-percent runoff value; however, this water will flow off the panels onto the groundcover below. Retention of the grass cover on this site will therefore not alter the runoff coefficient. The groundcover will absorb the same amount of rain that it is absorbing at present. Once runoff begins, it will be detained in the existing dam/sediment ponds located at the southern boundary of Lots 1 DP 1028323 and on 83 DP 753638 to the west of the solar farm.

The development is located within the area covered by the *Water Sharing Plan for the NSW Border Rivers Regulated River Water Source, 2021*. No surface water extraction is proposed therefore the WSP is not relevant to the proposed development.

6.10.2 Potential Groundwater Impacts

The site is located within the area covered by the *Water Sharing Plan for the NSW Border Rivers Regulate River Water Sources 2021*. 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 subject site is not mapped as supporting any aquatic or terrestrial Groundwater Dependent Ecosystems (GDEs) on the Bureau of Meteorology's GDE Atlas, with the closest identified GDE being the Macintyre River, situated approximately 4.4km east of the proposed development. Given available separation distances and the low-impact nature of the proposal, the proposed works are unlikely to impact any GDEs in the locality.

6.10.3 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 maintain the grass cover on the site.

6.11 Waste Management

A desktop assessment of the waste generated during construction and operation of the proposed Bindaree Solar Farm has been carried out to determine the appropriate means of waste disposal and recycling. The assessment considers 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, and domestic waste. Construction of a solar farm would not generate any putrescible waste products. Minimal waste would be generated when the farm is operational other than small amounts of replacement parts and packaging required for maintenance and repair works. The packaging waste can be recycled.

It is expected that the solar farm will be operational for at least 25 to 30 years as a minimum. The site has the potential to be upgraded and continue operations for an extensive period as a result of technology improvements and replacement of solar panels.

If the site is ever subject to decommissioning, all infrastructure, including cabling, panels, mounting frames, footings and the 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.

Steel and aluminium can be recycled. Other waste will either be recycled or disposed of at the Inverell Waste Management Facility, located at Inverell landfill, Burtenshaw Road, Inverell.

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 during each of the construction, operational and decommissioning phases.

6.12 Flora and Fauna

Desktop Assessment

A desktop assessment was undertaken using 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:

- NSW Environment and Heritage 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;
- 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;
- NSW Vegetation Information System (VIS) classification database; and
- NSW Sharing and Enabling Environmental Data (SEED) portal.

Satellite imagery is also used to determine the presence and extent of broad habitat types for these species. Where it is determined the habitat of a species, population or community is not present, this species is removed from the list of potential occurrences. This list is further refined based on the habitat features identified during field surveys.

The SEED Map presented in the following figure includes the modelled plant community types (PCT) expected to occur within the area based on desktop information available on the SEED portal for vegetation mapping. The desktop assessment indicated that the property and its surrounds is likely to contain vegetation consistent with two Plant Community Types (PCT), mainly:

- PCT 00 : Non-Native
- PCT 590 : White Box grassy woodland on the Inverell basalts mainly in the Nandewar Bioregion

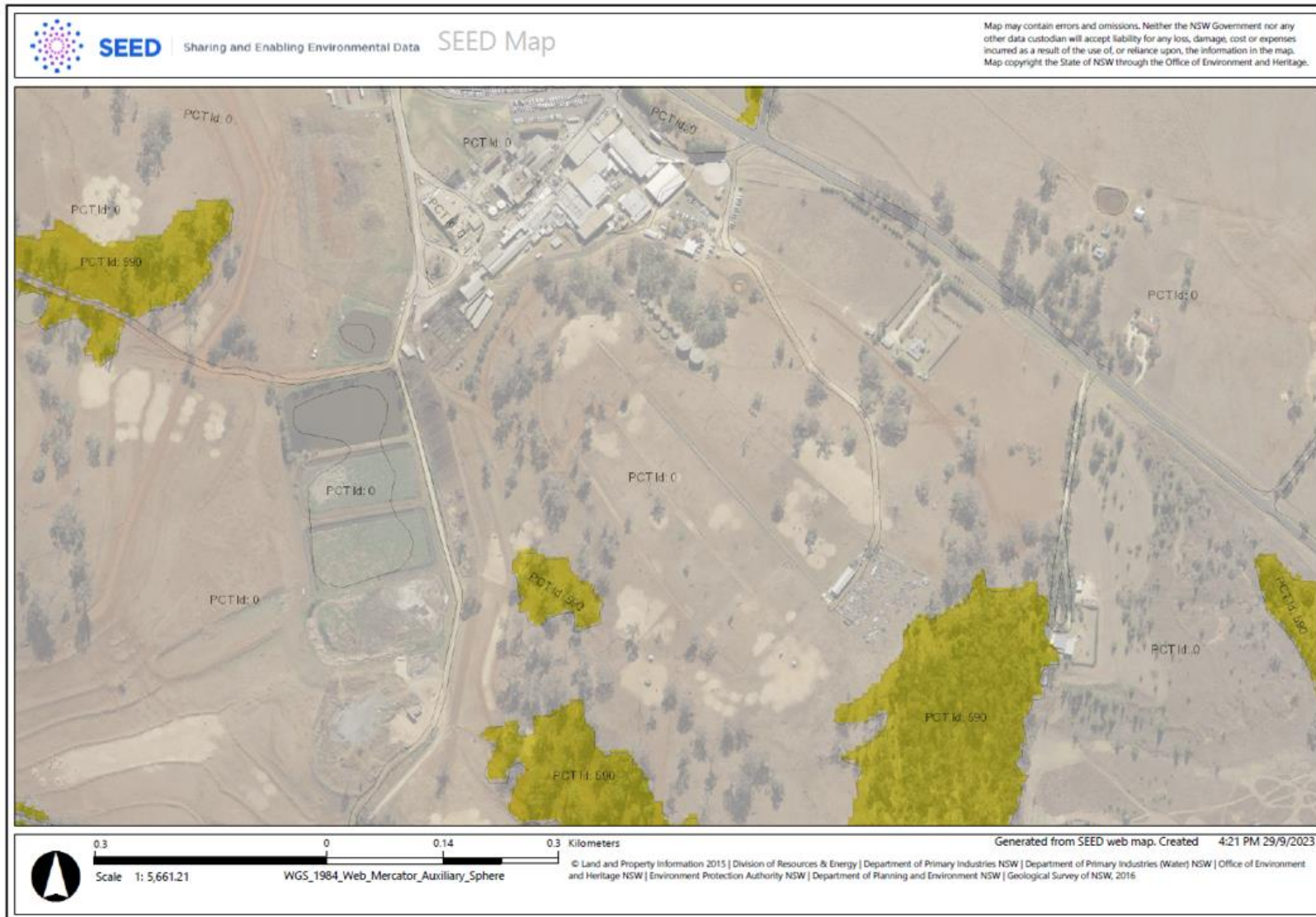
Table 7: Plant Community Type Description

PCT	Description
PCT 0	Non- native vegetation including cultivated areas, cleared areas and areas not mapped due to lack of identifiable vegetation.
PCT 590: White Box grassy woodland on the Inverell basalts mainly in the	Habitat: Fertile soils usually derived from basalt and low quartz sedimentary on flat to undulating terrain below 700 m elevation on the western fall of the Great Dividing Range. Mean annual rainfall varies from 550 to 800 mm.

Nandewar Bioregion	<p>Plant structure: Eucalypt woodland typically up to 20 m tall with a sparse shrub stratum and continuous groundcover of tussock grasses and a variety of herbs.</p> <p>Dominance tree Species: <i>Eucalyptus albens</i> (white box) dominates with <i>Brachychiton populneus subsp. populneus</i> (Kurrajong), <i>Callitris glaucophylla</i> (white cypress pine), <i>E. blakelyi</i> (Blakely Red Gum) and <i>E. melliodora</i> (yellow box). In the north <i>E. melanophloia</i> (silver ironbark) and <i>Eucalyptus pilligaensis</i> (narrow-leaved grey box) occur.</p> <p>Shrubs: <i>Bursaria spinosa</i> (blackthorn), <i>Cassinia arcuata</i> (Sifton bush), <i>Eremophila debilis</i> (winter apple), <i>Notelaea microcarpa</i> (native olive), <i>Pimelea curviflora</i> (curved rice flower), <i>Templetonia stenophylla</i> (leafy templetonia).</p>
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The solar farm site is mapped as PCT 00. The larger areas of white box woodland have been mapped as PCT 590. These areas do not extend to the edge of the solar farm.

Figure 21: SEED Plant Community Types modelled for the area.



Field Assessment

The solar farm site was cleared for agricultural purposes, mainly use as cattle pens for holding cattle prior to processing through the Abattoir. The site is no longer used for this purpose which has allowed grass to return. The grass cover is dominated mainly by non-native Kikuyu grass.

No trees can be retained within the solar farm area. The proposed development necessitates the removal of two White Box (*Eucalyptus albens*), one Ironbark and one Kurrajong. All four trees are isolated trees and do not form part of a woodland areas. The trees were severely impacted by storm events during the Christmas period of 2023.

The White Box grassy woodland surrounding the hilltop will be retained and remain undisturbed by the proposed development. The white box grassy woodland is PCT 590, which is a critically endangered ecological community.

Figure 22: Two trees marked with a red cross will be removed to accommodate the solar project.



The Kurrajong to be removed is at the western end of the solar farm footprint.

Biodiversity Values Map

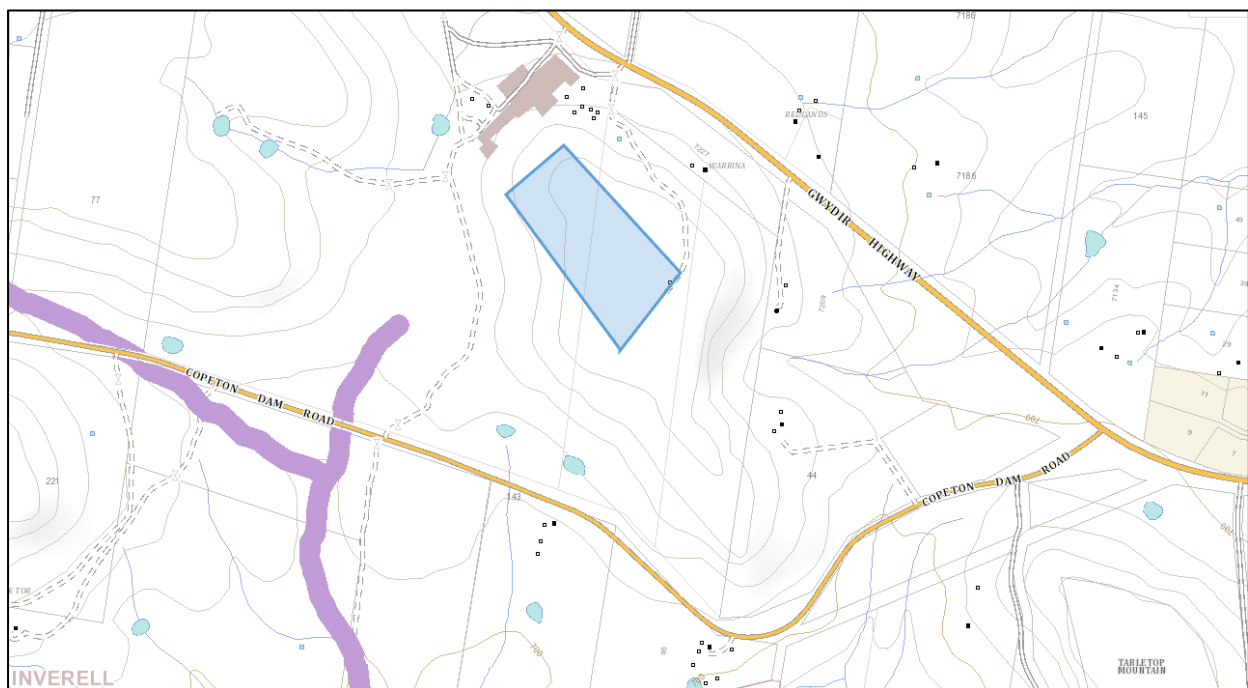
The primary objective of the Biodiversity Values map is to identify areas that possess a high level of biodiversity value in accordance with clause 7.3(3) of the Biodiversity Conservation Regulation 2017. It is crucial to note that the Biodiversity Offsets Scheme applies to all instances involving the clearing of native vegetation and other biodiversity impacts prescribed

by the regulation on land that has been identified on the map. The Biodiversity Values Map is provided in the figure below.

The Biodiversity Offsets Scheme is utilized to determine whether to employ the Biodiversity Assessment Method to assess the impacts of a development proposal. The scheme is triggered based on threshold levels of clearing that comprise the land area to be cleared and whether the area is mapped on the Biodiversity Values Map.

Ghost Gully and Auburn Vale Creek, located southwest of the solar farm site are marked in purple on the map. These watercourses are deemed to have high biodiversity value. The proposed project will not adversely affect these areas of land. There are no other areas in the vicinity that are designated as having high biodiversity value.

Figure 23: Biodiversity Value Map. Source: NSW Government, 2023



The area to be cleared involves the four trees only. The Area clearing threshold for the site is 1 Ha. Clearing of the four trees will not exceed this clearing threshold.

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.

6.13 Weed Management

It is the duty of the Applicant to ensure the risk associated with these weeds is prevented, eliminated or minimised, so far as is reasonably practicable.

Mitigation measures are recommended, specifically for the purpose of:

- Controlling existing weeds that are listed under the *Biosecurity Act 2015*; and
- Ensuring that machinery is free from propagules before entering the site.

Weeds will be managed in accordance with the following principles:

- All machinery, equipment and vehicles brought onto a property must be free of soil, seed or plant material;
- 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 partially shaded. The reduced daytime temperatures and limited sunlight will slow 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 be favourable for slow vegetation growth once the solar farm is operational. This will be enhanced by the tilting panels which will vary the shaded areas through the day and expose the ground beneath the panels to direct sunlight.

6.14 Natural Hazards

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

6.14.1 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 Rural Fire Service Planning Portal was accessed to assess whether the proposal is located in Bushfire Prone Land. Results of bush fire mapping indicates that the subject site is classified as 'Bushfire Prone Land' with a highest risk consistent with vegetation category 1. Vegetation category 1 is defined as

"Vegetation Category 1 is considered to be the highest risk for bush fire. It is represented as red on the bush fire prone land map and will be given a 100m buffer. This vegetation category

has the highest combustibility and likelihood of forming fully developed fires including heavy ember production. Vegetation Category 1 consists of Areas of forest, woodlands, heaths (tall and short), forested wetlands and timber plantations”.

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 regard to the development site are outlined in the Rural Fire Service (RFS) guideline “Planning for Bush Fire Protection” (PBP) (RFS 2019).

Figure 24: Site identified as category 1, bushfire prone land. (Lot 83 DP 753638)



Figure 25: Site identified as category 1, bushfire prone land. (Lot 1 DP 1028323)



6.14.1.1 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 minimum buffer of 10m will be observed between any structures present or erected onsite and native vegetation. Workers and employees are not expected to defend the facility from fire and would be evacuated should a bushfire threaten the site. Give 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 defensible 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 defensible 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. 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. NSW RFS and Fire and Rescue generally adopted a policy of stay away from the solar farms in the event of a fire due to the uncontrolled risk of electrocution.

It is recommended that the proponent contacts the NSW RFS to advise of the presence of the solar farm and provide safety and contact details.

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 10m APZ will consist of mown grass to a maximum height of 100mm.

This objective is satisfied.

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

6.14.1.2 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 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

A Bush Fire Emergency Management and Operations Plan can be prepared for the proposal if required. The proposed development will incorporate the establishment and maintenance of a 10m APZ around the perimeter of the solar farm. This will be maintained to the standard of an Inner Protection Area (IPA) for the lifetime of the proposal. The requirements for the establishment and maintenance of an IPA, in accordance with the PBP 2019, are set out below:

There will be no trees or shrubs allowed to regrow within the security fenced area of solar farm.

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.

6.14.1.3 Proposed Bushfire Protection Measures

The Applicant has prepared a Draft Bushfire Risk 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 finalized and implemented as part of the proposed development.

6.14.2 Flooding

The Inverell development control plan 2013 comprehensively outlines the details of the categories of flood prone land within the Inverell shire Area with information concerning the flood behavior of the Macintyre River. The solar farm site is not classified as flood-prone based on the flood maps provided within this development control plan. The solar farm is on top of a hill.

No flood mitigation measures are required.

6.15 Heritage

6.15.1 European Heritage

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

6.16 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 a 1km buffer area around the solar farm site. No recorded sites are listed around Bindaree Abattoir.

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 industrial activities.

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

Remnant woodland and riparian zones in the locality may contain some artefacts, however these areas will not be disturbed by the proposed development.

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;
- Present human activities on the site would have affected the integrity of any deposit based archaeological sites within the proposed development site, if they had been present;
- The area to be impacted by the construction of the solar farm has been subjected to clearing and disturbance from vehicles and machinery;
- 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 archaeological sites would be limited to 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 low in 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 Heritage recommends that the following procedure is adopted as an unanticipated finds protocol:

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 NSW Heritage as soon as possible on 1300 361 967, providing any detailed of the Aboriginal object and its location;*
- *Not recommence any work at the particular location unless authorized in writing by NSW Heritage.*

6.17 Traffic and Access

Traffic will include workers who will be accommodated in Inverell, components which will be trucked from either Sydney, Melbourne or Brisbane, and locally sourced construction equipment and materials will come from the surrounding region. All project related traffic will utilise the Gwydir Highway to access the site via the existing intersection.

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.

There will be a maximum of up to 20 people on site during the construction period. Accommodation will be sourced in Inverell 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 produce a maximum of 20 light-vehicle movements per day.

Over the construction period, the development will require around 20 heavy vehicles delivering shipping containers with the equipment. These trucks are expected to arrive in groups and be unloaded onsite. No over-mass or over-dimensional vehicle delivery will be required.

The initial construction work will involve concrete for foundations. This would be delivered from concrete providers in Inverell. Daily trips will occur for the concrete trucks over a period estimated to be 3-weeks.

Once operational, traffic would be limited to service personnel attending the site. Maintenance activities are expected to involve one or two vehicles attending site each year.

The traffic generated from the construction work will mix with the traffic generated by the Abattoir operation. At present, there are up to 700-workers at the Abattoir and they receive up to 1,000 head of cattle every week day. Additionally, numerous truck trips occur to remove processed meat during the week. The existing Abattoir operation is predicted to generate up

to 150 vehicle movements each day over a 12-16 hour period. The addition of 20 light vehicle movements and 20 to 40 trucks over the six month construction period is considered a minor increase in vehicle movements through the entrance to the Abattoir.

The intersection on the Gwydir Highway is approved for road trains. Vehicles associated with the solar farm will not include road trains and therefore the intersection is considered safe for the smaller vehicles to enter and exit the site.

6.17.1 Internal Access

The development will utilise the existing access to Lot 1 in DP 373572, which is located approximately 250m northeast of the development site. An existing internal access road will then be utilised to provide direct access to the site. The existing property access receives road trains associated with abattoir and therefore considered suitable for the proposed development considering the limited construction timeframe. No driveway or intersection upgrade is proposed as part of this development.

6.17.2 Parking

Vehicles attending the construction site will mostly be trade based vehicles carrying tools and equipment. They will need to attend their work sites to have access to their tools and equipment. There will be limited demand for parking facilities during the construction phase.

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

Visitors will generally park at the Abattoir car park. There is enough space for multiple vehicles when multiple visitors are present at any time.

6.18 Social and Economic Impacts

6.18.1 Social Impact

The proposal is not considered to have any adverse social impact on Inverell Shire. Overall, positive social benefits will result through the developments' support to increasing the efficiencies of local industry and the introduction of innovation.

Once construction is completed, the solar farm is not expected to provide employment for any additional staff. Monitoring of the site will be done remotely and therefore does not need to engage local staff for this purpose.

6.18.2 Economic Impact

The proposal's main financial impact will be to achieve a reduction in Bindaree Abattoir and processing plant's annual energy consumption costs, which will contribute to improving Company's financial stability in the long-term.

The community will also receive positive economic benefits from employment opportunities generated during the construction phase. During the initial planning phase Bindaree Food Group 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 20 personnel directly involved in construction on site which is expected to take up to 6-months. 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 work.

6.18.3 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;
- The proposal will contribute to Bindaree Food Group financial stability, reducing their energy costs and carbon footprint; and

6.19 Decommissioning

The solar farm will utilise current technology for the solar panels. These panels are expected to have a life of 30-years or more and are expected to be replaced with new technology at the end of their life.

If the solar farm technology is exceeded but other forms of renewable energy, the landowner will be responsible for decommissioning of the site. A Decommissioning Environmental Management Plan (DEMP) would be submitted to council for approval 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 agriculture production or industrial use.

6.20 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 locality of the proposal, therefore no cumulative impacts are predicted.

The use of solar panels on residences is becoming more common and therefore the solar industry is generally expanding.

The wider 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 windfarms as a green energy source is encouraged by Government policy.

The potential noise impacts associated with the construction and operation of the proposed solar farm are considered minor in comparison with noise levels produced by the operation of the adjoining roads and Abattoir facility. The minor additional noise from construction work is not considered to create local exceedances and disturbance of the existing amenity of neighbouring residents.

The development will change the landscape. The site to be occupied by the solar farm has been utilised for cattle feeding. The solar farm will change this to be landscape with a dark blanket type of coverage across the site. As no other solar farms are identified in the local area of this scale, the cumulative impact of the 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 a Bindaree Food Group company strategy to reduce their annual energy consumption cost and carbon footprint, which will benefit all residents within the Shire.

7 Suitability of Site for Development and Report Summary

- The proposed development involves the construction of a solar farm on Lot 1 DP 1028323 and Lot 83 DP 753638. Both Lots are currently occupied by works associated with the Bindaree Abattoir;
- The site is zoned RU1 'Primary Production' under the provisions of *Inverell Local Environmental Plan 2013*.
- The proposed solar farm has been preferentially sited on a previously cleared and disturbed site which is currently providing options to hold more cattle on the property if needed. Use of the site for the solar farm will not require changes or intensification of landuse on other parts of the property;
- No additional utility services are required.
- The proposed development will not require offsets or will involve any clearing of native vegetation that is considered significant;
- As-required vehicle access and parking 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 on the basis that the short term increase in traffic associated with construction of the solar farm is considered minor in regard to existing traffic volumes to and from the Abattoir;
- 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*.

7.1 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.

The public's interest is not considered to 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.

7.2 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.

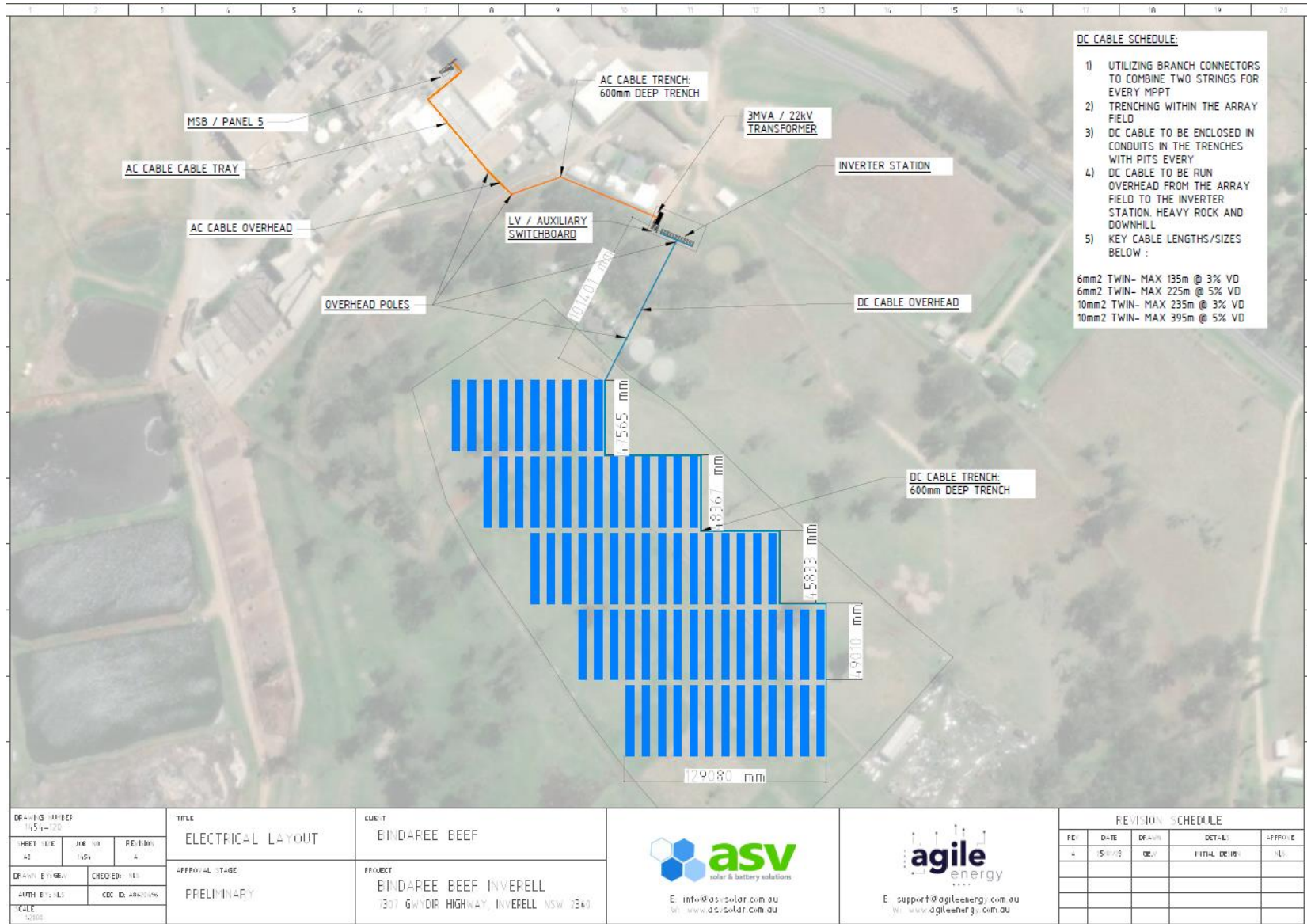
Solar energy is energy created by the heat and light of the sun. Solar power is produced when this energy is converted into electricity or used to heat air, water, or other substances. Australia has the highest average solar radiation per square metre of any continent in the world. The development of 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 energy 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 Bindaree Solar Farm aims to fill the gap in the mid-sized plants. It will generate 3MW 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 Bindaree 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



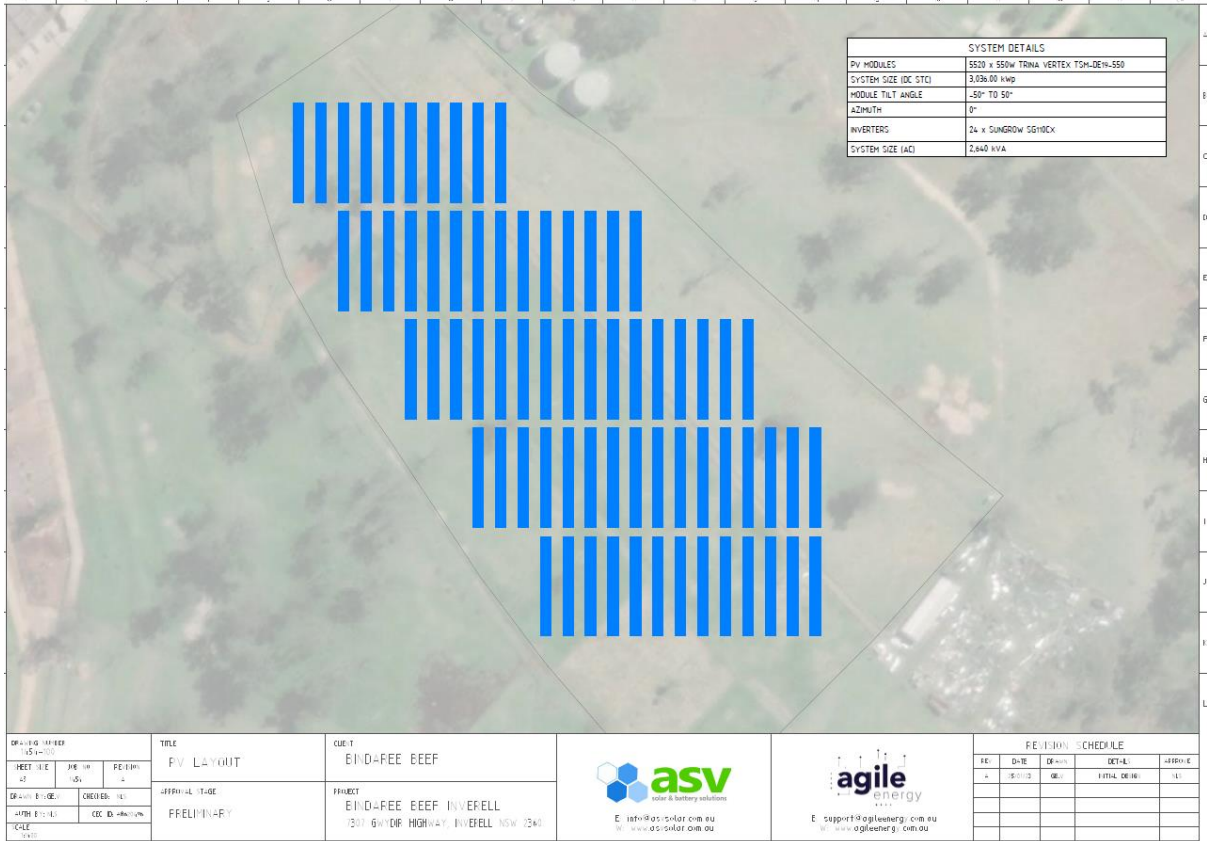


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Appendix 2 – Draft Bushfire Management Plan

Bindaree Solar Farm

7307 Gwydir Highway, Inverell NSW 2360



Draft Fire Risk Management Plan

REV A 2023

1. Existing Site Conditions

1.1. Location

The Bindaree Solar Farm is approximately 4 kilometres west of Inverell and will adjoin the existing infrastructure associated with the Bindaree Beef Abattoir facility. The site is accessed from Gwydir Highway.

Figure 1: Solar Farm Site Location



1.2 Adjoining Land Use

The subject land falls within a region that includes properties zoned as R5 Large Lot Residential to the north and RU1 Primary Production to the east, south, and west of the Bindaree Beef properties. Large residential and primary production lots predominantly characterise the area.

1.3 Topography

The Solar Farm is to be located on top of a plateau area that gently slopes to the southwest. The surrounding area consists of low rolling hills and gully watercourses.

In the context of bushfire risk, it is gently sloping.

1.4 Fire Suppression Assets

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

No water is available onsite, but water is not used to fight an electrical fire. The site adjoins the main water storage facilities for the Abattoir if water is required.

2. Fire Risk Management

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

2.1 Asset Protection Zone

A 10m Asset Protection Zone (APZ) surrounds the structures that comprise the solar farm.

The surrounding area is used as grazing land and as this is an Abattoir site, the grass is generally kept short.

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 surrounding APZ;
- Mowing of vegetation beneath the solar array to minimise the fuel load;
- The enclosures 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 vehicles and/or trailers;
- Keep to a minimum the storage of fuel or other flammable material. Only quantities 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 holds 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 in 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 the following:

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	An appropriately qualified vendor installs and services CO2 and ABE fire extinguishers. Fire extinguishers are located at the inverter. Fire extinguishers are inspected and serviced at regular intervals.
Warning signs	Warning and operational signs around the facility are checked periodically for deterioration or damage.
Waste Disposal	Waste is disposed of correctly to ensure no combustible materials are left on site.
Fuel management	Routine and remedial inspection and treatment tasks are employed to manage the growth of vegetation beneath the solar array.
Water Supply	Water will be made available in tanks specifically designed for storing water for the Bindaree beef property users near the proposed site's solar farm in the northeast direction.
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 reduce the impact of a fire on the site from elsewhere. Good housekeeping is required in all work areas to prevent fires (i.e. removing rubbish, removing oils and greases from surfaces, and using and storing welding and cutting equipment and flammable liquids properly). All visitors to the site must understand the location and use of all firefighting equipment and 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. Using 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 Gwydir Highway through the existing entrance. The access provides all-weather access to the site and can accommodate firefighting trucks of 30 tons or more.

2.8 Fire Fighting and Bushfire Response Procedures

There are two choices in response to the impending threat of fire: to stay and defend or evacuate.

Under worst-case scenarios, the most severe fire is envisaged to be a fire in the adjoining grassland areas. The solar farm would be exposed to embers. This is not considered to create a risk of the solar panels catching fire. Under such circumstances, it would be preferable to leave the site to ensure that 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

In the event of a fire emergency, the protection of human life is of paramount importance. As such, evacuation is the preferred response, provided sufficient time and a clear evacuation route.

The initial step in the evacuation process involves gathering at the designated emergency assembly area, where the supervisor would provide further evacuation instructions. The available evacuation routes are via the main entrance, proceeding south to Inverell along Gwydir Highway, or alternatively using Copeton Dam Road, then Gwydir Highway to Inverell.

It is essential to note that the evacuation process is critical to ensuring the safety and well-being of all individuals in such an emergency. As such, it is advisable to follow all evacuation instructions and procedures without hesitation or deviation.

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 fire approaching from the south and east. In this situation, the security gates are located on the site's western and northern side, so an exit will remain available.

The following procedures are to be followed during any fire-fighting activities:

- Only attempt to extinguish a fire if it is safe.
- 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 regularly or as required:

- Induction programs should address firefighting and bushfire response procedures and the location and use of firefighting equipment; and
- Fostering essential bushfire awareness, mainly calling attention to how fire behaviour is affected by weather conditions.

2.10 Bushfire Danger Periods

During a bushfire danger period, the Solar Farm will notify the local NSW RFS Fire Control Centre in Inverell (02 67210446) 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	Grassland/Trees	Grassland/Trees	Grassland/Trees	Grassland/Trees
Hazard slope	5 degrees	5 degrees	0 degrees	5 degrees
Asset protection zone	>10m	>10m	>10m	>10m
Significant environmental features	Commercial Infrastructure/ Abattoir and processing plant	Grassland/Trees Dwelling	Grassland	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 stations;
- Overhead powerlines connecting to the transformer at the Abattoir site.

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, 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 minimised under the PV arrays through mowing 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 if present. A vegetation exclusion zone around the inverter stations for at least 10m is to be covered in crushed rock and gravel.

The vegetation exclusion zones prevent a fire from reaching any flammable material. Marked firefighting equipment is also placed in several locations around the site and substations to assist in controlling any fire that breaks out.

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 classified as bushfire prone. During the operations phase, the Bindaree Solar Farm will undertake an annual risk assessment of bushfires. 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 minimal. The ground surface of the asset protection zone is mown grass.
- The array framing is made of steel, and other components are fire-resistant.
- Bindaree Solar Farm will have a Vegetation Management Plan involving routine and remedial inspection and treatment tasks.
- Bindaree Solar Farm will have an Operations and Maintenance Program that 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 bushfires at the site is set out below:

Table 3 - Bushfire Risk Assessment and Management

Risk	Impact	Initial risk rating	Risk management strategies	Residual risk
<p>Power infrastructure collapses due to natural events</p>	<p>Private electrical infrastructure connected to Essential Energy assets fall or collapse.</p> <ul style="list-style-type: none"> - 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 	<p>Consequence: Severe</p> <p>Likelihood: Rare</p> <p>Risk rating: Medium</p>	<p>Vegetation growth will be restricted under the arrays and around the solar farm:</p> <ul style="list-style-type: none"> - 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 	<p>Consequence: Moderate</p> <p>Likelihood: Rare</p> <p>Risk rating: Low</p>
<p>Power infrastructure collapses due to collision (especially with a vehicle)</p>	<p>Private electrical infrastructure connected to Essential Energy assets falls or collapses due to collision with an external object.</p> <ul style="list-style-type: none"> - Contact of live electrical assets with vegetation may potentially cause fire 	<p>Consequence: Severe</p> <p>Likelihood: Rare</p> <p>Risk rating: Medium</p>	<p>Vegetation growth will be restricted under the arrays and around the solar farm in accordance with the ISSC3</p> <p>The steel fence around the site reduces the likelihood of vehicle collisions.</p> <p>All operations on the site involving earth-moving equipment, vehicles, slashers, and hot works are to be in accordance with RFS directives.</p>	<p>Consequence: Minor</p> <p>Likelihood: Rare</p> <p>Risk rating: Low</p>

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

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

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 three 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 – Preliminary Contaminated Site Investigation

Preliminary Contaminated Site Investigation

Introduction

The scope of this assessment involves a contamination assessment for the proposed construction and operation of a solar farm on a plateau area to the east of the Bindaree Abattoir facility.

This Preliminary Site Investigation aims to determine if any contamination exists on the development site. If contamination were found to exist at a level considered unsuitable for the intended land use, the study would be extended to include recommendations for remediation and validation of the site to ensure the site is acceptable for the proposal.

The proposed development site is zoned as RU1 – primary production, and the proposed use is the construction and operation of a solar farm. Aside from minor earthworks for the solar farm construction and site access, the contact with soil on site is limited as a permanent fence will be constructed around the site.

Past and Present Potentially Contaminating Activities

The land under consideration was previously utilised as a cattle feeding area connected to abattoir activities. The field was enclosed and supports Kikuyu grasses to aid in cattle grazing. This included fencing, concrete feed bunks and concrete water troughs. The abattoir, production plant, and other facilities are situated northwest of the proposed solar farm, approximately 70 meters from its northern boundary.

The area immediately outside of the solar farm site supports the water tanks for the Abattoir and an area used for storage of old Abattoir equipment. None of these materials contain potentially contaminating materials that would move onto the development site.

The Abattoir includes a farming operation for disposal of wastewater from the Abattoir. The wastewater is applied via travelling irrigators. A review of the wastewater content identified that it contains organics and no substances that may drift onto the solar farm site that would cause contamination of concern.

As part of the ongoing investigation, the land use history of the site is being scrutinised using historical aerial images. From 2003 to 2023, the images reveal specific alterations in the abattoir and production plant site over time. Between 2013 and 2015, two large water tanks were installed in the vicinity of the proposed site. Despite these changes, the proposed site has experienced minimal disruption over time and has predominantly been utilised for grazing purposes.

Figure 1: 8/ 2003 Aerial image of the subject site



Figure 2: 10/ 2013 aerial image of the subject site



Figure 3: 2023 Aerial image of solar farm site

Historical imagery and anecdotal evidence indicate that the site has not been used for indiscriminate disposal of potentially hazardous materials or dip sites.

The property has historically been utilised for grazing of cattle on improved pastures. On occasion, herbicides may have been used for control of weeds. Given the locality, this would be limited to spot spraying. These chemicals are generally biodegradable with only a short period of residual presence. If present, the current concentration of these potential residues would be low.

The proposed development site is at a higher elevation than the surrounding lands. Consequently, no runoff water enters the proposed site. Run-off originating from the proposed site upslope to the northeast of the subject site departs from the development site and flows northwest.

No industrial activities of concern or potentially polluting activities are carried out in the catchment, which may drain onto the location of the solar farm.

Old infrastructure present onsite (Hay shed, steel materials from old abattoir) has no potential for contaminating the site.

No other materials were observed to be stored on the site and occupied by the solar farm.

Assessment of Site Contamination

Based on the site investigation, it was determined that the property in question had primarily been utilised for grazing and intensive feeding of cattle in a feedlot type complex for cattle prior to processing through the Abattoir.

No dip sites, historical dips, or cattle spray yards were noted on this site.

The surface soil did not contain any areas that could not be visually assessed in relation to bare ground or dead vegetation. The area has a relatively continuous grass cover other than where cattle had concentrated in the yards and laneways. No unexplainable sites of concern were located within the footprint of the solar farm.

Installation of the solar farm will require drilling to install the piers to support the solar panel frames. The drilling process will expose subsoil; however, since no other activity is noted on the site other than cattle, the risk of exposing a buried contaminant is considered extremely low.

The site has traditionally been used for cattle prior to processing. The Abattoir facility would be highly sensitive to contamination of the meat as the meat would be tested for a wide range of chemical contaminants. The Abattoir does not have a history of meat contamination and also avoids the use of any potential contaminants on the property.

The results of this assessment indicate that contamination issues on the site will not impact the potential to construct and operate a solar farm.

Further Investigation Requirements

SMK Consultants have concluded that any potential contamination would not impact 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 be appropriately restricted and advice sought from a suitably qualified and experienced consultant to assess the material and determine appropriate action for its management and removal before 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 : Bindaree Solar Farm

Client Service ID : 850934

SMK Consultants Pty Ltd - Moree

Date: 21 December 2023

P O Box 774

Moree New South Wales 2400

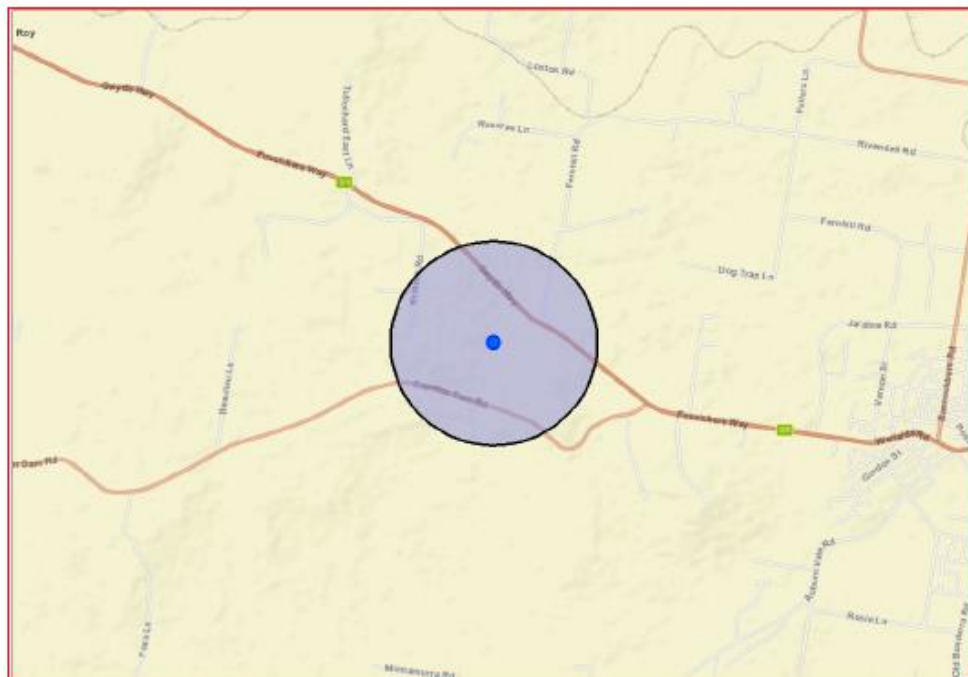
Attention: Peter Taylor

Email: ptaylor@smk.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Address : 7307 GWYDIR HIGHWAY INVERELL 2360 with a Buffer of 1000 meters, conducted by Peter Taylor on 21 December 2023.

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



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

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

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 assessing 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 Inverell Shire local government area. The solar farm is to be built on land within Lot 1 DP 1028323 and Lot 83 DP 753638, located approximately 4.4 kilometres west of Inverell. The site is zoned for RU1 'Primary Production' use.

Agile Energy Pty Ltd is the applicant and contractor to install the Bindaree Solar Farm.

The site currently supports cattle yards used to hold cattle awaiting processing. The site is mostly cleared of timber and now supports a ground cover dominated by Kikuyu grass.

Construction of the solar will involve perimeter fencing, formation of internal roads and the installation of piers to mount the solar panels. A weed management program will be implemented so the site does not become a source of weed populations that may propagate from the development activity.

Once operational, the grass beneath the solar panels will be mown and a fire break around the perimeter fencing will need to be mown and kept below a height of 100mm. Trees within the footprint of the solar farm will be removed. This will involve four mature trees that were retained within the cattle holding pens. The woodland surrounding the plateau will be retained as none of it will be shading the solar panels.

The Plant Community Type (PCT) present on site is PCT 0 – Non-native. The woodland around the site is mapped as PCT 590 - White Box grassy woodland on the Inverell basalts mainly in the Nandewar Bioregion.

Study Area and Site Delineation

The following definitions are used throughout this report to refer to locations in the proposal area:

- The 'subject site' describes all areas that the works would directly impact.
- The 'study area' includes the site and the adjacent areas that the proposed works may indirectly impact.
- This includes the property described as Lot 1 DP 1028323 and Lot 83 DP 753638.

- The 'search area' refers to a 5-kilometre area surrounding the proposal for database searches.

Assessment of Potential Presence of Threatened Species

A search of the National Parks and Wildlife Atlas of NSW Wildlife (BioNet) identified eleven threatened species with recorded sightings within a 5km radius of the proposed development site.

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

The availability of habitat on site was assessed using several 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 a potential habitat for each threatened species and assign each species a rating based on their likelihood to occur within the subject site. The 'likelihood of occurrence' categories are detailed in the table below. The habitat assessment is provided in Appendix A for the 21 species listed as threatened status in the NSW data bases. Species assigned with a rating of 'Moderate' or higher and are considered potentially impacted by the proposed works have been considered within this 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	A species would likely inhabit or utilise a habitat within the subject site. Criteria for this category may include: <ul style="list-style-type: none"> Species recently and/or regularly recorded in contiguous or nearby habitats. High-quality habitat types or resources present within the study area; Species is known or likely to maintain a resident population surrounding the study area; and Species are 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: <ul style="list-style-type: none"> Species previously recorded in contiguous habitat albeit not recently (> ten years); Poor quality, depauperate or modified habitat types and/or resources present within the study area; Species have the potential to utilise habitat during the 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	The species is unlikely to inhabit the area and would likely be considered a transient visitor if ever encountered. Criteria for this category may include: <ul style="list-style-type: none"> 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 the 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 the table below and assessed in this test of significance.

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

Common Name	Scientific Name	Legal Status	Records
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	3
Koala	<i>Phascolarctos cinereus</i>	E	57
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	1
Bluegrass	<i>Dichanthium setosum</i>	V	1
Austral Toadflax	<i>Thesium australe</i>	V	6

V Vulnerable (Commonwealth EPBC Act 1999)

E Endangered (Commonwealth EPBC Act 1999)

CE Critically Endangered (Commonwealth EPBC Act 1999)

Test of Significance - Assessment of Criteria and Discussion

The following is to be considered for determining whether a proposed development or activity is likely to significantly affect threatened species, 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,***

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

Koala

The project area may serve as a feeding ground for the species occasionally. However, due to historical clearing and the effects of previous land use, the feeding habitat within the subject site is not considered optimal. Hence, it is unlikely for the Koalas to utilise the subject site regularly or heavily. Koala sightings in the area identified preferred habitat as larger woodland areas and corridors. The few isolated trees on this site do not offer optimal habitat.

The proposed development does not pose any threat to the local Koala population's viability.

Grey-headed Flying-fox

Although the grey-headed flying fox species may occasionally forage where the project is to be carried out, it is essential to note that the habitat for foraging in the subject site is not ideal due to historical clearing and past land use activities. Therefore, it is unlikely that this species will use the project area regularly or extensively. Furthermore, it is worth mentioning that no roosting or breeding habitats were identified within the proposed development area.

Based on the assessment, the primary risk to the species in question from the proposed development is the loss of suboptimal foraging habitat. Therefore, it is reasonably concluded that this project does not pose a significant threat to the survival of any local population of threatened species. Consequently, there is no immediate risk of extinction associated with this development.

Regent Honeyeater

This species eat insects, spiders and fruit but their main source of food is nectar, and through this they act as a pollinator for many flowering plants. The Regent Honeyeater is a highly mobile species, following flowering eucalypts through box ironbark open-forest and woodland areas. However, the site of the solar farm supports four isolated trees that may provide a food source for this species. The loss of these four trees is not considered a

significant impact in the that the surrounding woodland, which is being retained, would provide a significantly greater food source for this bird.

Flora Species

Bluegrass, Austral Toadflax

The bio net atlas searches recorded Bluegrass near the township of Inverell and Toadflax at six places within 5km of the proposed solar farm site. The solar farm site has supported intensive holding paddocks used by cattle for an extended period which has resulted in the removal of most of the original ground cover. This has been replaced with a Kikuyu dominated ground cover for cattle grazing.

No Bluegrass or Austral Toadflax was present during the site inspections.

If these two species are present within the development area, they may be displaced in the short term. However, since the surrounding vegetation can still support these species, it is unlikely that a viable population will be at risk of extinction. Additionally, the solar farm development site will be allowed to revegetate naturally, so any adverse long-term impacts are expected to be minimal.

- 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 a NSW Listed endangered or critically endangered ecological community. The site is described as cattle yards. The following image shows the vegetation on the cattle yards.

Figure 1: Photo showing ground cover within the cattle yards to be used for the Solar Farm.



The development proposal is unlikely to impact the extent or composition of any 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*

No Endangered Ecological Community would be subject to vegetation removal or modification as part of the proposed development.

The proposed project will not lead to the displacement of any native communities except for the removal of four native trees. Some non-native grassland areas will be cleared to accommodate the solar panels, inverters, and the construction of a new entrance. In total, less than 0.5 Ha of land will be affected by vegetation removal.

(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 due to historic land clearing and development as pasture, comprising predominantly non-native grass species. Given the existing site conditions, the proposed small-scale solar farm is not predicted to cause or promote any further fragmentation of species or habitat within the area.

Fauna species that may periodically utilise the subject site would disperse into adjoining areas of quality habitat, which is widespread in the locality. Therefore, the small-scale removal of groundcover vegetation would not result in the fragmentation or isolation of these mobile species. Whilst not identified in the area, threatened flora species may be displaced in the short term. However, similar adjoining vegetation surrounding the solar farm site provides sufficient germination so that these species are not at risk of extinction or long-term fragmentation.

(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,*

Four single trees will be removed as part of this proposal. None of trees contain hollows. The site is currently dominated by ground cover consisting of native and non-native species. A small area of this vegetation will be cleared as part of the proposed works, and this habitat area is not considered to have any particular importance to the threatened species that may occur in the locality. Since non-native species dominate the site, the proposal will not fragment native vegetation 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 any critical declared area of outstanding biodiversity value (either directly or indirectly),***

The development proposal is located outside 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 to 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 a key threatening process. Exotic perennial grasses have the capacity to invade native plant communities, competing with and excluding native species. The invasion of these grasses also reduces the habitat value for many native fauna species.

The property associated with Bindaree Beef is farmed and subject to planting of improved pasture to support cattle held on the property. The farming operation includes an extensive weed management operation.

The site of the solar farm has been planted with Kikuyu grass for cattle production. This will be maintained.

As part of the proposed development, weed management protocols will be included in the construction phase. This will be continued with site maintenance as a routine process undertaken by the landowner for management of grass and weeds within their land.

Conclusion

This test of significance assesses the proposed project's potential impacts. The proposed project involves the construction and operation of a solar farm. The farm is to be located on land that has been highly modified for an extended period of time and is not considered to support any habitat or species of significance.

That vegetation present on-site 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 are 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 Nandewar Bioregion (Inverell Basalts IBRA subregion)

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
<i>Myuchelys bellii</i> Western Sawshelled Turtle, Bell's Turtle	BC Act - V	The Blue-billed Duck is widespread in NSW but most common in the Namoi, Gwydir, and Border Rivers systems On the escarpment of the Northwest Slopes. Shallow to deep pools in upper reaches or small tributaries of significant rivers in granite country. Occupied pools are most commonly less than 3 m deep with rocky or sandy bottoms and patches of vegetation. Primarily a vegetarian, eating aquatic plants and terrestrial leaves that fall into the watercourse. It also takes invertebrates ranging from insects to crayfish, other small animals and carrion.	P	Unlikely There is no suitable habitat for the species within the subject site.	No
<i>Uvidicolus sphyrurus</i> Border Thick-tailed Gecko	BC Act - V	his species often occurs on steep rocky or scree slopes, especially granite. Recent records from basalt and metasediment slopes and flats indicate its habitat selection is broader than formerly thought and may have extended into areas cleared for agriculture. Favours forest and woodland areas with boulders, rock slabs, fallen timber and deep leaf litter. Occupied sites often have a dense tree canopy that helps create a sparse understorey. These Geckos are active at night and shelter daily under rock slabs, in or under logs, and the bark of standing trees.	1	Unlikely There is no suitable habitat for the species within the subject site.	No
<i>Anomalopus mackayi</i> Five-clawed Worm-skink	BC Act - E	Close to or on the lower slopes of slight rises in grassy White Box woodland on moist black soils and River Red Gum-Coolibah-Bimble Box woodland on deep cracking loose clay soils. It may also occur in grassland areas and open paddocks with scattered trees. Live in permanent deep tunnel-like burrows and deep soil cracks, coming close to the surface under fallen timber and litter, especially partially buried logs.	5	Unlikely There is no suitable habitat for the species within the subject site.	No
<i>Hirundapus caudacutus</i>	BC Act – V, C, J, K	In New South Wales, this species is widespread from coast to inland, including the western slopes of the Great	2	Unlikely	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
White-throated Needletail		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, heathlands, and various modified habitats, including regenerating forests occasionally in moist forests or rainforests. Generally, the understorey is open with sparse eucalypt saplings, acacias and other shrubs, including heath.		There is no suitable habitat for the species within the subject site.	
<i>Calyptorhynchus lathami lathami</i> South-eastern Glossy Black-Cockatoo	BC Act - V	It inhabits open forests and woodlands of the coast and the Great Dividing Range, where stands of she-oak occur. Black Sheoak (<i>Allocasuarina littoralis</i>) and Forest Sheoak (<i>A. torulosa</i>) are important foods. Inland populations feed on a wide range of she-oaks, including Drooping Sheoak, <i>Allocasuarina diminuta</i> , and <i>A. gymnathera</i> . Belah is also utilised and may be a critical food source for some populations. In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak but also recorded in open woodlands dominated by Belah (<i>Casuarina cristata</i>). It feeds almost exclusively on the seeds of several she-oak species (<i>Casuarina</i> and <i>Allocasuarina</i> species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.	1	Low The site is not considered necessary for this species due to the paucity of suitable habitat.	No
<i>Lathamus discolor</i> Swift Parrot	BC Act - EC	Swift Parrots are migratory birds endemic to south-eastern Australia. They breed in Tasmania, mainly in southern and central Victoria and eastern New South Wales in winter.	P	Unlikely There is no suitable habitat for the species within the subject site.	No
<i>Anthochaera Phrygia</i> Regent Honeyeater	BC Act - EC	In NSW, the species inhabits dry open forest and woodland, particularly Box-Ironbark woodland and	8	Low	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
		<p>riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and bird species richness. These woodlands have significantly large numbers of mature trees, high canopy cover, and abundant mistletoes.</p> <p>There are three known key breeding areas, two of them in NSW - Capertee Valley and Bundarra-Barraba regions. The species breeds between July and January in Box-Ironbark and other temperate woodlands and riparian gallery forests dominated by River Sheoak.</p>		The site is not considered important for this species due to the paucity of suitable habitat.	
<i>Poephila cincta cincta</i> Black-throated Finch (southern subspecies)	BC Act - E	<p>Black-throated Finches inhabit dry, open, grassy woodlands, often along watercourses. They have been recorded in riparian Ti-tree and Melaleuca thickets surrounded by open grassy areas in the Inverell district. Mainly granivorous, consuming primarily native grass seed, although insects will also be taken. Typically, they forage in small flocks on the ground.</p> <p>They are considered to be sedentary but may move in response to drought.</p>	1	<p>Low</p> <p>The site is not considered important for this species due to the paucity of suitable habitat.</p>	No
<i>Dasyurus maculatus</i> Spotted-tailed Quoll	BC Act - E	<p>Habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.</p> <p>Quolls use hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops as den sites.</p> <p>Primarily nocturnal, although will hunt during the day; spend most of the time on the ground, although also an excellent climber and will hunt possums and gliders in tree hollows and prey on roosting birds.</p> <p>Use communal 'latrine sites', often on flat rocks among boulder fields, rocky cliff faces or along rocky stream beds or banks.</p>	1	<p>Unlikely</p> <p>There is no suitable habitat for the species within the subject site.</p>	No

Species Name	Status	Habitat Description and Locally Known Populations	Local Records	Potential to Occur and Importance of Habitat Present	Assessment of Significance
<i>Phascolarctos cinereus</i> Koala	BC Act - E	Koalas live over a range of open forest and woodland communities, but ultimately, their habitat is defined by the presence of a select group of food trees. Koalas are found in higher densities where food trees grow on more fertile soils and along watercourses. However, they remain in areas where their habitat has been partially cleared and in urban areas.	295	Moderate This species may hunt throughout the subject site as it hunts in open areas.	Yes
<i>Petauroides Volans</i> Southern Greater Glider	BC Act - E	Glider Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range. Occupy a relatively small home range with an average size of 1 to 3 ha. Give birth to a single young in late autumn or early winter, which remains in the pouch for approximately four months and is independent at nine months. Usually solitary, though mated pairs and offspring will share a den during the breeding season and until the young are independent.	P	Unlikely There is no suitable habitat for the species within the subject site.	No
<i>Pteropus poliocephalus</i> Grey-headed Flying-fox	BC Act - V	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps, urban gardens, and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, and in vegetation with a dense canopy. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines.	18	Low There is no forest or woodland habitat within the subject site.	No
<i>Large-eared Pied Bat</i> <i>Chalinolobus dwyeri</i>	BC Act - V	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and the disused, bottle-shaped mud nests of the Fairy Martin (<i>Petrochelidon ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40	P	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
		females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. Found in well-timed areas containing gullies. The relatively short, broad wing combined with the low weight per unit area of the wing indicates manoeuvrable flight. This species probably forage for small, flying insects below the forest canopy.			
<i>Nyctophilus corbeni</i> Corben's Long-eared Bat	BC Act - V	Inhabits a variety of vegetation types, including mallee, bullocke <i>Allocasuarina leuhmanni</i> and box eucalypt-dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark. Slow-flying agile bats, utilising the understorey to hunt non-flying prey - especially caterpillars and beetles - will even hunt on the ground.	3	Unlikely There is no suitable habitat for the species within the subject site.	No
Plantae					
<i>Picris evae</i> Hawkweed	BC Act - V	All recent collections appear to come from modified habitats, such as weedy roadside vegetation and paddocks. Its primary habitat is an open Eucalypt Forest, including a canopy of <i>Eucalyptus melliodora</i> , <i>E. crebra</i> , <i>E. populnea</i> , <i>E. albens</i> , <i>Angophora subvelutina</i> , <i>Allocasuarina torulosa</i> and/or <i>Casuarina cunninghamiana</i> with a <i>Dichanthium</i> grassy understorey. Soils are black, dark grey or red-brown (specified as shallow, stony soil over basalt for one collection) and reddish clay-loam or medium clay soils. The flowering and fruiting period is mainly October to January, with a few plants collected in flower or fruit until May	31	Low There is no eucalypt woodland 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
<i>Eucalyptus rubida</i> <i>subsp. Barbigerorum</i> Blackbutt Candlebark	BC Act - V	Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock. Seedling recruitment is common, even in disturbed soils, if protected from grazing and fire.	1	Unlikely There is no suitable habitat for the species within the subject site.	No
<i>Prasophyllum sp.</i> <i>Wybong</i>	BC Act -CE	A perennial orchid, appearing as a single leaf over winter and spring. Flowers in spring and die back to a dormant tuber over summer and autumn. Known to occur in open eucalypt woodland and grassland	P	Unlikely There is no suitable habitat for the species within the subject site	No
<i>Homoranthus prolixus</i> Granite Homoranthus	BC Act - V	Flowers from October to November. <i>Homoranthus prolixus</i> grows in heath patches and skeletal soil among granite outcrops' crevices. It is likely to be highly fire-sensitive and intolerant to frequent fire disturbances. <i>Homoranthus prolixus</i> has a localised distribution and may be the dominant shrub at some sites. Its population abundance ranges from regular or common to very locally abundant.	3	Low There is no forest or woodland habitat within the subject site.	No
<i>Dichanthium setosum</i> Bluegrass	BC Act - V	Associated with heavy basaltic black soils and red-brown loams with clay subsoil. Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pastures. (Often collected from disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched). It is open to question whether the species tolerates or is promoted by a certain amount of disturbance or whether this is indicative of the threatening processes behind its depleted habitat.	13	Moderate This species may hunt throughout the subject site as it hunts in open areas.	Yes
<i>Homopholis belsonii</i> Belson's Panic	BC Act - V	Grows in dry woodland (e.g., Belah) often on poor soils, although sometimes found in basalt-enriched sites north of Warialda and alluvial clay soils.	1	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
		Habitat and ecology appear to be poorly known.			
<i>Austral Toadflax</i> Thesium australe	BC Act - V	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (<i>Themeda australis</i>). A root parasite that takes water and some nutrients from other plants, especially Kangaroo Grass.	96	Moderate This species may hunt throughout the subject site as it hunts in open areas.	Yes

- V Vulnerable (Commonwealth EPBC Act 1999)
- E Endangered (Commonwealth EPBC Act 1999)
- CE Critically Endangered (Commonwealth EPBC Act 1999)
- C Listed on China Australia Migratory Bird Agreement
- J Listed on Japan Australia Migratory Bird Agreement
- K Listed on the Republic of Korea Australia Migratory Bird Agreement

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. All 4 wetlands that were identified during the search are situated at a substantial distance, each at least 150km away from the proposed site.	Nil
d) Any impact on a listed threatened species or communities? The proposal involves the removal of non-native vegetation, which consists mostly of grasses, from a small area. The area has already been disturbed due to previous agricultural activities. Additionally, the proposal only includes the removal of two native trees, which is not a significant issue. Therefore, it is unlikely that the proposal will have a significant impact on any threatened species or ecological communities in the locality of the Bindaree 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.