APPLICATION ON NOTIFICATION – CROWN DEVELOPMENT

Type of development:	Section 49 – Public Infrastructure
Development Number:	354/V004/18
Applicant:	Energy Projects Solar (EPS)
Nature of Development:	Construction of the Bungama Solar Farm
Subject Land:	Warnertown Road and Augusta Highway, Bungama, and Locks Road and Bungama North Road, Napperby, and comprises Certificates of Title: CT 6037/29 (a20, DP80628), CT 6127/5 (a558, FP188690), CT 5954/187 (a52, DP25903), CT 5949/272 (a4, DP24997), CT 5390/999 (a559, FP188691), CT 5360/334 (a551, FP188683), and CT 5972/304 (a1, DP24255). A connection to the existing Bungama substation (Warnertown Road) from the solar farm site is also proposed (a501, DP52803: CT 5776/531).
Development Plan:	Port Pirie Regional Council Development Plan (Consolidated 18 October 2017).
Zone / Policy Area:	Primary Production Zone
Contact Officer:	Laura Kerber
Phone Number:	7109 7073
Consultation Start Date:	Thursday 31 January 2019
Consultation Close Date:	Friday 1 March 2019
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders St, Adelaide, during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

Written representations must be received by the close date (indicated above) and can either be posted, hand-delivered, faxed or emailed to the State Commission Assessment Panel (SCAP). A representation form is provided as part of this document.

Any representations received after the close date will not be considered.

Postal Address:
The Secretary
State Commission Assessment Panel
GPO Box 1815
ADELAIDE SA 5001

Street Address:
Development Division
Department of Planning, Transport and Infrastructure
Level 5, 50 Flinders Street
ADELAIDE

Email Address: scapreps@sa.gov.au

Fax Number: (08) 8303 0753

#13556236

DEVELOPMENT ACT, 1993
S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Energy Projects Solar (EPS)
Development Number:	354/V004/18
Nature of Development:	Construction of the Bungama Solar Farm
Zone / Policy Area:	Primary Production Zone
Subject Land:	Warnertown Road and Augusta Highway, Bungama, and Locks Road and Bungama North Road, Napperby
Contact Officer:	Laura Kerber
Phone Number:	7109 7073
Close Date:	Friday 1 March 2019

My Name: _____ My phone number: _____

Primary method(s) of contact: Email: _____

Postal Address: _____ Postcode: _____

_____

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard by the State Commission Assessment Panel in support of your submission.

My interests are: *(please tick one)*

- ☐ owner of local property
- ☐ occupier of local property
- ☐ a representative of a company/other organisation affected by the proposal
- ☐ a private citizen

The address of the property affected is: _____

_____ Postcode _____

My interests are: *(please tick one)*

- ☐ I support the development
- ☐ I support the development with some concerns
- ☐ I oppose the development

The specific aspects of the application to which I make comment on are: _____

_____

_____

_____

_____

I: *(please tick one)*

- ☐ wish to be heard in support of my submission
- ☐ do not wish to be heard in support of my submission *(Please tick one)*

By: *(please tick one)*

- ☐ appearing personally
- ☐ being represented by the following person *(Please tick one)*

Signature: _____

Date: _____

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 /or
Email: scapadmin@sa.gov.au

Government of South Australia

Department of Planning, Transport and Infrastructure

DEVELOPMENT ACT 1993

SECTION 49 - PUBLIC INFRASTRUCTURE

NOTICE OF APPLICATION FOR CONSENT TO DEVELOPMENT

Notice is hereby given that an application has been made by **Energy Projects Solar (EPS)** for consent to construct the Bungama Solar Farm. **Development Number: 354/V004/18.**

The Bungama Solar Farm project comprises a 280MW capacity solar farm (photovoltaic panels mounted on single axis tracker structures); 140MW capacity Battery Energy Storage System; ancillary structures (including inverters, condensers, transformers, underground cabling, fencing); switching yard and electrical substation; landscaping; administration and controls area including site office, maintenance and storage buildings, laydown areas; overhead and/or underground transmission lines; and temporary construction components.

The subject land is situated at Warnertown Road and August Highway, Bungama, and Locks Road and Bungama North Road, Napperby, and comprises Certificates of Title: CT 6037/29 (a20, DP80628), CT 6127/5 (a558, FP188690), CT 5954/187 (a52, DP25903), CT 5949/272 (a4, DP24997), CT 5390/999 (a559, FP188691), CT 5360/334 (a551, FP188683), and CT 5972/304 (a1, DP24255). A connection to the existing Bungama substation (Warnertown Road) from the solar farm site is also proposed (a501, DP52803: CT 5776/531).

The development site is located within the Primary Production Zone and Industry Zone of the Port Pirie Regional Council Development Plan (Consolidated 18 October 2017).

The application may be examined during normal office hours at the office of the State Commission Assessment Panel (SCAP), Level 5, 50 Flinders Street and at the office of Port Pirie Regional Council, 115 Ellen Street, Port Pirie. Application documentation may also be viewed on the SCAP website http://www.saplanningcommission.sa.gov.au/scap/public_notices.

Any person or body who desires to do so may make representations concerning the application by notice in writing delivered to the Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide SA 5001 **NOT LATER THAN Friday 1 March 2019.** Submissions may also be emailed to: scapreps@sa.gov.au

Each person or body making a representation should state the reason for the representation and whether that person or body wishes to be given the opportunity to appear before the SCAP to further explain the representation.

Submissions may be made available for public inspection.

Should you wish to discuss the application and the public notification procedure please contact Laura Kerber on 7109 7073 or Laura.Kerber@sa.gov.au.

Alison Gill
SECRETARY
STATE COMMISSION ASSESSMENT PANEL
scapreps@sa.gov.au

PN3546

www.sa.gov.au

PN3546
25x2 (63mm)
The Advertiser, Port Pirie Recorder
31 January 2019
APPROVAL REQUIRED BY 11AM FRI 25.01

SECTION 49 & 49A – CROWN DEVELOPMENT
DEVELOPMENT APPLICATION FORM

PLEASE USE BLOCK LETTERS

COUNCIL: PORT PIRIE REGIONAL COUNCIL

APPLICANT: SEE ANNEXURE A

ADDRESS: PO BOX 195, CHARLESTOWN, NSW, 2290

CROWN AGENCY: DEPARTMENT FOR ENERGY AND MINING

FOR OFFICE USE

DEVELOPMENT No: _____

PREVIOUS DEVELOPMENT No: _____

DATE RECEIVED: / /

CONTACT PERSON FOR FURTHER INFORMATION

Name: STEVE MCCALL

Telephone: 02 9258 1362 [work] 0418 462 769 [Ah]

Fax: _____ [work] _____ [Ah]

Email: stevemccall@epsenergy.com.au

NOTE TO APPLICANTS:

(1) All sections of this form must be completed. The site of the development must be accurately identified and the nature of the proposal adequately described. If the expected development cost of this Section 49 or Section 49A application exceeds $100,000 (excl. fit-out) or the development involves the division of land (with the creation of additional allotments) it will be subject to those fees as outlined in Item 1 of Schedule 6 of the *Development Regulations 2008*. Proposals over $4 million (excl. fit-out) will be subject to public notification and advertising fees.
(2) Three copies of the application should also be provided.

☐ Complying	Decision: _____
☐ Merit	Type: _____
☐ Public Notification	Finalised: / /
☐ Referrals	

	Decision required	Fees	Receipt No	Date
Planning:				
Land Division:				
Additional:				
Minister's Approval				

EXISTING USE: AGRICULTURE - CROPPING/GRAZING

DESCRIPTION OF PROPOSED DEVELOPMENT: SEE ANNEXURE A

LOCATION OF PROPOSED DEVELOPMENT: SEE ANNEXURE A

House No: _____ Lot No: ____ Street: _____ Town/Suburb: _____

Section No [full/part] _____ Hundred: _____ Volume: _____ Folio: _____

Section No [full/part] _____ Hundred: _____ Volume: _____ Folio: _____

LAND DIVISION:

Site Area [m^2] _____ Reserve Area [m^2] _____ No of existing allotments _____

Number of additional allotments [excluding road and reserve]: _____ Lease: YES ☐ NO ☐

DEVELOPMENT COST [do not include any fit-out costs]: $ 650 MILLION

POWERLINE SETBACKS: Pursuant to Schedule 5 (2a)(1) of the *Development Regulations 2008*, if this application is for a building it will be forwarded to the Office of the Technical Regulator for comment unless the applicant provides a declaration to confirm that the building meets the required setback distances from existing powerlines. The declaration form and further information on electricity infrastructure and clearance distances can be downloaded from the DPLG website (www.dac.sa.gov.au).

I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the *Development Act 1993*.

SIGNATURE: _____ Dated: 30 / 11 / 2018

SECTION 49 & 49A – CROWN DEVELOPMENT DEVELOPMENT APPLICATION FORM: ANNEXURE A

APPLICANT: ENERGY PROJECTS SOLAR PTY LTD ACN: 609 935 588 ON BEHALF OF BUNGAMA SOLAR 1 PTY LTD ACN: 621 450 762 FOR THE PHOTOVOLTAIC ENERGY GENERATION SYSTEM (PVS) AND ASSOCIATED INFRASTRUCTURE AND ON BEHALF OF BUNGAMA SOLAR 2 PTY LTD ACN: 621 450 995 FOR THE BATTERY ENERGY STORAGE SYSTEM (BESS) AND ASSOCIATED INFRASTRUCTURE.

DESCRIPTION OF PROPOSED DEVELOPMENT: DEVELOPMENT OF AN INTEGRATED BUT SEPARATELY OPERATED GRID CONNECTED PHOTOVOLTAIC ENERGY GENERATION SYSTEM (PVS) AND ASSOCIATED INFRASTRUCTURE AND BATTERY ENERGY STORAGE SYSTEM (BESS) AND ASSOCIATED INFRASTRUCTURE INCLUDING BUT NOT LIMITED TO:

SOLAR MODULES, INVERTER STATIONS, TRANSFORMERS, SWITCHING SUBSTATION, UTILITY SCALE BATTERY FACILITY, ONE OR MORE SYNCHRONOUS CONDENSERS (SUBJECT TO REQUIREMENT), ASSOCIATED UNDERGROUND CABLES, UNDERGROUND AND/OR OVERHEAD TRANSMISSION LINES, ASSOCIATED CABLES, POLES, TO CONNECT THE PROJECT TO ELECTRANET'S ROBERTSTOWN SUBSTATION, ADMINISTRATION AND CONTROLS AREA, DRAINAGE WORKS, SECURITY MEASURES INCLUDING FENCING, CCTV AND LOW-LEVEL NIGHT TIME LIGHTING.

LOCATION OF THE PROPOSED DEVELOPMENT

TITLE	LOT/PLAN/SECTION	STREET/ROAD	AREA	HUNDRED
CT 5949/272	A4 DP24997	AUGUSTA HWY	BUNGAMA	PIRIE
CT 5954/187	A52 DP25903	LOCKS RD	WARNERTOWN	NAPPERBY
CT 6127/5	A558 FP188690	LOCKS RD	NAPPERBY	NAPPERBY
CT 6037/29	A20 DP80628	NORTH BUNGAMA RD	NAPPERBY	NAPPERBY
CT 5390/999	A559 FP188691	LOCKS RD	NAPPERBY	NAPPERBY
CT 5360/334	A551 FP188683	LOCKS RD	WARNERTOWN	NAPPERBY
CT 5972/304	A1 DP24255	WARNERTOWN RD	BUNGAMA	PIRIE
CT 5978/766	A55 DP71831	WARNERTOWN RD	BUNGAMA	PIRIE
CT 5776/531	A501 DP52803	WARNERTOWN RD	BUNGAMA	PIRIE
CT 5776/532	A502 DP52803	WARNERTOWN RD	BUNGAMA	PIRIE

Signature: _____ **Dated:** 30/ 11 /2018

DEVELOPMENT REGULATIONS 2008
Form of Declaration (Schedule 5 clause 2A)

Government of South Australia

To:

From:

Date of Application: 30 / 11 / 18

Location of Proposed Development: See below.

House No: _____ Lot No: _____ Street: _____

Town/Suburb: _____

Section No (full/part): _____ Hundred: _____

Volume: _____ Folio: _____

CT 5949/272 - A4 DP24997; CT 5954/187 - A52 DP25903; CT 6127/5 - A558 FP188690; CT 6037/29 - A20 DP80628; CT 5390/999 - A559 FP188691; CT 5360/334 - A551 FP188683; CT 5972/304 - A1 DP24255; CT 5978/766- A55 DP71831; CT 5776/531 - A501 DP52803; CT 5776/532 - A502 DP52803.

Nature of Proposed Development:

Development of an integrated but separately operated grid connected Photovoltaic Energy Generation system (PVS) and associated infrastructure and Battery Energy Storage System (BESS) and associated infrastructure including but not limited to:

Solar modules, inverter stations, transformers, switching substation, utility scale battery facility, one or more synchronous condensers (subject to requirement), associated underground cables, underground and/or overhead transmission lines, associated cables, poles, to connect the project to Electranet's Robertstown substation, administration and controls area, drainage works, security measures including fencing, CCTV and low-level night time lighting.

I STEPHEN McCALL **~~being the applicant~~/ a person acting on behalf of the applicant (delete the inapplicable statement) for the development described above declare that the proposed development will involve the construction of a building which would, if constructed in accordance with the plans submitted, not be contrary to the regulations prescribed for the purposes of section 86 of the Electricity Act 1996. I make this declaration under clause 2A(1) of Schedule 5 of the Development Regulations 2008.**

Signed: _____ **Date:** 30/11/2018

Government
of South Australia

Note 1

This declaration is only relevant to those development applications seeking authorisation for a form of development that involves the construction of a building (there is a definition of 'building' contained in section 4(1) of the Development Act 1993), other than where the development is limited to –

a) an internal alteration of a building; or
b) an alteration to the walls of a building but not so as to alter the shape of the building.

Note 2

The requirements of section 86 of the Electricity Act 1996 do not apply in relation to:

a) an aerial line and a fence, sign or notice that is less than 2.0 m in height and is not designed for a person to stand on; or
b) a service line installed specifically to supply electricity to the building or structure by the operator of the transmission or distribution network from which the electricity is being supplied.

Note 3

Section 86 of the Electricity Act 1996 refers to the erection of buildings in proximity to powerlines. The regulations under this Act prescribe minimum safe clearance distances that must be complied with.

Note 4

The majority of applications will not have any powerline issues, as normal residential setbacks often cause the building to comply with the prescribed powerline clearance distances. Buildings/renovations located far away from powerlines, for example towards the back of properties, will usually also comply.

Particular care needs to be taken where high voltage powerlines exist; or where the development:

- is on a major road;
- commercial/industrial in nature; or
- built to the property boundary.

Note 5

An information brochure: 'Building Safely Near Powerlines' has been prepared by the Technical Regulator to assist applicants and other interested persons.

This brochure is available from council and the Office of the Technical Regulator. The brochure and other relevant information can also be found at **sa.gov.au/energy/powerlinesafety**

Note 6

In cases where applicants have obtained a written approval from the Technical Regulator to build the development specified above in its current form within the prescribed clearance distances, the applicant is able to sign the form.

PLANNING REPORT

Prepared for Bungama Solar

BUNGAMA SOLAR

www.bungamasolar.com.au

EPS ENERGY

Reference No. 11297

November 18

QUALITY ASSURANCE AND DECLARATION

Quality Assurance and Version Control Table		
Project:	Bungama Solar	
Client:	Bungama Solar 1 Pty Ltd and Bungama Solar 2 Pty Ltd	
Rev:	**Date:**	**Reference:**
V01	29.11.2018	11297_Bungama Solar Planning Report
Checked By:	Steve McCall	
Approved By:	Steve McCall	
Declaration:	*The opinions and declarations in this document are ascribed to EPS Energy and are made in good faith and trust that such statements are neither false nor misleading.* *In preparing this document, EPS Energy has considered and relied upon information obtained from the public domain, supplemented by discussions between key EPS Energy staff, representatives from governing agencies and independents, including the client and specialist consultants.*	
Applicant:	EPS Energy PO Box 195 Charlestown NSW 2290 (02) 9258 1362	
Prepared By:	Alina Tipper and Simon Duffy	
Project Land:	CT 6037/29 – A20 DP80628 CT 6127/5 – A558 FP188690 CT 5954/187 – A52 DP25903 CT 5949/272 – A4 DP24997 CT 5390/999 – A559 FP188691 CT 5360/334 – A551 FP188683 CT 5972/304 – A1 DP24255 CT 5776/531 – A501 DP52803 CT 5776/532 – A502 DP52803 CT 5978/766 – A55 DP71831	

EXECUTIVE SUMMARY

At this stage Bungama Solar is proposed to be an integrated but separately operated grid connected Photovoltaic Energy Generation System (PVS) of approximately 280MW (AC) generation capacity and a 140MW capacity Battery Energy Storage System (BESS) with 560MWh of storage that will feed into the National Electricity Market via ElectraNet's Bungama Substation. The PVS element, the BESS element and associated infrastructure, together are "the Project".

This Planning Report (PR) has been prepared by Energy Projects Solar (EPS) Pty Ltd ACN: 609 935 588 for Bungama Solar 1 Pty Ltd ACN: 621 450 762 the special purpose vehicle for the (PVS) and Bungama Solar 2 Pty Ltd ACN: 621 450 995 the special purpose vehicle for the (BESS).

Bungama Solar 1 Pty Ltd, the special purpose vehicle for the PVS, has applied to the Australian Energy Market Operator (AEMO) to become a Registered Generator in the National Electricity Market (NEM). The PVS will connect to the Bungama Substation via its own dedicated connection allowing the PVS to export electricity into the national electricity grid.

Bungama Solar 2 Pty Ltd, the special purpose vehicle for the BESS, has applied to the Australian Energy Market Operator (AEMO) to become a Registered Generator in the National Electricity Market (NEM). The BESS will connect to the Bungama Substation via its own dedicated connection allowing the BESS to export and import electricity into and out of the national electricity grid.

PROJECT LAND LOCATION

The Project land comprises the Project area on which the PVS, BESS Project's substation, Operations and Maintenance buildings and associated infrastructure will be built and operated, and land required to connect the Project's elements to ElectraNet's Bungama Substation. The Project land is shown in Figure 2-2.

The Project area shown is approximately 530ha located in the suburbs of Bungama, Napperby and Warnertown in South Australia. The Project is situated approximately 6km east of Port Pirie, and 218km north of the State's capital, Adelaide. The Project is within the Local Government Area (LGA) of Port Pirie Regional Council.

Land within the immediate surrounding area of the Project area is used for agriculture, rural residential living and public services including electricity infrastructure.

PROJECT AREA SELECTION

On behalf of Bungama Solar, EPS Energy undertook an extensive solar site identification assessment across the Eastern Australian National Electricity Network examining potential project areas based on several criteria including:

- Proximity to electrical substations;
- Access to existing electrical substations and capacity of each substation to accept new generation;
- Marginal loss factors and future forecasts;
- Consideration of known solar projects proximate to a proposed project area and the potential for impact on capacity and connection;
- Irradiation levels;
- Agreements with landowners to host a project;
- Utilised land such as land used for agricultural land uses to reduce the likelihood of the solar development encountering significant areas of native vegetation, Aboriginal cultural heritage items or other environmental constraints;
- Environmental analysis of ecology, archaeology and potential environmental constraints including flooding;
- Favourable topography and geotechnical conditions for constructing and operating a solar development;
- Proximity to towns but equally enough distance between the site and urban populated areas;
- Suitable infrastructure surrounding the project area e.g. roads access for construction and operation of a solar development;
- NEM capacity, grid strength and the ever-increasing market demand for renewable energy;
- Favourable response from enquires with the Transmission Network Service Provider (ElectraNet); and
- Details on interstate connectors and relevant known transmission constraints.

The initial assessment of the 530ha (approximately) Project area found it met several key criteria including:

- The Project area is close to and can access the Bungama Substation;
- Bungama Substation has the capacity to accept new electricity generation;
- The area has a strong electrical transmission network;
- The landowners of the Project area were receptive to hosting a solar development;
- The Project area is used for agricultural land uses including cropping and grazing thereby reducing the likelihood of the Project encountering significant areas of native vegetation, Aboriginal cultural heritage items or other environmental constraints;
- Suitable infrastructure surrounding the Project area including good State and Local road access to the Project area for construction and operation of a solar development;
- Good irradiation levels; and

- Proximity to the City of Port Pirie but equally enough distance between the Project area and Port Pirie.

Based on the positive outcomes of the initial assessment and with strong landowner support the next phase of assessment was commenced including detailed grid connection studies, financial feasibility modelling, specific Project area investigations including preliminary field works to identify any unknown environmental and cultural constraints and preliminary Project design works. The assessment found:

- Power generated by the Project can be exported into the grid without any significant constraints;
- Colocation of the Project close to the Bungama Substation minimises the connection transmission line distance thereby reducing the need for transmission tower structures, electrical transmission losses and consequently improving the economics of the Project on the Project area;
- The Project will not be constrained by environmental constraints such as flooding, ecology or archelogy; and
- Favourable topography and geotechnical conditions for constructing and operating a solar and battery development.

Based on the findings the Project was considered feasible. Consideration then turned to the social aspect of the Project including ascertaining relevant stakeholder opinions on the Project in the Project area's locality.

On behalf of Bungama Solar, EPS Energy carried out pre-Development Application lodgement community and stakeholder engagement to understand the opinions of relevant stakeholders on the Project in the Project area's locality. Details of the consultation are set out in the following section Consultation.

CONSULTATION

The following stakeholders were identified as key to the Project:

- Landowners and occupiers of the properties forming the Project area and adjacent properties;
- Key government and agency members;
- The Nukunu Peoples Council Inc.;
- The wider Bungama/Napperby/Warnertown communities and established groups; and
- The relevant authorities who manage the registered easements across the Project area.

The response from the Pre-Development Application lodgement community and other stakeholder engagement has been largely positive and supportive of the Project.

An estimated 124 guests attended the information sessions over the two days (Thursday 31 May 2018 and Friday 01 June 2018)). This included 13 of the 27 identified adjacent landowners who attended the dedicated Neighbour Information Session. This also included a number of representatives from the Port Pirie Regional Council, Regional Development Australia and ElectraNet.

A number of key members of Council, State Government and other agencies attended the Community Information Sessions. The responses remained largely positive and supportive of the Project.

Most attendees of the Community Information Sessions were generally interested in learning more about the Project and looking for additional details around some of the information in the Information Brochure. Conversations with the attendees also identified anecdotal information about the area, including potential risks that may be useful to inform various aspects of the Project (e.g. the occurrence of strong winds, local resources).

The key themes that have arisen from correspondence with the general community to date include:

- Expressions of interest to participate in the Construction Phase by providing services and/or equipment;
- Interest in the locality for future projects;
- Economic benefit to the locality during construction;
- The potential adverse visual impacts of the Project;
- Clean energy production/ reduction in use of fossil fuels;
- Environmental benefits; and
- Lower power costs.

A total of 13 of the 27 identified adjacent landowners attended the Information Sessions. While supporting renewable energy in the form of solar energy, some landowners raised concerns about the Project being located near their land. Common concerns that were raised included:

- The potential adverse visual impact on their land;
- The potential adverse noise impacts on their land;
- The potential adverse impact on their livestock and horses on their land;
- The potential negative impacts on the value of their land; and
- The potential safety issues with construction traffic.

In direct response to adjacent landowner concerns, designs have been amended to reduce the potential for adverse impacts by:

- Including in excess of 7 km of visual buffering in the form of landscape screening at a direct Project cost estimated to exceed $750,000;
- Reducing the land area allocated to solar panels by approximately 24 hectares, equivalent to a reduction of 36,000 panels and equating to approximately $5,000,000 in relinquished income over the life of the Project; and
- Power Conditioning Units (inverters) near adjoining boundaries being relocated to reduce the potential for noise impact.

PROJECT DESCRIPTION

The PVS element of the Project will have a maximum output capacity of approximately 280MW (AC). The BESS element of the Project includes up to 140MW capacity battery with up to 560MWh of storage. The Project may also include one or more synchronous condensers to assist in providing inertia for managing power system strength. Further detailed assessments are underway to ascertain the option and appropriate sizing of any synchronous condensers.

The Project will include, but not be limited to, the following components:

- Solar Photovoltaic modules and ground mounted tracking racks;
- DC/AC containerised or skid mounted Inverter stations;
- Battery storage area;
- Synchronous condensers (subject to requirement);
- Transformers;
- Switching yard and electrical substation;
- Associated underground cables connecting groups of solar panels to inverter stations and inverter stations via overhead and/or underground transmission lines to a transformer in the substation;
- Ancillary infrastructure and buildings associated with the development including a site office, maintenance sheds, laydown area/compound access tracks and perimeter fencing; and
- Connection to Bungama Substation via overhead and/or underground transmission lines.

The Project will likely connect to Bungama Substation via a dedicated 275 kV circuit overhead and/or underground transmission lines having a route length of between 0.5-3km (approximately) dependant on the final design and location of the Project's transformers and switch gear. These network connection facilities will be designed, constructed and operated to ensure compliance with all statutory requirements.

Extensive technical assessments and National Electricity Market rules for connection to the high voltage transmission network require a separate approval process, coordinated with Australian Energy Market Operator (AEMO) and ElectraNet, for the PVS and BESS connection to the Bungama Substation.

In line with other utility scale solar developments the Project includes three broad phases, the development or construction phase, the operation phase and the decommissioning phase.

The development/construction phase of the Project with a maximum output capacity of approximately 280MW (AC) and a battery energy storage system with 560MWh capacity is multifaceted and consequently is likely to be constructed in a number of phases over a number of years.

STATUTORY PLANNING CONTEXT

The development application is submitted pursuant to Section 49 of the *Development Act 1993*.

ENVIRONMENTAL ASSESSMENT

Initial Project technical studies conclude there will be minimal impact to the surrounding environment. The studies underpin the key findings and recommendations outlined in this Planning Report.

The following is a summary of the key environmental considerations:

Visual Amenity

The Visual Impact Assessment (VIA) found that the overall visual impact rating to residential and viewpoint receptors is “Low” and “Moderate-Low” respectively.

Notwithstanding, the Community Consultation undertaken for the Project indicated that some residents living in close proximity to the Project were concerned about the visual impact of the Project, while others were impartial. These concerned residents include existing residents and those who own land adjacent to the Project but do not reside on the land as there is no dwelling.

In direct response to the concerns raised by some residents, the Project has implemented an additional key mitigation measure for further ameliorating Project visibility from not only the adjacent existing residences, but also the potential future residences. The additional key mitigation measure is to include a “visual buffer zone” in targeted sections of the Project area to further screen the Project.

Traffic and Transport

Anticipated traffic volumes will be highest during the Project's construction while operational traffic volumes are expected to be minimal.

A Transport Impact Assessment (TIA) assessed the potential impact of the Project's construction traffic movements on transport routes and other road users and assessed the potential impact of the Project's operational traffic movements on transport routes and other road users based on the Project being completely operational. The assessment reaches several conclusions including the traffic generated by the Project during the construction and operational phases is very low in comparison to existing traffic volumes on the State controlled roads and therefore is not expected to compromise the safety or function of the surrounding State road network and the traffic generated by the proposed Project area during the construction and operational phases is not expected to compromise the safety or function of the local roads that experience low volumes of traffic.

A Traffic Management Plan for the construction phase will be prepared before the commencement of construction in consultation with Department of Planning, Transport and Infrastructure (DPTI) and Port Pirie Regional Council. The Traffic Management Plan will address construction vehicle access arrangements and identify traffic management measures to address traffic safety and access issues inherent with using oversized vehicles and general construction traffic.

Biodiversity

The Project's area is predominately used for cropping and grazing livestock. Approximately 0.1% of the Project Area is covered in native vegetation.

Desktop and initial field survey assessment of the Project area's ecological values were completed to determine the presence of species of conservation significance (i.e. species protected under Commonwealth or State legislation).

The Project area is predominantly cleared agricultural land used for cropping with thin strips of vegetation along field boundaries. Avoiding these strips of native vegetation will be considered as part of the final Project design.

Two scattered trees where identified in the Project area. Initial fauna surveys opportunistically identified the presence of four (4) bird and one mammal species. None of these are listed as threatened under either the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) or *National Parks and Wildlife Act 1972* (SA).

Further Flora and Fauna field survey work may be carried out to inform the Project's final layout plans.

Cultural Heritage

Desktop and initial archaeological survey assessment of the Project area were completed to understand the possible presence of Aboriginal and/or European archaeological value within the Project area.

The initial assessment identified four (4) Aboriginal sites (including one site which was already registered), 20 isolated artefacts along with six (6) culturally sensitive landscapes.

Discussions have commenced with the Nukunu Peoples Council Inc. regarding further archaeological survey assessment of the Project area to identify the presence of Aboriginal heritage within the Project area.

The Cultural heritage survey works and discussion with the Nukunu Peoples Council Inc. will inform the Project's final layout plans.

Land Use

The possible medium - term change of land use of approximately 5.3km² of agricultural land is a very minor (0.02%) change on the region's 3.2 million+ hectare agricultural production potential (Based on Australian Bureau of Agricultural and Resource Economics land use data 2011).

Investigations are being undertaken to assess if sheep grazing or other co-located limited agricultural activities under the panels is feasible during the operation phase.

After the Project's decommissioning the Project area will be available for agricultural production. Consequently, the Project will not have an adverse impact on the long-term agricultural use of the land.

Flooding

The Project will not have a demonstrable impact on local flooding.

Hydrology

The Project will not affect basic landholder water rights and harvestable rights.

Soils and Salinity

The Project will involve short - term construction, followed by decades of operation with either limited co-location agricultural land uses or no agricultural land uses. The Project will not contribute to an increase in the existing salinity levels or adversely impact the existing soil conditions.

Surface Water and Erosion

The majority of the Project area will be retained in its current condition allowing infiltration of rainfall. A small area of the Project area (approximately 13ha or 2.5% of the Project area) could potentially increase the runoff volumes and velocities however with appropriate management the potential for erosion and migration of sediment is considered unlikely.

During the construction and operational phases, the Project will implement measures to ensure peak runoff rates or long-term runoff yields are not increased or are minimal and the possibility of soil erosion is limited.

Groundwater

The risk of groundwater contamination is very low. Fuel, oils and lubricants required during construction and operation will be stored and managed in accordance with relevant standards.

Water Resource

Australia is one of the world's top 20 water-stressed nations.

A report by the World Resources Industry notes the following key points:

- It identified Australia as one country vulnerable to water stress where the potential for cheap renewable energy, solar and wind as opposed to fossil fuels, could reduce water consumption country-wide as these technologies use minimal water.
- Every megawatt hour of electricity generated by coal withdraws around 60,700 litres and consumes about 2,600 litres of water.
- In the 2017-2018 financial year, Australian's have consumed 147 terawatt hours of electricity, about 73 per cent of which comes from coal, which equates to around 455 billion litres of water.

The Project will contribute to reducing the amount of water required to generate electricity.

Climate

The Project will, deliver clean and renewable energy to the South Australian people in the face of climate change, assist in meeting renewable energy targets for the State and the nation, displace the annual equivalent of 497,000 tonnes of greenhouse gas emissions, comparable to planting 69,500 trees or removing 195,000 cars from the road and provide clean energy to power an equivalent of 86,000 homes for each year of the Project's 30 year life.

Noise

A Noise Assessment quantifies potential noise levels associated with the construction and operation of the Project.

The assessment found noise emissions during the construction and operation phase will be compliant with the Environment Protection (Noise) Policy 2007 and will not cause adverse impacts.

The Noise Assessment concluded there are no noise related issues which would prevent the approval of the Project.

Bushfire

The risk of initiating fire from the solar panels, inverters and other solar infrastructure is very low due to high quality of the components. Potential ground cover on the Project area does pose a potential risk of fire. Mitigation of this risk will include the internal access roads being maintained for access and where relevant as a firebreak.

Air Quality

Potential dust generated by construction traffic on internal access roads and unsealed public roads will be mitigated by standard management controls. The Project is not expected to generate measurable dust during operations.

Electric and Magnetic Fields

The Project design will adhere to the clearance distances from sensitive receivers for safety purposes and incorporate suitable buffers to limit exposures in accordance with several technical and legislative requirements.

Socio-Economic

The Project will:

- Deliver clean and renewable energy for Australia in the face of climate change;
- Assist in meeting renewable energy targets for the State and the Nation;

- For each year of its 30-year operational life, displace the equivalent of 497,000 tonnes of greenhouse gas emissions per annum, the equivalent of offsetting the impact of 195,000 cars or providing the equivalent benefit of 69,500 trees per annum;
- Provide clean energy to power an equivalent of 86,000 homes for each year of the Project's life;
- Create industry diversity for the Port Pirie region;
- Create substantial employment opportunities during Project construction phases;
- Be located in a suitable area with access to existing infrastructure;
- Provide a flexible, low-impact alternative to the existing agricultural land use;
- Generate an estimated economic benefit in the order of $292.5 million for the broader economy and approximately $164 million as direct domestic Project expenditure;
- Generate up to an estimated 275 equivalent full-time jobs during construction, and a further 410 indirect full-time equivalent jobs;
- Generate up to an estimated 8 equivalent full-time jobs during operations; and
- Provide a direct benefit to the community in the form of a community fund.

Glint and Glare

A Glint and Glare Analysis assessed the potential optical effects on drivers on certain parts of relevant roads, residence in some adjacent areas for housing, a section of the railway line as well as airplanes approaching the Port Pirie Airport from the PVS solar panels on a single axis tracking system during the Project's operational phase.

There are no Glint or Glare issues for pilots or for the section of the railway line near the Project area or for the section of the Augusta Highway adjacent to the Project area.

No harmful glint or glare will be experienced for sensitive receivers as a result of the Project, with the potential for a low level of glare experienced for some locations either very early morning or late evening in the Autumn and or Winter, if these areas are not impeded by existing vegetation.

A section of Warnertown Road experiences only 2 minutes of low level glare late evening on some Autumn and Winter days for a total cumulative less than one hour per annum. A section of Gulf View Road experiences low level glare for two minutes per year. The proposed visual screening will mitigate low-level glare.

Some areas of the adjacent Napperby rural living area may experience some low-level glare in early morning or late evening during Autumn and or Winter if views directly to the PVS solar panels were unimpeded. Proposed landscape screening will mitigate the potential for this low-level glare.

Environmental Management Framework

Environmental Management Plans for the Project's construction phase and operation phase will be prepared detailing the management measures for any potential environmental risk.

CONCLUSION

The Planning Report concludes the Project:

- Is consistent with the relevant statutory provisions;
- Will not result in significant environmental impacts;
- Is suitable at the proposed Project area; and
- Is in the public interest.

Therefore, it is respectively requested the Project be approved subject to final Project documents and plans being approved by relevant Government authorities prior to the commencement of construction and operation.

ABBREVIATIONS

Abbreviation	Description
AADT	Annual Average Daily Traffic
AC	Alternating Current
ACMA	The Australian Communications and Media Authority
AEMO	Australian Energy Market Operator
APZ	Asset Protection Zones
Asl	Above Sea Level
BESS	Battery Energy Storage System
CASA	Civil Aviation Safety Authority
CMP	Construction Management Plan
DC	Direct Current
DRP	Decommissioning and Rehabilitation Plan
DPTI	Department of Planning, Transport and Infrastructure
EMF	Electromagnetic Fields
EMP	Environmental Management Plan
EPA	Environment Protection Authority
ESCOSA	Essential Services Commission of South Australia
FTE	Full Time Equivalent
GHG	Greenhouse Gases
LGA	Local Government Area
MW	Megawatt
MWh	Megawatt hour
NEM	National Electricity Market
OMP	Operational Management Plan
OP	Observer locations
OTR	Office of the Technical Regulator
PBS	Performance Based Standards
PR	Planning Report
Project	Bungama Solar
PV	Photovoltaic
PVS	Photovoltaic Energy Generation System
RFI	Radio Frequency Interface
RO	Route locations
RET	Renewable Energy Target

The Act	Development Act 1993
TIA	Transport Impact Assessment
SA	South Australia
SARIG 2018	South Australian Resource Information Gateway
VIA	Visual Impact Assessment

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APPENDICES

1. INTRODUCTION

Bungama Solar ('the Project') is situated approximately 6km east of Port Pirie, and 218km north of the State's capital, Adelaide. The Project is within the Local Government Area (LGA) of Port Pirie Regional Council. The Project land comprises the Project area on which the PVS, BESS, Project's substation, Operations and Maintenance buildings and associated infrastructure will be built and operated, and land required to connect the Project's elements to ElectraNet's Bungama Substation. The Project area is approximately 530ha.

This Planning Report (PR) has been prepared to explain the environmental, social and economic matters associated with the Project. At this stage the Project is proposed to be an integrated but separately operated grid connected Photovoltaic Energy Generation System (PVS) of approximately 280MW (AC) generation capacity and a 140MW capacity Battery Energy Storage System (BESS) with 560MWh of storage. The PVS element, the BESS element and associated infrastructure, together "the Project", requires an estimated capital investment of AUD $650 million. The Project's detailed design will be completed prior to construction.

Attached as Appendix 1 is Department for Energy and Mining's endorsement of the Project for the purposes of section 49 of the *Development Act 1993* (SA). The Development Application is submitted for the approval of construction, operation and decommissioning of the Project including the Project's connection to the Bungama Substation.

1.1. APPROVALS SOUGHT

The Development Application seeks development approval for the following Project components and approach:

- Development approval for the construction, operation and decommissioning of the following components:
  - A Photovoltaic Energy Generation System (PVS) of approximately 280MW (AC) generation capacity and associated infrastructure;
  - A 140MW capacity Battery Energy Storage System (BESS) with 560MWh of storage and associated infrastructure;
  - Temporary construction components required to construct the Project's PVS element and BESS element including (but not limited to) access points, construction camp (if required), workshops, outbuildings, site office, amenities, laydown areas, waste storage areas, car parking areas, refuelling areas, clean-down facilities, roads, fences;

- Permanent operations components of the PVS element including (but not limited to) the series of mounted photovoltaic modules set out in arrays, inverter/ transformer stations, interconnector substations, switching station, all overhead transmission and/or underground cabling and operational, maintenance and control buildings;
- Permanent operations components of the BESS element including (but not limited to) the battery energy storage area, sheds (if required) and all overhead transmission and underground cabling;
- Connection of the Project's PVS element and BESS element to ElectraNet's Bungama Substation and required connection infrastructure including but not limited to overhead transmission and/or underground cabling and associated poles;
- Infrastructure upgrades to ElectraNet's Bungama Substation to allow to the Project's PVS element and BESS element to export and import electricity into and out of the national electricity grid;
- Any synchronous condensers if included in the Project;
- Permanent operations ancillary components of the Project including (but not limited to) all internal roads, car parking areas, fencing, and access points to the road network, and any other relevant matter; and
- Landscaping plan(s).

- An approval validity timeframe providing for four (4) years after the operative date of the development approval to substantially commence construction, and six (6) years after the operative date of the development approval to substantially complete construction;
- Temporary construction facilities to be dismantled post construction; and
- Staging of building rules consent and commencement of construction for different Project elements and/or components, as described in section 1.3 of this document.

1.2. TIMING

Construction, including the commissioning, of a 280MW(AC) PVS element with an integrated; but separately operated 140MW/560MWh BESS element is complex multifaceted and dependant on a number of factors including:

- Development of the required final detailed construction/engineering plans;
- Tender process for the PVS technology and BESS technology, the construction of the PVS technology and BESS technology and the operation of the PVS technology and BESS technology;
- Project financing, which is itself dependent on a number of factors including a feasible development consent, the economic and political environment at the time of construction, the time required for a financial organisation's diligence enquires for an estimated capital investment of AUD $650 million, the financial

arrangements/requirements for constructing the Project and possibly negotiating and entering into offtake agreements;

- Lead times for the delivery from overseas suppliers of the various components for the Project. The lead times are influenced by the selected technology which will not be known until the final design stage. Given the world's current interest in solar development, some components are anticipated to have delivery lead times of up to 2 years from order;
- Phased completion of construction;
- Efficiencies associated with both economies of scale and with reduced demobilisation and remobilisation costs, which influences the timing of the phases for construction; and
- The time required to comply with AEMO's commissioning tests and verification testing requirements prior to grid connection.

To adequately manage the factors influencing the construction of a 280MW(AC) PVS element with an integrated but separately operated 140MW/560MWh BESS element the development timeframes provided in Table 1-1 and Table 1-2 are proposed for the Project with the option of the relevant approval authority being permitted to extend these periods if required.

Table 1-1: Development Milestone Timeframes – PVS – Bungama Solar 1 Pty Ltd

Milestone	Timeframe Sought
Substantial Commencement	4 years from the Development Approval operative date
Substantial Completion	6 Years from the Development Approval operative date

Table 1-2: Development Milestone Timeframes – BESS – Bungama Solar 2 Pty Ltd

Milestone	Timeframe Sought
Substantial Commencement	4 years from the Development Approval operative date
Substantial Completion	6 Years from the Development Approval operative date

1.3. STAGING OF CONSTRUCTION WORKS AND BUILDING RULES CONSENT

A project's PVS element, of this size, would typically be constructed in 2 phases. The PVS phases would typically comprise the following works:

- PVS Phase 1: PVS up to approximately 140MW(AC) with associated infrastructure; and
- PVS Phase 2: PVS up to approximately 140MW(AC) with associated infrastructure.

The BESS construction would also typically be phased to meet incremental project maturity.

The BESS grid connection infrastructure is proposed to be constructed adjacent to the switchyard for the Project. The Project seeks development approval to incrementally add to the BESS up to and after substantial completion, up to a total capacity of 140MW.

The BESS physical grid connection works will be completed as part of substantial completion while the battery capacity and storage will be incrementally added over the life of the Project to allow flexibility in increasing the BESS as technology and commerciality of utility scale batteries matures.

On that basis, it is proposed that once development approval for the entire Project has been obtained, building rules consent will be obtained and construction will proceed in stages.

Works which do not require building rules consent will comprise a separate stage so that construction can commence as soon as practicable subject to compliance with development approval conditions and reserved matters (if any). This stage will encompass such things as site mobilisation activities, establishing temporary laydown areas and facilities, access roads formation or widening, underground cable works and other civil works.

For works that do require building rules consent, it is proposed that building rules consent may be obtained separately for each structure and for each stage of construction as exemplified but not limited to following list:

- PVS Phase 1: PVS up to approximately 140MW(AC) with associated infrastructure;
- PVS Phase 2: PVS up to approximately 140MW(AC) with associated infrastructure;
- BESS Phased storage area suitable for a BESS up to approximately 140MW(AC) and 560MW/hrs with associated infrastructure;
- Battery units (in incremental sub-stages) up to a total capacity of 140MW;
- Temporary construction components required to construct the Project's PVS element and BESS element including (but not limited to) access points, construction camp, workshops, outbuildings, site office, amenities, laydown areas, waste storage areas, car parking areas, refuelling areas, clean-down facilities, roads, fences;
- Permanent operations components of the PVS element including (but not limited to) the series of mounted photovoltaic modules set out in arrays, inverter/ transformer stations, interconnector substations, switching station, all overhead transmission and underground cabling and operational, maintenance and control buildings;
- Permanent operations components of the BESS element including (but not limited to) the battery energy storage area, sheds (if relevant) and all overhead transmission and underground cabling;

- Connection of the Project's PVS element and BESS element to ElectraNet's Bungama Substation and required connection infrastructure including but not limited to overhead transmission and/or underground cabling and associated poles;
- Infrastructure upgrades to ElectraNet's Bungama Substation to allow the Project's PVS element and BESS element to export and import electricity into and out of the national electricity grid;
- Any synchronous condensers if included in the Project; and
- Permanent operations ancillary and associated components of the Project including (but not limited to) all internal roads, car parking areas, fencing, and access points to the road network, landscaping plans and any other relevant matter.

The Office of the Technical Regulator (OTR) prescribes technical requirements that Generators must meet in order to lodge an application for Development Approval. In summary the technical conditions to be met include:

- The Generator shall provide either Real Inertia (real physical inertia provided by a synchronous system) or Fast Frequency Response;
- The Generator is connected to the network via a switched connection (breaker and half connection) or other connection approved by the OTR; and
- The Essential Services Commission of South Australia's (ESCOSA) current Generator Licencing conditions must be met.

The OTR has issued a certificate of approval for the Project which is provided in Appendix 1.

1.4. OBJECTIVES

The Project's objectives are:

- To provide a large-scale, grid connected solar power development that can contribute to SA's electricity supply;
- To provide dispatchable clean energy via energy storage in the form of a battery system;
- To contribute to Australia's competitive electricity market with a renewable energy resource;
- To contribute to Australia's growing solar industry;
- To encourage development in regional SA areas;
- To develop infrastructure and technical knowledge that will contribute to the Australian renewable energy industry;
- To assist in reducing electricity prices in South Australia; and
- To assist in South Australia's electricity network and increase resilience to operation of the network.

1.5. PROPONENT

Bungama Solar 1 Pty Ltd is the special purpose vehicle for the Photovoltaic Energy Generation System (PVS) and Bungama Solar 2 Pty Ltd is the special purpose vehicle for the Battery Energy Storage Systems (BESS). The PVS element, BESS element and associated infrastructure together are “the Project”.

Energy Projects Solar (EPS) Pty Ltd is the development consultant for the Project.

2. LAND DESCRIPTION

2.1. PROJECT AREA SELECTION

On behalf of Bungama Solar, EPS Energy undertook an extensive solar site identification assessment across the Eastern Australian National Electricity Network examining potential project areas based on several criteria including:

- Proximity to electrical substations;
- Access to existing electrical substations and capacity of each substation to accept new generation;
- Marginal loss factors and future forecasts;
- Consideration of known solar projects proximate to a proposed project area and the potential for impact on capacity and connection;
- Irradiation levels;
- Agreements with landowners to host a project;
- Utilised land such as land used for agricultural land uses to reduce the likelihood of the solar development encountering significant areas of native vegetation, Aboriginal cultural heritage items or other environmental constraints;
- Environmental analysis of ecology, archaeology and potential environmental constraints including flooding;
- Favourable topography and geotechnical conditions for constructing and operating a solar development;
- Proximity to towns but equally enough distance between the site and urban populated areas;
- Suitable infrastructure surrounding the project area e.g. roads access for construction and operation of a solar development;
- NEM capacity, grid strength and the ever-increasing market demand for renewable energy;
- Favourable response from enquires with the Transmission Network Service Provider (ElectraNet); and
- Details on interstate connectors and relevant known transmission constraints.

The initial assessment of the 530ha (approximately) Project area found it met several key criteria including:

- The Project area is close to and can access the Bungama Substation;
- Bungama Substation has the capacity to accept new electricity generation;
- The area has a strong electrical transmission network;
- The landowners of the Project area were receptive to hosting a solar development;

- The Project area is used for agricultural land uses including cropping and grazing thereby reducing the likelihood of the Project encountering significant areas of native vegetation, Aboriginal cultural heritage items or other environmental constraints;
- Suitable infrastructure surrounding the Project area including good State and Local road access to the Project area for construction and operation of a solar development;
- Good irradiation levels; and
- Proximity to the City of Port Pirie but equally enough distance between the Project area and Port Pirie.

Based on the positive outcomes of the initial assessment and with strong landowner support the next phase of assessment was commenced including detailed grid connection studies, further financial modelling, specific Project area investigations including preliminary field works to identify any unknown environmental and cultural constraints and preliminary Project design works. The assessment found:

- Power generated by the Project can be exported into the grid without any significant constraints;
- Colocation of the Project close to the Bungama Substation minimises the connection transmission line distance thereby reducing electrical transmission losses through long transmissions and consequently improving the economic rationalisation of the Project on the Project area;
- The Project will not be constrained by environmental constraints such as flooding, ecology or archelogy; and
- Favourable topography and geotechnical conditions for constructing and operating a solar development.

Based on the findings the Project on the Project area was considered feasible. Consideration then turned to the social aspect of the Project including ascertaining relevant stakeholder opinions on the Project in the Project area's locality.

On behalf of Bungama Solar, EPS Energy carried out pre-Development Application lodgement community and stakeholder engagement to understand the opinions of relevant stakeholders on the Project in the Project area's locality. Details of the consultation are set out in Section 6 Community and other Stakeholders.

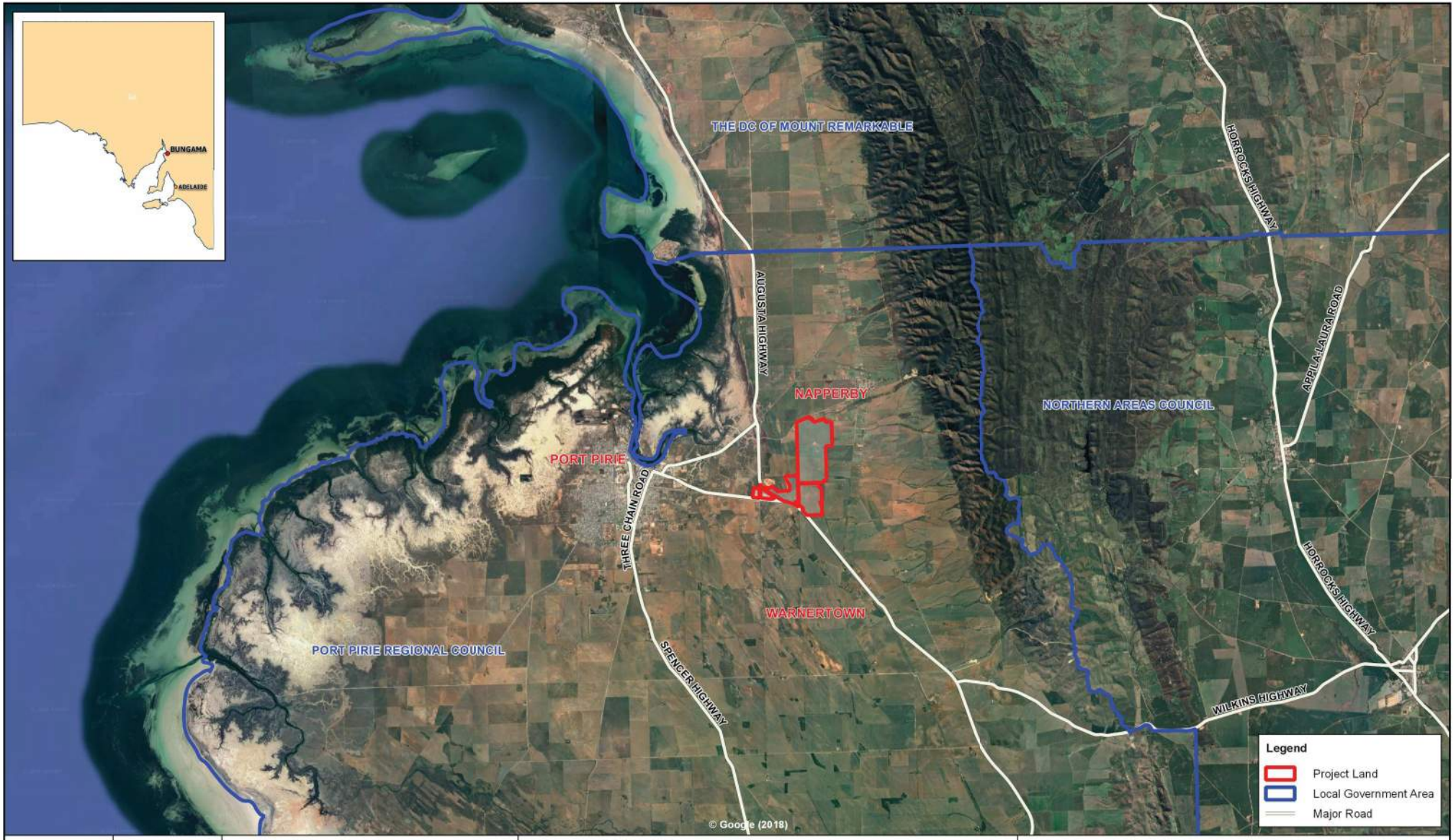
2.2. PROJECT AREA CONTEXT

The Project area is approximately 530ha (5.3km^2) located in the suburbs of Bungama, Napperby and Warnertown in South Australia. The Project is situated approximately 6km east of Port Pirie, and 218km north of the State's capital, Adelaide. The Project is within the Local Government Area (LGA) of Port Pirie Regional Council.

The Port Pirie Regional Council is in the Mid North region of South Australia situated on the upper reaches of the Spencer Gulf in the Southern Flinders Ranges of South Australia. It is a diverse region encompassing agricultural and industrial activities, with a history as a major manufacturing and export centre, where industry, century old buildings and attractive parks and gardens sit side by side.

The Port Pirie Regional Council area is approximately 1,761 km^2 a with a population of 17,364 (2016 census). The Port Pirie Regional Council area is located within the Mid North Region of South Australia which covers about 23,000km^2 with a population of 33,500 (2016 census).

Figure 2-1 shows the location of the Project land.



Author:	MB
Reviewer:	SMC/ JB
A3 Scale:	1:150,000
Job Ref/Version:	11297/ V02

0 2.5 5 7.5 10 km

Map Projection: GDA 1994 MGA Zone 54

Figure 2-1

Location Plan

Bungama Solar | Bungama SA Australia

21/11/2018

BUNGAMA SOLAR

11297_FR_Location Plan.qgs

2.3. PROJECT LAND

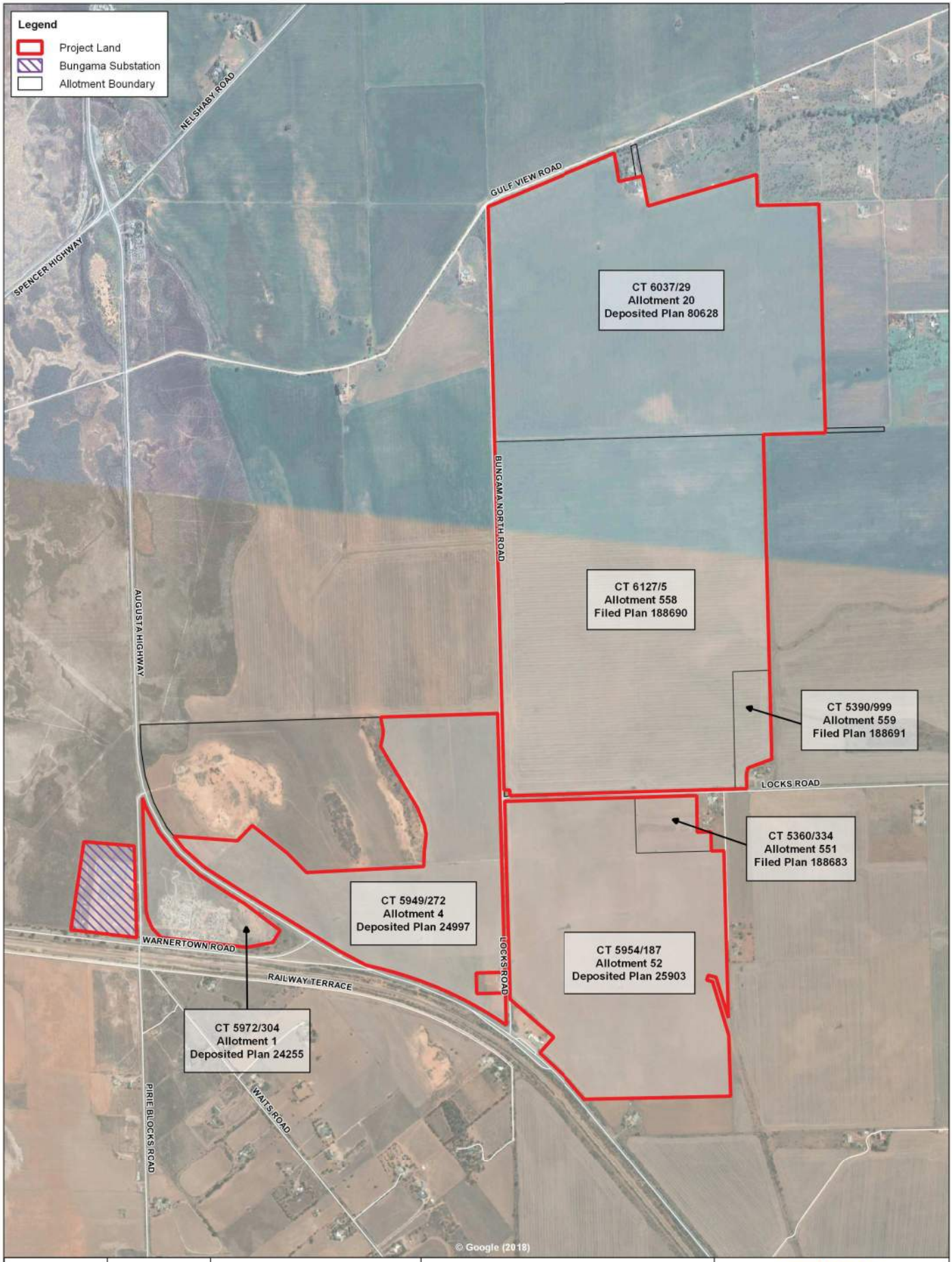
The Project land title particulars are:

Title	Lot/Plan/Section
CT 6037/29	A20 DP80628
CT 6127/5	A558 FP188690
CT 5954/187	A52 DP25903
CT 5949/272	A4 DP24997
CT 5390/999	A559 FP188691
CT 5360/334	A551 FP188683
CT 5972/304	A1 DP24255
CT 5776/531	A501 DP52803
CT 5776/532	A502 DP52803
CT 5978/766	A55 DP71831

The Project land comprises the Project area on which the PVS, BESS, Project's substation, Operations and Maintenance buildings and associated infrastructure will be built and operated, and land required to connect the Project's elements to ElectraNet's Bungama Substation.

A copy of the Project land Certificates of Titles are attached as Appendix 2.

Figure 2-2 shows the Project land.



Author:	MB
Reviewer:	SMC/ JB
A3 Scale:	1:15,000
Job Ref/Version:	11297/ V04

0 100 200 300 400 500 m

Map Projection: GDA 1994 MGA Zone 54

Figure 2-2

Project Land Plan

Bungama Solar | Bungama SA Australia

21/11/2018

BUNGAMA SOLAR

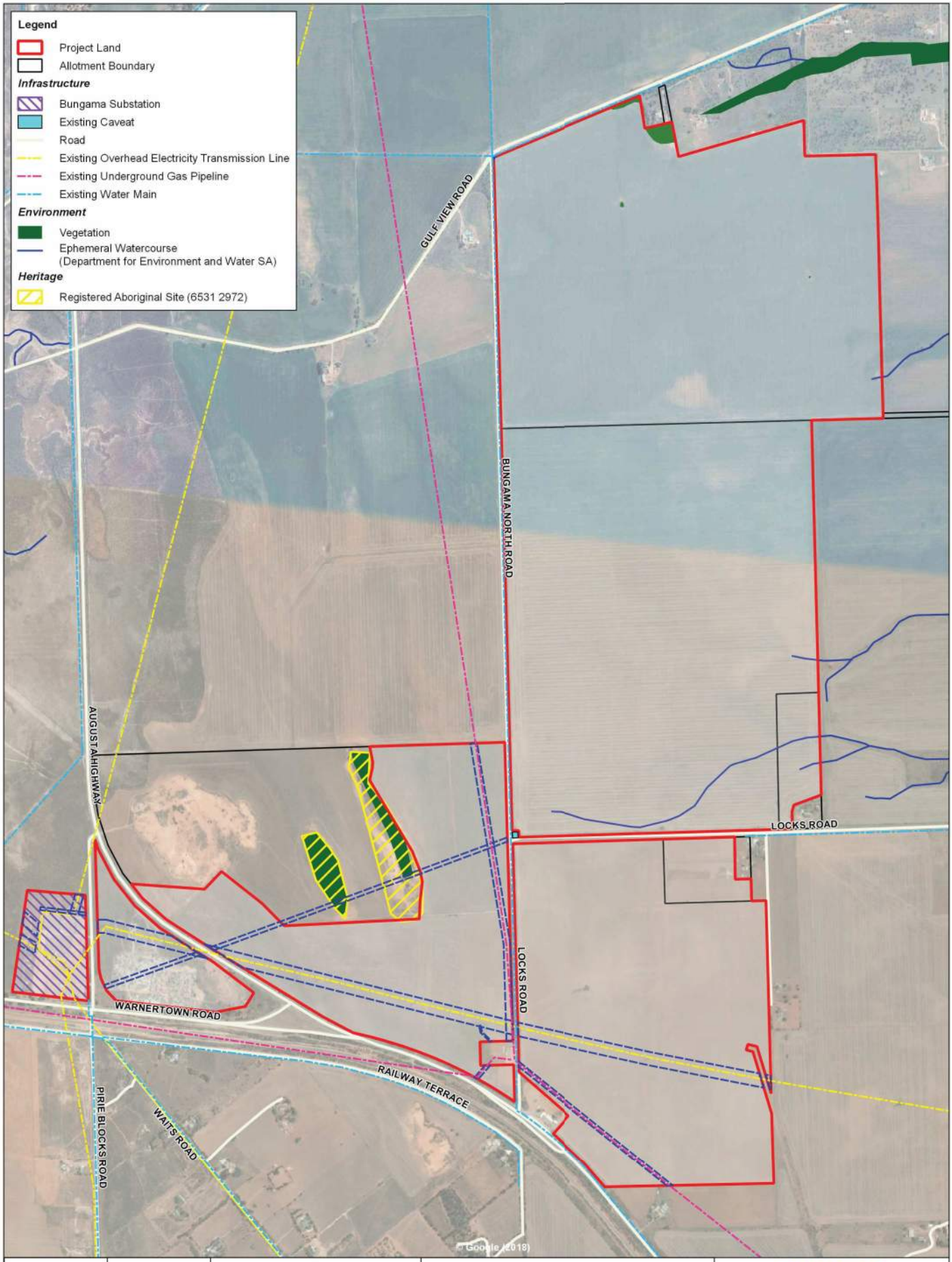
11297_PR_Project Land.qgs

2.4. EXISTING LAND USE OPERATIONS

The Project area has been used for many years for cereal cropping and grazing. Land within the immediate area of the Project area is predominately used as agricultural land and rural residential living.

There is existing utility scale electricity infrastructure in the immediate area including the Bungama Substation.

Figure 2-3 shows key physical features of the Project land.



Author:	MB
Reviewer:	SMC/ JB
A3 Scale:	1:13,000
Job Ref/Version:	11297/ V02

0 100 200 300 400 500 m

Accuracy: location and scale of features is indicative only

Map Projection: GDA 1994 MGA Zone 54

Figure 2-3

Key Physical Features of the Project Land

Bungama Solar | Bungama SA Australia

23/11/2018

BUNGAMA SOLAR

11297_PR_Key Features of Project Land.qgs

3. PROJECT DESCRIPTION

3.1. PROJECT CAPACITY

3.1.1. Description of Development

The Project land comprises the Project area on which the PVS, BESS, Project's substation, Operations and Maintenance buildings and associated infrastructure will be built and operated, and land required to connect the Project's elements to ElectraNet's Bungama Substation.

The Project area is approximately 530ha and the Project development footprint is approximately 413ha (approximately 78% of the Project Area).

The predominance of the development footprint comprises the PVS which will have a maximum capacity of approximately 280MW (AC).

The BESS element of the Project will have a maximum energy storage capacity of 140MW/560MWh and depending on the final BESS technology could occupy a footprint of up to approximately 12ha being approximately 2.9% of the Project development footprint.

The PVS element & BESS element will be connected to the adjacent Bungama Substation via a dedicated 275 kV circuit over-head and poles or underground transmission lines having a route length of between 0.5-3km (approximately) dependant on the final design and location of the Project's transformers and switch gear.

<u>PVS description</u>

Solar photovoltaic (solar panel) technology uses manufactured semiconductor material to absorb and convert sunlight into electricity. Each solar panel contains a series of interconnected cells that convert sunlight directly into electricity. The solar panels produce energy in the form of direct current (DC), which is converted to alternating current (AC) via a solar inverter.

The solar panels will be mounted on single axis tracking racks. The panels will be installed in parallel rows with the spacing being between approximately 4m to 10m depending on the type of the single axis tracking racks selected as part of the final design.

Groups of solar panels are connected to each inverter by underground cabling and the inverters are linked together to collect the total energy being produced. Step-up transformers, that increase the voltage are housed in the inverter containers. Underground or overhead lines are run from each inverter station to the Project's on-site switching substation where the voltage is again stepped up via one or more transformers to match the voltage of the transmission network.

The PVS will connect to the Bungama Substation via the 275Kv transmission line to the Bungama Substation allowing the PVS to export a maximum capacity of approximately 280MW (AC) into the national electricity grid.

BESS description

A utility-scale BESS encompasses multiple battery units and associated infrastructure housed in a storage structure or structures.

The BESS will connect to the Bungama Substation via the 275Kv transmission line to the Bungama Substation allowing the BESS to export and import electricity into and out of the national electricity grid.

The BESS can support the South Australian electricity grid through a variety of services such as frequency control and short-term network security services and can assist in stabilising the South Australian electricity grid, facilitate integration of renewable energy in the State, provide arbitrage and assist in preventing load-shedding events.

3.2. PROJECT DESIGN AND LAYOUT

The Project's integrated but separately operated PVS and BESS elements together with supporting ancillary infrastructure includes (but is not limited to):

- Solar modules – mounted on single axis tracking racks;
- Module footings and racking for solar modules;
- Inverter stations;
- Transformers;
- Switching substation;
- One or more synchronous condensers (subject to requirement);
- Utility scale battery facility;
- Associated underground cables connecting groups of solar panels to inverter stations and underground and/or overhead transmission lines from inverter stations to the Project's switching substation;

- Associated cables, poles and to connect the Project to ElectraNet's Bungama Substation;
- Administration and controls area including:
    - Control room and site office with amenities;
    - Maintenance and spare parts building;
    - Other buildings;
    - Car parking sufficient for employees and contractors during operation;
    - Laydown/compound area and future battery storage area;
    - Internal access roads;
- Drainage works, including stormwater management systems;
- Areas not to be developed e.g. native vegetation areas, heritage areas;
- Security fencing and CCTV;
- Low-level night time lighting; and
- Lightning protection.

Indicative layout and preliminary PVS Operation design drawings are attached as Appendix 3. Illustrative examples of typical project componentry are included within the visual impact assessment at Appendix 7.

The following subsections examine the Project's proposed key elements identified in the indicative layout and preliminary PVS Operations design drawings. The Project's final key elements will be identified in the final design plans.

3.2.1. Single Axis Panel Solar Photovoltaic Modules

Further site layout assessments and detailed engineering will define the preferred configuration of panels to ensure:

- Maximum exposure to sun;
- Efficient layout of solar panels across the Project area;
- Efficient connection to the substation;
- Ease of construction;
- Efficient access for maintenance and long-term operation; and
- Technology advances can be incorporated.

The solar panels will be mounted on single axis tracking racks. Depending on the type of single axis panel solar photovoltaic modules selected for the final design and layout the height of the bottom of the solar modules could be in the range of 0.3 to 1.2m (approximately) above ground level while the height of modules could be approximately 2-4m above ground level.

Based on preliminary designs the Project's photovoltaic area including the spaces between the arrays and non-developed area will cover approximately 517ha or 98% of the 530ha Project area. The modules will generally be aligned on the tracking system in a north/south row and rotate in position from east to west.

Prior to the commencement of construction final layout and design drawings will be submitted to the authority specified in the development approval for endorsement.

3.2.2. Module Foundation Systems

Foundation systems for photovoltaic solar panel arrays typically comprise driven piles (most common), screw piles or mass concrete foundations that are sized to resist uplift and lateral loading during wind events.

The results of preliminary geotechnical investigations indicate driven piles is the likely foundation for the Project's geotechnical conditions. Additional investigations will be conducted prior to final design to confirm the Project's optimum foundation solution.

3.2.3. Inverter Stations

The solar panels produce energy in the form of direct current (DC), which is converted to alternating current (AC) via a power conversion unit (inverter), to allow the solar generated energy to be fed into the electricity grid. Utility-scale inverters harvest the maximum power from the solar photovoltaic array over a wide range of operating conditions (e.g. solar irradiation, temperature and shading). Typically, the inverter units will be approximately 3m in height.

The final type, design and therefore quantity of the inverter stations to be used for the Project are yet to be finalised. Final selection will be dependent on several factors including suitability for the Project area, relative cost, maintenance requirements, efficiency and reliability of units available on the market at the time of detailed design.

3.2.4. Solar Modules Connection to Inverter Stations

Groups of solar panels are connected to each inverter by underground cabling and the inverters are linked together to collect the total energy being produced. Step-up transformers, that increase the voltage, are housed in the inverter containers. Underground lines and or overhead transmission lines may be used due to the long distances across the Project area. These will run from each inverter station to the Project's switchyard/substation where the voltage is again stepped up via one or more transformers to match the voltage of the transmission network. The solar energy generated from the Project will be exported to the transmission network.

Existing SA Power Networks and ElectraNet's Bungama Substation is located near the Project's western boundary. The Project's network connection will be made to the ElectraNet substation via the Project's switchyard/substation. Formal connection enquiries with ElectraNet confirmed the feasibility of connecting to the electricity network at this location.

3.2.5. Project's Switchyard/Substation

275/33/33 kV transformers are likely to be installed to provide reliable supply reticulation to the solar farm. These network connection facilities will be designed, constructed and operated in accordance with all statutory requirements. The number and size of transformers will be a function of technical requirement and confirmed in the Project's final design.

3.2.6. Battery Energy Storage Systems (BESS)

The Project's BESS, to be integrated although operated independently from the PVS, will allow the Project to appropriately distribute power outside PVS generating periods. Utility-scale battery storage structures are typically constructed according to two design methodologies; modular systems and building-based systems. A number of technologies are being assessed to provide the optimum solution for the Project and integration in the South Australian transmission electricity network. The BESS footprint and storage structure is subject to the final technology decision.

At this stage storage of the battery energy storage system could include a combination of solid structures representative either of typical agricultural style storage buildings e.g. intensive animal keeping sheds used in the Primary Production Zone or Tesla style battery units or 40-foot shipping containers. The specific height of storage structures within the battery storage area is yet to be determined.

The indicative layout and preliminary BESS Operations design drawings are attached as Appendix 3. The BESS storage area will be located near the Project substation (refer to Appendix 3). The battery storage structures to be implemented will be a function of technical requirement coupled with economic viability and confirmed in the Project's final detailed design.

3.2.7. Synchronous Condensers

Fundamentally, a synchronous condenser is simply a large generator similar to those found in thermal power plants, with the difference being that rather than being powered from an external source such as a gas or steam turbine, the generator can be operated as an electric motor. In this way, the synchronous condenser stores rotational energy (inertia). The synchronous condenser can therefore instantaneously absorb/deliver both real and reactive power from/to the grid to maintain grid stability.

The Project may include one or more synchronous condensers to assist in providing inertia for managing power system strength requirements. The synchronous condensers, if required, will most likely be located within the switchyard or substation.

At this stage the storage/housing of a synchronous condenser could be outdoors and/or could include a combination of solid structures representative of typical agricultural style storage buildings e.g. intensive animal keeping sheds used in the Primary Production Zone. The specific height of structures is yet to be determined.

Further detailed assessments are underway to ascertain the option and appropriate sizing of any synchronous condensers. Final design and synchronous condenser inclusion will be a function of technical requirement and confirmed in the final Project design.

3.2.8. Administration and Controls Area

The administration and control area will incorporate several buildings including a single ancillary office building and control room, together with a maintenance and spare parts building. These structures have been located in the western section of the Project with access from Locks Road and sited to allow for ease of access of the workforce and to maximise the area available for solar panels. Amenities and car parking will also be provided in the administration and controls area. This area may also be used as a laydown and storage area during the construction phase.

3.2.9. Control Room and Site Office / Maintenance and Spare Parts Buildings

The proposed buildings will likely be single storey structures with heights of approximately 6m. The control room will be the centralised control area for managing operations associated with the Project. The site office will be the administrative centre for the Project and will house permanent operational staff associated with the facility.

3.2.10. Car Parking

Car parking will be in the vicinity of the control room and site office to accommodate staff, visitors and temporary contractor parking (note that following sign-in to the site, contractors/tradespeople required to access the solar fields will drive their vehicle directly to the site of work and will not require a formal car parking area).

3.2.11. Amenities

Depending on availability and approval the administration and control area may be connected to mains water and electricity supply where available at Locks Road to provide water and electricity services for the buildings. A suitably sized sewage treatment system will be installed to manage wastewater from the amenities.

3.2.12. Laydown/Compound Area

An indicative layout of the operations administration/controls and laydown/compound area are illustrated in Appendix 3.

3.2.13. Site Access and Internal Access Roads

Site access is proposed from the existing road network surrounding the Project Area. Access will be via existing site access points and possibly additional access points. An indicative internal access road layout and design is provided in Appendix 3. The internal access roads will be designed and constructed to allow for vehicle manoeuvring including large vehicle deliveries.

3.2.14. Drainage works, including stormwater management system

The Project's final design will determine the drainage and stormwater management design.

3.2.15. Fencing and Security

Security fencing will be installed around the perimeter of the Project. Signage will be clearly displayed identifying hazards present within the Project area. Perimeter fencing will likely be approximately 1.8m chain wire mesh fencing with three strand barb-wire top. Fencing of this nature is required for security, insurance and to minimise wildlife interaction with the Project.

CCTV with infrared capability will be used to manage security on the Project area.

3.2.16. Lighting

Low-level night time lighting will be installed in the administration area for safety and security purposes.

3.2.17. Lightning Protection

Lightning protection will be incorporated into the Project. Lightening protection masts will likely be established for every third or fourth inverter station, with the final numbers and siting to be determined during detailed design. The lightning protection masts are thin, tubular structures, approximately 8 m high with a concrete base and earthing.

3.2.18. Landscaping

Given the scale and extent of the proposed development and the low level of visual impact, providing landscaping which is adequate to screen the entire Project area's 19km perimeter is not considered practical. In response to neighbouring landowner feedback, targeted landscaping to provide in excess of 7 kilometres of screening of the solar arrays and the BESS for adjoining landowners and viewpoints is proposed and shown in the preliminary landscape plan attached in Appendix 14.

Native species will be used for their habitat value; however, the landscaping is not intended to be revegetation. The landscaping will be removed in the decommissioning phase of the Project, so the land has the capacity to return to its former agricultural use.

3.2.19. Connection to ElectraNet's Bungama Substation

To enable the Project's PVS element and BESS element to export and import electricity into and out of the national electricity grid the following works including (but not limited to) will be required:

- Connection of the Project's PVS element and BESS element to ElectraNet's Bungama Substation and required connection infrastructure including but not limited to overhead transmission and/or underground cabling and associated poles.
- Infrastructure upgrades to ElectraNet's Bungama Substation to allow the Project's PVS element and BESS element.

The indicative connection layout to ElectraNet's Bungama Substation is attached as Appendix 3.

3.2.20. Final Project Layout

The indicative PVS Operations layout (Appendix 3) and indicative BESS Operations layout (Appendix 3) depict the Project's development footprint. The PVS final footprint and BESS final footprint will be determined following the completion of detailed design, and influenced by:

- Final selection of panels and other Project components: the physical and operational requirements of the various components required by the Project (e.g. solar panels, inverters and Battery storage system) will influence the final layout, spacing between panels and the number of ancillary components required (inverters, lightning protection etc.).
- Detailed geotechnical investigation: an investigation to determine the geotechnical characteristics of the Project area will influence the final footing selection and may result in alterations to the Project layout.
- Outcomes of a final network constraints and opportunity analysis to determine export constraints, network constraints and sizing and staging of the Project elements.

As a result, the following information will be submitted to the relevant authority prior to the commencement of construction for each Phase of the Project:

- The final design, specification and layout of all temporary construction components required to construct the Project's PVS element and BESS element including (but not limited to) access points, workshops, outbuildings, site office, amenities, laydown areas, waste storage areas, car parking areas, refuelling areas, clean-down facilities.
- The final design, specification and layout of all permanent operations components of the PVS element including (but not limited to) the series of mounted photovoltaic modules set out in arrays, inverter/ transformer stations, interconnector substations, switching station, all overhead transmission and underground cabling and operational, maintenance and control buildings.

- The final design, specification and layout of any synchronous condensers if included in the Project.
- The final design specification and layout of all permanent operations components of the BESS element including (but not limited to) the battery energy storage area, sheds (if relevant), transformers, ancillary connection components and all overhead transmission and underground cabling.
- The final design, specification and layout of all permanent operations ancillary and associated components of the Project including (but not limited to) all internal roads, car parking areas, fencing, and access points to the road network, and any other relevant matter.
- The final landscaping plans.
- The final design for the connection of the Project's PVS element and BESS element to ElectraNet's Bungama Substation and required connection infrastructure including but not limited to overhead transmission and/or underground cabling and associated poles.
- The final design infrastructure upgrades to ElectraNet's Bungama Substation to allow the Project's PVS element and BESS element.

3.3. PROJECT PHASES

3.3.1. Construction Phase

The PVS development timeframes are explained in Section 1 "Introduction" provided in Table 1-1.

The BESS development timeframes are explained in Section 1 "Introduction" provided in Table 1-2.

The majority of construction works is associated with the PVS element with relevant BESS phases most likely constructed concurrently.

3.3.2. Construction Works

The key construction works required to complete the construction phase include (but are not limited to):

- Construction of internal access tracks and laydown areas;
- Installation of site office, maintenance sheds and other buildings;
- Site preparation earthworks for installation of panel supports;
- Installation of panel supports;

- Solar panel erection;
- Installation of the battery system/technology and battery storage structures;
- Electrical substations and connection between solar panels and central inverters, substations and battery storage;
- Provision of other utility services (electricity, communications, etc.) as required;
- Overhead or underground electrical connections to the Bungama substation;
- Bungama Substation infrastructure works;
- Installation of the remaining system components (including synchronous condensers if included);
- Landscaping (if required), fencing and signage; and
- Commissioning.

3.3.3. Construction Workforce

Direct employment generation during the construction period is up to approximately 275 full time equivalent (FTE) jobs. An estimated additional 410 FTE roles are indirectly anticipated to be generated by the Project. Additional support to local employment is also anticipated during the construction period with a preference for local goods, accommodation and skills if available and practicable and spending in local retail and services by construction employees if available and practicable.

3.3.4. Temporary Construction Facilities

Temporary facilities will be established during construction to provide basic amenities for construction workers and temporary laydown and storage areas for construction materials. The requirements for temporary facilities will be determined by the construction contractor, however are anticipated to include (but not limited to):

- Site office;
- Temporary toilet facilities;
- Multiple Laydown areas; and
- Temporary car parking (informal).

Lay-down areas will be required for the delivery and management of construction material. The construction contractor will determine the lay-down requirements within the Project area.

Other temporary construction facilities will most likely be accommodated within the Project area.

3.3.5. Temporary Construction Camp

While the Project has a preference for local accommodation, if insufficient accommodation suitable to meet the requirements of the Project is not available, then a temporary construction workers camp on a suitable part of the Project area will likely be the most efficient/effective way to manage the construction workforce during the construction phase.

The Project seeks approval for a temporary construction camp to ensure that if the camp is required due to other accommodation alternatives being unsuitable, then construction will not be delayed by requiring a further development approval at a later stage.

The construction workers camp would be designed to accommodate up to an estimated 275 equivalent full-time workers during construction.

Approximately 3ha – 5ha may be required for the construction workers camp. An example of a typical construction workers camp layout is attached as Appendix 4.

If a construction workers camp is required, adequate arrangements will need to be made for the provision of essential services including, the supply of water, the supply of electricity, the disposal and management of sewage/waste water, stormwater drainage, and general waste management.

Therefore, if the temporary construction camp is required, then the final design, specification and layout of the temporary construction workers camp, including essential services, within the Project area will be submitted to the relevant authority for approval prior to the commencement of construction.

3.3.6. Utilities

The construction contractor will be responsible for providing power and water required to support construction activities. It is anticipated the first priority will be establishment of a permanent auxiliary power supply, so it can be used to supply power during the construction period. It is anticipated construction water requirements will be trucked in.

3.3.7. Vehicle Movements

Construction/commissioning vehicle movements are linked to the phases explained in Section 1 “Introduction”.

Based on the estimated level of light and heavy vehicle construction/commissioning vehicles movements on the highways are not expected to greatly alter existing highway traffic movements and are within the design criteria of the roads.

Available traffic data is limited for Locks Road but based on discussions with some of the local landowners the roads have relatively minor vehicle flows, except during harvest. The estimated level of light and heavy vehicle construction/commissioning vehicles movements on Locks Road is not expected to greatly alter the existing Locks Road traffic movements and are within the design criteria of the road.

A Traffic Management Plan for the construction phase will be prepared before the commencement of construction in consultation with DPTI and Port Pirie Regional Council. The Traffic Management Plan will address construction vehicle access arrangements and identify traffic management measures to address traffic safety and access issues inherent with using oversized vehicles and general construction traffic.

3.3.8. Waste Management

Waste products will be generated during construction. Construction waste management procedures will be implemented via a Construction Management Plan (CMP). Suitable management measures typically include:

- Construction waste will be separated into different streams to facilitate recycling with waste removed from the Project area by a licensed contractor as appropriate.
- Liquid waste (including hydrocarbons, paints and solvents) will be stored in sealed drums or containers in a bunded area before removal from the Project area by an EPA licensed contractor for recycling, where possible, or disposal to a licensed facility.
- Temporary ablution facilities will be serviced by pump-out tanker trucks, used with offsite disposal by a licensed contractor.

3.3.9. Stormwater Management

The Project's construction has the potential to cause erosion, sedimentation, and pollution of water courses running through the Project area. Suitable key principles that could be incorporated into the Project's detailed design to appropriately manage stormwater runoff include:

- Surface water runoff will be discharged to match existing drainage patterns (if any) as much as possible.

- All drainage works will be designed and constructed to prevent scour and erosion. Additional protection measures will be included as required at locations particularly susceptible to scour/erosion.
- If practicable all drainage works will be formed to provide a consistent fall along drainage lines and to avoid flat spots, where water may be subject to collection adjacent to the Project's infrastructure.

A soil erosion and drainage management plan will be prepared as part of the CMP.

3.4. OPERATIONAL PHASE

The Project's PVS element and BESS element are expected to operate for approximately 30 years. It is expected up to approximately 8 permanent full-time staff will be required to run the Project during operations. Some of the permanent staff will operate out of the site office while others will operate generally across the Project area. Specialist contractors will be on-call to assist with maintenance activities that will include (but not be limited to):

- Solar panel washing;
- General PVS and BESS equipment maintenance;
- Fence and landscape maintenance; and
- Land management.

Equipment updates and replacements will be required from time to time as equipment fails or is rendered obsolete by improvements in technology.

3.4.1. Utilities

Depending on availability and approval the Project area will be connected to electricity and water at Lower Bright Road.

Requirements for disposal of sewerage during operations are considered small as there will be minimal staff on site at any one time. Sewerage management will likely comprise either:

- Installation of a small on-site sewerage treatment system such as a BioCycle; or
- Installing holding tanks to be pumped out and disposed of at a suitably licenced facility.

3.4.2. Vehicle Movements

Operational vehicle movements are expected to be minimal, and not have any significant impact on the State or local road network. During the operational phase staff attendance on site will be up to approximately 8 personnel employed on a full-time basis. Additional staff are expected to be employed on part-time and contract basis, for specialist electrical skills, module cleaning and other maintenance requirements associated with the Project. Operational vehicle movements are not expected to significantly impact on other road users and the local road network.

3.4.3. Waste Management

A limited amount of waste products will be generated during Operations. Operational waste management procedures will be implemented via an Operational Management Plan (OMP). Suitable management measures typically include:

- Operation waste will be separated into different streams to facilitate recycling with waste removed from the site by a licensed contractor as appropriate.
- Liquid waste (including hydrocarbons, paints and solvents) will be stored in sealed drums or containers in a bunded area before removal from the site by an EPA licensed contractor for recycling, where possible, or disposal to a licensed facility.
- Management of ablution facilities.

3.4.4. Stormwater Management

Approximately 401ha or approximately 76% of the Project area will be covered by the PVS solar array and spacing between the arrays. The areas underneath and surrounding the solar modules will not be impervious and therefore most of the Project area will be retained substantially in the current infiltration condition. Consequently, the runoff from most of the Project area, is likely to remain at the same pre-development levels and allow infiltration of rainfall.

Runoff from areas such as the administration and control area, laydown and compound area, inverters stations, battery storage structures and switchyard/substation area may increase compared with current levels but this is not anticipated to be significant because the areas will comprise less than approximately 14ha or approximately 3.2% of the Project's development footprint.

Drainage will be designed for all Project-disturbed areas to ensure there is no or minimal increase in developed flow intensity/frequency beyond the Project area boundaries. Suitable key principles that could be incorporated into the Project's detailed design to appropriately manage stormwater runoff include:

- Surface water runoff will be discharged to match existing drainage patterns (if any) as much as possible.
- All drainage works will be designed and constructed to prevent scour and erosion. Additional protection measures will be included as required at locations particularly susceptible to scour/erosion.
- If practicable all drainage works will be formed to provide a consistent fall along drainage lines and to avoid flat spots, where water may be subject to collection adjacent to the Project's infrastructure.

3.5. DECOMMISSIONING PHASE

The Project would likely be decommissioned at the end of its operational lifespan. In consultation with the landowners, all Project related infrastructure would be removed from the Project area, and the land returned for agricultural use.

Prior to the commencement of Project's operation phase a Decommissioning and Rehabilitation Plan (DRP) that outlines end-of-project decommissioning works (describing the extent of reinstatement and restoration activities upon the removal of the renewable energy infrastructure and associated facilities) will be provided to the relevant authority for approval.

The plan will include, but is not limited to;

a) identification of structures, including but not limited to all solar panels, the control and facility building and electrical infrastructure, including underground infrastructure to be removed, except where such facilities are to be transferred to or in the control of the local network operator, and how they will be removed;
b) measures to reduce impacts of the development on the environment and surrounding land uses; and
c) details of how the land will be rehabilitated back to its predevelopment condition, including slope and soil profile.

The alternate to decommissioning is to extend the life of the Project however currently it is not possible to determine if extending the life of the Project is a viable option.

4. STRATEGIC CONTEXT

4.1. ALIGNMENT WITH NATIONAL POLICY OBJECTIVES

The Project will assist fulfil Australia's commitment to reducing greenhouse gas emissions as a signatory to the Paris Agreement.

The Project will complement and increase the generation of renewable energy within South Australia and the broader National Electricity Market. Australia's Renewable Energy Target (RET) emphasises the need to reduce greenhouse gases, specifically in the electricity generation sector through the encouragement of additional sustainable and renewable sources. The RET targets both large-scale and small-scale renewable generation. The RET envisages that by 2020, renewable sources will provide 20 percent of Australia's electricity supply. The Project supports the achievement of the RET through generation of additional renewable energy.

Federal Government is considering replacing the RET with a number of options that aim to:

- Put downward pressure on household and business power bills and reduces spot price volatility—more investment and therefore more supply of electricity puts downward pressure on prices;
- Encourage the right investment in the right place at the right time—to meet the obligation, retailers will need to secure power from a variety of sources ensuring an ongoing place for coal, gas, wind, solar, batteries and hydro in the Nation's energy mix;
- Improve reliability—increasing investment in new and existing dispatchable supply;
- Reduce emissions at lowest cost—emissions targets can be met using a range of technology, including existing resources; and
- Is not a subsidy or a tax—allows the lowest cost range of technologies to meet overall targets.

The Project's 280MW(AC) PVS element with an integrated; but separately operated 140MW/560MWh BESS element supports the aims of the Federal Government.

4.2. ALIGNMENT WITH STATE POLICY OBJECTIVES

The South Australian Government is reviewing a number of the previous Government's long - standing State renewable energy strategic policies. The Project's alignment with current key Government State policy objectives is summarised in Table 4-1.

Table 4-1 State Policy Objectives

Objective/Target	Project Alignment
South Australia's greenhouse gas emissions	
South Australia's *Climate Change and Greenhouse Emissions Reduction Act 2007* provides renewable energy and emissions reduction targets. Under the Act, South Australia has a target to 'reduce by 31 December 2050 greenhouse gas emissions within the State by at least 60% to an amount that is equal to or less than 40% of 1990 levels as part of a national and international response to climate change. The Australian Government Department of the Environment reports South Australia's net greenhouse gas emissions were 26.3 million tonnes of carbon dioxide equivalent in 2015/16.	The Project is a renewable energy development with a maximum output capacity of approximately 280MW(AC) from the PVS and storage capacity of 140MW/560MWh from the BESS. The Project will annually displace the equivalent of… 497,000 tonnes of greenhouse gas emissions, comparable to planting 69,500 trees or removing 195,000 cars from the road each year of it's operational life. The Project contributes to South Australia's emissions reduction targets.
South Australia's Virtual Power Plant	
The South Australian government is embarking on the largest expansion of home battery storage in the world and has reconfirmed its support for Tesla's virtual power plant of solar and Powerwall home batteries. Analysis by Frontier Economics shows the new 250MW power plant is expected to lower energy bills for participating households by around 30 per cent. Additionally, all South Australians will benefit, with lower energy prices and increased energy stability.	The Project is a utility scale solar Photovoltaic Energy Generation System (PVS) and Battery Energy Storage System (BESS) with a maximum output capacity of approximately 280MW (AC) from the PVS and storage capacity of 140MW/560MWh from the BESS to feed into the National Electricity Market via ElectraNet's Bungama Substation. The Project supports the Government aim to lower SA energy bills through increasing supply and competition and increase energy stability.

4.3. ALIGNMENT WITH MID NORTH REGION PLAN

The State Government's broad vision for sustainable land use and the built development of the State is outlined in the Planning Strategy. The relevant volume of the Planning Strategy for the Port Pirie Council Development Plan is the Mid North Region Plan (May 2011).

The Mid North Region Plan provides a link between broad, state wide planning aims and local, council-specific planning needs, and they work in tandem with key state policies, leading to a consistent approach to land use and development across the state.

The Mid North Region Plan includes the following vision, Principle and Policies for renewable and clean energy:

- *In addition, state and local governments continue to investigate ways to organise land use such that it supports renewable and clean energy technologies. These opportunities will give South Australia a competitive advantage in a carbon-constrained economy. Investment in infrastructure will be critical to realise such opportunities. These initiatives will extend the life and reliability of our water and energy supplies and allow the population and the economy to grow without placing unsustainable demands on our natural resources (P8).*
- *Expanding local electricity generation through renewable energy sources, such as wind farms and gas-fired peak demand plants, which will provide greater capacity for economic activity. This will require expansion of the transmission infrastructure to service this growth (P12).*
- *Enhance development of renewable energy (P14).*
- *Energy supply is limited in many parts of the region. Building design and innovative local solutions (for example, solar, wind and co-generation) can make the best use of energy supplies. There are opportunities to further develop wind farms in several locations across the central and southern parts of the region, which would facilitate the achievement of SASP targets related to renewable energy development (P30).*
- *Provide for the development of alternative and innovative energy generation (for example, wind, solar, marine, biomass and geothermal technologies) and water supply facilities, as well as guidance on environmental assessment requirements (P30).*
- *South Australia has the potential to be a 'green' energy hub and to help other states achieve the Federal Government's target of 20 per cent renewable energy by 2020 (P32).*
- *Identify land suitable to accommodate renewable energy development, such as wind farms (P36).*
- *Support the development of wind farms in appropriate locations, including the collocation of wind farms and existing agricultural land (P38).*
- *increasing renewable and low emission energy generation (for example, wind farms) (P62).*

The Project's 280MW(AC) PVS element with an integrated; but separately operated 140MW/560MWh BESS element supports the aims of the Federal Government, State Government and supports the Mid North Region Plan's vision, Principle and Policies for renewable and clean energy.

4.4. ALIGNMENT WITH PORT PIRIE REGIONAL COUNCIL STRATEGY

The alignment of the Project with Port Pirie Regional Council's Community Plan 2016-2025 relevant strategies is summarised in Table 4-2.

Table 4-2 Port Pirie Regional Council Community Plan

Strategy/Outcome/Action	Project Alignment
Community Wellbeing	
Built Environment Goal CW7 - *A community that values and promotes its rich cultural and built heritage and provides pleasant, well designed environments (living, working, shopping and civic) that are enduring and sustainable.*	
Strategy: 8. Encourage development that enhances and complements existing characters, aspirations and the natural environment.	The existing character of the Project area is a rural setting with established electrical infrastructure, including the Bungama Substation and electricity transmission lines. The Project is in line with the existing character of the Project area, featuring existing electrical infrastructure, whilst also embodying Council aspirations for the development of beneficial renewable energy in the Region.
Place Goal CW8 - *Create a strong sense of place within the City and each rural township in the region.*	
Strategy: 1. Engage with the community to build on and harness the strong sense of community pride.	Anecdotal evidence collected during community consultation for the Project, indicates the local community is supportive of renewable energy and have expressed interest to participate in the Project's construction and operation. The Project will contribute to the growing number of renewable energy developments in region. This Project will allow the Port Pirie community to establish a sense of community pride as being and area in the region involved in the delivery renewable energy.
Economic Prosperity	
Economic Diversity Goal EP1 - *Grow the regional economy by supporting existing businesses and attracting new businesses and industry sectors*	
Strategy: 1. Promote local economic growth and development.	The Project is expected to generate a total estimated economic benefit in the order of $292.5 million for the broader economy and approximately $164 million as direct domestic Project expenditure. The Project will provide a direct benefit to the community in the form of a community fund. The Project will deliver local economic growth and development through to the locality during construction and operations.

Strategy/Outcome/Action	Project Alignment
Strategy: 5. Encourage developers of large infrastructure and projects to offer training and development opportunities.	The Project will promote local economic growth and development through the creation of an estimated 275 equivalent full-time jobs during construction, and a further 410 indirect full-time equivalent jobs. During operations an estimated 8 equivalent full-time jobs during operations. The Project potentially will offer training and development opportunities for workers to upskill and provide exposure to the renewable energy industry.
Sustainability	
Energy Goal S2 - *Increase reliance on renewable energy sources and clean fuels in the region and Council's operations.*	
Strategy 1. Ensure regulatory processes positively discriminate towards renewable energy.	The Project offers a sustainable alternative to traditional fuel sources, delivering clean and renewable energy to the Australian people in the face of climate change. The Project is able to provide clean energy to power an equivalent of 86,000 homes for each year of the Project's 30 year life. The Project offers a source of renewable energy in the Port Pirie Region.
Climate Change Goal S5 - *Adapt to climate change and ensure community resilience.*	
Strategy 1. Identify methods of adapting actions and processes to ensure climate impacts are minimised and resilience to change is maximised.	The Project provides a flexible, low-impact alternative to existing agriculture land use. The Project is capable of displacing the equivalent of 497,000 tonnes of greenhouse gas emissions, comparable to planting 69,500 trees or removing 195,000 cars from the road each year for 30 years. The Project creates industry diversity for the Port Pirie Region, offering an adaption to climate change and better resilience for the future.

The Port Pirie Regional Council Strategic Plan 2010-2019 has been prepared to achieve a shared vision for the community. The alignment of the Project with the Port Pirie Regional Council Strategic Plan is summarised in Table 4-3.

Table 4-3 Port Pirie Regional Council Strategic Plan 2010-2019

Policy Recommendations	Project Alignment
Goal 2 – Economic Prosperity	
Outcome 2.1 Economic Development *To grow the regional economy by attracting new businesses and employment opportunities through a diverse business base. (SAP Targets: T1.1 Economic Growth; T1.5 Business Investment; T1.10 Jobs; T1.11 Unemployment; T1.12 Employment Participation).*	
Target 2.1.2 Actively promote, support, attract and encourage sustainable economic development, investment and the business opportunities available in the city and region.	The Project encourages sustainable economic development through the provision of a project lifespan of 30 years. The Project is a renewable energy project which will create employment opportunities both during the construction and operational phases of the Project. The Project offers a new business opportunity to the Port Pirie Region with potential to promote, support, attract and encourage renewable energy business opportunities.
Target 2.1.5 Maximise the employment opportunities that arise from business growth.	The Project aims to provide a wide range of employment opportunities, with the creation of an estimated 275 equivalent full-time jobs during construction, and an estimated 8 equivalent full-time jobs during operations. The Project will support local business growth indirectly through the creation of a further 410 indirect full-time equivalent jobs.
Outcome 2.2 Tourism and Promotion *Develop and support tourism and promotional initiatives and programs that will enhance the Port Pirie Region's reputation as a must for tourists and visitors. (SAP Targets: T1.15 Tourism Industry).*	
Target 2.2.3 Develop a positive image of Port Pirie and the region	Port Pirie has a strong history as a major Port in South Australia, which contributes significantly to the sense of place. The smelting of metals and the operation of grain silos are key industries for Port Pirie and create a sense of identity for the Region. The introduction of renewable energy to an area can generate media attention and may offer opportunities for eco-philosophy tourism. The development of the Project in the Region has the potential to positively contribute to the style the image of Port Pirie.

Policy Recommendations	Project Alignment
Goal 4 – Environmental Sustainability	
Outcome 4.3 Healthy Environment *Support a clean, green and healthy environment. (SAP Targets: T2.4 Healthy South Australians; T3.4 Green House Gas Emission Reduction; T3.7 Ecological Footprint)*	
Target 4.3.9 Encourage the establishment of renewable energy in the region	The Project will establish an approximate 280MW (AC) utility-scale solar development in the Port Pirie Region.
Target 4.3.11 Provide community leadership in environmental management and sustainability.	The Project is a sustainable development, able to deliver clean and renewable energy to the Australian people in the face of climate change. The Project will produce electricity for the needs of the present generation without compromising the ability of future generations to meet their future economic, social and environmental needs. The Project's development shows leadership in the Port Pirie Region community in the promotion of environmental sustainability.
Target 4.3.13 Assess the likely impacts of climate change and seek to implement the appropriate responsive action to the issues identified.	Australia faces significant environmental and economic impacts from climate change across a number of sectors. Decisions made today will undoubtable impact upon the future. The Project will assist in meeting renewable energy targets for the state and the nation. The Project implements an appropriate responsive action to the issue of climate change.

5. STATUTORY CONTEXT

The following section outlines the key legislation and planning instruments relevant to the proposed development.

5.1. DEVELOPMENT APPROVAL

The development application is submitted pursuant to Section 49 of the *Development Act 1993* (the Act).

The Department of Energy and Mining's endorsement of the Project is provided in Appendix 1.

5.1.1. Public Notification

The proposed development has an estimated cost of AUD $650 million. Accordingly, public notification pursuant to subsection 49(7(d)) of the Act is required.

5.1.2. Statutory Referrals

In accordance with Section 49 of the Act, and Schedule 8 of the *Development Regulations 2008* (the Regulations), statutory referrals are required including:

- Commissioner of Highways; and
- Port Pirie Regional Council.

5.2. ADDITIONAL APPROVALS

Additional statutory approvals may be required prior to the construction and operation of the Project including:

- Approval for the clearance of native vegetation.
- Authorisation of a planned activity to damage, disturb or interfere with an Aboriginal site or object.
- Network Connection agreement to connect the Project to the adjacent substation in accordance with the National Electricity Rules.
- Electricity Generation Licence for connection to the National Electricity Market in accordance with the requirements of the *Electricity Act 1996*.

- Authorisation to place infrastructure and access tracks across road reserves under the *Local Government Act 1999* and possibly the *Roads (Opening and Closing) Act 1991*.
- Approval for on-site sewage handling or treatment systems under the *South Australian Public Health (Wastewater) Regulations 2013*.

5.3. DEVELOPMENT PLAN ASSESSMENT

The Port Pirie Regional Council Development Plan (Consolidated – 31 October 2017) (Development Plan) is a statutory policy document guiding the type of development that can occur within the council area.

Assessment of the Project against the relevant provisions of the applicable Development Plan provisions is provided in Appendix 5.

The assessment of the Project against the relevant provisions of the Development Plan determined:

- The Project is a type of Renewable Energy Facility contemplated for the Port Pirie Regional Council area. Specifically, 'solar farms' are contemplated for the Port Pirie Regional Council area.
- The Project is located on land Primary Production Zone. The Development Plan expressly seeks 'solar and ancillary development' within the Primary Production Zone.
- The Development Plan acknowledges that given the size of utility scale renewable energy facilities it is difficult to mitigate all impacts.
- Subject to implementation of management techniques set out by the general/Council wide policy regarding renewable energy facilities a level of impacts including visual impacts are to be accepted in pursuit of benefits derived from increased generation of renewable energy.
- The general / Council wide policy comprises general provisions that contain Objectives and Principles of Development Control that establish the development standards or management techniques that apply to renewable energy facilities and provide the yardstick against which the suitability of the Project is measured.
- The key findings of the assessment of the Project against the applicable Development Plan controls include:
    - Primary Production Zone - The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Controls for the Project.
    - Renewable Energy Facilities - The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Controls for the Project.

- Orderly and Economic Development - The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Control of General Provisions - “Infrastructure”, “Interface between Land Uses”, “Orderly and Sustainable Development” and “Renewable Energy Facilities”.
- Visual Amenity – The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Control of General Provisions - “Design and Appearance”, “Infrastructure”, “Interface between Land Uses”, “Landscaping, Fences and Walls”, “Renewable Energy Facilities” and “Siting and Visibility”, “Landscape Protection Policy Area 11” and “Landscape Protection Policy Area 12”.
- Noise - The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Control of General Provision - “Interface between Land Uses”.
- Health and Amenity - The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Control of General Provisions - “Interface between Land Uses” and “Waste”.
- Flora and Fauna - The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Control of General Provision - “Natural Resources”.
- Traffic and Transport - The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Control of General Provision - “Transportation and Access”.
- Heritage - The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Control of General Provisions - “Historic Conservation Area” and “Heritage Places”.
- Hazards - The Project is sufficiently in compliance with the relevant Objectives and Principles of Development Control of General Provision - “Hazards”.

Conducted on behalf of Bungama Solar, EPS Energy’s assessment of the Project against the relevant provisions of the Development Plan concludes the Project is sufficiently in compliance with the relevant provisions of the Development Plan to warrant development approval.

6. COMMUNITY AND OTHER STAKEHOLDERS

A Community & Stakeholder Engagement Plan was prepared at the Project Preparation Phase to ensure that the engagement for the Project was undertaken in a comprehensive and constructive manner. The Plan is founded on a Statement of Intent and subsequent Aims and Objectives to promote effective community and other stakeholder engagement. The Plan was used as a tool to assist with the planning and management of engagement activities proposed to be undertaken at various stages of the Project including the Pre-development application engagement stage.

Subsequently, a Community & Stakeholder Engagement Report has been prepared with the purpose of communicating the outcomes of the Pre-development application engagement that has taken place. The full report is provided at Appendix 6 and is summarised in the following sections.

6.1. KEY STAKEHOLDERS

On behalf of Bungama Solar, EPS Energy conducted an audience analysis during the Project Preparation Phase to identify parties known to be potentially impacted by the Project, and those who may have an interest in the Project, vested or otherwise. The following stakeholders have been identified as key to the Project;

- Landowners and occupiers of the:
  - Properties forming the proposed Project area;
  - Adjacent properties;
- Key government and agency members:
  - Low Carbon Economy Unit within the Department for Energy and Mining;
  - ElectraNet;
  - Regional Development Australia;
  - Federal Member for Grey;
  - State Member for Frome; and
  - CEO, Mayor and relevant Development Officers of the Port Pirie Regional Council;
- The Nukunu Peoples Council Inc.;
- The wider Bungama/Napperby/Warnertown communities and established groups including:
  - Upper Spencer Common Purpose Group;
  - Napperby Tennis Club and Community Centre;
  - Napperby Memorial Hall;
  - Port Pirie CommUNiTY;
  - HOPE Partnership;

- Rotary Club of Port Pirie;
- Uniting Care Wesley Country SA; and
- Soroptimist International of Port Pirie Incorporated;

- The relevant authorities who manage the registered easements across the Project area:
  - ElectraNet;
  - SA Power Networks;
  - Epic Energy;
  - Telstra; and
  - The Minister for Transport, Infrastructure and Local Government.

Additional stakeholders may be identified as the Project progresses over time. Bungama Solar will continue to review the above list as stakeholders gain or lose interest in participating in the engagement process over the Project's life.

Further, the initial release of Project information was staged with the purpose of directly informing the local community and ensuring the parties considered likely to have the highest level of impact and/or interest in the Project were notified earliest. Details of the staging are outlined in the attached report at Appendix 6.

6.2. ENGAGEMENT PROGRAMME

The Engagement Programme has five key phases which provide effective consultation from Project preparatory phase through to inception, construction, operation and decommissioning stages. This programme aimed to ensure that all relevant environmental, social and economic issues raised by the community and other stakeholders were considered and addressed within the Planning Report.

The Engagement Programme Phases are provided at Appendix 6.

6.3. COMMUNITY AND STAKEHOLDER RESPONSE

The response from the Pre-Development Application lodgement community and other stakeholder engagement has been largely positive and supportive of the Project.

An estimated 124 guests attended the information sessions over the two days (Thursday 31 May 2018 and Friday 01 June 2018)). This included 13 of the 27 identified adjacent landowners who attended the dedicated Neighbour Information Session. This also included a number of representatives from the Port Pirie Regional Council, Regional Development Australia and ElectraNet.

A number of key members of Council, State Government and other agencies attended the Community Information Sessions. The responses remained largely positive and supportive of the Project.

Most attendees of the Community Information Sessions were generally interested in learning more about the Project and looking for additional details around some of the information in the Information Brochure. Conversations with the attendees also identified anecdotal information about the area, including potential risks that may be useful to inform various aspects of the Project (e.g. the occurrence of strong winds, local resources).

The key themes that have arisen from correspondence with the general community to date include:

- Expressions of interest to participate in the Construction Phase by providing services and/or equipment;
- Interest in the locality for future projects;
- Economic benefit to the locality during construction;
- The potential adverse visual impacts of the Project;
- Clean energy production/ reduction in use of fossil fuels;
- Environmental benefits; and
- Lower power costs.

A total of 13 of the 27 identified adjacent landowners attended the Information Sessions. While supporting renewable energy in the form of solar energy, some landowners raised concerns about the Project being located near their land. Common concerns that were raised included:

- The potential adverse visual impact on their land;
- The potential adverse noise impacts on their land;
- The potential adverse impact on their livestock and horses on their land;
- The potential negative impacts on the value of their land; and
- The potential safety issues with construction traffic.

In direct response to adjacent landowner concerns, designs have been amended to reduce the potential for adverse impacts by;

- Including in excess of 7 km of visual buffering in the form of landscape screening at a direct Project cost estimated to exceed $750,000;
- Reducing the land area allocated to solar panels by approximately 24 hectares, equivalent to a reduction of 36,000 panels and equating to approximately $5,000,000 in relinquished income over the life of the Project; and
- Power Conditioning Units (inverters) near adjoining boundaries being relocated to reduce the potential for noise impact.

7. KEY ENVIRONMENTAL ISSUES

At this stage, the Project is proposed to be an integrated but separately operated grid connected Photovoltaic Energy Generation System (PVS) of up to approximately 280MW (AC) generation capacity, and up to a 140MW capacity Battery Energy Storage System (BESS) with 560MWh of storage. The PVS element, the BESS element and associated infrastructure, together are "the Project".

The following sections summarise the outcomes of investigations undertaken to identify, predict and analyse the potential impacts of the Project on the physical environment as well as social, cultural and health impacts and if necessary, identify mitigation measures to reduce the potential impact of the Project.

7.1. VISUAL IMPACT AND LANDSCAPE

A Visual Impact Assessment (VIA) has been completed and is attached as Appendix 7. The VIA assesses the existing landscape within the Project Area, as well as the surrounding area, to determine the potential visual impact of the Project to the landscape and visual receptors during the operational phase.

7.1.1. Existing Environment

The landscape within and surrounding the Project area can be described as predominantly rural, typified by flat terrain with scattered vegetation, and the land is primarily utilised for agricultural purposes.

There are potentially 231 residential receptors within a 2km Visual Catchment of the Project area, three (3) of which are owned by Project landowners, and potential viewpoint receptors who may view part of the Project area from other areas e.g. from the roads, within a 2km Visual Catchment of the Project area.

7.1.2. Potential Impact

The VIA found that the overall visual impact rating to residential and viewpoint receptors is "Low" and "Moderate-Low" respectively. Further, that renewable energy facilities were contemplated by the local Development Plan in the rural landscape.

Notwithstanding, the Community Consultation undertaken for the Project indicated that some residents living in close proximity to the Project were concerned about the visual impact of the Project, while others were impartial. These concerned residents include existing residents and those who own land adjacent to the Project but do not reside on the land as there is no dwelling.

7.1.3. Mitigation Measures

In direct response to the concerns raised by some residents, the Project has implemented an additional key mitigation measure for further ameliorating Project visibility from not only the adjacent existing residences, but also the potential future residences. The additional key mitigation measure is to include in excess of 7 kilometres of landscape screening to form a "visual buffer zone" in targeted sections of the Project area to further screen the Project as shown in the preliminary landscape plan attached in Appendix 14. The visual buffer zone will:

- Setback the PVS behind a 50m visual buffer zone from parts of the Project boundary for existing residential receptors, including the potential future residences, and consequently, reduce the physical size/scale of Project, which also reduces the renewable energy production of the Project;
- Establish and maintain within the 50m visual buffer zone a 10m wide landscape screen of vegetation approximately 3-5m in height, further reducing views of the Project; and
- As a result, ameliorate the degrees of visibility of the Project from other receptors located further away from the Project.

The following standard mitigation measures are also proposed to be implemented during the construction and operation phases, where practicable:

- Stakeholder engagement activities will continue to be undertaken to understand relevant landowner and community relationships with visual aspects of the Project;
- The development will occur on land previously cleared of vegetation and which is disturbed;
- Utility buildings or structures will be sited together, away from residences and constructed of materials that are muted in colour;
- Any landscaping that is completed as part of the Project will be selected and designed so that it is complementary to the landscape and visual receptors;
- Any signage will be designed and located so it is sensitive to the landscape and visual receptors;
- Fencing will be sited and designed appropriately to blend with the facility; and
- Construction equipment and waste will be removed from the site in a timely manner.

7.2. LAND USE

7.2.1. Existing Environment

The Project area and surrounding properties are used for agricultural land uses including cropping and grazing and rural residential land uses. Crops change over time according to market prices, changing demand and water availability.

7.2.2. Potential Impact

The medium-term change of land-use of approximately 530ha (5.3km^2). The medium-term change of agricultural land, 0.35% of the Port Pirie Regional Council area and 0.02% of the Mid North Region of South Australia, is considered very minor relative to the region's agricultural production potential (Based on Australian Bureau of Agricultural and Resource Economics land use data 2011).

The consistent income from the solar lease arrangements will assist each of the Project landowner's agricultural enterprises.

Investigations are being undertaken to assess agricultural co-location opportunities. Sheep grazing or cropping under or between the panels may be feasible during the operation phase.

Internationally examples of co-location in comparable climatic conditions include oilseed, Aloe Vera and Agave plantations in the US, India and Mexico.

On decommissioning the Project, the land will be available for agricultural activities, consequently the Project will not have an adverse impact on the long-term agricultural use of the Project area.

7.2.3. Mitigation Measures

Following the Project's decommissioning the land will be available for agricultural uses.

7.3. BIODIVERSITY

7.3.1. Existing Environment

An assessment of ecological values of the Project area was undertaken to determine the presence of species of conservation significance (i.e. species protected under Commonwealth or State legislation) and to identify any potential impacts on biodiversity.

It is highlighted that only approximately 0.6ha or approximately 0.1% of the 5.3km² Project area contains native vegetation.

The desktop ecological assessment, attached as Appendix 8, and preliminary field flora assessment undertaken in May 2018 determined the dominant landform in the Project area is "*a plain, which has been extensively cleared for agriculture*" (EBS, 2018). As such, the likelihood of suitable habitat for threatened flora species being present was assessed as very low.

The preliminary field flora assessment conducted in May 2018 was performed in accordance with the Scattered Tree Assessment Method and Bushland Assessment Method derived by the Native Vegetation Council. The field fauna assessment included recording of opportunistic fauna sightings, signs of fauna (e.g. scats, burrows, nests and skeletons) and potential fauna habitat (e.g. hollows).

No targeted fauna searches were conducted as part of the field investigations. However, four (4) bird and one (1) mammal species were opportunistically observed during the flora assessment. None of these species are listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) or the *National Parks and Wildlife Act 1972* (SA).

Six (6) vegetation associations and two (2) scattered trees were assessed within the Project area.

No species listed under *Environment Protection and Biodiversity Conservation Act 1999* and *National Parks and Wildlife Act 1972* were observed during the surveys.

The current land use in the Project area is agricultural cropping with thin strips of vegetation occurring only along field boundaries which are up to approximately 3m in width. Avoiding these strips of native vegetation will be considered as part of the final Project design.

7.3.2. Potential Impact

The Project area was selected due to its high-level of disturbance and associated historical vegetation clearance.

To assist with the construction of the PVS and BESS elements and the Project's effective operation, two (2) scattered trees (both *Eucalyptus camaldulensis var. camaldulensis*) and the six (6) vegetation associations may need to be removed. The six (6) vegetation associations of which all or part may need to be removed are:

- *Acacia spp. +/- Senna artemisioides spp. petiolaris over Maireana brevifolia+/- Atriplex spp.* Low Shrubland;
- *Acacia salicina* Tall Shrubland over *Maireana brevifolia*;
- *Alectryon oleifolius* over *Enchylaena tomentose*;
- *Typha domingensis* Small Wetland;
- *Atriplex vesicaria / Maireana brevifolia* Low Shrubland; and
- *Enneapogon nigricans* Grassland.

Any adverse impact on native vegetation or ecosystems that cannot be avoided will be submitted to the Native Vegetation Council for approval as required.

Perimeter fencing is proposed for not only security, but for safety of fauna. Fencing will minimise opportunities for wildlife to interact with the solar infrastructure area and the potential for fauna to be harmed, or damage infrastructure.

Based on the preliminary biodiversity investigations the Project's potential to adversely impact the existing biodiversity environment is low.

7.3.3. Mitigation Measures

The biodiversity investigations along with several other investigations have informed the Project's preliminary layout and design.

A key criterion for selecting the Project area was most of the area used for cropping (approximately 99% of the Project's area) is cleared of native vegetation to allow efficient cropping practices. An aim of the Project's layout and design is to position as much of the Project's development footprint, as is technically possible, on the cropped land thereby avoiding the need to remove native vegetation.

Where scattered native trees and/or thin strips of native vegetation will adversely impact the construction of the PVS element and/or BESS element and/or the Project's effective operation the native vegetation will need removal.

The Project's preliminary layout and design has endeavoured to avoid the unnecessary clearance of native vegetation for the Project's construction and operation.

Suitable mitigation measures for this potentially low impact typically include:

- Prioritise use of cleared, agricultural land, and avoid unnecessary clearance of thin strips of vegetation along allotment boundaries and native scattered trees;
- Removal of native vegetation be avoided and minimised, as far as practicable, as part of the final design;
- Weed and pathogen hygiene measures will be employed as part of the removal process to ensure that no new weeds or other pathogens are introduced to existing native vegetation; and
- An Application for approval to clear native vegetation under Division 5 of the *Native Vegetation Regulations 2017* be submitted to Native Vegetation Council based on the Project's final design.

7.4. SOILS AND SALINITY

7.4.1. Existing Environment

Preliminary geotechnical investigations indicate that the Project area is predominantly located within flat plains with some gentle slopes, with a sandy surface, underlain by two main geological units. The subsurface conditions can be generally described as Holocene sand and silty/ sandy clay.

The South Australian Resource Information Gateway (SARIG 2018) Salinity non-watertable (soil salinity) mapping layer identifies the Project area as having low to moderate salinity. The SARIG 2018 Salinity watertable induced (soil salinity) mapping layer identifies the Project area as having moderately high to very high or extreme salinity.

The South Australian Environment Protection Authority (EPA) holds a record of a Section 83 notification relating to a diesel spill at the nearby service station (Allotment 549 FP 188681). No works are proposed on Allotment 549 FP 188681.

7.4.2. Potential Impact

The potential for the Project to exacerbate soil erosion is considered in Section 7.5, while this section addresses the potential impacts of the Project on soil physical and chemical attributes.

Agricultural soils are commonly detrimentally affected by compaction, acidification, structural decline, loss of organic matter and fertility, and salinity. These can be due to a combination of factors such as removal of native vegetation, cultivation, the type of crop or pasture grown, irrigation and specific farming practices.

The Project area soils are understood not to be adversely impacted by the listed impacts. Nonetheless, it is likely that when compared to native soils in their pre-farming condition, there have been changes due to cultivation.

The Project will involve short-term construction, followed by possibly decades of the land being inactive. The limited or no cropping and consequently limited use of farm machinery on the Project area will be beneficial for the soils. While constructing the Project will require removal of a very small amount of vegetation and the Project's operations will require water to clean the PVS panels from time to time, these activities will not lead to an increase in the Project area's typical groundwater levels and/or the leaching of salts, and consequently the Project will not contribute to an increase in salinity levels.

7.4.3. Mitigation Measures

No specific mitigation measures are required because the Project is not expected to adversely impact the existing soil and salinity environments.

7.5. SURFACE WATER AND EROSION

7.5.1. Existing Environment

The Project's area is predominantly flat, ranging between 7-50m above sea level (asl), comprising cleared land historically used for cropping. Rainfall on the Project area predominately infiltrates and during high rainfall some of the rain from the southern Flinders Ranges is captured by drainage lines and flows down into the Project area.

The Project is located outside both the Murray Darling Basin Water Management Area and Rangelands Natural Resource Management District. Rainfall and temperature data indicate that the area experiences a Mediterranean climate, with cool wet winters and hot dry summers. Changes of weather are generally associated with frontal systems from southwest in the Spencer Gulf. These frontal systems are most active in winter and spring and bring reliable and frequent light to moderate rainfall. Annual average rainfall is approximately 474mm. The majority of the rainfall occurs during winter with the highest falls in June and July.

The major waterway in the area is the Port Pirie River, and its associated estuary, which is west of the Project area. The Port Pirie River is a tide dominated tidal flat / creek. It is not a freshwater source. The Project area is not located within the Port Pirie River or its associated estuary.

The second most important waterway is the Broughton River and the Broughton catchment area. The Broughton catchment is the major drainage system in the district. The Project is not located within the Broughton catchment.

Figure 2-3 shows the ephemeral drainage lines running down from the southern Flinders Ranges into the Project area. These drainage lines are not defined drainage channels, do not hold permeant water, and are currently used for cropping.

The Project area has minor water erosion caused from the flow of water during high rainfall and minor wind erosion. The potential for water or wind erosion is partly reduced by existing cropping practices and pasture management, which is dependent on rainfall frequency.

7.5.2. Potential Impacts

The largest component of the Project's operation is the PVS solar array layout including the spacing between the arrays anticipated to occupy approximately 97% of the Project development footprint. The areas underneath and surrounding the solar modules will not be impervious but will be retained substantially in the current condition and allow infiltration of rainfall. Even though the site is predominantly flat, earthmoving activities required for the PVS solar array layout are expected to grade areas suitable for the single axis tracking system. These activities will remove vegetation, if existing, exposing soils to erosive forces (e.g. wind and rain).

Erosion control measures to be adopted during construction will be further detailed and implemented as part of the Environmental Management Plan suite to be prepared as indicated at Section 7.5.3 and Section 9 of this report.

Construction of the Project will require earthmoving activities (topsoil stripping and contouring) for the internal access roads, parts of the PVS area, hardstands, BESS storage area, laydown and site infrastructure (inverters, demountable buildings, etc.). These activities will remove vegetation, if existing, exposing soils to erosive forces (e.g. wind and rain). The earthmoving activities can result in erosion and sediment release, deterioration of water quality, changes to surface runoff volume and overland flow paths.

Erosion control measures to be adopted during construction will be further detailed and implemented as part of the Environmental Management Plan suite to be prepared as indicated at Section 7.5.3 and Section 9 of this report.

The use and storage of fuels and chemicals for light vehicles, plant and construction equipment may potentially result in surface water or groundwater contamination through spills, leaks or other uncontrolled releases.

Surface water and Ground water pollution control measures to be adopted during construction will be further detailed and implemented as part of the Environmental Management Plan suite to be prepared as indicated at Section 7.5.3 and Section 9 of this report.

Approximately 13ha or approximately 3.2% of the Project development footprint could be occupied by the administration and laydown compound area, substation, invertors, BESS storage area and internal access roads. These areas could potentially increase the runoff volumes and velocities and consequently erosion and migration of sediment, though given the small size of this part of the development footprint any adverse impact is considered low.

Surface water, erosion and sediment management control measures to be adopted during construction and operation will be further detailed and implemented as part of the Environmental Management Plan suite to be prepared as indicated at Section 7.5.3 and Section 9 of this report.

The Project will include a wastewater treatment system for workforce. Discharge of treated sewage from the ablution block has the potential to decrease groundwater quality (e.g. through increased biological oxygen demands) if the sewage is not adequately treated or if the lining has not been appropriately designed the evapotranspiration bed could seep into the surrounding area.

Wastewater control measures to be adopted during construction and operation will be further detailed and implemented as part of the Environmental Management Plan suite to be prepared as indicated at Section 7.5.3 and Section 9 of this report.

The Project's potential to adversely impact the existing surface water and erosion environments is low.

7.5.3. Mitigation Measures

Suitable mitigation measures for this potentially low impact typically include:

- During construction, main access tracks will be permanently gravelled where required;
- Rows of PV panels rotate and will be separated from the next row, so providing an infiltration area and sunlight to potential co-located agricultural activities or pasture;
- If practicable, the ground under and adjacent the PV panels will be used for co-located agricultural activities and may be sown with a permanent pasture mix;
- If practicable, the Project area will include co-located agricultural activities such as pasture managed by controlled grazing (most likely with sheep) to maintain ground cover density and manage the sward length;
- During the construction and operation phases an erosion and sediment control plan for each phase will be developed detailing the control measures to be implemented;
- Sewage treatment and disposal to be conducted in accordance with relevant Australian Standards and local regulations/approval; and
- During the construction and operation phases a storage and handling of chemical and hazardous materials management plan for each phase will be developed detailing the control measures to be implemented.

7.6. FLOODING

7.6.1. Existing Environment

The Project area is not mapped as subject to inundation, is not located in the Murray Floodplain or within the River Murray protected area, is not within Broughton catchment or any local catchment area identified as being liable to inundation.

7.6.2. Potential Impacts

The Project will not have a demonstrable impact on local flooding.

7.6.3. Mitigation Measures

No specific mitigation measures are required because the Project is not expected to adversely impact the existing flooding environment.

7.7. GROUNDWATER

7.7.1. Existing Environment

The 1:100,000 Pirie sheet of SARIG 2018 shows the area to be underlain by a number of geological units. The following units are expected on the Project area:

- Qhe2/Qpe1 – Holocene Sand Capping in Dune Fields
- Qhe3/Qa – Holocene Sand Spread
- Qa – Undifferentiated Quaternary Alluvial/Fluvial Sediments

Preliminary geotechnical investigations in May 2018 of some of the Project area noted;

"The Holocene sand was not encountered in 5 out of the 12 boreholes drilled. Based on the regional geology maps, this unit was anticipated to be present at all boreholes (except BH08). Given the loose nature of the deposit (which will impact on pile embedment depth), further investigation of these areas is recommended to delineate the loose Holocene sand."

The SARIG 2018 groundwater mapping layer indicates the Shallow Standing Water Level is 0-10m Below Ground Level (BGL). The Shallow Standing Water Level represents the depth to standing water of the shallowest aquifer only. Other aquifers may well give rise to standing water at significantly different depths.

Groundwater was not encountered during site investigations. The July 2018 preliminary geotechnical investigation report states:

"*Groundwater was not encountered during the investigation. Portions of the site are expected to be underlain by shallow groundwater based on regional groundwater maps.*

Information provided by SARIG (2018) suggests the project area is expected to have shallow groundwater (up to 2m BGL) in the western portion of the site (Lot 4 DP24997). The rest of the project area is expected to have groundwater between 2 to 5 mBGL and 5 to 10m BGL".

7.7.2. Potential Impacts

Construction works will involve earthworks and limited vegetation clearing for the erection of the PVS solar panels, substation, BESS storage area, buildings, internal access roads and other infrastructure. During operation, the primary land management activities will likely relate to erosion and sediment control.

Potential geology, topography and soil impacts on the environment due to site activities include:

- Increased risk of erosion and sediment mobilisation due to alterations to drainage patterns and stormwater flows during high rainfall events. Erosion risk is higher where Project works encroach on drainage lines.
- Exposure of soil to erosive forces (wind and rain) causing soil erosion and sediment transport that can result in:
    - Deterioration of the receiving environments water quality during ephemeral flows;
    - Sedimentation of vegetated areas resulting in reduced vegetation growth/health; and
    - Reduced air quality (dust impacts) of neighbouring agricultural operations.
- Loss of topsoil integrity from improper removal or storage;
- Entrainment of soils off-site by construction vehicles and machinery leading to sedimentation external to the Project area;
- Physical degradation of soil as a result of the use of heavy construction machinery; and
- Soil contamination as a result of hazardous and other chemicals spills.

While the Project is not expected to directly interfere with groundwater, activities have the potential to impact groundwater quality through the accidental release of contaminants to the environment. These water affecting activities associated with the Project may include:

- Construction activities (e.g. operation of heavy machinery);
- Waste storage;
- Ablutions;
- Sewerage systems;
- Operation of the substation and inverters;
- Operation of heavy vehicles; and
- Storage of oils, hydraulic fluids, greases, coolants and other maintenance items including minor amounts of cleaning solvents, paints and thinners.

Contaminants, if released, have the potential to reach the water table via infiltration and recharge from the point of release or via stormwater mobilisation and subsequent infiltration.

The Project's potential to adversely impact the existing groundwater environment is low.

7.7.3. Mitigation Measures

Suitable mitigation measures for this potentially low impact typically include:

- Erosion and sediment control devices will be installed where necessary and monitored to assess efficacy of erosion and sediment control measures;
- No unnecessary clearing or earthworks;
- Measures implemented to control flow velocities in such a manner that prevents soil erosion along drainage paths;
- Ensure the use of appropriately designed laydown areas for vehicles and machinery and storage areas for chemicals, oils and fuels;
- Make available spill kit(s) within the operational and maintenance area;
- Ensure all staff to be made aware of spill response procedures and the requirement to report any spills or leaks;
- Ensure regular maintenance and checks of heavy vehicles, machinery and equipment to identify potential leaks; and
- All chemical storage vessels are to be bunded and/or constructed on impermeable surfaces in compliance with relevant Australian Standards.

7.8. CLIMATE

7.8.1. Existing Environment

South Australia's *Climate Change and Greenhouse Emissions Reduction Act 2007* provides emissions reduction targets to be achieved by 2050.

7.8.2. Potential Impacts

The Project will deliver clean and renewable energy to the South Australian people in the face of climate change, assist in meeting South Australia's renewable energy targets, displace the annual equivalent of 497,000 tonnes of greenhouse gas emissions, comparable to planting 69,500 trees or removing 195,000 cars from the road and provide clean energy to power an equivalent of 86,000 homes per annum for the Project's life.

The Project will make a significant contribution to achieving the State emission reduction targets.

7.8.3. Mitigation Measures

The Project is a mitigation measure, contributing to lower GHG and consequently climate change. Other measurable GHG mitigation measures could include where practicable:

- Efficient PV components and Project design to maximise electricity production;
- Components updated as they become obsolete or superseded by more efficient technologies, as required; and
- Panels will be maintained to maximise solar collection.

7.9. NOISE

7.9.1. Existing Environment

The Project area is located within an area typified by rural-residential and agricultural land, which generally has a low to moderate levels of existing background noise. Agricultural noise emissions primarily occur when farm machinery is used to prepare the land for cropping, sow crops, harvest crops and move stock. Rural-residential noise emissions primarily occur as a result of people, animals and transportation.

The Bungama Substation and associated transmission lines owned and operated by ElectraNet running through the southern part of the Project area emit a crackling or buzzing noise named 'Corona', which is the leakage of electricity into the air (which is a natural insulator). Often hard to hear, damp weather increases its audibility.

7.9.2. Potential Impacts

The Project's noise emissions will be generated primarily during some of the construction phase from construction vehicles and machinery.

The Project's construction noise emissions have the potential to impact receptors some of the time during the construction phase.

The Noise Assessment found noise emissions during the construction phase are expected to be less than 45dBA at existing and identified potential future receptors and therefore will be compliant with the Environment Protection (Noise) Policy 2007 and not cause adverse impacts.

The Project's components such as inverters, synchronous condensers and the BESS will generate noise during the operational phase. Using a 'worst-case' operational scenario, the results of the assessment calculated noise levels to be less than 35dBA during the daytime and 38dBA during the night time at all existing and identified potential future receptor locations. As such, relevant noise criteria will be satisfied at all receptors.

7.9.3. Mitigation Measures

In specific response to operational noise concerns raised by neighbouring land owners during the Project's community consultation, the Project design was altered to ensure no invertors are located within 200m of an existing residence and also some possible future residence locations. A Nosie Assessment has been undertaken to demonstrate that the Project should comply with relevant noise criteria and will not result in noise impacts for the neighbouring existing residences and for future possible residences adjoining the Project boundary.

Additional suitable mitigation measures for construction noise typically include compliance with the Environment Protection (Noise) Policy 2007 i.e.:

- Work on-site will occur within the standard work hours of 7.00a.m. and 7.00p.m. Monday to Saturday;
- Particularly noisy activities will be commenced after 9.00am where the noise exceeds industry guidelines;
- Noisy equipment and processes will be located so that their impact on neighbouring properties is minimised whether by maximising the distance to the premises, using structures or elevations to create barriers or otherwise;
- Equipment will be shut down or throttled down whenever it is not in use;
- Equipment will be equipped with feasible noise control (e.g. mufflers, silenced exhausts, acoustic enclosures);
- Equipment will be properly maintained so as to eliminate or reduce noise as far as practicable;
- Equipment shall be handled so as to minimise impact of noise;
- As far as practicable, off-site or alternative processes that eliminate or lessen noise will be utilised; and
- A complaints hotline will be established and advertised for the receipt of feedback on the Project, including any complaints regarding noise nuisance.

Subject to approval from the relevant authority, circumstances, such as extreme summer heat, may warrant construction activity to be permitted outside of the hours of 7.00am and 7.00pm Monday to Saturday or on a Sunday or Public Holiday.

The following recommendations were provided in the Noise Assessment for consideration during construction activities, where practicable, to reduce emissions to the surrounding community:

- Scheduling of construction activities to minimise the number of work fronts and simultaneous activities occurring along the boundaries of the Project area (within 200m) to minimise noise levels;
- Development of a construction noise management protocol to minimise noise emissions, manage out of hours (minor) works to be inaudible, and to respond to potential concerns from the community;
- Where possible, use localised mobile screens or construction hoarding around plant to act as barriers between construction works and receptors, particularly where equipment is near the site boundary and/or a residential receptor including areas in constant or regular use (e.g. unloading and laydown areas);
- Operating plant in a conservative manner (no over-revving), be shut down when not in use, and be parked/started at farthest point from relevant assessment locations;
- Selection of the quietest suitable machinery available for each activity;
- Avoidance of noisy plant/machinery working simultaneously where practicable;
- Minimise impact noise wherever possible;
- Utilise a broadband reverse alarm in lieu of the traditional high frequency type reverse alarm;
- Provide toolbox meetings, training and education to drivers and contractors visiting the site during construction so they are aware of the location of noise sensitive receptors and to be cognisant of any noise generating activities;
- Signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off-site; and
- Utilise Project related community consultation forums to notify residences within close proximity of the site with Project progress, proposed/upcoming potentially noise generating works, its duration, nature and complaint procedure.

Further, the following recommendations were provided in the Noise Assessment to actively minimise potential noise emissions during the operations phase:

- Complete a one-off noise validation monitoring assessment to quantify emissions from site and to confirm emissions meet relevant criteria; and
- Prepare an operational noise management protocol to minimise noise emissions and to respond to potential concerns from the community regarding Project noise emissions.

7.10. ARCHAEOLOGY

7.10.1. Existing Environment

An archaeological assessment of the Project was completed to determine the presence of Aboriginal and/or European heritage value within the Project area.

The desktop archaeological assessment is attached as Appendix 9. Preliminary field investigations in May 2018 entailed systematic inspection using pedestrian survey approach, looking for areas of interest for archaeological sites and object. Survey visibility was high as the majority of the Project area is heavily disturbed by cropping and animal grazing.

Aboriginal

As part of the assessment, a search of the National Native Title register was completed. The Search returned one Native Tile claim applicable to the Project area: Nukunu Native Title (SC1996/005). The contact for this claim is the Nukunu Peoples Council Inc.

A search of the Department of Premier and Cabinet Aboriginal Affairs and Reconciliation, Register of Aboriginal Sites and Objects, and the SA Museum Database was completed. The searches returned one recorded Aboriginal site located on the boundary of the Project area. The boundaries of this Aboriginal site require confirmation.

During the preliminary field investigations survey a total of four (4) Aboriginal sites (including one (1) Aboriginal site already registered), 20 isolated artefacts and six (6) culturally sensitive landscapes were located.

European

There are no State Heritage Places or Local Heritage Places registered in the Project area. The preliminary field investigations survey did not identify any potential sites.

7.10.2. Potential Impacts

The Project, especially during the construction phase, could result in damaging significant Aboriginal and/or European heritage sites and/or artefacts within the Project area.

The Project's potential to adversely impact the existing archaeological environment during the construction phase is moderate.

7.10.3. Mitigation Measures

The archaeological investigations along with several other investigations have informed the Project's preliminary layout and design.

A key criterion for selecting the Project area was most of the area used for cropping (approximately 99% of the Project's area) is cleared of native vegetation to allow efficient cropping practices. An aim of the Project's layout and design is to position as much of the Project's development footprint, as is technically possible, on the cropped land thereby ameliorating the possibility of disturbing Aboriginal and/or European cultural heritage items.

Where Aboriginal archaeological value may adversely impact the construction of the PVS element and/or BESS element and/or the Project's effective operation the relevant provisions of the *Aboriginal Heritage Act 1988* will be considered.

Discussions have commenced with the Nukunu Peoples Council Inc. regarding the presence of Aboriginal archaeological value within the Project area.

The preliminary cultural heritage works plus further cultural heritage work with the Nukunu Peoples Council Inc. will inform the final layout plans.

The Project's preliminary layout and design has endeavoured to avoid the disturbance of Aboriginal sites.

Suitable mitigation measures for this potentially moderate impact typically include:

- Further cultural heritage works with the Nukunu Peoples Council Inc. will inform the final detailed Project layout plans;
- Any Aboriginal sites and artefacts will be taken into consideration for the final detailed Project layout plans;
- Compliance with the relevant provisions of the *Aboriginal Heritage Act 1988*;
- Construction personnel will receive a heritage induction prior to work on-site;
- A stop work/site discovery procedure for both Aboriginal and European heritage will be developed prior to the commencement of construction to manage the event of an unexpected find; and
- The Construction Management Plan will include information on recorded heritage items.

7.11. BUSHFIRE

7.11.1. Existing Environment

The Project area is located within the General Bushfire Risk area shown on the Bushfire Protection Area (Location SA Map Viewer, 2018).

The Project area contains dry pastures and crop stubble, with thin strips of vegetation up to approximately 3m in width only occurring along field boundaries.

Potential ignition that exists in and around the Project area include: stubble burning, littered cigarettes, short circuiting electrical equipment, and lightning strikes.

7.11.2. Potential Impacts

Fires that might spread to the Project area would cause significant damage to wiring, panels and other components. Conversely, fires ignited on Project area could spread to neighbouring land and infrastructure.

To prevent the invasion of stubble or grass fires onto the Project area, the design will incorporate an appropriate Asset Protection Zones (APZ). Ongoing, long-term liaison with adjacent landholders should ensure that the Project area is staffed in the event of neighbouring stubble burns.

The risk of initiating fire from commercial solar panels and inverters is very low due to their high quality and remote sensing/operating systems.

The Project's potential to adversely impact the existing bushfire environment is low.

7.11.3. Mitigation Measures

Suitable mitigation measures for this potentially low impact typically include:

- Installation of only Standard compliant components;
- Ongoing monitoring and review of the solar system performance;
- Installation of thermal overload protection on inverters;
- Controlled grazing or machinery maintenance of pastures under panel arrays; and
- Maintenance of firebreaks.

7.12. TRAFFIC AND TRANSPORT

A Transport Impact Assessment (TIA) has been completed and is attached as Appendix 10. The TIA assesses the potential impact of the Project's construction traffic movements on transport routes and other road users based on an indicative construction scenario.

7.12.1. Existing Environment

Anticipated traffic volumes will be highest during the Project's construction while operational traffic volumes are expected to be minimal.

A Transport Impact Assessment (TIA) attached as Appendix 10 included assessing the potential impact of the Project's construction traffic movements on transport routes and other road users and assessed the potential impact on transport routes and other road users based on the Project being completely operational.

The TIA defined the existing environment as the component delivery route to the Project area. Consequently, the environment includes other road users and the road infrastructure.

While the component delivery route will be finalised as part of the Traffic Management Plan preliminary analysis indicates the feasible trucking option is components are shipped to Flinders Port Adelaide and trucked direct to the Project area via National Highway A9 (Port River Expressway, Salisbury Highway) and National Highway A1 (Port Wakefield Road, Port Wakefield Highway, Augusta Highway) and Locks Road.

The National Highway A9 (Port River Expressway, Salisbury Highway) and National Highway A1 (Port Wakefield Road, Port Wakefield Highway, Augusta Highway) are under the care and control of the Department of Planning Transport and Infrastructure (DPTI).

Locks Road is under the care and control of the Port Pirie Regional Council.

The existing DPTI approved restricted access vehicle routes detailed on the DPTI RAVnet website and reproduced as Figure 4.1 and Figure 4.2 in the TIA shows the existing 26m B-Double approved route for the Port Adelaide to Port Wakefield section of the indicative heavy vehicle route and the existing 26m B-Double approved route for the Port Wakefield to the Project area section of the indicative heavy vehicle route.

Locks Road is currently gazetted for 26m B-Double (PBS Level 2) access.

7.12.2. Potential Impacts

The majority of construction works are associated with the PVS element. The TIA is based on a construction scenario of approximately 24 months.

Other road users and key stakeholders including the DPTI and Port Pirie Regional Council are considered the potential sensitive receivers for the purposes of construction traffic.

Operational vehicle movements are expected to be minimal, and not have any significant impact on the local road network. During the operational phase staff attendance on site will be up to approximately 8 personnel employed on a full time, on site basis. Additional staff are expected to be employed on part-time and contract basis, for specialist electrical skills, module cleaning and other maintenance requirements associated with the Project. Operational vehicle movements are not expected to significantly impact other road users and the local road network.

Anticipated traffic volumes will be highest during the construction phase. The types of vehicles anticipated to be used during the construction phase include buses to transport workers to and from the Project area, if a temporary construction workers camp on the Project area is not used, light vehicles, heavy construction vehicles and oversized vehicles. A summary of the estimated number of construction vehicle traffic two-way movements estimated to take place during the indicative construction phase is presented in Table 7-1.

Table 7-1 Estimated Construction Traffic

Construction Phase	Light Vehicles	Heavy Vehicles	OD Heavy Vehicles	Total
Months 1-2	10	9	N/A	19
Months 3-4	15	11	N/A	26
Months 5-6	23	13	N/A	36
Months 7-8	34	18	N/A	52
Months 9-10	32	12	N/A	44
Months 11-12	27	24	2	43
Months 13-14	30	14	N/A	44
Months 15-16	32	12	N/A	44
Months 17-18	26	13	N/A	39
Months 19-20	18	11	N/A	29
Months 21-22	15	0	N/A	15
Months 23-24	9	0	N/A	9

It is important to note both Project phasing and the construction company's construction methodology, based on the Project's final design, may vary these predicted Project traffic volume estimates.

Based on the TIA findings the traffic generated by the proposed Project area during the construction and operational phases is very low in comparison to existing traffic volumes for the National Highway A9 (Port River Expressway, Salisbury Highway) and National Highway A1 (Port Wakefield Road, Port Wakefield Highway, Augusta Highway) section of the indicative heavy vehicle route under the care and control of DPTI and therefore is not expected to compromise the safety or function of this road network.

Locks Road is under the care and control of the Port Pirie Regional Council. While the TIA was unable to source traffic volume data for Locks Road, the existing traffic volumes are expected to be low. Based on the TIA findings the traffic generated by the proposed Project area during the construction and operational phases is very low and therefore is not expected to compromise the safety or function of Locks road that experiences low volumes of traffic.

The other potential impact is the potential deterioration of local road conditions from construction traffic. Although the construction traffic will be for a short time it will possibly contribute to the wear and tear on the approved local road access routes.

The Project's potential to adversely impact the existing State road traffic and transport environment during the construction phase is low. The Project's potential to adversely impact the existing local road traffic and transport environments during some of the construction phase is low-moderate.

7.12.3. Mitigation Measures

Suitable mitigation measures for the potentially low-moderate impacts will be addressed in the following documents:

- A Traffic Management Plan prepared prior to commencement of construction works in consultation with DPTI and Port Pirie Regional Council; and
- A dilapidation report or equivalent report, of the road conditions along the nominated Local access roads, prepared prior to commencement of construction in consultation with the Port Pirie Regional Council.

7.13. AIR QUALITY

7.13.1. Existing Environment

The Environmental Protection Authority (EPA) conducts long-term ambient air quality monitoring around the state of South Australia. The air quality rating is based on a comparison between pollutant concentrations and the relevant National Environment Protection Measures standards. The nearest air quality monitoring site is in Oliver Street, Port Pirie, which is approximately 4.8km west of the Project area. At the time of this report (November 2018), the air quality for the site was rated Good (with a station index of 39). A rating of Good means that the air quality is rated between 34 to 66, for particles and sulphur dioxide.

7.13.2. Potential Impacts

Installation of the Project will involve trenching, plant and vehicular movements over soil and local unsealed roads and general movement of construction vehicles. This limited activity is not expected to generate more dust than the regular cultivation and crop stripping that currently occurs on the Project area and adjacent paddocks.

The Project is not expected to generate measurable dust during operations and natural ground cover or sown pasture (if practicable) on what is now a series of cropping paddocks will reduce the dust generation potential of the Project area.

During operations the Project will contribute towards improving air-quality by reducing Australia's reliance on fossil fuels for electricity generation. The Project equates to the equivalent to the displacement of 487,000 tonnes of greenhouse gas emissions per annum (14.6 million tonnes over it's 30 year lifetime).

The Project's potential to adversely impact the existing air quality environment is low.

7.13.3. Mitigation Measures

Suitable mitigation measures for this potentially low impact typically include:

- Dust management measures will be included in the Construction Management Plan;
- During construction, dust raised on site will be monitored and, if dust is creating a nuisance, a water cart will be used to manage problem areas;
- Dust generation from construction traffic will be monitored and dust suppression activities will be undertaken to minimise dust emissions, if required;

- Wind speed and direction will be monitored, and dust generating activities will be adapted to the wind conditions; and
- Properly maintained equipment will be used to minimise emissions.

7.14. ELECTRIC AND MAGNETIC FIELDS, AND RADIO FREQUENCY INTERFERENCE

7.14.1. Existing Environment

A brief discussion of electrical terminology is useful to aid an understanding of electric and magnetic fields (EMF) and the separate question of radio frequency interference (RFI).

EMF are produced by all electrical equipment, from high voltage power lines to hair dryers, with fields increasing with voltage and current respectively. Both fields drop away rapidly with distance from the source, or due to shielding by insulation or earth (in the case of buried installations). For comparative purposes, in unshielded overhead high voltage transmission wiring, both electrical and magnetic fields would drop to approximately zero within 60 metres from the centreline of the transmission line's conductor bundles.

Radio Frequency Interference (RFI) can be generated by a range of electrical apparatus. The Australian Communications and Media Authority (ACMA) is the Australian regulator of radio communications, telecommunications, broadcasting and the internet, responsible for ensuring compliance with the *Radio Communications Act 1992*. Part of ACMA's role is to regulate the use of equipment that might affect important telecommunications.

There have been reports of household solar installations detrimentally affecting television reception. It appears that this reported interference is not strictly due to RFI affecting reception but are generally due to poor quality domestic inverters inserting RFI into the household wiring system that disturbs the television set power supply, which in turn causes screen distortion.

The Project area and adjacent land incudes utility scale electricity infrastructure comprising a substation and powerlines. The ElectraNet transmission network 275/132kV Bungama substation is located on Pirie Blocks Road in close proximity to the Project area. Overhead 275kV/132kV transmission lines connecting into the ElectraNet Bungama substation transect the Project land within registered easements. Two overhead 275kV transmission lines run north/north west from the substation across the western portion of the Project area within registered easements (Figure 2-3). Two overhead 275kV/132kV transmission lines run south/south east from the substation across adjoining land (Figure 2-3).

An ElectraNet 275kV transmission line running east/west crosses the southern portion of the Project area (Figure 2-3).

7.14.2. Potential Impacts

Substantial EMF's have the potential to interrupt electrical equipment and impact human health.

The Project's various EMF generating components include the PVS panels, the interconnecting buried cables, the direct to alternating current inverters, overhead transmission lines, step up transformers, the BESS, and overhead or underground connection to the Bungama substation.

Essentially EMF increases with voltage and proximity to the apparatus producing, transmitting or consuming electricity. EMF does vary according to specific design and construction parameters such as conductor height, electrical load and phasing, and most importantly, whether the conductors are overhead or buried.

The Project's components that will generate the highest EMF are the Project's substation, BESS and potentially the synchronous condenser(s) together with the overhead line connection to the Bungama substation.

With regard to RFI, solar inverters do emit harmonics but not radio frequency waves and so will not directly affect television transmissions. As discussed previously, poor quality household solar inverters can insert undesirable interference into wiring systems and so indirectly reduce picture quality. Inverters should be tested according to International Electrotechnical Commission (of which Australia is a full member) standards for radio interference, and, depending on the make and model may emit some radiation within acceptable limits. The commercial Inverters being considered for the Project, have been tested to international standards and have proven to not disturb radio signals except in the immediate area around the inverter (approximately <5m).

The Project's potential to adversely impact the existing EMF and RFI environment is low.

7.14.3. Mitigation Measures

Suitable mitigation measures for this potential impact typically include:

- Installing electricals to the relevant Australian Standards and guidelines;

- Post-construction confirmation that electricals have been installed to the relevant Australian Standards;
- Setting the PVS back behind the Project boundary;
- Setting the inverters for the PVS outside 200 metres of existing or anticipated dwellings;
- Locating the high voltage electrical equipment such as switchyard, substation, BESS and synchronous condensers (if required) appropriately on the Project area;
- Use of International Electrotechnical Commission compliant commercial inverters; and
- Restriction of access to areas of high voltage electrical equipment such as switchyard, substation, BESS areas and synchronous condensers (if required).

7.15. WATER RESOURCES

7.15.1. Existing Environment

A 2018 report by the World Resources Industry notes the following key points:

- Australia is one of the world's top 20 water-stressed nations.
- Every megawatt hour of electricity generated by coal withdraws around 60,700 litres and consumes about 2,600 litres of water.
- In the 2017-2018 financial year, Australian's have consumed 147 terawatt hours of electricity, about 73 per cent of which comes from coal, which equates to around 455 billion litres of water.

7.15.2. Potential Impacts

The Project's use of water to produce electricity is limited to cleaning the solar panels during the operational phase. Continual improvements in panel cleaning technology is reducing the small amount of water currently required to produce electricity.

The World Resources Industry report notes "*the potential for cheap renewable energy, solar and wind as opposed to fossil fuels, could reduce water consumption country-wide as these technologies use minimal water*".

If the Project produced 750GW/hours of electricity per year this would equate to approximately 45 billion litres of water annually not being required for electricity production.

The Project will contribute to reducing the current amount of water required to generate electricity in Australia.

7.15.3. Mitigation Measures

The Project is a mitigation measure, contributing to lower use of water for electricity generation.

7.16. SOCIO-ECONOMIC

A socio-economic impact assessment has been undertaken to consider the likely outcomes of the Bungama Solar Project. Key findings of this study are provided below. The full analysis and discussion are provided at Appendix 11.

7.16.1. Socio-Economic Benefits

The Project will:

- Deliver clean and renewable energy for Australia in the face of climate change;
- Assist in meeting renewable energy targets for the State and the Nation;
- For each year of its 30-year operational life, displace the equivalent of 497,000 tonnes of greenhouse gas emissions per annum, the equivalent of offsetting the impact of 195,000 cars or providing the equivalent benefit of 69,500 trees per annum;
- Provide clean energy to power an equivalent of 86,000 homes for each year of the Project's life;
- Create industry diversity for the Port Pirie region;
- Create substantial employment opportunities during Project construction phases;
- Be located in a suitable area with access to existing infrastructure;
- Provide a flexible, low-impact alternative to the existing agricultural land use;
- Generate an estimated economic benefit in the order of $292.5 million for the broader economy and approximately $164 million as direct domestic Project expenditure;
- Generate up to an estimated 275 equivalent full-time jobs during construction, and a further 410 indirect full-time equivalent jobs;
- Generate up to an estimated 8 equivalent full-time jobs during operations; and
- Provide a direct benefit to the community in the form of a community fund.

To ensure that the employment opportunities, afforded by the Project, are maximised for the local community, an expressions of interest register has been established. This register allows local people and businesses to express interest in participating with the construction and operations of the Project. The register has been established and maintained since initial community consultation phases.

This register will be passed onto the construction contractor, and where skills and resources can be appropriately matched, local and regional community members and businesses will be considered in participation opportunities.

7.16.2. Potential Socio-Economic Impacts and Mitigation Measures

Notwithstanding the positive impacts noted above, a number of potential or perceived impacts have also been raised, through assessment and community engagement including adjacent landowner concerns about visual impacts comprising general amenity and glint/glare, perceived impact on agricultural land, potential impacts arising during the construction phase including dust and noise and perceived health impacts from electromagnetic fields.

These and other potential impacts plus appropriate mitigation measures are addressed in this Planning Report.

7.17. GLINT AND GLARE

A Glint and Glare Analysis is attached as Appendix 12. The Glint and Glare Analysis assessed the potential optical effects on drivers on certain parts of relevant roads, residence in some adjacent areas for housing, a section of the railway line as well as airplanes approaching the Port Pirie Airport from PVS solar panels on a single axis tracking system during the Project's operational phase.

The Glint and Glare Analysis report explains the methodology and modelling undertaken to carry out the assessment of potential Glint and Glare impacts. The methodology's conservative assumptions and estimates gives quantified results. However, the results do not take into consideration a number of factors which mitigate the results and potential risks including:

- The model does not rigorously represent the detailed geometry of the solar panel arrays, for example gaps between panels, detailed variations in height of the array and support structures.

- The tool does not consider any obstacles (e.g. trees, structures or earth, topography, buildings) between the observation points and the solar panel arrays that may obstruct observed glare. The model does not consider mitigation measures such as proposed or existing vegetation buffers.
- The tool does not define directional viewpoints from each observation point. Instead it considers the cumulative impact of the entire solar panel array areas.
- The tool uses a typical clear-day solar irradiance profile (worst-case for glare). The model profile has a lower irradiance level in the mornings and evenings and a maximum at solar noon. Actual irradiance levels and profile on any given day can be affected by cloud cover and other environmental factors, however is not considered in this model.

7.17.1. Existing Environment

The Project area and surrounding landscape is characterised by mostly flat, smooth and open land. The dominant landform in the Project area is a plain, which has been extensively cleared for agriculture. There are little to no natural landscape features aside from clumped or scattered vegetation.

Port Pirie Airport is a located approximately 10km southwest of the Project area. Port Pirie Airport consists of three runways of which the east-west facing runway 80/26 is sealed and used for commercial aircrafts. The two other runways facing SW/NE, 35/17 and 03/21 are unpaved and most likely only used for private airplanes.

A number of houses are located northeast of the Project area in the Napperby rural living and township areas. Some houses are located in the primary production areas adjacent to the Project area.

The Project area is located immediately to the northeast of the Augusta Highway. Warnertown Road runs off the Augusta Highway in a westerly direction towards Port Pirie. Locks Road crosses the Project area in both a north- south and east – west direction. Bungama North Road follows part of the Project's western boundary. Gulf View Road follows part of the Project's northern boundary. Scenic Drive is located to the east of the Project area. Sections of these roads are included as part of the route locations (RO). Routes were chosen to assess potential areas where the public (car or train drivers) may experience Glint and Glare when looking towards the PVS solar panels.

7.17.2. Potential Impacts

The PVS solar panels can potentially cause a glint and/or glare impact beyond the Project area. The Glint and Glare Analysis key findings are:

Overall:

No harmful or dangerous glint or glare will be experienced for sensitive receivers as a result of the Project, with the potential for a low level of glare experienced for some locations either very early morning or late evening in the Autumn and or Winter, if these areas are not impeded by existing vegetation.

Air Traffic:

The Australian Civil Aviation Safety Authority (CASA) provides guidelines to planning authorities in relation to referring solar projects for assessment to ensure there is no likelihood of any glare and glint issues for pilots on approach to or on departure from an airport or impact on traffic controllers.

The Project is approximately 10km south-west of Port Pirie Airport and it is therefore considered unlikely that any Glint or Glare issues will be created for pilots on approach to or departure from Port Pirie Airport. However, CASA requires an assessment for any solar farm within approximately 5 nautical miles from an airport and therefore a calculation for potential Glint and Glare issues was performed.

Port Pirie Airport consists of three runways of which the east-west facing runway 80/26 is sealed and used for commercial aircrafts. The two other runways facing SW/NE, 35/17 and 03/21 are unpaved and most likely only used for private airplanes. All three runways were assessed.

The calculation for all six approach paths did not indicate any Glint or Glare issues for pilots.

Houses:

The observer locations (OP) described in Table 5 of the Glint and Glare Analysis and shown as white markers in the accompanying map were chosen to represent potential areas where the residents of houses may experience Glint and Glare when looking towards the PVS solar panels if the view is unimpeded.

The assessment identified areas within the Napperby rural living area as potentially where the residents of houses may experience low-level glare when looking towards the PVS solar panels.

Roads:

The section of Augusta Highway shown Table 6 of the Glint and Glare Analysis does not experience glare issues.

The section of Warnertown Road shown in Table 6 of the Glint and Glare Analysis experiences only a cumulative total of one hour per year (approximately 2 minutes on some Autumn and Winter days) of low-level glare.

The section of Gulf View Road shown in Table 6 of the Glint and Glare Analysis experiences only a total of two minutes per year of low-level glare.

Trains

The section of railway shown in Table 6 of the Glint and Glare Analysis does not experience glare issues.

7.17.3. Mitigation Measures

Air Traffic:

No mitigation measures are required.

Houses:

The observer locations (OP) described in Table 5 of the Glint and Glare Analysis and shown as white markers in the accompanying map were chosen to represent potential areas where the residents of houses or potential residents of houses may experience Glint and Glare when looking towards the PVS solar panels if the view is unimpeded.

The assessment identified areas within the Napperby rural living area where the residents of houses may potentially experience low-level glare during certain early mornings or late evenings in Autumn and or Winter when looking towards the PVS solar panels if the view is unimpeded. The key mitigation measures to address this low-level glare include:

1. A visual buffer zone in targeted sections of the Project area to further screen the Project shown in the Landscape Plan attached as Appendix 14. The visual buffer zone will provide for the following:
    - Setback the PVS behind a visual buffer zone from the Project boundary for existing residential receptors, including the potential future residences, and consequently, reduce the physical size/scale of Project, which also reduces the renewable energy production of the Project; and
    - Establish and maintain within the visual buffer zone a landscape screen of vegetation approximately 3-5m in height, further reducing views of the Project.
2. Existing obstacles including existing vegetation, structures and buildings between the residents of houses or potential residents of houses and the PVS panel arrays that may obstruct observed glare.
3. Additional landscape screening shown in the Landscape Plan attached as Appendix 14.

As a result, the buffer zone, landscaping within the buffer zone, additional landscape screening and existing obstacles including existing vegetation, structures and buildings between the residents of houses or potential residents of houses and the PVS panel arrays ameliorates the low-level glare identified in the Glint and Glare report.

<u>Roads:</u>

No mitigation measures are required for the section of Augusta Highway shown Table 6 of the Glint and Glare Analysis.

The section of Warnertown Road shown in Table 6 of the Glint and Glare Analysis experiences only a cumulative total of one hour per annum of low-level glare. The section of Gulf View Road shown in Table 6 of the Glint and Glare Analysis experiences a cumulative total of two minutes per year of low-level glare. The key mitigation measures to address this minimal low-level glare include:

1. A visual buffer zone in targeted sections of the Project area to screen the Project as shown in the Landscape Plan attached as Appendix 14. The visual buffer zone will provide for the following:
    - Setback the PVS behind a visual buffer zone from the Project boundary and consequently, reduce the physical size/scale of Project, which also reduces the renewable energy production of the Project; and

- Establish and maintain within the visual buffer zone a landscape screen of vegetation approximately 3-5m in height, further reducing views of the Project.

2. Existing obstacles including existing vegetation, structures and buildings between the residents of houses or potential residents of houses and the PVS panel arrays will obstruct observed glare.
3. Additional landscape screening along the Project's boundary with Augusta Highway shown in the Landscape Plan attached as Appendix 14.

As a result, the combined; buffer zone; landscaping within the buffer zone; additional landscape screening; and existing obstacles (including existing vegetation, structures and buildings) between the relevant sections of roads and the PVS panel arrays, ameliorates the low-level glare identified in the Glint and Glare report.

Railway line/Trains

No mitigation measures are required.

8. SUMMARY OF MITIGATION MEASURES

8.1. PVS ELEMENT AND ANCILLARY COMPONENTS

Table 8-1 provides a summary of mitigation measures for the PVS element and ancillary components of the Project.

Table 8-1: Summary of Mitigation Measures for the PVS element of the Project

Issue	Mitigation Measure	Section of Planning Report
Visual Impact and Landscape	• Landscape screening is proposed for some parts of the Project boundary; • Stakeholder engagement activities will continue be undertaken to understand relevant landowner and community relationships with visual aspects of the Project; • As far as practicable, the development will occur on land previously cleared of vegetation and disturbed; • Utility buildings or structures will be sited together, away from residences and constructed of materials that are muted in colour; • The use of reflective materials in construction will be limited, as far as practicable; • Any landscaping that is completed as part of the Project will be selected and designed so it is sensitive to the landscape and visual receptors; • Any signage will be designed and located so it is sensitive to the landscape and visual receptors; • Fencing will be sited and designed appropriately to blend with the facility; and • Construction equipment and waste will be removed from the Project area in a timely manner.	7.1
Land Use	• Following the Project's decommissioning the land will be available for current agricultural uses.	7.2
Biodiversity	• Prioritise use of cleared, agricultural land, and avoid unnecessary clearance of thin strips of vegetation along allotment boundaries and native scattered trees; • Removal of native vegetation be avoided and minimised, as far as practicable, as part of the final design;	7.3

Issue	Mitigation Measure	Section of Planning Report
	• Weed and pathogen hygiene measures will be employed as part of the removal process to ensure that no new weeds or other pathogens are introduced to existing native vegetation; and • An Application for approval to clear native vegetation under Division 5 of the *Native Vegetation Regulations 2017* be submitted to Native Vegetation Council based on the Project's final design.	
Surface Water and Erosion	• During construction main access tracks will be permanently gravelled where required; • Rows of PV panels will rotate and be separated from the next row, so providing an infiltration area and sunlight to potential pasture; • If practicable, the ground under and adjacent the PV panels will be sown with a permanent pasture mix, suitable to the region and long - term stock grazing; • If practicable, the Project area will be controlled grazed (most likely with sheep) to maintain ground cover density and manage the sward length; • During the construction and operation phases an erosion and sediment control plan for each phase will be developed detailing the control measures to be implemented; • Sewage treatment and disposal to be conducted in accordance with relevant Australian Standards and local regulations/approval; and • During the construction and operation phases a storage and handling of chemical and hazardous materials management plan for each phase will be developed detailing the control measures to be implemented.	7.5
Groundwater	• Erosion and sediment control devices will be installed where necessary and monitored to assess efficacy of erosion and sediment control measures; • No unnecessary clearing or earthworks; • Measures implemented to control flow velocities in such a manner that prevents soil erosion along drainage paths; • Ensure the use of appropriately designed laydown areas for vehicles and machinery and storage areas for chemicals, oils and fuels; • Make available spill kit(s) within the operational and maintenance area;	7.7

Issue	Mitigation Measure	Section of Planning Report
	• Ensure all staff to be made aware of spill response procedures and the requirement to report any spills or leaks; • Ensure regular maintenance and checks of heavy vehicles, machinery and equipment to identify potential leaks; and • All chemical storage vessels are to be bunded and/or constructed on impermeable surfaces in compliance with relevant Australian Standards.	
Climate	• Efficient PV components and Project design to maximise electricity production; • Components updated as they become obsolete or superseded by more efficient technologies, as required; and • Panels will be maintained to maximise solar collection.	7.8
Noise	• Work on-site will occur within the standard work hours of 7.00a.m. and 7.00p.m. Monday to Saturday; • Particularly noisy activities will be commenced after 9.00am if they exceed noise guidelines; • Noisy equipment and processes will be located so that their impact on neighbouring properties is minimised whether by maximising the distance to the premises, using structures or elevations to create barriers or otherwise; • Equipment will be shut down or throttled down whenever it is not in use; • Equipment will be equipped with feasible noise control (e.g. mufflers, silenced exhausts, acoustic enclosures); • Equipment will be properly maintained so as to eliminate or reduce noise as far as practicable; • Equipment shall be handled so as to minimise impact of noise; • As far as practicable, off-site or alternative processes that eliminate or lessen noise will be utilised; • A complaints hotline will be established and advertised for the receipt of feedback on the Project, including any complaints regarding noise nuisance; • Subject to approval from the relevant authority, circumstances, such as extreme summer heat, may warrant construction activity to be permitted outside of the hours of 7.00am and 7.00pm Monday to Saturday or on a Sunday or Public Holiday;	

Issue	Mitigation Measure	Section of Planning Report
	• Scheduling of construction activities to minimise the number of work fronts and simultaneous activities occurring along the boundaries of the Project area (within 200m) to minimise noise levels; • Development of a construction noise management protocol to minimise noise emissions, manage out of hours (minor) works to be inaudible, and to respond to potential concerns from the community; • Where possible use localised mobile screens or construction hoarding around plant to act as barriers between construction works and receptors, particularly where equipment is near the site boundary and/or a residential receptor including areas in constant or regular use (e.g. unloading and laydown areas); • Operating plant in a conservative manner (no over-revving), be shut down when not in use, and be parked/started at farthest point from relevant assessment locations; • Selection of the quietest suitable machinery available for each activity; • Avoidance of noisy plant/machinery working simultaneously where practicable; • Minimise impact noise wherever possible; • Utilise a broadband reverse alarm in lieu of the traditional high frequency type reverse alarm; • Provide toolbox meetings, training and education to drivers and contractors visiting the site during construction so they are aware of the location of noise sensitive receptors and to be cognisant of any noise generating activities; • Signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off-site; • Utilise Project related community consultation forums to notify residences within close proximity of the site with Project progress, proposed/upcoming potentially noise generating works, its duration and nature and complaint procedure; • Complete a one-off noise validation monitoring assessment to quantify emissions from site and to confirm emissions meet relevant criteria; and	

Issue	Mitigation Measure	Section of Planning Report
	• Prepare an operational noise management protocol to minimise noise emissions and to respond to potential concerns from the community regarding Project noise emissions.	
Archaeology	• Further cultural heritage works with the Nukunu Peoples Council Inc. will inform the final detailed Project layout plans; • Any Aboriginal sites and artefacts will be taken into consideration for the final detailed Project layout plans; • Compliance with the relevant provisions of the *Aboriginal Heritage Act 1988*; • Construction personnel will receive a heritage induction prior to work on-site; • A stop work/site discovery procedure for both Aboriginal and European heritage will be developed prior to the commencement of construction to manage the event of an unexpected find; and • The Construction Management Plan will include information on recorded heritage items.	7.10
Bushfire	• Installation of only Standard compliant components; • Ongoing monitoring and review of the solar system performance; • Installation of thermal overload protection on inverters; • Controlled grazing or machinery maintenance of pastures under panel arrays; and • Maintenance of firebreaks.	7.11
Traffic and Transport	• A Traffic Management Plan will be prepared, prior to commencement of construction works in consultation with DPTI and Port Pirie Regional Council; and • A dilapidation report or equivalent report, of the road conditions along the nominated local access roads will be undertaken prior to the commencement of construction in consultation with the Port Pirie Regional Council.	7.12
Air Quality	• Dust management measures will be included in the Construction Management Plan; • During construction, dust raised on site will be monitored and, if dust is creating a nuisance, a water cart will be used to manage problem areas;	7.13

Issue	Mitigation Measure	Section of Planning Report
	• Dust generation from construction traffic will be monitored and dust suppression activities will be undertaken to minimise dust emissions, if required; • Wind speed and direction will be monitored, and dust generating activities will be adapted to the wind conditions; and • Properly maintained equipment will be used to minimise emissions.	
Electric and Magnetic Fields	• Installing electrical componentry to the relevant Australian Standards and guidelines; • Post-construction confirmation that electricals have been installed to the relevant Australian Standards; • Setting the PVS back behind the Project boundary; • Setting the inverters for the PVS outside 200 metres of existing or anticipated dwellings; • Use of International Electrotechnical Commission compliant commercial inverters; and • Restriction of access to areas of high voltage electrical equipment such as switchyard, substation, BESS areas and synchronous condensers (if required).	7.14
Glint and Glare	• Landscape screening is proposed for some parts of the Project boundary.	7.17

8.2. BESS ELEMENT

Table 8-2 provides a summary of mitigation measures for the BESS element of the Project.

Table 8-2: Summary of Mitigation Measures for the BESS element of the Project

Issue	Mitigation Measure	Section of Planning Report
Visual Impact and Landscape	• Stakeholder engagement activities will continue be undertaken to understand relevant landowner and community relationships with visual aspects of the Project; • Utility buildings or structures will be sited together, away from residences and constructed of materials that are muted in colour; • The use of reflective materials in construction will be limited, as far as practicable;	7.1

Issue	Mitigation Measure	Section of Planning Report
	• Any landscaping that is completed as part of the Project will be selected and designed so it is sensitive to the landscape and visual receptors; • Any signage will be designed and located so it is sensitive to the landscape and visual receptors; • Fencing will be sited and designed appropriately to blend with the facility; and • Construction equipment and waste will be removed from the Project area in a timely manner.	
Land Use	• Following the Project's decommissioning the land will be available for current agricultural uses.	7.2
Surface Water and Erosion	• During the construction and operation phases an erosion and sediment control plan for each phase will be developed detailing the control measures to be implemented.	7.5
Groundwater	• Erosion and sediment control devices will be installed where necessary and monitored to assess efficacy of erosion and sediment control measures; • No unnecessary clearing or earthworks; and • Measures implemented to control flow velocities in such a manner that prevents soil erosion along drainage paths.	7.7
Noise	• Work on-site will occur within the standard work hours of 7.00a.m. and 7.00p.m. Monday to Saturday; • Particularly noisy activities will be commenced after 9.00am if they exceed noise guidelines; • Noisy equipment and processes will be located so that their impact on neighbouring properties is minimised whether by maximising the distance to the premises, using structures or elevations to create barriers or otherwise; • Equipment will be shut down or throttled down whenever it is not in use; • Equipment will be equipped with feasible noise control (e.g. mufflers, silenced exhausts, acoustic enclosures); • Equipment will be properly maintained so as to eliminate or reduce noise as far as practicable; • Equipment shall be handled so as to minimise impact of noise;	7.9

Issue	Mitigation Measure	Section of Planning Report
	• As far as practicable, off-site or alternative processes that eliminate or lessen noise will be utilised; • A complaints hotline will be established and advertised for the receipt of feedback on the Project, including any complaints regarding noise nuisance; • Subject to approval from the relevant authority, circumstances, such as extreme summer heat, may warrant construction activity to be permitted outside of the hours of 7.00am and 7.00pm Monday to Saturday or on a Sunday or Public Holiday; • Development of a construction noise management protocol to minimise noise emissions, manage out of hours (minor) works to be inaudible, and to respond to potential concerns from the community; • Where possible use localised mobile screens or construction hoarding around plant to act as barriers between construction works and receptors, particularly where equipment is near the site boundary; • Operating plant in a conservative manner (no over-revving), be shut down when not in use, and be parked/started at farthest point from relevant assessment locations; • Selection of the quietest suitable machinery available for each activity; • Avoidance of noisy plant/machinery working simultaneously where practicable; • Minimise impact noise wherever possible; • Utilise a broadband reverse alarm in lieu of the traditional high frequency type reverse alarm; • Provide toolbox meetings, training and education to drivers and contractors visiting the site during construction so they are aware of the location of noise sensitive receptors and to be cognisant of any noise generating activities; • Signage is to be placed at the front entrance advising truck drivers of their requirement to minimise noise both on and off-site; • Utilise Project related community consultation forums to notify residences within close proximity of the site with Project progress, proposed/upcoming potentially noise generating works, its duration and nature and complaint procedure;	

Issue	Mitigation Measure	Section of Planning Report
	• Complete a one-off noise validation monitoring assessment to quantify emissions from site and to confirm emissions meet relevant criteria; and • Prepare an operational noise management protocol to minimise noise emissions and to respond to potential concerns from the community regarding Project noise emissions.	
Archaeology	• Further cultural heritage works with the Nukunu Peoples Council Inc. will inform the final detailed Project layout plans; • Any Aboriginal sites and artefacts will be taken into consideration for the final detailed Project layout plans; • Compliance with the relevant provisions of the *Aboriginal Heritage Act 1988* if required; • Construction personnel will receive a heritage induction prior to work on-site; • A stop work/site discovery procedure for both Aboriginal and European heritage will be developed prior to the commencement of construction to manage the event of an unexpected find; and • The Construction Management Plan will include information on recorded heritage items.	
Bushfire	• Installation of only Standard compliant components; • Ongoing monitoring and review of the Battery system performance; and • Installation of thermal overload protection on inverters.	7.11
Electric and Magnetic Fields	• Locating the high voltage electrical equipment such as switchyard, substation, BESS and synchronous condensers (if required) appropriately on the Project area; • Installing electrical componentry to the relevant Australian Standards and guidelines; • Post-construction confirmation that electricals have been installed to the relevant Australian Standards; • Use of International Electrotechnical Commission compliant commercial inverters; and • Restriction of access to areas of high voltage electrical equipment such as switchyard, substation, BESS areas.	7.14

9. ENVIRONMENTAL MANAGEMENT AND MONITORING

While the purpose of the reviewing the key environmental issues is to consider the potential environmental impacts resulting from the Project, the role of an ongoing environmental management system is to ensure that the identified controls and commitments are maintained throughout the construction and operational phases of the Project. Further, a formal environmental management system will implement and monitor the objectives and measures outlined in the development consent, relevant licenses and legislation. Accordingly, this section outlines an overall environmental management framework to guide the development and management of the Project.

Following a development approval, an Environmental Management Plan (EMP) for the construction and operational phases of the development will be prepared taking into account the following documents:

- This Planning Report;
- Conditions of Approval; and
- Any other approval, licence or permit required, including but not limited to grid connection to the ElectraNet Bungama Substation.

It is intended to prepare a suite of EMPs including a Construction Management Plan and Operational Management Plan. These EMPs will be drafted and finalised following development approval. Notwithstanding, the EMPs are expected to specify all environmental management activities and measures used to control, prevent or minimise environmental impacts. In addition, the plan will assign responsibility for mitigation measures to specific personnel and allocate quantitative or qualitative criteria to the performance of each measure where applicable. The following matters are likely to be addressed in the suite of EMPs:

- Project description;
- Environmental management structure and responsibilities;
- Approval and licensing requirements;
- Environmental training requirements;
- Emergency contacts and responsible procedures;
- Risk assessment;
- Environmental management measures;
- Environmental management maps, as required;
- Environmental monitoring requirements;
- Environmental auditing, as required;
- Corrective action; and
- Review.

The nature of the Project means that environmental monitoring required by more intrusive projects (mines, quarries, roads, etc.) is likely not required.

Following development approval, environmental management will be implemented in accordance with the following environmental objectives:

- Implement a standard of environmental management that reflects proactive planning and recognition of environmental impact;
- Comply with applicable Commonwealth and South Australian legislative requirements;
- Comply with applicable environmental standards and approvals throughout all phases of the Project; and
- Commit to undertake all environmental management practices in accordance with best-practice.

Management procedures may be adjusted in the event of an environmental incident or the receipt of complaints.

10. CONCLUSION

The Project area selection, assessment and design has been a considered and iterative process influenced by a number of factors including legislative and technical requirements, on-ground environmental attributes, financial feasibility, and potential for economic, social and environmental benefits.

Detailed and measured investigations has allowed the Project to achieve its intent of maximising the benefits derived from increased production of renewable energy, while being sustainable for the needs of the present generation without compromising the ability of future generations to meet their future economic, social and environmental needs.

This Planning Report has considered the details of the Project, the strategic and statutory context, and identified key environmental, social and economic issues. Where potential impacts have been identified, mitigation measures have been proposed for incorporation in the Project design and future management plans.

Assessment of the Project against the Development Control Plan has demonstrated its compatibility and appropriateness for the Project land and locality. Specifically, the land selected is predominantly cleared and previously disturbed, and is located in close proximity to existing electricity network infrastructure.

The provision of appropriately designed new generating facilities, such as the Project, is critical for the future of South Australia's energy security. Further, it is considered the Project will have positive socio-economic and environmental impacts on the local, state and national scales.

The Planning Report concludes the Project:

- Is consistent with the relevant strategic and statutory provisions;
- Will not result in significant environmental impacts;
- Is suitable at the proposed site; and
- Is in the public interest.

Therefore, it is respectively requested the Project be approved subject to final Project documents and plans being approved by relevant Government authorities prior to the commencement of construction and operation.

11. REFERENCES

BV Consulting (2018) *Glint and Glare Analysis – Bungama Solar, South Australia, Draft, 06/05/2018*

CMW Geosciences (2018) *Bungama Solar Geotechnical Investigation,* ADL2018-0004AD Rev2. 06/07/2018

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EBS Ecology (2018) *Native Vegetation Clearance Proposal Bungama Solar*, Version 2, Project Number: G80401, Author Dr M. Louter, 25/07/2018.

Engel, Z., Wszołe, T. (1996) *Audible noise of transmission lines caused by the corona effect: Analysis, modelling, prediction*, Applied Acoustics, Volume 47, Issue 2, Pages 149-163, ISSN 0003-682X, https://doi.org/10.1016/0003-682X(95)00041-7, accessed at: http://www.sciencedirect.com/science/article/pii/0003682X95000417)

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Government of South Australia, *Environment Protection (Noise) Policy 2007* accessed at https://www.legislation.sa.gov.au/LZ/C/POL/Environment%20Protection%20(Noise)%20Policy%202007.aspx

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World Resources Institute (2018), *These 20 Water-Stressed Countries Have the Most Solar and Wind Potential*

APPENDIX 1

Regulatory Endorsement

1.1 Department for Energy and Mining's S49 endorsement

1.2 Office of Technical Regulator Certificate

1.1 Department for Energy and Mining's S49 Endorsement

Government of South Australia

Department for Energy and Mining

DEMC18/00022

Mr Steve McCall
Director
Energy Projects Solar (EPS) Pty Ltd
3/153 Pacific Highway
CHARLESTOWN NSW 2290

Email: stevemccall@epsenergy.com.au

Dear Mr McCall

CROWN SPONSORSHIP BUNGAMA SOLAR PROJECT

Thank you for your letter of 7 September 2018 requesting Crown Sponsorship under section 49 of the *Development Act 1993* to assist with Energy Projects Solar (EPS) Pty Ltd's Bungama Solar Project (Project).

This Project has been considered within the South Australian Department for Energy and Mining (DEM) with input from the Department of Planning, Transport and Infrastructure, the Department of Environment and Water, the Environmental Protection Agency and the Technical Regulator. In principle, the Project is supported, recognising the possible environmental and community issues that will need to be addressed through the development assessment process.

On balance, the development of the Project has the potential to benefit South Australia and can be considered public infrastructure. Accordingly I, as the Chief Executive of the DEM, will support the development and specifically endorse the Development Application to construct the Project comprising up to 280 MW solar photovoltaic with up to 140MW capacity battery with up to 560MWh of storage as a development of public infrastructure as required by section 49 of the *Development Act 1993* (the Act).

It is the responsibility of EPS to prepare all documentation as required by section 49 of the Act. All costs in the preparation of the development application, lodgement and any other subsequent action in relation to this application are the responsibility of EPS.

Office of the Chief Executive
Level 12, 11 Waymouth Street, Adelaide SA 5000 | GPO Box 320 Adelaide SA 5001 | DX 452
Tel +61 8 8429 3216 | **Email** DEM.OCE@sa.gov.au | **ABN** 83 768 683 934

SOUTH AUSTRALIA

The DEM makes no representations or gives no warranties in relation to the outcome of the Development Application or time that it takes to secure a planning outcome. It is EPS's responsibility to obtain all other statutory approvals, licences, connection agreements and permits from relevant authorities, manage community expectations and to fund the project. The State Government makes no commitment to purchase any product or service related to the project.

A Development Application under this Crown sponsorship must be lodged with the State Planning Commission and is valid for 12 months from the date of this letter. If this is not achieved by that time, my support under Section 49(2)(c) of the *Development Act 1993* for EPS's Project will lapse.

If you have any questions regarding the preparation of the material to support this section 49 application, please contact Mr Adam Cook on (08) 8429 3496 or via email: adam.cook@sa.gov.au.

Yours sincerely

Paul Heithersay
CHIEF EXECUTIVE

18 / 10 / 2018

1.2 Office of the Technical Regulator Certificate

Government of South Australia
Department of the Premier and Cabinet

Ref: 2017/01873.01 D18089943

Energy and Technical Regulation

Office of the Technical Regulator

Level 8, 11 Waymouth Street
Adelaide SA 5000

GPO Box 320
Adelaide SA 5001

Telephone: 08 8226 5500
Facsimile: 08 8226 5866

www.sa.gov.au/otr

27 June 2018

Steve McCall
EPS Energy
PO Box 195
Charlestown NSW 2290
By email: stevemccall@epsenergy.com.au

Dear Steve,

RE: CERTIFICATE FOR DEVELOPMENT OF THE BUNGAMA SOLAR PROJECT

The development of the Bungama Solar Project has been assessed by the Office of the Technical Regulator (OTR) under Section 37 of the Development Act 1993.

Regulation 70 of the *Development Regulations 2008* prescribes if the proposed development is for the purposes of the provision of electricity generating plant with a generating capacity of more than 5 MW that is to be connected to the State's power system – a certificate from the Technical Regulator is required, certifying that the proposed development complies with the requirements of the Technical Regulator in relation to the security and stability of the State's power system.

In making a decision on your application, our office has taken the following information into account:

- An email from yourself 18 June 2018, which included the project application attached '20180618 Bungama Solar Statement to OTR.pdf';
- Revised project information emailed by John Thompson of John Thompson Inclusive Pty Ltd on 27 June 2018;

After assessing the information provided, I advise that approval is granted for the proposed project.

Should you have any questions regarding this matter, please do not hesitate to call David Bosnakis on (08) 8226 5521.

Yours sincerely

Rob Faunt
TECHNICAL REGULATOR

cc: Jeff Burns – EPS Energy
Simon Duffy – EPS Energy
John Thompson – John Thompson Inclusive

APPENDIX 2

Certificate of Titles

Government of South Australia
Department of Planning, Transport and Infrastructure

Product	Register Search
Date/Time	13/07/2016 01:02PM
Customer Reference	N/A
Order ID	20160713006061
Cost	$37.50

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Registrar-General

Certificate of Title - Volume 5949 Folio 272

REAL PROPERTY ACT, 1886 South Australia

Parent Title(s)	CT 5887/188
Dealing(s) Creating Title	TG 10236543
Title Issued	20/09/2005
Edition	1
Edition Issued	20/09/2005

Estate Type

FEE SIMPLE

Registered Proprietor

JOHN CORNELIUS CUNNINGHAM
OF 190 KINGSTON ROAD PORT PIRIE SA 5540

Description of Land

ALLOTMENT 4 DEPOSITED PLAN 24997
IN THE AREA NAMED BUNGAMA
HUNDRED OF PIRIE

Easements

SUBJECT TO THE EASEMENT(S) AS PROVIDED FOR BY SECTION 9 OF THE NATURAL GAS AUTHORITY ACT 1967

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED A AND G TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (T 1801173 AND TG 10236543 RESPECTIVELY)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B AND C TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (T 2839453 AND T 3398857 RESPECTIVELY)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED D.E AND F TO THE NATURAL GAS AUTHORITY OF SOUTH AUSTRALIA (T 3819714 T 4189221 AND RE 6961727 RESPECTIVELY)

Schedule of Dealings

NIL

Notations

Dealings Affecting Title

NIL

Priority Notices

NIL

Notations on Plan

NIL

Registrar-General's Notes

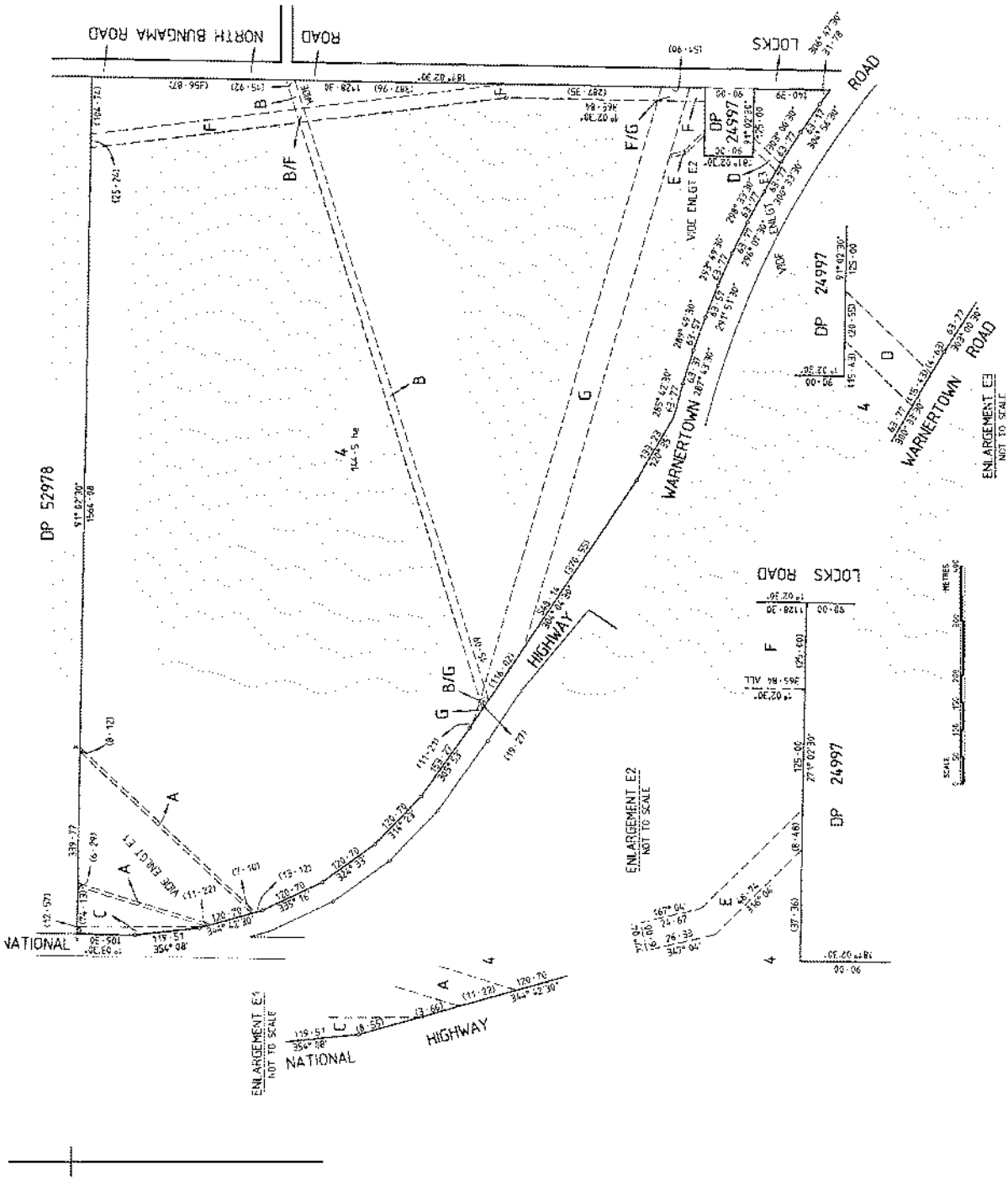
CONTROLLED ACCESS ROAD VIDE PLAN 5

Administrative Interests

NIL

* Denotes the dealing has been re-lodged.

Product	Register Search
Date/Time	13/07/2016 01:02PM
Customer Reference	N/A
Order ID	20160713006061
Cost	$37.50



Government of South Australia
Department of Planning, Transport and Infrastructure

Product	Register Search
Date/Time	13/07/2016 01:10PM
Customer Reference	
Order ID	20160713006205
Cost	$37.50

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

Registrar-General

Certificate of Title - Volume 5954 Folio 187

REAL PROPERTY ACT, 1886
South Australia

Parent Title(s)	CT 5887/34
Dealing(s) Creating Title	TG 10283691
Title Issued	28/11/2005
Edition	1
Edition Issued	28/11/2005

Estate Type

FEE SIMPLE

Registered Proprietor

ROBERT LESLIE LOCK
NEVILLE HARTLEY LOCK
OF PO BOX 276 PORT PIRIE SA 5540
AS JOINT TENANTS

Description of Land

ALLOTMENT 52 DEPOSITED PLAN 25903
IN THE AREA NAMED WARNERTOWN
HUNDRED OF NAPPERBY

Easements

SUBJECT TO THE EASEMENT(S) AS PROVIDED FOR BY SECTION 9 OF THE NATURAL GAS AUTHORITY ACT 1967

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED A TO THE NATURAL GAS AUTHORITY OF SOUTH AUSTRALIA (T 3811284)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (TG 10283691)

Schedule of Dealings

NIL

Notations

Dealings Affecting Title

NIL

Priority Notices

NIL

Notations on Plan

NIL

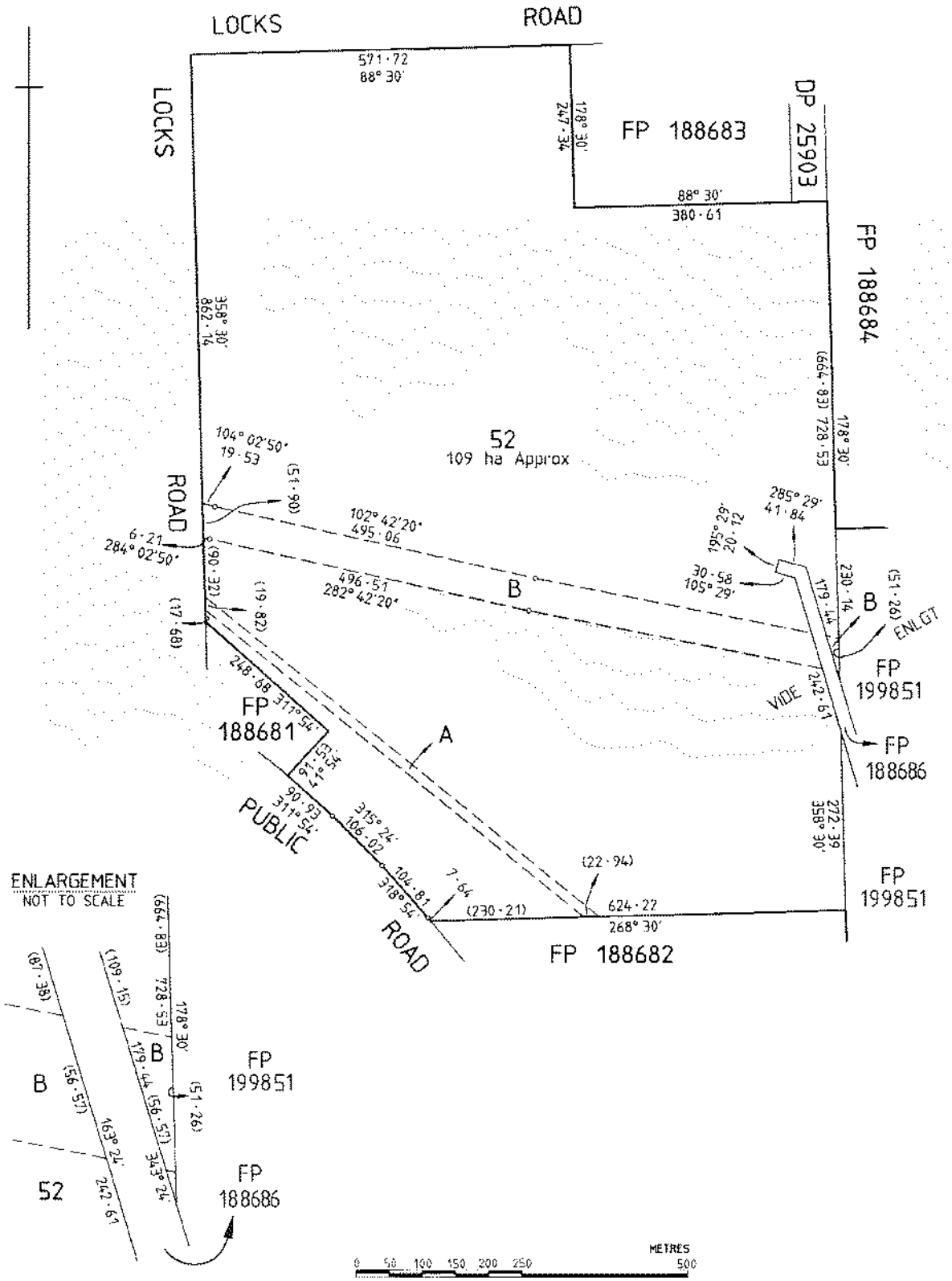
Registrar-General's Notes

CONTROLLED ACCESS ROAD VIDE PLAN 93

Administrative Interests

NIL

* Denotes the dealing has been re-lodged.



Product	Register Search (CT 6127/5)
Date/Time	13/02/2018 01:41PM
Customer Reference	11297 Bungama
Order ID	20180213007723
Cost	$28.25

REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Certificate of Title - Volume 6127 Folio 5

Parent Title(s) CT 5734/376

Creating Dealing(s) DDA 12041294

Title Issued 13/12/2013 **Edition** 3 **Edition Issued** 13/04/2017

Estate Type

FEE SIMPLE

Registered Proprietor

BRENDON NATHAN JOHNS
DENISE JOHNS
OF PO BOX 1385 PORT PIRIE SA 5540
WITH NO SURVIVORSHIP

Description of Land

ALLOTMENT 558 FILED PLAN 188690
IN THE AREA NAMED NAPPERBY
HUNDRED OF NAPPERBY

Easements

NIL

Schedule of Dealings

Dealing Number	Description
12295867	MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA
12826787	CAVEAT BY TELSTRA CORPORATION LTD. (ACN: 051 775 556) OVER PORTION (T IN F48977)

Notations

Dealings Affecting Title NIL

Priority Notices NIL

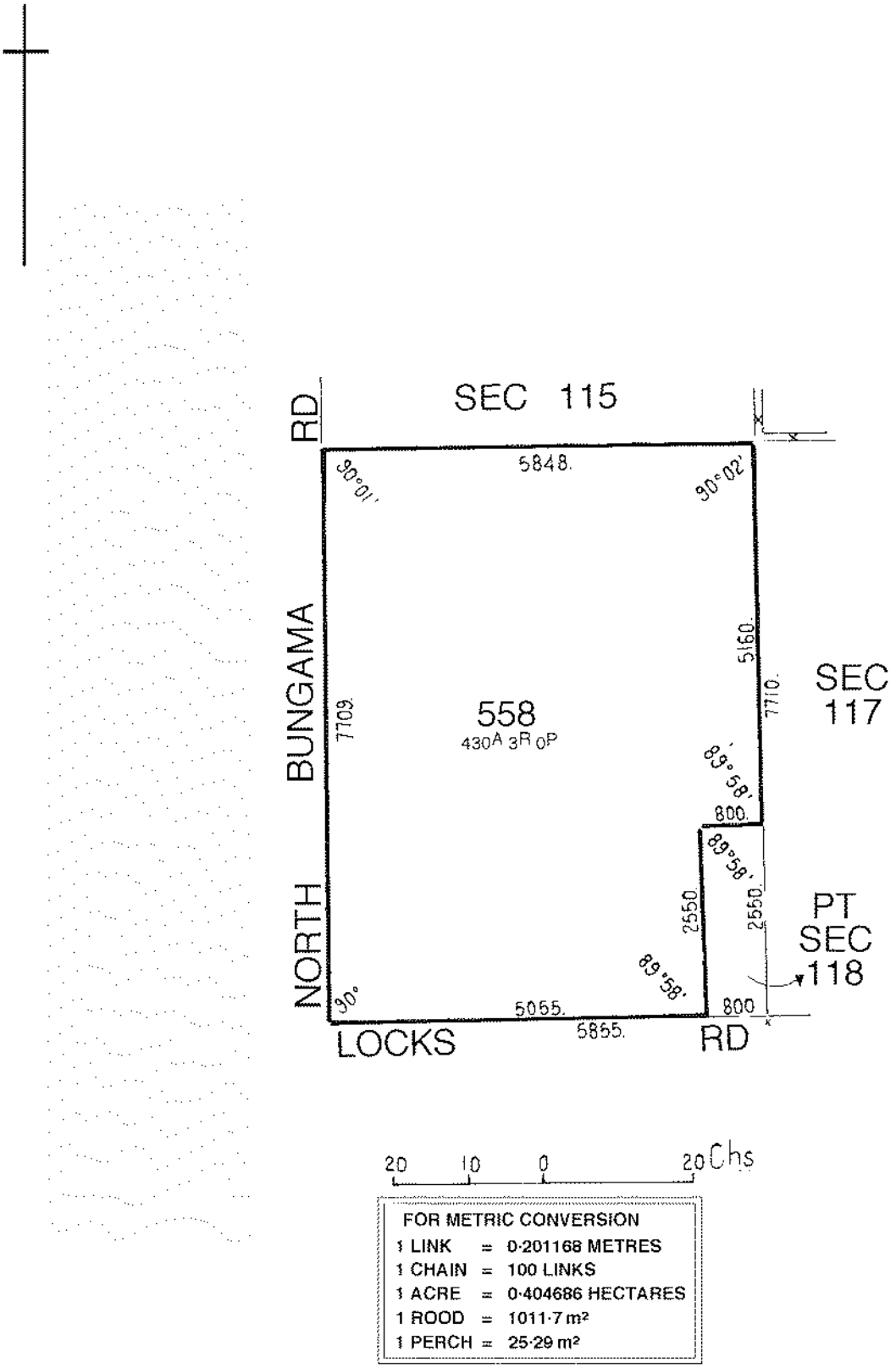
Notations on Plan NIL

Registrar-General's Notes

APPROVED FILED PLAN FOR LEASE PURPOSES FX48977
NEW EDITION CREATED DUE TO EXPIRATION OF LEASE

Administrative Interests NIL

THIS PLAN IS SCANNED FOR CERTIFICATE OF TITLE 3870/88



FOR METRIC CONVERSION		
1 LINK	=	0·201168 METRES
1 CHAIN	=	100 LINKS
1 ACRE	=	0·404686 HECTARES
1 ROOD	=	1011·7 m²
1 PERCH	=	25·29 m²

NOTE: SUBJECT TO ALL LAWFULLY EXISTING PLANS OF DIVISION

Government of South Australia
Department of Planning, Transport and Infrastructure

Product	Register Search (CT 5390/999)
Date/Time	21/06/2018 03:34PM
Customer Reference	11297 Bungama
Order ID	20180621009895
Cost	$28.25

REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Certificate of Title - Volume 5390 Folio 999

Parent Title(s) CT 3870/87

Creating Dealing(s) CONVERTED TITLE

Title Issued 13/01/1997 **Edition** 6 **Edition Issued** 11/08/2017

Estate Type

FEE SIMPLE

Registered Proprietor

JACQUELYN ANN ATZE
ANTHONY GEORGE ATZE
OF 215 LOCKS ROAD NAPPERBY SA 5540
AS JOINT TENANTS

Description of Land

ALLOTMENT 559 FILED PLAN 188691
IN THE AREA NAMED NAPPERBY
HUNDRED OF NAPPERBY

Easements

NIL

Schedule of Dealings

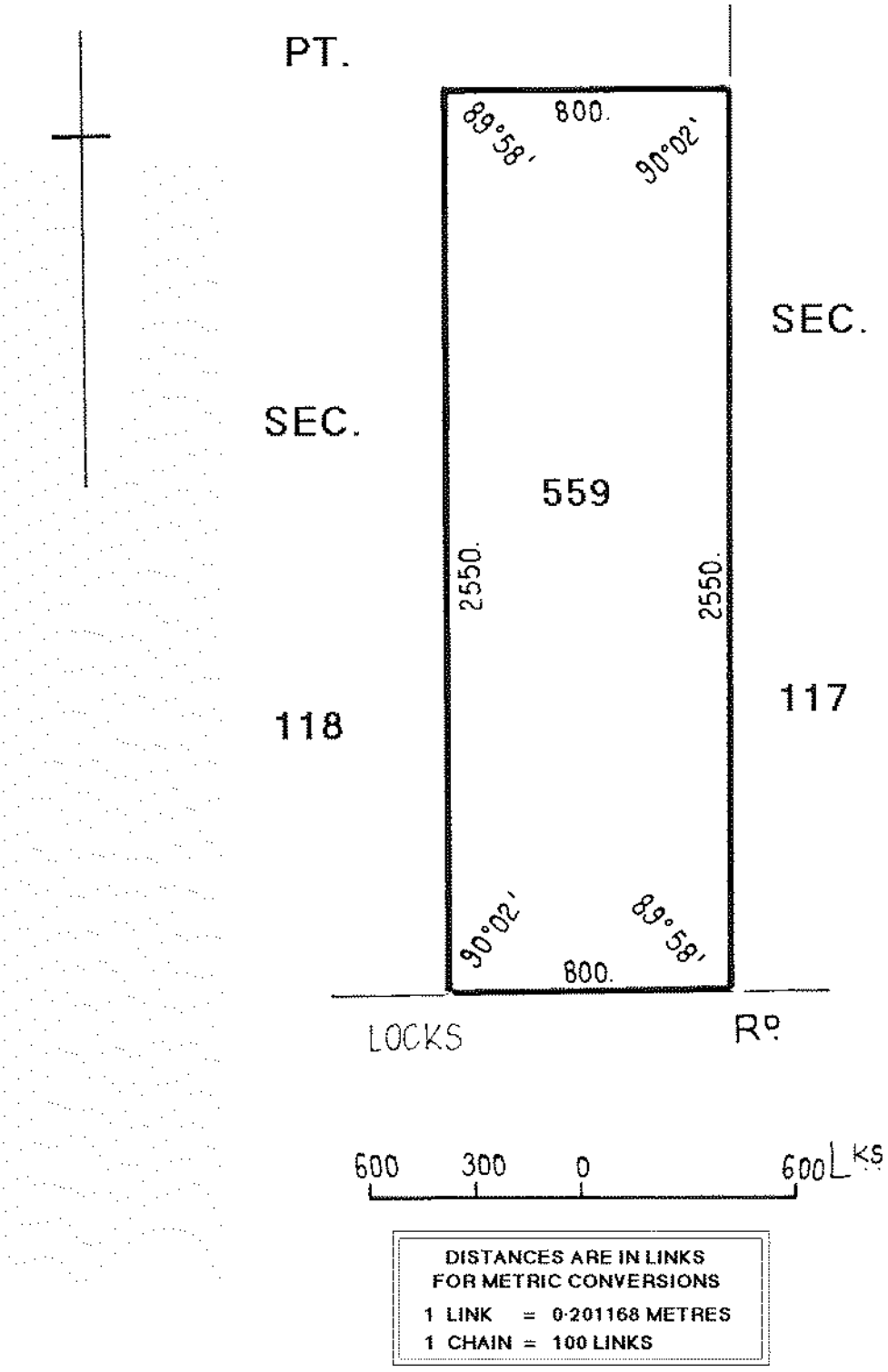
NIL

Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL

Product	Register Search (CT 5390/999)
Date/Time	21/06/2018 03:34PM
Customer Reference	11297 Bungama
Order ID	20180621009895
Cost	$28.25

THIS PLAN IS SCANNED FOR CERTIFICATE OF TITLE 3870/87



DISTANCES ARE IN LINKS
FOR METRIC CONVERSIONS
1 LINK = 0·201168 METRES
1 CHAIN = 100 LINKS

NOTE: SUBJECT TO ALL LAWFULLY EXISTING PLANS OF DIVISION

Product	Register Search (CT 5360/334)
Date/Time	21/06/2018 03:28PM
Customer Reference	11297 Bungama
Order ID	20180621009773
Cost	$28.25

REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Certificate of Title - Volume 5360 Folio 334

Parent Title(s) CT 3769/80

Creating Dealing(s) CONVERTED TITLE

Title Issued 09/09/1996 **Edition** 4 **Edition Issued** 28/04/2016

Estate Type

FEE SIMPLE

Registered Proprietor

ALAN WAYNE FRICKER
KATHLEEN TRAUDE FRICKER
OF PO BOX 764 PORT PIRIE SA 5540
AS JOINT TENANTS

Description of Land

ALLOTMENT 551 FILED PLAN 188683
IN THE AREA NAMED WARNERTOWN
HUNDRED OF NAPPERBY

Easements

NIL

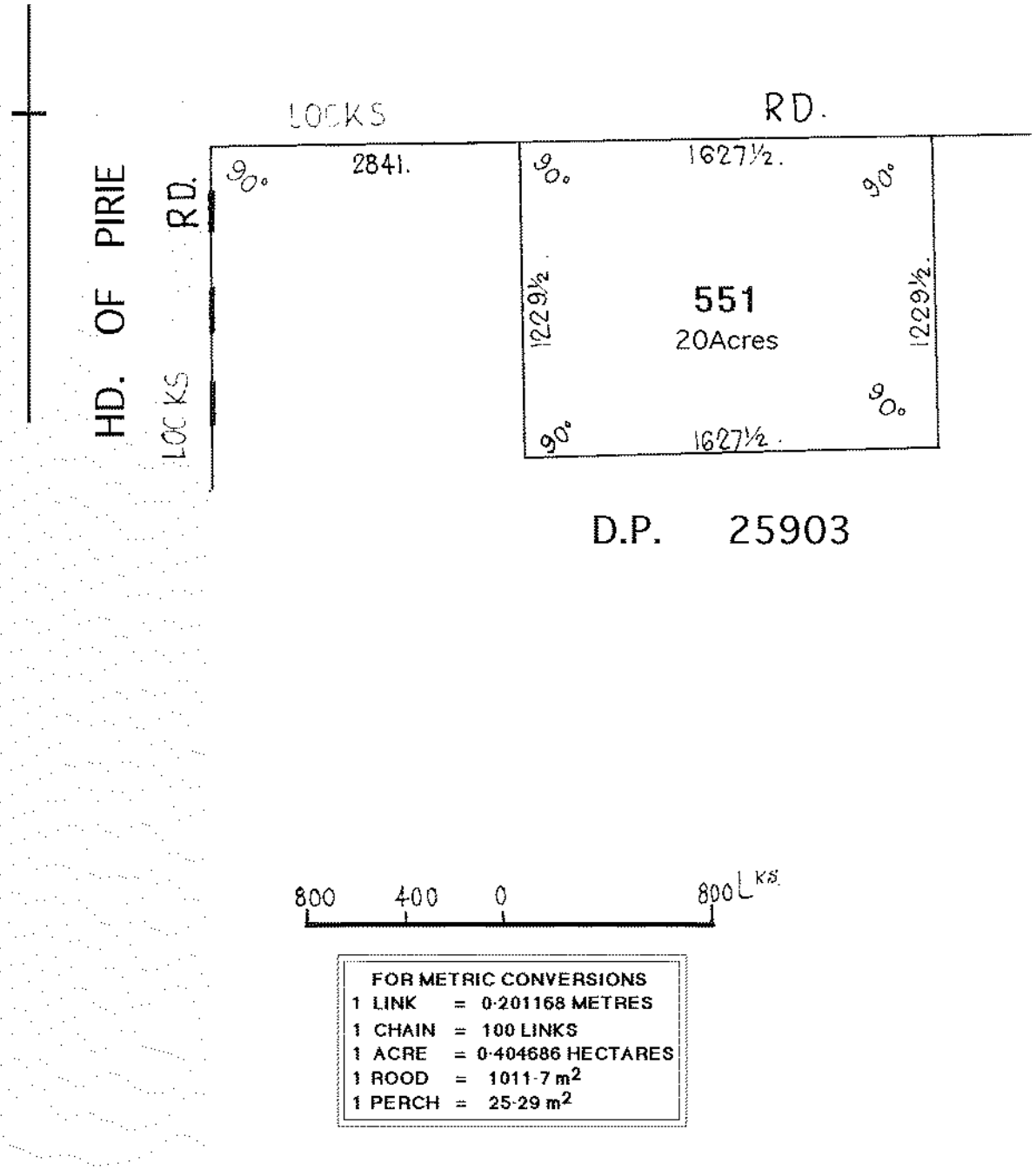
Schedule of Dealings

Dealing Number	Description
12502264	MORTGAGE TO AUSTRALIAN CENTRAL CREDIT UNION LTD. (ACN: 087 651 125)

Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL

THIS PLAN IS SCANNED FOR CERTIFICATE OF TITLE 3769/80



FOR METRIC CONVERSIONS
1 LINK = 0·201168 METRES
1 CHAIN = 100 LINKS
1 ACRE = 0·404686 HECTARES
1 ROOD = 1011·7 m^2
1 PERCH = 25·29 m^2

NOTE: SUBJECT TO ALL LAWFULLY EXISTING PLANS OF DIVISION

Product	Register Search (CT 6037/29)
Date/Time	13/02/2018 02:33PM
Customer Reference	
Order ID	20180213008991
Cost	$28.25

REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Certificate of Title - Volume 6037 Folio 29

Parent Title(s) CT 5108/759, CT 6028/970, CT 6028/974

Creating Dealing(s) RTC 11176946

Title Issued 18/06/2009 **Edition** 4 **Edition Issued** 14/09/2015

Estate Type

FEE SIMPLE

Registered Proprietor

TILLER AG PTY. LTD. (ACN: 130 458 552)
OF PO BOX 1475 PORT PIRIE SA 5540

Description of Land

ALLOTMENT 20 DEPOSITED PLAN 80628
IN THE AREA NAMED NAPPERBY
HUNDRED OF NAPPERBY

Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED A TO THE MINISTER FOR INFRASTRUCTURE (T 5096344)

SUBJECT TO FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED B

SUBJECT TO FREE AND UNRESTRICTED RIGHT(S) OF WAY OVER THE LAND MARKED C (RTC 11176946)

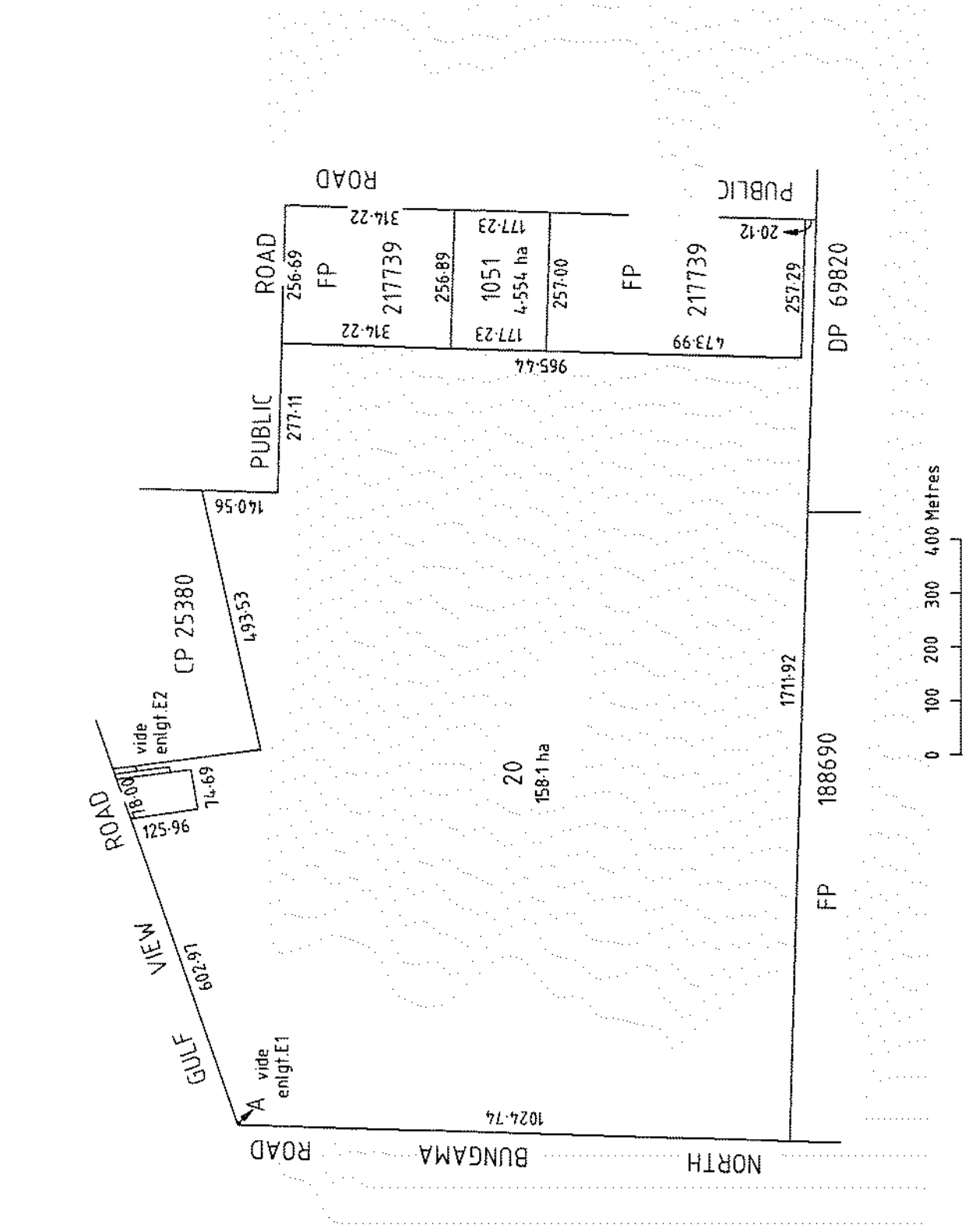
Schedule of Dealings

Dealing Number	Description
11200895	AGREEMENT UNDER DEVELOPMENT ACT, 1993 PURSUANT TO SECTION 57(2)
12382826	MORTGAGE TO RABOBANK AUSTRALIA LTD. (ACN: 001 621 129)

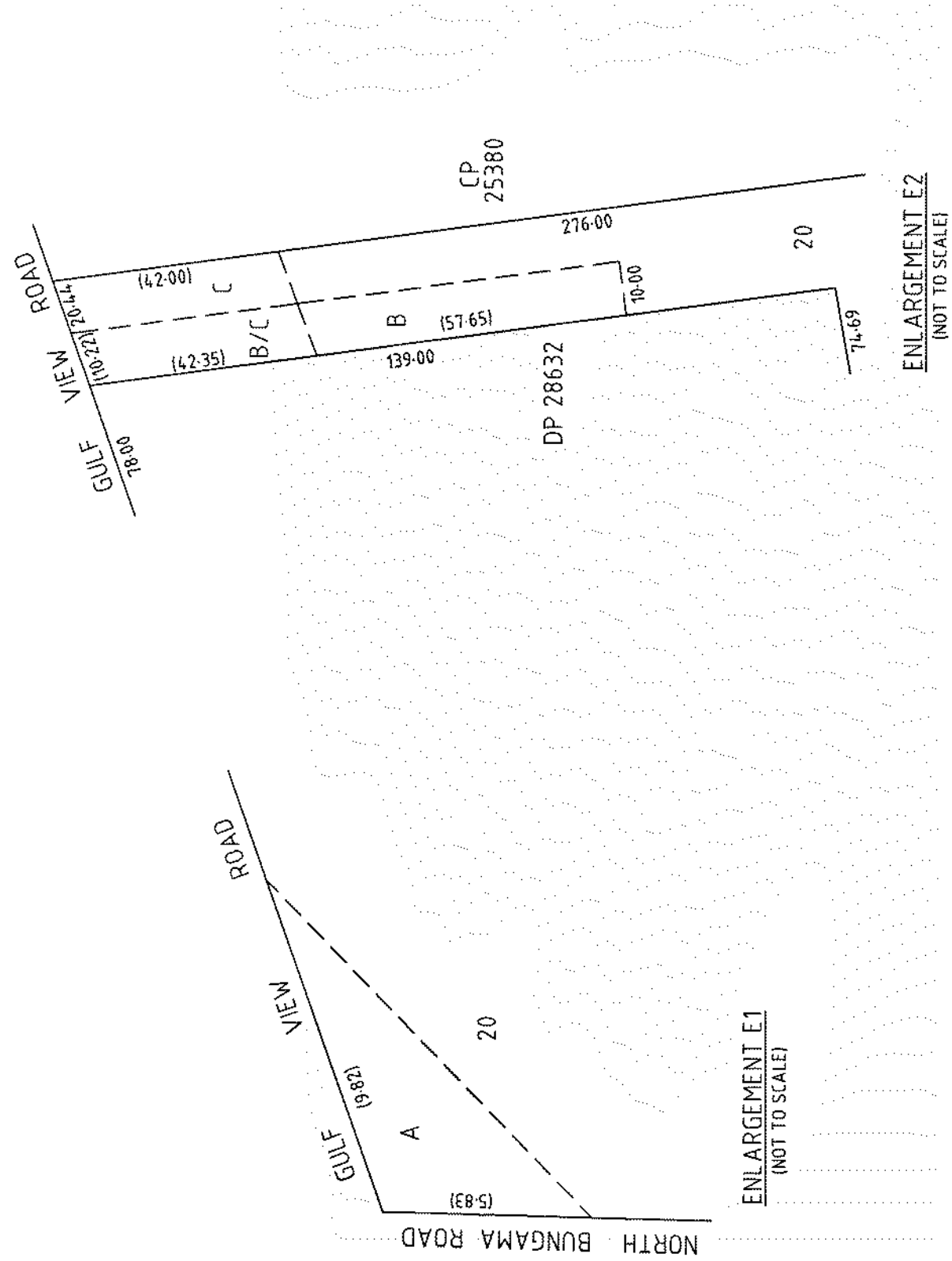
Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL

Product	Register Search (CT 6037/29)
Date/Time	13/02/2018 02:33PM
Customer Reference	
Order ID	20180213008991
Cost	$28.25



Product	Register Search (CT 6037/29)
Date/Time	13/02/2018 02:33PM
Customer Reference	
Order ID	20180213008991
Cost	$28.25



Product	Register Search (CT 5776/531)
Date/Time	13/03/2018 09:52AM
Customer Reference	11297 Bungama
Order ID	20180313001929
Cost	$28.25

REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Certificate of Title - Volume 5776 Folio 531

Parent Title(s) CT 5734/976

Creating Dealing(s) RTD 8718368, V 8826696

Title Issued 23/05/2000 **Edition** 3 **Edition Issued** 12/10/2001

Estate Type

FEE SIMPLE

Registered Proprietor

TRANSMISSION LESSOR CORPORATION
OF 200 VICTORIA SQUARE ADELAIDE SA 5000

Description of Land

ALLOTMENT 501 DEPOSITED PLAN 52803
IN THE AREA NAMED BUNGAMA
HUNDRED OF PIRIE

Easements

SUBJECT TO RIGHT(S) OF WAY OVER THE LAND MARKED A (V 8826696)

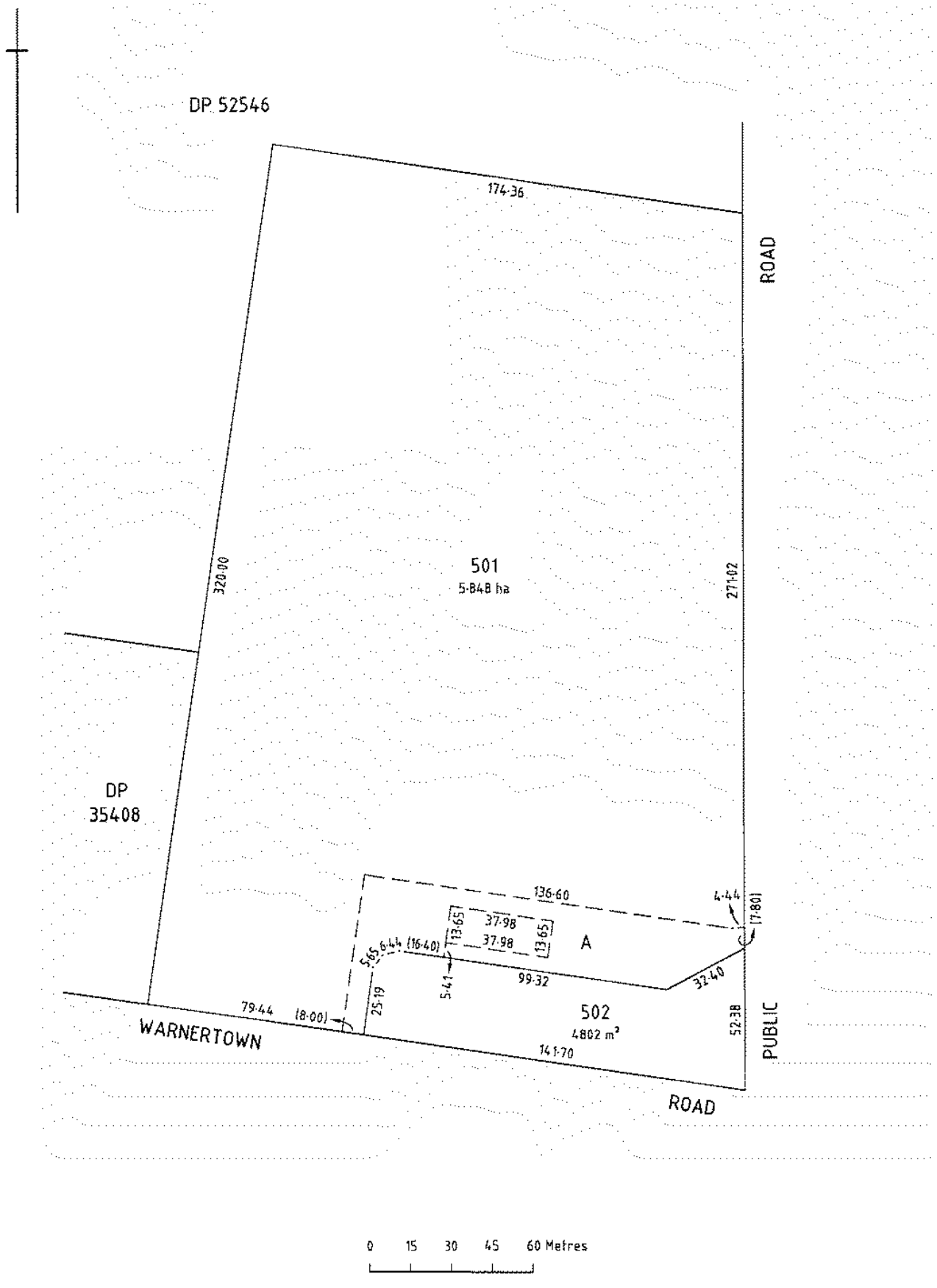
Schedule of Dealings

Dealing Number	Description
9061500	LEASE TO ELECTRANET PTY. LTD. COMMENCING ON 31/10/2000 AND EXPIRING ON 30/10/2200 PURSUANT TO ELECTRICITY CORPORATIONS (RESTRUCTURING AND DISPOSAL) ACT 1999

Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL

Product	Register Search (CT 5776/531)
Date/Time	13/03/2018 09:52AM
Customer Reference	11297 Bungama
Order ID	20180313001929
Cost	$28.25



REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Certificate of Title - Volume 5776 Folio 532

Parent Title(s) CT 5734/976

Creating Dealing(s) RTD 8718368, V 8826696

Title Issued 23/05/2000 **Edition** 2 **Edition Issued** 22/10/2000

Estate Type

FEE SIMPLE

Registered Proprietor

DISTRIBUTION LESSOR CORPORATION
OF 1 ANZAC HIGHWAY KESWICK SA 5035

Description of Land

ALLOTMENT 502 DEPOSITED PLAN 52803
IN THE AREA NAMED BUNGAMA
HUNDRED OF PIRIE

Easements

TOGETHER WITH RIGHT(S) OF WAY OVER THE LAND MARKED A (V 8826696)

Schedule of Dealings

Dealing Number	Description
8890000	LEASE TO CKI UTILITIES DEVELOPMENT LTD., PAI UTILITIES DEVELOPMENT LTD., SPARK INFRASTRUCTURE SA (NO. 1) PTY. LTD., SPARK INFRASTRUCTURE SA (NO. 3) PTY. LTD. AND SPARK INFRASTRUCTURE SA (NO. 2) PTY. LTD. COMMENCING ON 28/1/2000 AND EXPIRING ON 27/1/2200 AS TO THE SHARES SPECIFIED THEREIN PURSUANT TO THE ELECTRICITY CORPORATIONS (RESTRUCTURING AND DISPOSAL) ACT 1999

Notations

Dealings Affecting Title NIL

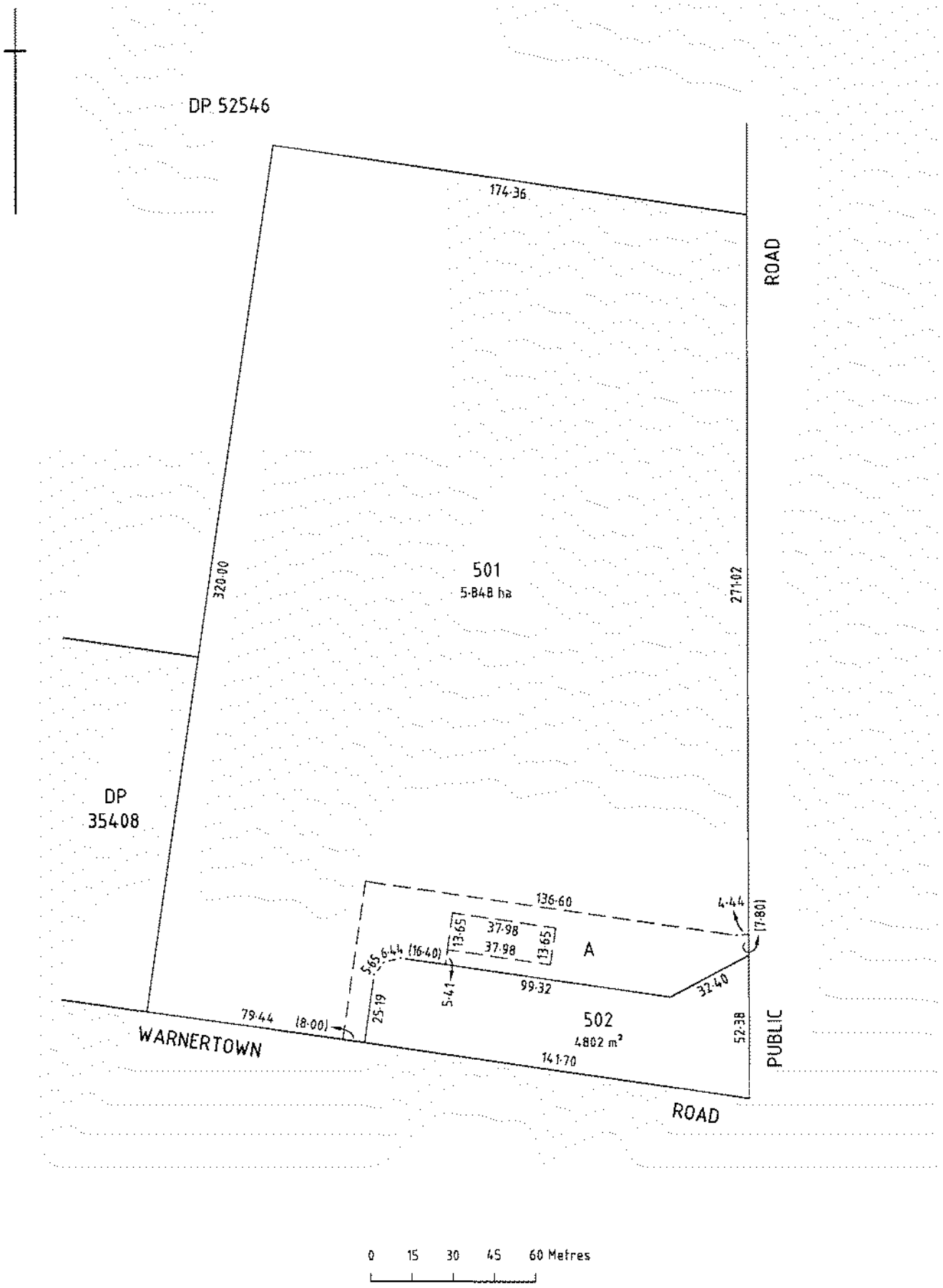
Priority Notices NIL

Notations on Plan NIL

Registrar-General's Notes

ENDORSEMENT NAME(S) UPDATED REFER DEALING 12261488

Administrative Interests NIL



Product	Register Search (CT 5978/766)
Date/Time	09/03/2018 02:42PM
Customer Reference	
Order ID	20180309008796
Cost	$28.25

REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Certificate of Title - Volume 5978 Folio 766

Parent Title(s) CT 5971/856, CT 5971/857, CT 5971/858

Creating Dealing(s) RTU 10554746

Title Issued 22/01/2007 **Edition** 3 **Edition Issued** 11/11/2016

Estate Type

FEE SIMPLE

Registered Proprietor

BLUE SKY GENERATION PTY. LTD. (ACN: 612 989 634)
OF BOX 644 COLLINS STREET WEST POST OFFICE MELBOURNE VIC 8007

Description of Land

ALLOTMENT 55 DEPOSITED PLAN 71831
IN THE AREA NAMED BUNGAMA
HUNDRED OF PIRIE

Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED E AND F TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (RTC 8722735 AND TG 10500024 RESPECTIVELY)

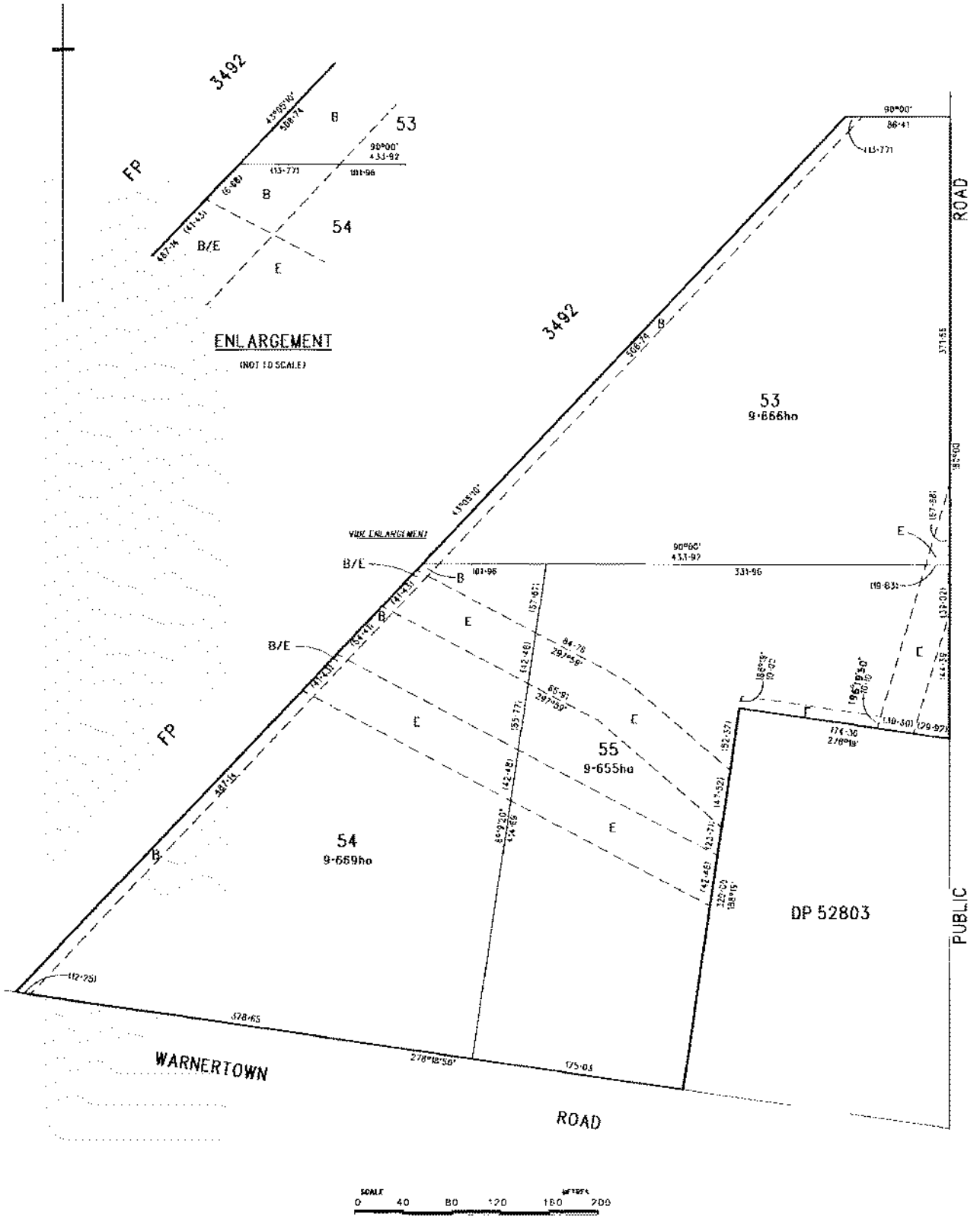
Schedule of Dealings

NIL

Notations

Dealings Affecting Title	NIL
Priority Notices	NIL
Notations on Plan	NIL
Registrar-General's Notes	NIL
Administrative Interests	NIL

Product	Register Search (CT 5978/766)
Date/Time	09/03/2018 02:42PM
Customer Reference	
Order ID	20180309008796
Cost	$28.25



Product	Register Search (CT 5972/304)
Date/Time	15/02/2018 11:49AM
Customer Reference	11297 Bungama
Order ID	20180215005014
Cost	$28.25

REAL PROPERTY ACT, 1886
South Australia

The Registrar-General certifies that this Title Register Search displays the records maintained in the Register Book and other notations at the time of searching.

REGISTRAR - GENERAL SOUTH AUSTRALIA

Certificate of Title - Volume 5972 Folio 304

Parent Title(s) CT 3954/13, CT 5946/879

Creating Dealing(s) VE 10457315, TG 10457316

Title Issued 06/10/2006 **Edition** 3 **Edition Issued** 12/04/2016

Estate Type

FEE SIMPLE

Registered Proprietor

CRAIG ADAM MANNERS
LISA ANGELA MANNERS
OF 465 WARNERTOWN ROAD BUNGAMA SA 5540
AS JOINT TENANTS

Description of Land

ALLOTMENT 1 DEPOSITED PLAN 24255
IN THE AREA NAMED BUNGAMA
HUNDRED OF PIRIE

Easements

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED E (TG 10457316)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED B AND F TO DISTRIBUTION LESSOR CORPORATION (SUBJECT TO LEASE 8890000) (T 2839453 AND T 3398857 RESPECTIVELY)

SUBJECT TO EASEMENT(S) OVER THE LAND MARKED A AND D TO TRANSMISSION LESSOR CORPORATION OF 1 UNDIVIDED 2ND PART (SUBJECT TO LEASE 9061500) AND ELECTRANET PTY. LTD. OF 1 UNDIVIDED 2ND PART (T 1801173 AND TG 10247803 RESPECTIVELY)

Schedule of Dealings

Dealing Number	Description
12493133	MORTGAGE TO WESTPAC BANKING CORPORATION (ACN: 007 457 141)

Notations

Dealings Affecting Title NIL

Priority Notices NIL

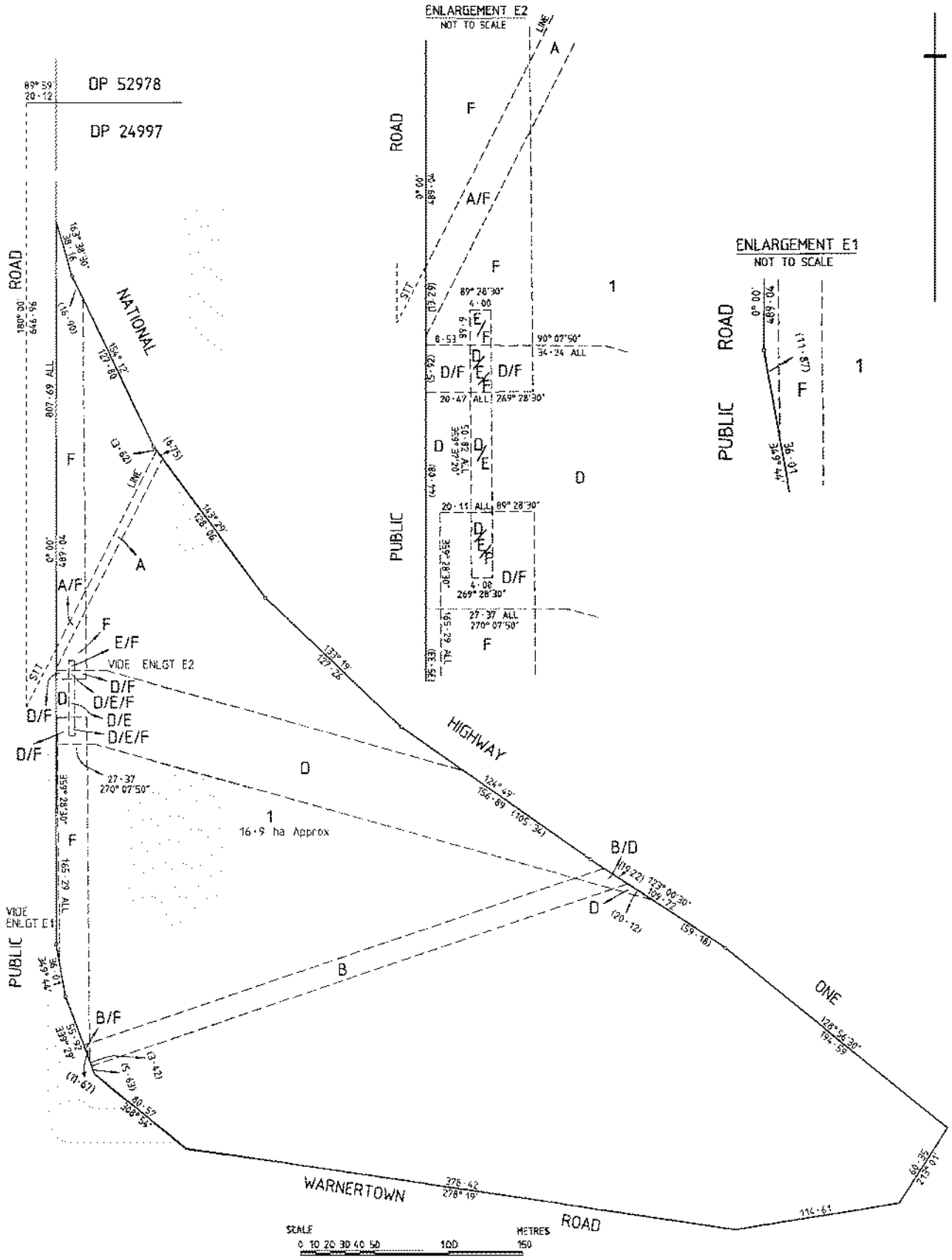
Notations on Plan NIL

Registrar-General's Notes

CONTROLLED ACCESS ROAD VIDE PLAN 5

Administrative Interests NIL

Product	Register Search (CT 5972/304)
Date/Time	15/02/2018 11:49AM
Customer Reference	11297 Bungama
Order ID	20180215005014
Cost	$28.25



APPENDIX 3

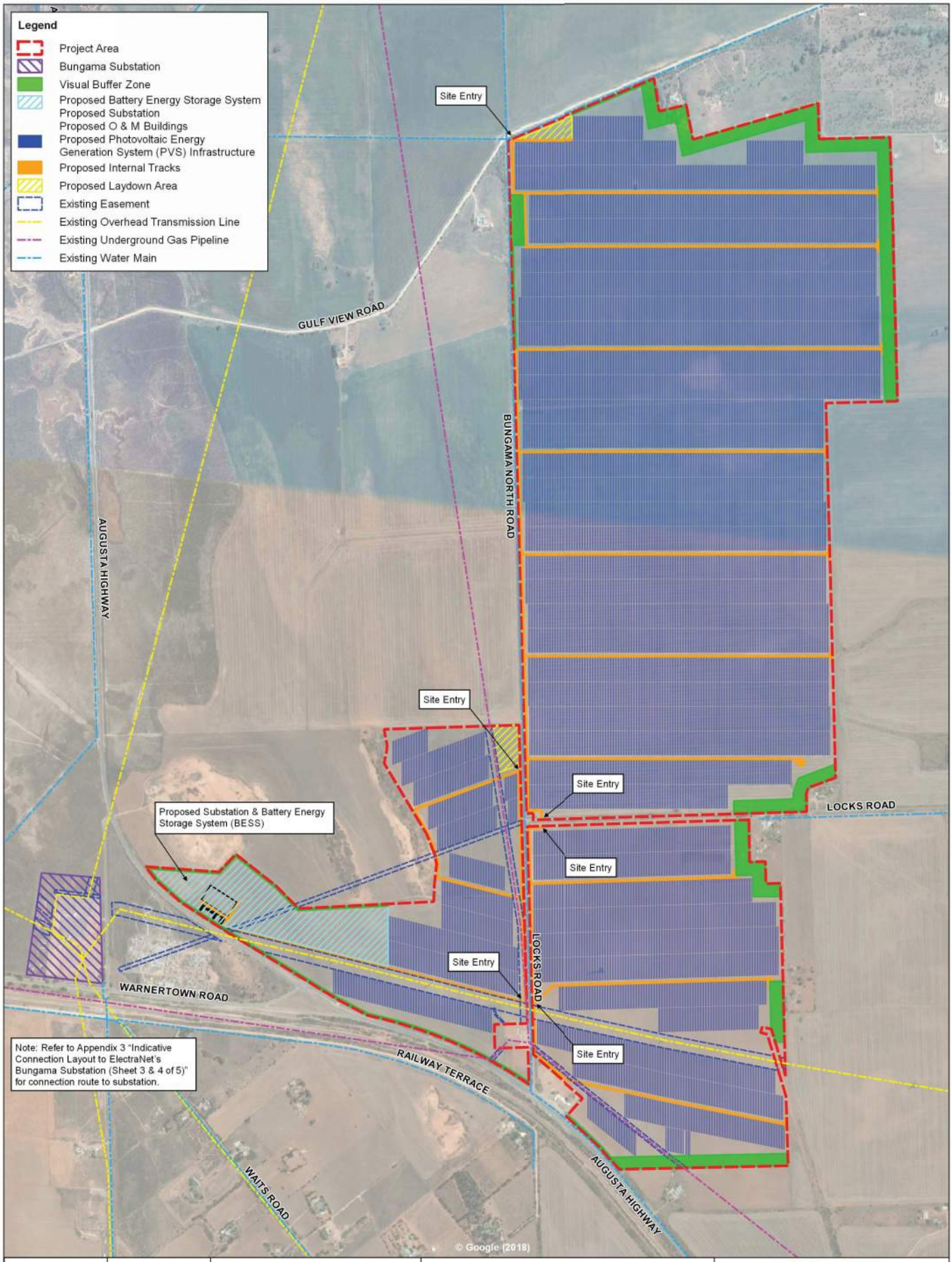
Indicative Layouts

3.1 Indicative PVS Operations Layout

3.2 Indicative BESS Operations layout, Indicative Project Substation Layout and Indicative Operations and Maintenance Layout

3.3 Indicative Connection Layout to ElectraNet's Bungama Substation

3.1 Indicative PVS Operations Layout



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:13,000
Job Ref/Version:	11297/ V05

0 100 200 300 400 500 m

Accuracy: location and scale of features is indicative only

Map Projection: GDA 1994 MGA Zone 54

Sheet 1 of 5

Indicative PVS Operations Layout

Bungama Solar | Bungama SA Australia

29/11/2018

BUNGAMA SOLAR

11297_PR_Preliminary Layout.qgs

3.2 Indicative BESS Operations layout, Indicative Project Substation Layout and Indicative Operations and Maintenance Layout

Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:2,000
Job Ref/Version:	11297/ V01

0 25 50 75 100 m

Sheet 2 of 5

Indicative BESS Operations Layout, Project Substation Layout and Operations and Maintenance Layout

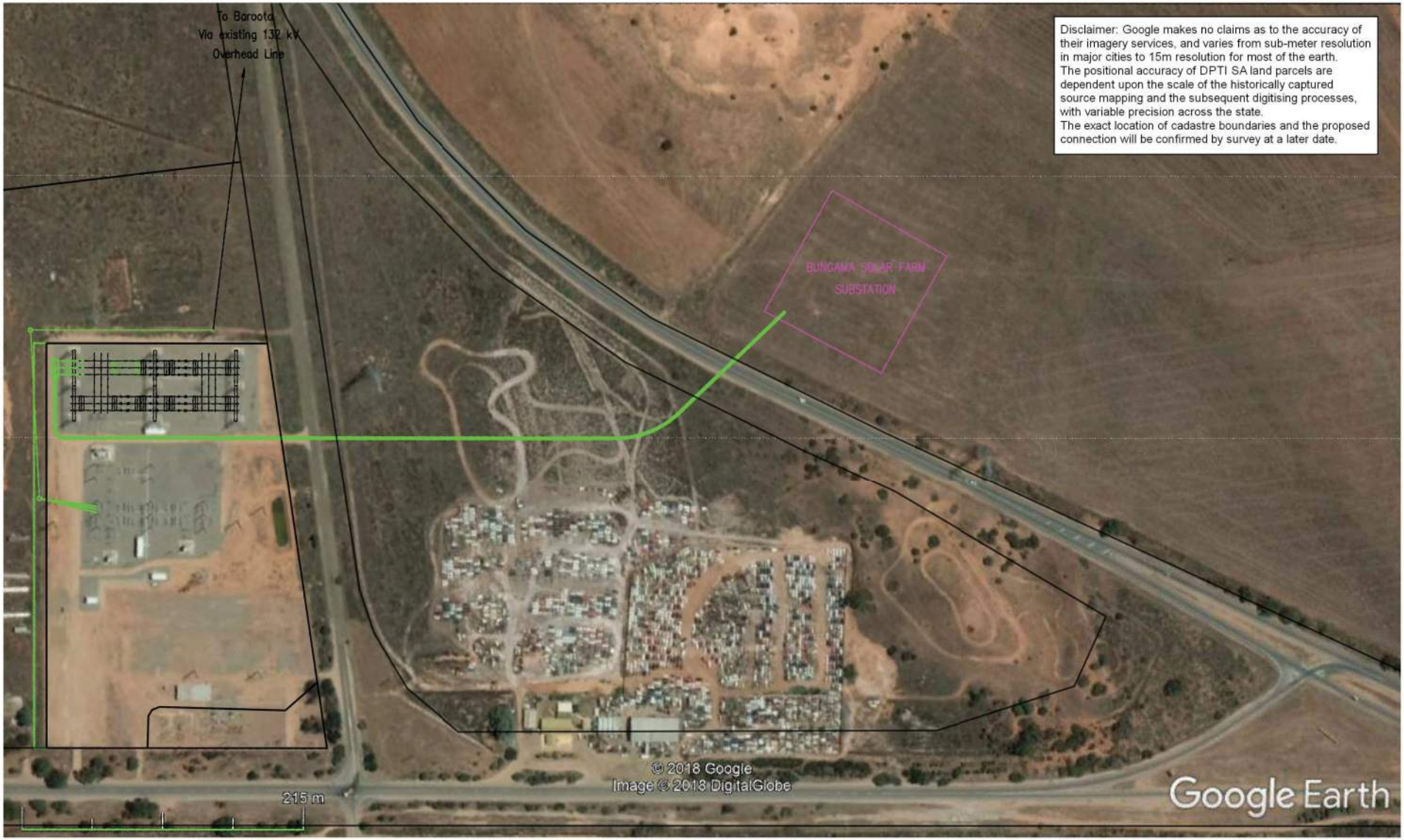
Bungama Solar | Bungama SA Australia

29/11/2018

BUNGAMA SOLAR

11297_PR_Indicative_BESS_Substation_OM.qgs

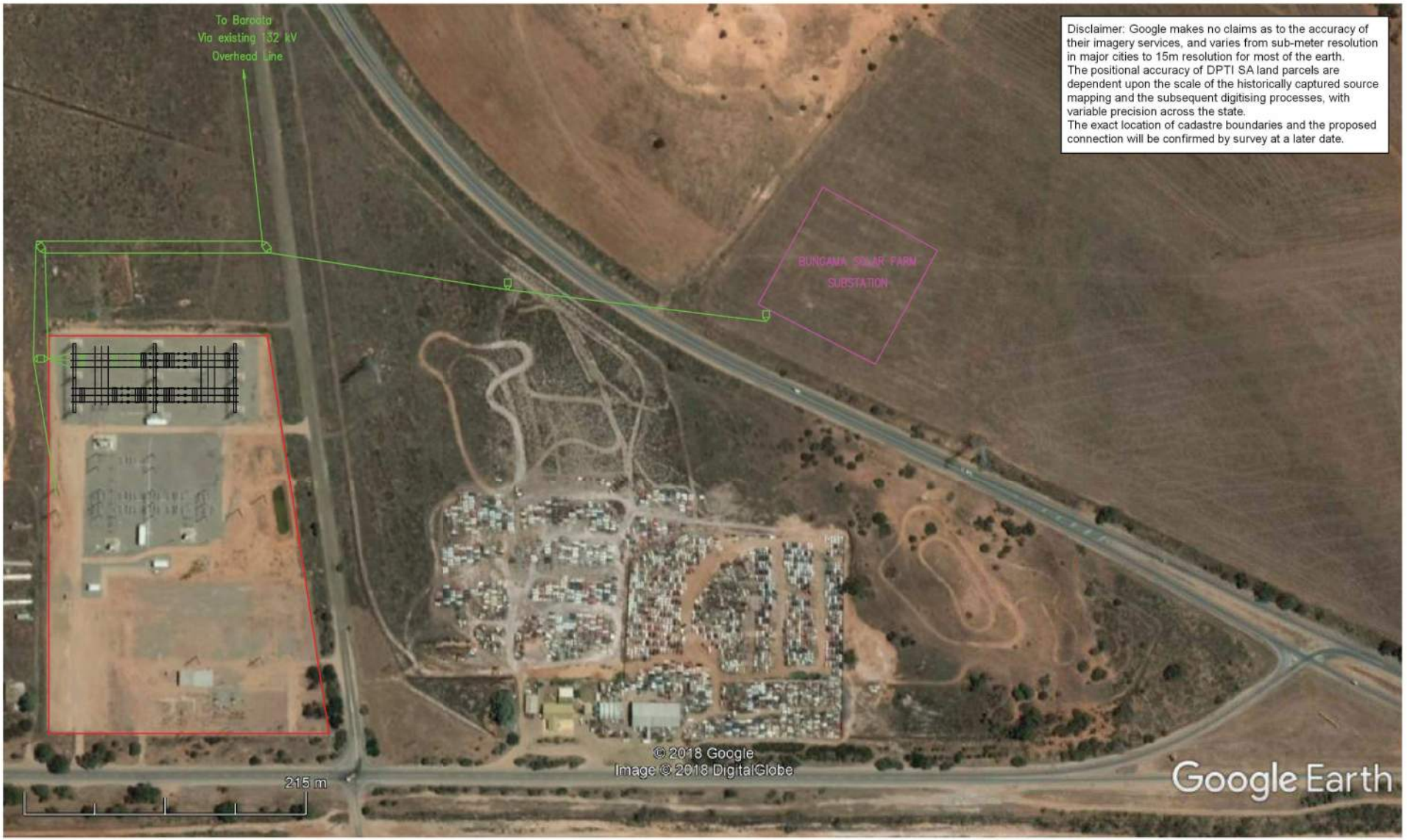
3.3 Indicative Connection Layout to ElectraNet's Bungama Substation



Author:	SW		**Sheet 3 of 5**	**Indicative Connection Layout to ElectraNet's Bungama Substation (Underground Cable - Option 1)**
Reviewer:	SMC/ JB			**Bungama Solar | Bungama SA Australia**
A3 Scale:	N/A			29/11/2018
Job Ref/Version:	11297/ V02			

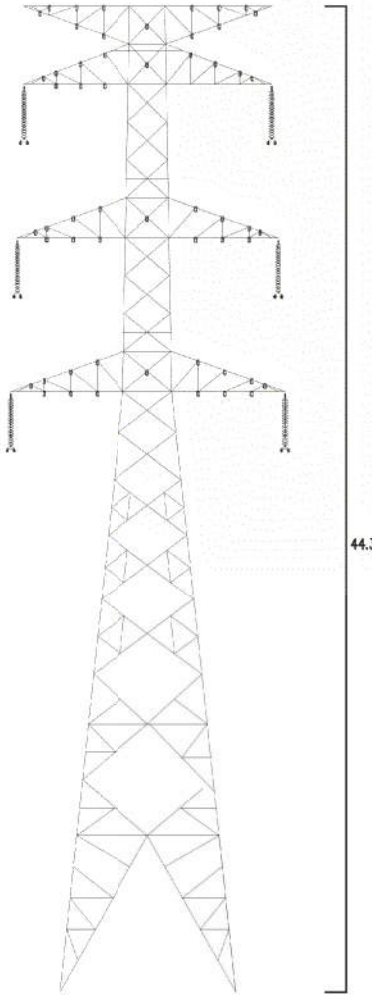
BUNGAMA SOLAR

11297_PR_Indicative_Connection_Layout1.qgs

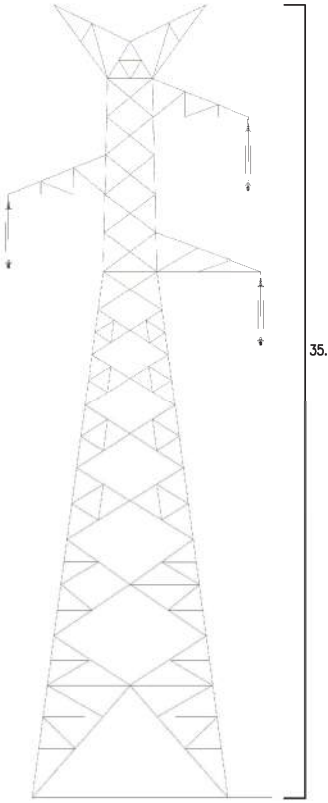


Author:	SW		**Sheet 4 of 5** **Indicative Connection Layout to ElectraNet's Bungama Substation (Overhead 275kV Transmission Line - Option 2)**	BUNGAMA SOLAR
Reviewer:	SMC/ JB			
A3 Scale:	N/A		**Bungama Solar | Bungama SA Australia**	
Job Ref/Version:	11297/ V01		29/11/2018	

11297_PR_Indicative_Connection_Layout2.qgs



Double Circuit 275kV Lattice Tower



Single Circuit 275kV Lattice

Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	N/A
Job Ref/Version:	11297/ V01

Sheet 5 of 5

Typical Overhead Transmission Towers

Bungama Solar | Bungama SA Australia

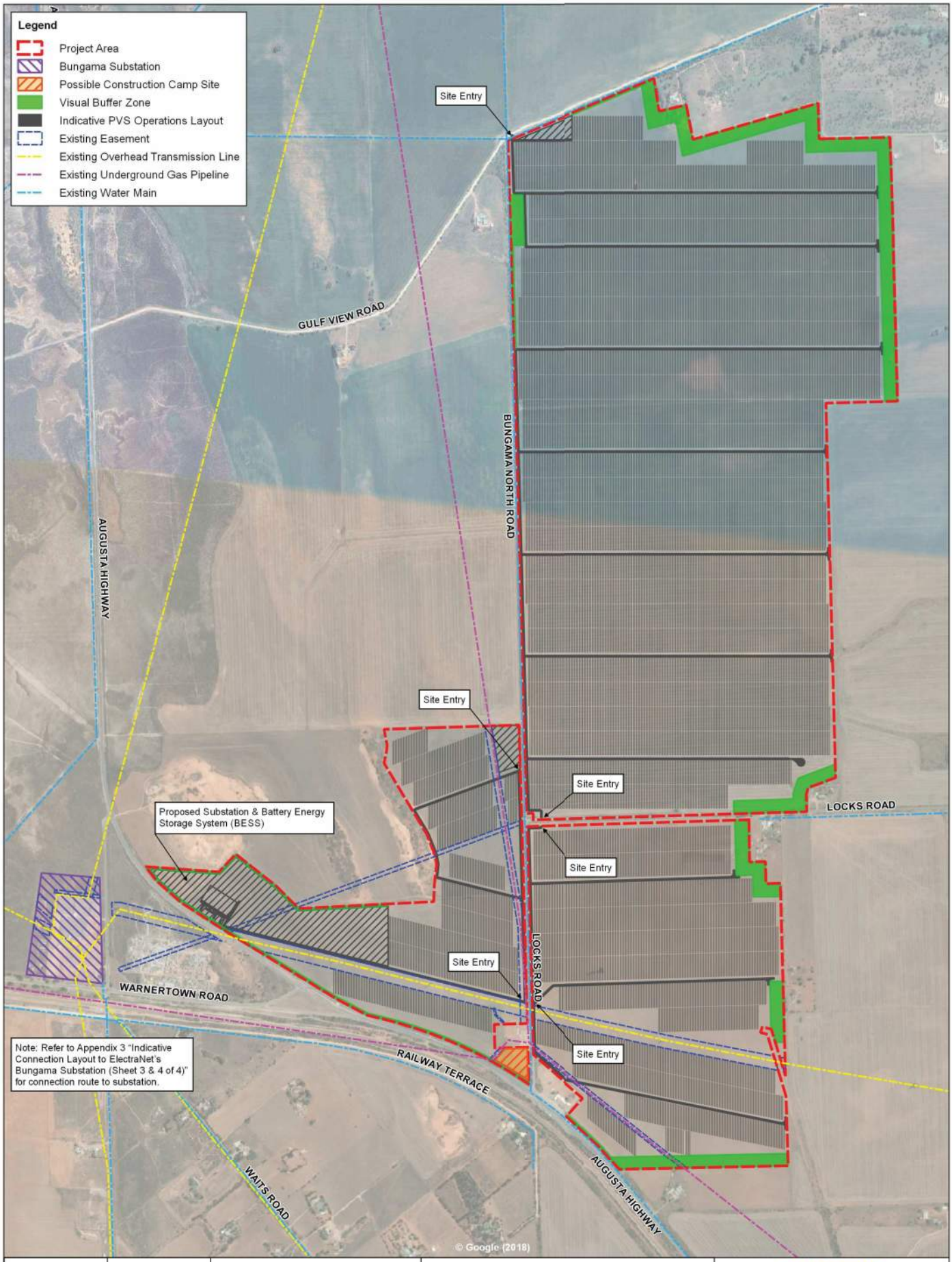
29/11/2018

BUNGAMA SOLAR

11297_PR_Typical_OH_Transmission.qgs

APPENDIX 4

Typical Construction Camp Layout



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:13,000
Job Ref/Version:	11297/ V01

0 100 200 300 400 500 m

Accuracy: location and scale of features is indicative only

Map Projection: GDA 1994 MGA Zone 54

Sheet 1 of 2

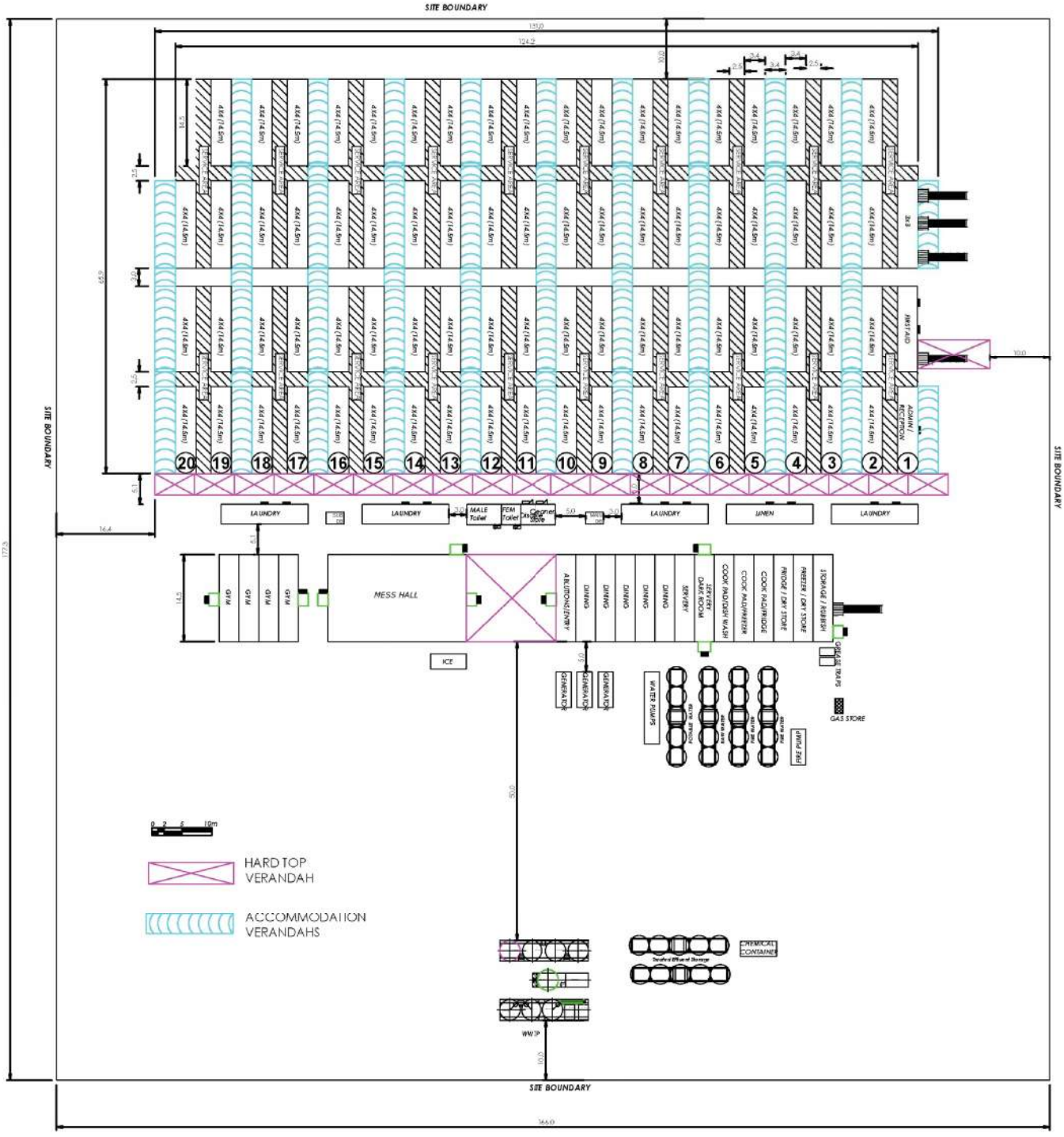
Possible Location of Construction Camp

Bungama Solar | Bungama SA Australia

23/11/2018

BUNGAMA SOLAR

11297_PR_Potential_Construction_Camps.qgs



Note: While the Project has a preference for local accommodation, if insufficient accommodation suitable to meet the requirements of the Project is not available, then a temporary construction workers camp on a suitable part of the Project area

Author:	SW		**Sheet 2 of 2**	BUNGAMA SOLAR
Reviewer:	SMC/ JB		**Indicative Construction Camp Layout Plan**	
A3 Scale:	N/A		**Bungama Solar | Bungama SA Australia**	
Job Ref/Version:	11297/ V01		23/11/2018	

11297_PR_Indicative_Camp_Layout.qgs

APPENDIX 5

Development Plan Assessment

DEVELOPMENT PLAN ASSESSMENT

Prepared for Bungama Solar

BUNGAMA SOLAR

EPS ENERGY

Reference No. 11297 November 18 www.bungamasolar.com.au

QUALITY ASSURANCE AND DECLARATION

Quality Assurance and Version Control Table		
Project:	Bungama Solar Project	
Client:	Bungama Solar 1 Pty Ltd and Bungama Solar 2 Pty Ltd	
Rev:	**Date:**	**Reference:**
V01	29.11.2018	11297_Bungama Development Plan Assessment

Checked by:	Marina Budisavljevic
Approved by:	Steve McCall
Declaration:	*The opinions and declarations in this document are ascribed to EPS Energy and are made in good faith and trust that such statements are neither false nor misleading.* *In preparing this document, EPS Energy has considered and relied upon information obtained from the public domain, supplemented by discussions between key EPS Energy staff, representatives from governing agencies and independents, including the client and specialist consultants.*
Applicant:	EPS Energy PO Box 195 Charlestown NSW 2290 (02) 9258 1362
Prepared By:	Simon Duffy
Project Land:	CT 6037/29 – A20 DP80628 CT 6127/5 – A558 FP188690 CT 5954/187 – A52 DP25903 CT 5949/272 – A4 DP24997 CT 5390/999 – A559 FP188691 CT 5360/334 – A551 FP188683 CT 5972/304 – A1 DP24255 CT 5776/531 – A501 DP52803 CT 5776/532 – A502 DP52803 CT 5978/766 – A55 DP71831

PORT PIRIE REGIONAL COUNCIL DEVELOPMENT PLAN (CONSOLIDATED – 31 OCTOBER 2017)

Assessment Section		Project Response
Primary Production Zone Provisions		
Objectives **(P147)**	*1. The long-term continuation of primary production, including value adding activities associated with primary production.*	The Bungama Solar project ('the Project') is located within the Primary Production Zone as shown in Zone Map PtPi/14 and PtPi/16. After the Project's decommissioning the Project area will be available for agricultural production. Consequently, the Project will not have an adverse impact on the long-term agricultural use of the land.
	2. Economically productive, efficient and environmentally sustainable primary production.	The Project will implement a Construction Management Plan for the construction phase and Operation Management Plan for the operation phase approved, by the Minister for Planning or delegate, to manage potential adverse impacts. The Project will not impede the operation of the established agricultural land uses in the area through any nuisance or harmful creating impact.
	3. Allotments of a size and configuration that promote the efficient use of land for primary production.	The Project will not alter the allotment size or configuration. After the Project's decommissioning, the Project area will be available for agricultural production. Consequently, the Project will not have an adverse impact on the long-term agricultural use of the land.

Assessment Section		Project Response
	4. Protection of primary production from encroachment by incompatible land uses and protection of scenic qualities of rural landscapes.	The Project is envisaged in the Primary Production Zone and therefore is not considered an incompatible land use. The key features of the Project's rural landscape include, cleared land used for cropping and grazing, vegetated land used for grazing and utility scale electricity infrastructure comprising a substation and powerlines. The ElectraNet Bungama Substation is located on Pirie Blocks Road, in close proximity to the Project area. The Planning Report's Figure 2-3 - key physical features of the Project land, show a number of major power transmission lines, i.e. overhead 132kV and 275kV transmission lines connecting into the Bungama substation from a north-north-east, north-west, south, and south-east direction. Some of the transmission lines cross the Project area. Solar and ancillary development is a type of development that is envisaged within the Primary Production Zone in Port Pirie Regional Council area. Utility scale solar projects are becoming more common place in rural setting and acceptable rurally located infrastructure. While the Project is not located within an area of known visual or scenic significance, the Project area is located between the Augusta Highway (A1) viewpoint and Landscape Protection Policy Area 11 and 12. A Visual Impact Assessment of the Project completed which concludes the overall visual impact rating to residential and viewpoint receptors is "Low" and "Moderate-Low" respectively.

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	5. Wind farms and ancillary development located in the zone, accepting that this may need to be sited in visually prominent locations to take advantage of natural resources such as wind.	Wind farms are a type of a renewable energy facility. The Project is another type of renewable energy facility suitable in the Primary Production Zone. The Project is development that contributes to the desired character of the zone and is a form of development contemplated within the zone. While the Project is not sited in a visually prominent area, it is acceptable that it will be visible from some reception points. Its location has been selected to take advantage of the natural resource of the Project area, i.e. the flat, cleared land and sun exposure. The Project area is an appropriate location because of the co-location with existing utility scale electricity infrastructure and the short distance for the grid connection to the Bungama substation thereby minimising the expanse of overhead power lines.
	6. Development that contributes to the desired character of the zone.	Solar and ancillary development are envisaged within the zone and constitute a component of the zone's desired character subject to implementation of management techniques set out by general/Council wide policy regarding renewable energy facilities.
Desired Character **(P147)**	*Wind farms and ancillary development are an envisage form of development within the zone. Such facilities may be of a large scale, comprise a number of components and require an extended and/or dispersed development pattern. These facilities will need to be located in areas where they can take advantage of the natural resource upon which they rely and, as a consequence may be need to be:* • *located in visually prominent locations such as ridgelines*	The Project is a type of renewable energy facility envisaged within the zone and constitute a component of the zone's desired character subject to implementation of management techniques set out by general / Council wide policy regarding renewable energy facilities. The Project will contribute to the benefits derived from increased generation of renewable energy. The Project area is an appropriate location because of the co-location with existing utility scale electricity infrastructure and the short

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	• *visible from scenic routes and valuable scenic and environmental areas* • *located closer to roads than envisaged by generic setback policy.* *This, coupled with the large scale of these facilities (in terms of both height and spread of components), renders it difficult to mitigate the visual impacts of wind farms to the degree expected of other types of development. Subject to implementation of management techniques set out by general / council wide policy regarding renewable energy facilities, these visual impacts are to be accepted in pursuit of benefits derived from increased generation of renewable energy.*	distance for the grid connection to the Bungama substation thereby minimising the expanse of overhead power lines.
Principles of Development Control (P148)	**Land Use:** *1. The following forms of development are envisaged in the zone:* • *solar and ancillary development* • *wind farm and ancillary development* • *wind monitoring mast and ancillary development.*	Solar and ancillary development, as well as other types of renewable energy facilities, are identified as suitable within the Primary Production zone. The Project is development envisaged in the zone.
	2. Development listed as non-complying is generally inappropriate.	The Project is not listed as a non-complying.
	3. Wind farms and ancillary development should be located in areas which provide opportunity for harvesting of wind and efficient generation of electricity and may therefore be sited: *(a) in visually prominent locations in the landscape*	The Project area has good energy generation potential and provides the opportunity for efficient generation of electricity. The Project area is not in a visually prominent location. The Project's final design may site some of the Project's components including buildings closer to Augusta Highway, Locks Road and Gulf

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	(b) closer to roads and not to be subject to the setback requirements of other forms of development.	View Road than envisaged by the generic setback policy to maximise the opportunity to harvest the sun for the generation of electricity. The final Project layout that will be submitted to the relevant authority for approval prior to the commencement of construction will identify the setbacks.
	6. Buildings, other than where required to facilitate wind farms and ancillary development, should primarily to be limited to farm buildings, a detached dwelling associated with primary production or a tourist related use on the allotment and residential outbuildings that are: *(a) grouped together on the allotment and set back from allotment boundaries to minimise the visual impact of buildings on the landscape as viewed from public roads* *(b) screened from public roads and adjacent land by existing vegetation or landscaped buffers.*	The Project does not include dwellings or residential outbuildings. The Project's preliminary layout in the indicative design drawings attached as Appendix 3 to the Planning Report shows the buildings required for a utility scale solar development. For example, one of the buildings is for the Project's administration and control functions for Project. The building will likely be a single storey structure with the overall height of approximately six metres. Car parking will be located within the vicinity of the administration building that will accommodate staff, visitors and contractor parking. The BESS may be in open form boxes (Tesla technology), shipping container style structures or large sheds similar in size to buildings typically found in a primary production area e.g. intensive animal keeping infrastructure, to be determined by the technology installed. The buildings are grouped together and located near the Bungama substation and the existing transmission lines that aligns with the current infrastructure visual amenity when viewed from this part of the Augusta Highway. Depending on the final layout plan the buildings may be totally or partially screened from public roads by exiting vegetation. Targeted

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		landscape screening for the buildings will be incorporated into the final design.
	Form and Character: *10. Development should not be undertaken unless it is consistent with the desired character for the zone.*	The Project is a type of development envisaged within the zone and constitute a component of the zone's desired character.
	12. Development should provide an access way of at least 3 metres wide that provides access for emergency vehicles to the rear of the allotment.	During the construction phase access will likely be via existing access points and additional access points to allow for the efficient transport of components onto and around the Project area. During the operation phase the access point will likely be reduced. Access points and internal access roads will be of a sufficient width to enable emergency vehicles to access to the rear of allotments.
	13. Development on land situated between National Highway 1 and Landscape Protection Policy Area 10 should be designed and sited to ensure the natural view of the ranges is not impaired.	While the Project is not located within an area of known visual or scenic significance, the Project area is located between the Augusta Highway (A1) viewpoint and Landscape Protection Policy Area 11 and 12. A Visual Impact Assessment of the Project completed which concludes the overall visual impact rating to residential and viewpoint receptors is "Low" and "Moderate-Low" respectively. Appropriate visual buffer zones and landscaping is proposed in Appendix 14 of the Planning Report.
	Land Division: *14. For land not within a policy area, land division, including boundary realignments, should only occur where it:*	The Project doesn't trigger the Land Division requirements.

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	(a) will promote economically productive, efficient and sustainable primary production and not create any allotment less than 40 hectares in area. *15. Land division involving boundary realignments should only occur where the number of resulting allotments of less than 40 hectares is not greater than the number that existed prior to the realignment.*	
Landscape Protection Policy Area 11		
Objectives (P169)	*1. The conservation and enhancement of the natural environment and natural ecological processes for their historic, scientific, landscape, faunal habitat, biodiversity and cultural values, with grazing continuing as the preferred rural use, where appropriate.* *2. Provision of opportunities for the public to experience and appreciate the significance of the native vegetation and original remnant natural habitat of the area through low impact recreational activities and interpretive facilities.* *3. Development that contributes to the desired character of the policy area.*	The Project area is not located within Landscape Protection Policy Area 11. The Project area is located approximately 4.5km distance from Landscape Protection Policy Area 11. The Project will not impact on the conservation and enhancement of the natural environment in Landscape Protection Policy Area 11. The Project will not impact on grazing within Landscape Protection Policy Area 11. The Project will not impede the publics opportunity to experience and appreciate Landscape Protection Policy Area 11 through low impact recreational activities and interpretive facilities. No development is proposed within Landscape Protection Policy Area 12.
Desired Character (P169)	*The policy area is of high environmental value and includes outstanding scenery, which includes the southern portion of the Mount Remarkable National Park known as the Napperby Block. The area also includes large tracts of well-vegetated grazing lands on the steep western hills overlooking, and clearly visible from, National Highway 1. There should*	The Project is not located within the portion of the Mount Remarkable National Park known as the Napperby Block. The Project area is located approximately 4.5km distance from Landscape Protection Policy Area 11.

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	be no further vegetation clearance and development should be limited, particularly in those areas visible from a publicly accessible place.	Landscape Protection Policy Area 11 is considered in this Development Plan assessment as the Project Area is located between the Augusta Highway (A1) and Landscape Protection Policy Area 11 (as per Primary Production Zone Provisions – Item 13). A Visual Impact Assessment of the Project has been completed which concludes the overall visual impact rating to residential and viewpoint receptors is "Low" and "Moderate-Low" respectively. The development should not obstruct views of the Mount Remarkable National Park known as the Napperby Block from Augusta Highway (A1). From the Augusta Highway the Project will be visible in the middle ground for approximately 1 minute 48 seconds when travelling at the signposted limit.
Principles of Development Control (P169)	***Form and Character*** *3. Development should not be undertaken unless it is consistent with the desired character for the zone.* *4. Development should use the following measures to avoid impacting detrimentally on the natural environment, processes and/or conservation qualities of land in the policy area:* *(c) minimising the extent of earthworks* *(d) minimising the extent of vehicle access servicing that development* *(e) minimising the extent of locally indigenous vegetation removal*	No development is proposed on land within Landscape Protection Policy Area 12.

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	(f) being sited in an unobtrusive manner preferably below hilltops or prominent ridgelines *(g) screening the visual impact by planting locally indigenous species having due regard to bushfire risk* *(h) utilising external low reflective materials and finishes that will minimise glare and blend in with the features of the landscape.* *7. The natural character and conservation of the scenic, scientific and heritage, features of the policy area should be retained and the area kept free of development that is not a necessary part of conservation or pastoral activities.*	
Landscape Protection Policy Area 12		
Objectives (P171)	*1. Preservation of the natural and rural character and scenic and heritage features of the ranges whilst accommodating established pastoral, agricultural and forestry activities within the policy area.* *2. Low intensity rural activities on large land holdings.* *3. Tourist facilities, attractions, and accommodation that are secondary to farming and blend with the natural environment.* *4. Development that contributes to the desired character of the policy area.*	The Project area is not located within Landscape Protection Policy Area 12. The Project area is located approximately 4.5km distance from Landscape Protection Policy Area 12. The Project will not impact established pastoral, agricultural and forestry activities within Landscape Protection Policy Area 12. The Project will not impact on low intensity rural activities or tourist facilities and accommodation within Landscape Protection Policy Area 12. No development is proposed within Landscape Protection Policy Area 12.
Desired Character (P171)	*This area has generally been cleared for farming, mainly for cropping and grazing purposes in the past, however the significant areas of native*	No development is proposed within Landscape Protection Policy Area 12. The Project will not impact on existing or proposed development or uses of Landscape Protection Policy Area 12.

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	vegetation that remain in place throughout the policy area should be preserved for their amenity, conservation and scenic value. *Low intensity farming activities such as cropping and grazing activities are appropriate in previously cleared areas where buildings and structures associated with the farming activities on the land can be effectively screened from adjoining roads or public vantage points, either through the use of terrain to hide the development or with intensive landscaping using endemic species.*	
Principles of Development Control (P171)	***Form and Character*** *2. Development should not be undertaken unless it is consistent with the desired character for the policy area.*	No development is proposed within Landscape Protection Policy Area 12.
Rural Living Policy Area 13		
Objectives (P178)	*1. A policy area accommodating rural living on existing allotments with provision for low intensity animal keeping.* *2. No additional allotments.*	The northernmost portion of the Project area is located adjacent to Rural Living Policy Area 13. No Project development is proposed to be located in Rural Living Policy Area 13. The Project will not result in the creation of any additional allotments in Rural Living Policy Area 13.
Desired Character (P178)	*The policy area includes the existing rural living settlement of Bungama, located east of Port Pirie and the Napperby Creek Estate. This policy area contains allotments of varying sizes, which should primarily accommodate rural living and associated low intensity animal keeping on existing allotments.*	The northernmost portion of the Project area is located adjacent to Rural Living Policy Area 13. No Project development is proposed to be located in Rural Living Policy Area 13. The Project Planning Report has considered existing and potential rural living and associated low intensity animal keeping on existing

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	The policy area is also located on the western side of the National highway and the township of Warnertown and provides for rural living and associated low intensity animal keeping on existing allotments.	allotments located in Rural Living Policy Area 13. Amendments have been proposed
Principles of Development Control (P178)	**Form and Character** *2. Development should not be undertaken unless it is consistent with the desired character for the policy area.*	No Project development is proposed to be located in Rural Living Policy Area 13. While there is currently only residential development on one (1) of the allotments within the Rural Living Policy Area 13 directly neighbouring the Project area, the Project has engaged in consultation with the landowners of the undeveloped allotments and considered the Project impacts on the desired character for the policy area as part of the Planning Report. The Project design incorporates a 50m visual and landscape screening buffer between the solar array areas and Rural Living Policy Area 13. The following amendments to the Project have been made as a result of consultation with neighbouring landowners and consideration of the desired character of the policy area: • Including in excess of 7 km of visual buffering in the form of landscape screening at a direct Project cost estimated to exceed $750,000; • Reducing the land area allocated to solar panels by approximately 24 hectares, equivalent to a reduction of 36,000 panels and equating to approximately $5,000,000 in relinquished income over the life of the Project; and • Power Conditioning Units near adjoining boundaries being relocated to reduce the potential for noise impact.

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General Provisions		
Building near Airfields (P20)	**Objectives:** 1. *Development that ensures the long-term operational, safety, commercial and military aviation requirements of airfields (airports, airstrips and helicopter landing sites) continue to be met.* **Principles of Development Control:** 3. *Development in the vicinity of airfields should not create a risk to public safety, in particular through any of the following:* *(a) lighting glare* *(b) smoke, dust and exhaust emissions* *(c) air turbulence* *(d) storage of flammable liquids* *(e) attraction of birds* *(f) reflective surfaces (e.g. roofs of buildings, large windows)* *(g) materials that affect aircraft navigational aids.*	The Project area is located approximately 10km north-east of the Port Pirie Airport. A Glint and Glare Assessment is attached as Appendix 12 to the Planning Report. Port Pirie Airport consists of three runways of which the east west facing runway 80/26 is sealed and used for commercial aircrafts. The two other runways facing SW/NE, 35/17 and 03/21 are unpaved and most likely only used for private airplanes. All three runways were assessed. The calculation for all six approach paths did not indicate any Glint or Glare issues for pilots.
Coastal Areas (P24)	**Objectives:** 1. *The protection and enhancement of the natural coastal environment, including environmentally important features of coastal areas such as mangroves, wetlands, sand dunes, cliff tops, native vegetation, wildlife habitat shore and estuarine areas.*	While a portion of the site is mapped 'Wetlands' on Overlay Map PtPi/14 – Natural Resources it is not considered a delicate or environmentally sensitive coastal feature. The site has been heavily modified and used for agricultural purposes and does not display characteristics of a wetland.

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	Environmental Protection: *3. Development should not be located in delicate or environmentally-sensitive coastal features such as sand dunes, cliff tops, wetlands or substantially intact strata of native vegetation.* *8. Development should be designed and sited so that it does not prevent natural landform and ecological adjustment to changing climatic conditions and sea levels and should allow for the following:* *(a) the unrestricted landward migration of coastal wetlands* *(b) new areas to be colonised by mangroves, samphire and wetland species* *(c) sand dune drift* *(d) where appropriate, the removal of embankments that interfere with the abovementioned processes.*	
Crime Prevention (P29)	**Objectives:** *1. A safe, secure, crime resistant environment where land uses are integrated and designed to facilitate community surveillance.* **Principles of Development Control:** *1. Development should be designed to maximise surveillance of public spaces through the incorporation of clear lines of sight, appropriate lighting and the use of visible permeable barriers wherever practicable.*	Alarms and cameras are likely to be used to monitor the Project facilities 24 hours a day, 7 days a week. Low spill Security lighting will be used in certain locations predominantly surrounding the BESS & the Substation. Approximately 4m will be provided free of infrastructure for visibility & monitoring between the perimeter fence and the solar panel blocks.

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Design and Appearance (P30)	**Objectives:** *1. Development of a high design standard that responds to and reinforces positive aspects of the local environment and built form.* **Principles of Development Control:** *1. Buildings should reflect the desired character of the locality while incorporating contemporary designs that have regard to the following:* *(a) building height, mass and proportion* *(b) external materials, patterns, colours and decorative elements* *(c) roof form and pitch* *(d) façade articulation and detailing* *(e) verandas, eaves, parapets and window screens.* *2. Where a building is sited on or close to a side or rear boundary, the boundary wall should minimise:* *(a) the visual impact of the building as viewed from adjacent properties* *(b) overshadowing of adjacent properties and allow adequate sunlight access to neighbouring buildings.* *3. The external walls and roofs of buildings should not incorporate highly reflective materials which will result in glare to neighbouring properties, drivers or cyclists.*	The Project is defined as *'electricity infrastructure, in accordance with the definition provided in Section 4 of the Electricity Act 1996'*. The Project is an electricity generating plant with powerlines, substation/s, equipment for metering, monitoring and controlling electricity and will include items required in the connection and supply of electricity. The 'Design and Appearance' 'Objective' and 'Principles of Development Control' are predominately for urban built form. The principle objective in designing a solar farm is to configure the design that best utilises the space to collect as much of the sun's energy as possible on any given day. This includes the number, size, and angle of the panels. The Project area is an appropriate location because of the co-location with existing utility scale electricity infrastructure and the short distance required for the grid connection minimising the expanse of possible overhead power lines. The storage and service areas will be appropriately located, and adequate access will be provided. The Project's buildings have been sited to minimise any potential visual impacts of the Project's buildings when viewed from an adjoining property. The Project's buildings will not overshadow adjoining properties.

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	6. Transportable buildings and buildings which are elevated on stumps, posts, piers, columns or the like, should have their suspended footings enclosed around the perimeter of the building, and the use of verandas, pergolas and other suitable architectural detailing to give the appearance of a permanent structure. **Outdoor Storage and Service Areas:** *19. Outdoor storage, loading and service areas should be:* *(a) screened from public view by a combination of built form, solid fencing and/or landscaping* *(b) conveniently located and designed to enable the manoeuvring of service and delivery vehicles* *(c) sited away from sensitive land uses.* **Building Setbacks from Road Boundaries:** *20. Except in areas where a new character is desired, the setback of buildings from public roads should:* *(a) be similar to, or compatible with, setbacks of buildings on adjoining land and other buildings in the locality* *(b) contribute positively to the function, appearance and/or desired character of the locality.*	The Project's buildings will not unreasonably restrict existing views available from neighbouring properties and public spaces. Any transportable buildings and buildings which are elevated on stumps, posts, piers, columns or the like, will have their suspended footings enclosed around the perimeter of the building, and were practicable adopt the use of verandas, pergolas and other suitable architectural detailing to give the appearance of a permanent structure. 'Primary Production Zone' 'Principles of Development Control - Land Use' 3 permits the Project to be closer to roads than envisaged by generic setback policy.
Hazards **(P36)**	*Objectives:* *1. Maintenance of the natural environment and systems by limiting development in areas susceptible to natural hazard risk.*	The Project is not in an area susceptible to significant natural hazard risk. A review of overlays from SA Map viewer indicate the only

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	2. Development located away from areas that are vulnerable to and cannot be adequately and effectively protected from the risk of natural hazards. *3. Development located to minimise the threat and impact of bushfires on life and property.* *4. Expansion of existing non-rural uses directed away from areas of high bushfire risk.* *5. Critical community facilities such as hospitals, emergency control centres, major service infrastructure facilities, and emergency service facilities located where they are not exposed to natural hazard risks.* *6. The environmental values and ecological health of receiving waterways and marine environments protected from the release of acid water resulting from the disturbance of acid sulphate soils.* *7. Protection of human health and the environment wherever site contamination has been identified or suspected to have occurred.* *9. Minimisation of harm to life, property and the environment through appropriate location of development and appropriate storage, containment and handling of hazardous materials.*	potential hazard is bushfire. The Project area's bushfire risk is mapped General. The Project's final design will apply appropriate standards and management strategies to manage hazards such as bushfire, the Project area's environmental values, potential harm to life, potential harm to property and potential harm to environment. The South Australian Environment Protection Authority (EPA) holds a record of a Section 83 notification relating to a diesel spill at the nearby service station (Allotment 549 FP 188681). No works are proposed on Allotment 549 FP 188681. The Project area is not listed on the South Australian Contamination index. Based on the historical and current agricultural activities no areas of significant contamination are expected to be encountered during the Project's construction or operation. Based on the proposed use of the Project area the historical and current agricultural activities do not pose a significant human or environmental health risk.
	Principles of Development Control – Flooding: *5. Development should not occur on land where the risk of flooding is likely to be harmful to safety or damage property.* *6. Development should not be undertaken in areas liable to inundation by tidal, drainage or flood waters unless the development can achieve all of the following….*	A review of overlays in the Development Control Plan and from SA Map viewer indicate the Project area is not subject to inundation. There are a number of ephemeral natural watercourses/drainage lines in the Project area that may contain water from time to time. The Project's final design will consider the ephemeral watercourses/drainage lines.

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	7. Development, including earthworks associated with the development, should not do any of the following: *(a) impede the flow of floodwaters through the land or other surrounding land* *(b) increase the potential hazard risk to public safety of persons during a flood event* *(c) aggravate the potential for erosion or siltation or lead to the destruction of vegetation during a flood* *(d) cause any adverse effect on the floodway function* *(e) increase the risk of flooding of other land* *(f) obstruct a watercourse.*	The Project including required earthworks will not impede the flow of floodwaters through the land or other surrounding land, is not on land where the risk of flooding is unacceptable having regard to personal and public safety and to property damage, will not increase the potential hazard risk to public safety of persons during a flood event, will not aggravate the potential for erosion or siltation or lead to the destruction of vegetation during a flood, will not cause any adverse effect on the floodway function, will not increase the risk of flooding of other land and will not obstruct a pertinent watercourse.
	Principles of Development Control – Bushfire: *10. Buildings and structures should be located away from areas that pose an unacceptable bushfire risk as a result of one or more of the following:* *(a) vegetation cover comprising trees and/or shrubs* *(b) poor access* *(c) rugged terrain* *(d) inability to provide an adequate building protection zone* *(e) inability to provide an adequate supply of water for fire-fighting purposes.*	The Project area's bushfire risk is mapped General. The majority of the Project area is cleared land with a few scattered trees and vegetation along boundary lines. The Project area's dominant landform is flat plains which have been extensively cleared for agriculture. Vegetation along boundary lines will likely be retained as part of the Project. The risk of initiating fire from commercial solar panels and inverters is very low due to their high quality. The Project area does pose a risk of fire due to ground cover. The Project will employ fire response measures to mitigate the risk and prevalence of bushfires including internal and perimeter roads

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	16. Vehicle access and driveways to properties and public roads created by land division should be designed and constructed to: *(a) facilitate safe and effective operational use for fire fighting and other emergency vehicles and residents* *(b) provide for two-way vehicular access between areas of fire risk and the nearest public road.*	designed to facilitate safe and effective operational use for fire-fighting.
	Principles of Development Control – Salinity: *18. Development should not increase the potential for, or result in an increase in, soil and water salinity.*	The South Australian Resource Information Gateway (SARIG 2018) Salinity non-watertable (soil salinity) mapping layer identifies the Project area as having low to moderate salinity. The SARIG 2018 Salinity watertable induced (soil salinity) mapping layer identifies the Project area as having moderately high to very high or extreme salinity. The SARIG 2018 groundwater mapping layer indicates the Shallow Standing Water Level is 0-10m below Ground Level (BGL). The Shallow Standing Water Level represents the depth to standing water of the shallowest aquifer only. Other aquifers may well give rise to standing water at significantly different depths. The Project will involve short-term construction, followed by possibly decades of the land being inactive during operations. The limited or no cropping and consequently limited use of farm machinery on Project area will be beneficial for the soils. While constructing the Project will require removal of some vegetation and the Project's operations will require water to clean the panels from time to time these activities will not lead to an increase in the Project area's typical

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		groundwater levels and/or the leaching of salts, consequently the Project will not contribute to an increase in salinity levels.
	Principles of Development Control – Acid Sulfate Soils: 21. *Development and activities, including excavation and filling of land, that may lead to the disturbance of potential or actual acid sulfate soils should be avoided unless such disturbances are managed in a way that effectively avoids the potential for harm or damage to any of the following:* *(a) the marine and estuarine environment* *(b) natural water bodies and wetlands* *(c) agricultural or land-based aquaculture activities* *(d) buildings, structures and infrastructure* *(e) public health.*	The Australian Soil Resource Information System (ASRIS 2014) notes the probability of Acid Sulfate soils in the area is extremely low. However, on Overlay Map PtPi/14 – Development Constraints, the Project area is partially mapped 'Coastal Acid Sulfate Soils'. The Project will develop an environmental framework through implementing a Construction Environmental Management Plan (CEMP) for the construction phase and Operational Environmental Management Plan (OEMP) for the operation phase which will be finalised prior to the commencement of construction and operation. The CEMP will consider Acid Sulfate Soils.
	Principles of Development Control – Site Contamination: 23. *Development, including land division, should not occur where site contamination has occurred unless the site has been assessed and remediated as necessary to ensure that it is suitable and safe for the proposed use.*	The Project area is not listed on the South Australian Contamination index. Preliminary geotechnical investigations in May 2018 of some of the Project area found *"The site and subsurface conditions was visually assessed for contamination during the site investigations. No fill materials were encountered during the site investigation and there was no indication of contaminated soils".*

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		Based on the historical and current agricultural activities no areas of significant contamination are expected to be encountered during the construction or operation of the Project. Based on the proposed use of the Project area the historical and current agricultural activities do not pose a significant human or environmental health risk.
	Principles of Development Control – Containment of Chemical and Hazardous Materials: *24. Hazardous materials should be stored and contained in a manner that minimises the risk to public health and safety and the potential for water, land or air contamination.*	Fuels and chemicals are required during the construction and operation phases for light vehicles, plant and equipment. During the construction and operation phases a storage and handling of chemical and hazardous materials management plan for each phase will be developed detailing the control measures to be implemented.
	Principles of Development Control – Landslip: *27. Development, including associated cut and fill activities, should not lead to an increased danger from land surface instability or to the potential of landslip occurring on the site or on surrounding land.*	The Project area is not susceptible to land slip. The Project's earthworks will not lead to an increased danger from land surface instability or to the potential of landslip occurring on the Project area or on surrounding land.
Heritage Places **(P40)**	**Objectives:** *1. The conservation of State and local heritage places.* *2. The continued use, or adaptive reuse, of State and local heritage places that supports the conservation of their cultural significance.* *3. Conservation of the setting of State and local heritage places.*	The Project land is not identified in the Overlay Maps – Heritage or listed in PtPi/5 - State Heritage Places or in Table PtPi/4 - Local Heritage Places. The Project land is not identified on the Historic Conservation Area Maps. An archaeological assessment of the Project was completed to determine the presence of Aboriginal and/or European heritage value within the Project area.

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	Principles of Development Control: *1. A heritage place spatially located on Overlay Maps - Heritage and more specifically identified in Table PtPi/ 5 - State Heritage Places or in Table PtPi/4 - Local Heritage Places should not be demolished, destroyed or removed, in total or in part, unless either of the following apply:* *(a) that portion of the place to be demolished, destroyed or removed is excluded from the extent of the places identified in the Table(s)* *(b) the structural condition of the place represents an unacceptable risk to public or private safety.*	The desktop archaeological assessment is attached as Appendix 9. Preliminary field investigations in May 2018 entailed systematic inspection of high-risk areas using pedestrian survey approach. Survey visibility was high as the majority of the Project area was heavily disturbed by cropping and animal grazing. **European** The *Heritage Places Act 1993* makes provision for the identification, recording and conservation of places and objects of non-Aboriginal heritage significance in South Australia. Once registered, State Heritage Places are protected under the *Heritage Places Act 1993* and the *Development Act 1993*. It is an offence to damage, destroy, excavate or disturb locally and State significant heritage places without consent. There are no State Heritage Places or Local Heritage Places registered in the Project area.
Infrastructure **(P49)**	**Objectives:** *1. Infrastructure provided in an economical and environmentally sensitive manner.* *2. The visual impact of infrastructure facilities minimised.* *3. The efficient and cost-effective use of existing infrastructure.*	The Project area is an appropriate location because of the co-location with existing utility scale electricity infrastructure i.e. Bungama Substation and associated transmission lines and the short distance required for the grid connection, minimising the expanse of connection resulting in efficient and cost-effective use of existing infrastructure. The Project is a type of renewable energy facility the Development Plan contemplates the presence of in the Council area and in the Primary Production Zone. The Development Plan acknowledges it is

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		difficult to mitigate visual impacts of large-scale renewable energy facilities. The Project has been designed to minimise the visual impact of the infrastructure while maximising the generation of renewable energy from this Project.
	Principles of Development Control: *1. Development should only occur where it has access to adequate utilities and services, including:* *(a) electricity supply* *(b) water supply* *(c) drainage and stormwater systems* *(d) effluent disposal systems* *(e) formed all-weather public roads* *(f) telecommunications services* *(g) gas services.* *9. Electricity infrastructure should be designed and located to minimise visual and environmental impacts.* *10. Utilities and services, including access roads and tracks, should be sited on areas already cleared of native vegetation. If this is not possible, their siting should cause minimal interference or disturbance to existing native vegetation and biodiversity.*	The Project's design will incorporate the provision of adequate utilities and services. The Project area is an appropriate location because of the co-location with existing utility scale electricity infrastructure i.e. Bungama substation and associated transmission lines and the short distance required for the grid connection, minimising the expanse of connection. The Project is a type of renewable energy facility the Development Plan contemplates the presence of in the Council area and in the Primary Production Zone. The Development Plan acknowledges it is difficult to mitigate visual and environmental impacts of large-scale renewable energy facilities. The Project has been designed to minimise the visual and environmental impacts of the infrastructure while maximising the generation of renewable energy from this Project. A key criterion for selecting the Project area is the land is currently used for agricultural land uses, including cropping, that reduces and minimises the amount of native vegetation that may need to be cleared or disturbed for the Project. The Project has been designed to minimise the interference or disturbance to existing native vegetation and biodiversity. The Development Plan recognises that a

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	11. Utility buildings and structures should be grouped with non-residential development, where possible. *12. Development in proximity to infrastructure facilities should be sited and be of a scale to ensure adequate separation to protect people and property.* *13. Incompatible uses should not encroach upon the easements of infrastructure corridors for existing and proposed transmission lines.* *15. Provision should be made for new transmission and distribution substations and overhead major electricity line corridors (having a capacity greater than or equal to 33kV) in areas which have the required buffer distance to protect people and allow for adequate access.*	large renewable energy facility cannot be constructed in the Primary Production Zone without some disturbance to wildlife and vegetation. The proposed substation and transmission lines will be positioned in close proximity to the existing Bungama substation buffered from residences and with provision for adequate access.
Interface between land uses **(P51)**	**Objectives:** *1. Development located and designed to minimise adverse impact and conflict between land uses.* *2. Protect community health and amenity from adverse impacts of development.*	The key neighbouring land uses are agricultural land uses, utility scale electricity infrastructure comprising a substation and powerlines and roads. The Project design and co-location with existing utility scale electricity infrastructure i.e. Bungama substation and associated transmission lines prevents adverse impact and conflict between land uses, prevents adverse impact to community health and amenity and will not unreasonable impede all desired land uses in this area. The Project is a type of renewable energy facility the Development Plan contemplates the presence of in the Council area and in the Primary Production Zone.

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	Principles of Development Control: *1. Development should not detrimentally affect the amenity of the locality or cause unreasonable interference through any of the following:* *(a) the emission of effluent, odour, smoke, fumes, dust or other airborne pollutants* *(b) noise* *(c) vibration* *(d) electrical interference* *(e) light spill* *(f) glare* *(g) hours of operation* *(h) traffic impacts.* *2. Development should be sited and designed to minimise negative impacts on existing and potential future land uses desired in the locality.*	The Project is a type of renewable energy facility the Development Plan contemplates the presence of in the Council area and in the Primary Production Zone. The Development Plan acknowledges it is difficult to mitigate visual and environmental impacts of large-scale renewable energy facilities. The Project has been designed to minimise the visual and environmental impacts of the infrastructure while maximising the generation of renewable energy from this Project. The Planning Report concludes the Project will not detrimentally affect the amenity of the locality or cause unreasonable interference through the environmental issues listed in Development Control 1. The Project has been designed and sited to minimise negative impact on existing and potential future land uses considered appropriate in the locality. The Development Plan acknowledges it is difficult to mitigate the potential negative impacts of large-scale renewable energy facilities. The Project will develop an environmental framework through implementing a Construction Environmental Management Plan (CEMP) for the construction phase and Operational Environmental Management Plan (OEMP) for the operation phase which will be finalised prior to the commencement of construction and operation. The environmental framework establishes objectives and targets to manage the environmental aspects of the Project. The Project's CEMP and OEMP will address compliance with regulatory requirements, environmental protection policies and

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		relevant guidelines and codes of practice. The specific regulatory requirements for each environmental aspect will be identified in the CEMP and / or OEMP and incorporated, where appropriate, in the performance indicators utilised for monitoring environmental compliance. Both the CEMP and OEMP will be implemented throughout the relevant phase of the Project, to ensure that potential environmental impacts are minimised.
	Principles of Development Control – Noise Generating Activities: *7. Development that emits noise (other than music noise) should include noise attenuation measures that achieve the relevant Environment Protection (Noise) Policy criteria when assessed at the nearest existing noise sensitive premises.*	The Project will be designed and sited to minimise negative impacts of noise and to avoid unreasonable interference. The Project will be constructed and operated in accordance with relevant Australian Standards and statutory guidelines. A Noise Assessment is attached as Appendix 13 of the Planning Report. The assessment found noise emissions during the construction and operation phase will be compliant with the Environment Protection (Noise) Policy 2007 and will not cause adverse impacts. The CEMP and OEMP will address compliance with regulatory noise requirements.
	Principles of Development Control – Air Quality: *11. Development with the potential to emit harmful or nuisance-generating air pollution should incorporate air pollution control*	The Project's potential to adversely impact the existing air quality environment is low.

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	measures to prevent harm to human health or unreasonable interference with the amenity of sensitive uses within the locality.	
	Principles of Development Control – Rural Interface: *15. Existing primary production and mineral extraction should not be prejudiced by the inappropriate encroachment of sensitive uses such as urban development.*	The Project does not include urban development such as residential development.
Land Division **(P54)**	**Objectives:** *2. Land division that creates allotments appropriate for the intended use.* *5. Land division restricted in rural areas to ensure the efficient use of rural land for primary production and avoidance of uneconomic infrastructure provision.*	The Project will not trigger the division provisions.
Landscaping, Fences and Walls **(P58)**	**Objectives:** *1. The amenity of land and development enhanced with appropriate planting and other landscaping works, using locally indigenous plant species where possible.* *2. Functional fences and walls that enhance the attractiveness of development.* **Principles of Development Control:** *1. Development should incorporate open space and landscaping and minimise hard paved surfaces in order to:* *2. Landscaping should…*	Given the scale and extent of the proposed development and the low level of visual impact, providing landscaping which is adequate to screen the entire Project area is not considered practical. Targeted landscaping for some adjoining landowners is shown in the preliminary landscape plan attached in Appendix 14 of the Planning Report. Security fencing will be installed around the perimeter of the solar plant. Signage will be clearly displayed identifying hazards present within the solar plant. Targeted landscaping may be established to support erosion control and improved amenity adjacent to car parking areas and control

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	3. Landscaping should not… *4. Fences and walls, including retaining walls, should…*	room/site office, BESS areas and the Project substation but this is anticipated to be minimal. Security fencing will be installed around the perimeter of the solar plant. Signage will be clearly displayed identifying hazards present within the solar plant.
Mineral Extraction **(P63)**	**Objectives:** *2. Protection of mineral deposits against intrusion by inappropriate forms of development.* **Principles of Development Control:** *1. Known reserves of economically-viable mineral deposits should be kept free of development that may inhibit their future exploitation.* *2. Development in proximity to mining operations should not be allowed where it may be exposed to adverse impacts resulting from mining activities.*	The SARIG 2018 Mineral tenements production layer does not indicate current mining activities within the Project area of 530ha. Outside the Project area, within the Project land, the current Extractive minerals lease is active: Tenement Label: EML 5945 Operation Name: Cunningham Sand Pit The extractive minerals lease is excluded from the Project area.
Natural Resources **(P65)**	**Objectives:** *1. Retention, protection and restoration of the natural resources and environment.* *2. Protection of the quality and quantity of South Australia's surface waters, including inland, marine and estuarine and underground waters.*	The Project is a type of renewable energy facility the Development Plan contemplates the presence of in the Council area and in the Primary Production Zone. The Development Plan acknowledges it is difficult to mitigate environmental impacts of large-scale renewable energy facilities. The Project has been designed to minimise environmental impacts of the infrastructure while maximising the generation of renewable energy from this Project. An objective of the Project is to apply appropriate standards and management strategies to minimise impacts to the areas natural

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	3. The ecologically sustainable use of natural resources including water resources, including marine waters, ground water, surface water and watercourses. *5. Development consistent with the principles of water sensitive design.* *6. Development sited and designed to:…* *8. Native flora, fauna and ecosystems protected, retained, conserved and restored.* *10. Minimal disturbance and modification of the natural landform.* *12. Protection of areas prone to erosion or other land degradation processes from inappropriate development.*	resources and environment while maximising the generation capability of the Project. The Project's final design aims to retain, protect and restore the natural resources and environment where possible including protecting the natural resources via the adoption of a CEMP and OEMP that will address compliance with regulatory requirements, environmental protection policies and relevant guidelines and codes of practice. The specific regulatory requirements for each environmental aspect will be identified in the CEMP and OEMP and incorporated, where appropriate, in the performance indicators utilised for monitoring environmental compliance.
	Principles of Development Control – Water Sensitive Design: *5. Development should be designed to maximise conservation, minimise consumption and encourage re-use of water resources.* *6. Development should not take place if it results in unsustainable use of surface or underground water resources.* *7. Development should be sited and designed to:…* *8. Water discharged from a development site should: …* *9. Development should include stormwater management systems to protect it from damage during a minimum of a 1-in-100 year average return interval flood.* *10. Development should have adequate provision to control any stormwater over-flow runoff from the site and should be sited and designed to improve the quality of stormwater and minimise pollutant transfer to receiving waters.*	Australia is one of the world's top 20 water-stressed nations. A report by the World Resources Industry notes the following key points: • It identified Australia as one country vulnerable to water stress where the potential for cheap renewable energy, solar and wind as opposed to fossil fuels, could reduce water consumption country-wide as these technologies use minimal water. • Every megawatt hour of electricity generated by coal withdraws around 60,700 litres and consumes about 2,600 litres of water. • In the 2017-2018 financial year, Australian's have consumed 147 terrawatt hours of electricity, about 73 per cent of which

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	11. Development should include stormwater management systems to mitigate peak flows and manage the rate and duration of stormwater discharges from the site to ensure the carrying capacities of downstream systems are not overloaded. *12. Development should include stormwater management systems to minimise the discharge of sediment, suspended solids, organic matter, nutrients, bacteria, litter and other contaminants to the stormwater system.* *13. Stormwater management systems should preserve natural drainage systems, including the associated environmental flows.* *14. Stormwater management systems should:…*	comes from coal, which equates to around 455 billion litres of water. The Project will contribute to reducing the amount of water required to generate electricity. Most of the Project area will be covered by solar array and spacing between the arrays. The areas underneath and surrounding the solar modules will not be impervious and therefore most of the Project area will be retained substantially in the current condition. Consequently, the runoff from most of the Project area, is likely to remain at the same post development levels and allow infiltration of rainfall. During the construction and operation phases a small area of the Project area will be occupied by administration buildings, laydown and compound area, inverters stations, battery area and switchyard/substation area that may increase runoff from this small area compared with current levels. The Project will include a minor wastewater treatment system. Discharge of treated sewage from the ablution block has the potential to decrease groundwater quality (e.g. through increased biological oxygen demands) if the sewage is not adequately treated or if the lining has not been appropriately designed the evapotranspiration bed could seep into the surrounding area. During the construction phase and operational phase, fuels oils and herbicides will be stored in the on-site compound area. Contaminants (e.g. hydrocarbons) from spills and leaks may potentially enter

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		groundwater or drainage lines and impact on the environmental value of the receiving environment. The Project's CEMP and OEMP will include specific management measures or plans for a number of aspects including erosion and stormwater management, waste management, storage and handling of hazardous substances. The management strategies are designed in part to address the relevant principles of development controls for water sensitive design. The SARIG 2018 Salinity non-watertable (soil salinity) mapping layer identifies the Project area as having low to moderate salinity. The SARIG 2018 Salinity watertable induced (soil salinity) mapping layer identifies the Project area as having moderately high to very high or extreme salinity. While constructing the Project will require removal of some vegetation and the Project's operations will require water to clean the panels from time to time these activities will not lead to an increase in the Project area's typical groundwater levels and/or the leaching of salts, consequently the Project will not contribute to an increase in salinity levels. The Project area is not mapped as subject to inundation and is not located in the Murray Floodplain or within the River Murray protected area or within a local Catchment area. Figure 2-3 shows there are ephemeral watercourses and drainage lines on the Project area. The ephemeral watercourses and drainage lines do not hold permanent water and only run during high rainfall. The Project's final

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		design will consider the Project area's watercourses and drainage lines.
	Principles of Development Control - Water Catchment Areas: *17. Development should ensure watercourses and their beds, banks, wetlands and floodplains are not damaged or modified and are retained in their natural state, except where modification is required for essential access or maintenance purposes.* *18. No development should occur where its proximity to a swamp or wetland will damage or interfere with the hydrology or water regime of the swamp or wetland.* *21. No development should be located within 50 metres of:* *(a) a watercourse identified as a blue line on a current series 1:50 000 SA Government topographic map* *(b) any river, stream, creek or channel in which water is contained or flows permanently, intermittently or occasionally.* *24. The location and construction of dams, water tanks and diversion drains should….* *26. Development should comply with the current Environment Protection (Water Quality) Policy.*	The Project is located outside both the Murray Darling Basin Water Management Area and Rangelands Natural Resource Management District. Figure 2-3 shows there are ephemeral watercourses and drainage lines on the Project area. The ephemeral watercourses and drainage lines do not hold permanent water and only run during high rainfall. The Project's final design will consider the Project area's ephemeral watercourses and drainage lines.
	Principles of Development Control – Biodiversity and Native Vegetation:	A key criterion for selecting the Project area is the land is currently used for agricultural land uses, including cropping, that reduces and minimises the amount of native vegetation that may need to be cleared or disturbed for the Project. The Project has been designed to

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	28. Development should retain existing areas of native vegetation and where possible contribute to revegetation using locally indigenous plant species. *30. Native vegetation should be conserved and its conservation value and function not compromised by development if the native vegetation does any of the following:…* *31. Native vegetation should not be cleared if such clearing is likely to lead to, cause or exacerbate any of the following:…* *32. Development that proposes the clearance of native vegetation should address or consider the implications that removing the native vegetation will have on the following:…* *33. Where native vegetation is to be removed, it should be replaced in a suitable location on the site with locally indigenous vegetation to ensure that there is not a net loss of native vegetation and biodiversity.* *38. Trees and other vegetation* should be conserved which is of:…	minimise the interference or disturbance to existing native vegetation and biodiversity. The Development Plan recognises that a large renewable energy facility cannot be constructed in the Primary Production Zone without some disturbance to wildlife and vegetation. An objective of the Project is to minimise impacts to the areas Biodiversity and native vegetation while maximising the generation capability of the Project. An assessment of ecological values at the Project area was undertaken to determine the presence of species of conservation significance (i.e. species protected under Commonwealth or State legislation) and to identify any potential impacts on biodiversity. The desktop ecological assessment, attached as Appendix 8, and preliminary field flora assessment in May 2018 determined the dominant landform in the Project area is "*a plain, which has been extensively cleared for agriculture*" (EBS, 2018). As such, the likelihood of suitable habitat for threatened flora species being present was assessed as very low. The preliminary field flora assessment in May 2018 was performed in accordance with the Scattered Tree Assessment Method and Bushland Assessment Method derived by the Native Vegetation Council. The field fauna assessment included recording of opportunistic fauna sightings, signs of fauna (e.g. scats, burrows, nests and skeletons) and potential fauna habitat (e.g. hollows).

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		No targeted fauna searches were conducted as part of the field investigations. However, four (4) bird and one mammal species were opportunistically observed during the flora assessment. None of these species are listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) or the *National Parks and Wildlife Act 1972* (SA). Six (6) vegetation associations and two (2) scattered trees were assessed within the Project area. The two scattered trees were considered to provide suitable roosting habitat for the state Rare, *Falco peregrinus* (Peregrine Falcon). The Peregrine falcon is known to forage over plains and to roost on dead limbs, cliffs and broadcasting pylons. No Peregrine falcon were observed during the preliminary Project area investigations. To assist with the construction of the PVS and BESS elements and the Project's effective operation, two (2) scattered trees (both *Eucalyptus camaldulensis var. camaldulensis*) and the six (6) vegetation associations may need to be removed. The six (6) vegetation associations of which all or part may need to be removed are: • *Acacia spp. +/- Senna artemisioides spp. petiolaris over Maireana brevifolia+/- Atriplex spp.* Low Shrubland; • *Acacia salicina* Tall Shrubland over *Maireana brevifolia*; • *Alectryon oleifolius* over *Enchylaena tomentose*; • *Typha domingensis* Small Wetland; • *Atriplex vesicaria / Maireana brevifolia* Low Shrubland; and • *Enneapogon nigricans* Grassland.

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		Any adverse impact on native vegetation or ecosystems that cannot be avoided will be submitted to the Native Vegetation Council for approval as required.
	Principles of Development Control – Soil Conservation: *39. Development should not have an adverse impact on the natural, physical, chemical or biological quality and characteristics of soil resources.* *40. Development should be designed and sited to prevent erosion.* *41. Development should take place in a manner that will minimise alteration to the existing landform.* *42. Development should minimise the loss of soil from a site through soil erosion or siltation during the construction phase of any development and following the commencement of an activity.*	The Project will involve short-term construction, followed by possibly decades of the land being inactive. The limited or no cropping and consequently limited use of farm machinery on Project area will be beneficial for the soils. As previously discussed, erosion and sediment control measures will be implemented during the construction and operation phases to prevent erosion and loss of soil from the Project area.
Orderly and Sustainable Development **(P75)**	**Objectives:** *1. Orderly and economical development that creates a safe, convenient and pleasant environment in which to live.* *2. Development occurring in an orderly sequence and in a compact form to enable the efficient provision of public services and facilities.* *3. Development that does not jeopardise the continuance of adjoining authorised land uses.* *4. Development that does not prejudice the achievement of the provisions of the Development Plan.*	The Project area is an appropriate location because of the co-location with existing utility scale electricity infrastructure and the short distance required for the grid connection. The Project aligns with the Development Plan's Renewable Energy Facilities objective. The Project supports the existing electricity infrastructure and will not impede the operation of the established agricultural land uses in the area through any nuisance or harmful creating impact.

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	Principles of Development Control: *1. Development should not prejudice the development of a zone for its intended purpose.* *2. Land outside of townships and settlements should primarily be used for primary production and conservation purposes.* *6. Development should be located and staged to achieve the economical provision of public services and infrastructure, and to maximise the use of existing services and infrastructure.* *7. Where development is expected to impact upon the existing infrastructure network (including the transport network), development should demonstrate how the undue effect will be addressed.*	The Project is located within the Primary Production Zone as shown in Zone Map PtPi/14 and PtPi/16. The Project is a type of development envisaged within the zone and constitute a component of the zone's desired character subject to implementation of management techniques set out by general / council wide policy regarding renewable energy facilities. The Project area is an appropriate location because of the co-location with existing utility scale electricity infrastructure and the short distance required for the grid connection (minimising the expanse of overhead power lines). The Project's construction traffic will impact the existing local transport network. A Traffic Management Plan will be developed with the DPTI, Safety and Services (Traffic Operations) and Port Pirie Regional Council to minimise the impact during the construction phase.
Renewable Energy Facilities **(P76)**	**Objectives:** *1. Development of renewable energy facilities that benefit the environment, the community and the state.* *2. The development of renewable energy facilities, such as wind farms and ancillary development, in areas that provide opportunity to harvest natural resources for the efficient generation of electricity.* *3. Location, siting, design and operation of renewable energy facilities to avoid or minimise adverse impacts on the natural environment and other land uses.*	The Project will complement and increase the generation of renewable energy within South Australia and the broader National Electricity Market, reduce greenhouse gases and decrease the use of water in the production of electricity. The Project area is an appropriate location because of the co-location with existing utility scale electricity infrastructure and the short distance required for the grid connection (minimising the expanse of overhead power lines).

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		An objective of the Project is to minimise impacts on the natural environment and other land uses in the area while maximising the generation capability of the Project.
	Principles of Development Control: *1. Renewable energy facilities, including wind farms, solar farms and ancillary development, should be:* *(a) located in areas that maximize efficient generation and supply of electricity* *(b) designed and sited so as not to impact on the safety of water or air transport and the operation of ports, airfields and designated landing strips.*	The identification of the Project area is the result of an extensive solar site identification assessment of possible locations across Australia. The following factors/criteria were used to select the Project area: • Proximity to the Bungama substation; • Access to the Bungama substation and capacity of the substation to accept new generation; • Agreements with landowners to host the Project; • Marginal loss factors and future forecasts; • Details on interstate connectors and relevant known transmission constraints; • Consideration of known projects proximate to the Project's area and potential for impact on capacity and connection; • Irradiation levels; • Environmental analysis of topography and environmental constraints; • Topography of the Project area providing suitable conditions for the construction and operation of a solar farm; • Site visits and initial field investigations;

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		• Located close to the regional centre of Port Pirie; • Suitable infrastructure surrounding the Project area e.g. road access for construction and operation of a solar farm; and • Most of the Project area is disturbed through continuous agricultural land uses reducing the likelihood that the Project's development footprint will contain significant areas of native vegetation, Aboriginal cultural heritage items, or other environmental constraints.
	Principles of Development Control - Wind Farms and Ancillary Development: *2. The visual impacts of wind farms and ancillary development (such as substations, maintenance sheds, access roads and wind monitoring masts) should be managed through:* *(a) wind turbine generators being:* *(i) setback at least 1000 metres from non-associated (non-stakeholder) dwellings and tourist accommodation* *(ii) setback at least 2000 metres from defined and zoned township, settlement or urban areas (including deferred urban areas)* *(iii) regularly spaced* *(iv) uniform in colour, size and shape and blade rotation direction*	The Project has been appropriately setback and is proposed to be screened from non-associated (non-stakeholder) dwellings. The Project is appropriately setback from tourist accommodation and areas defined and zoned township, settlement or urban areas (including deferred urban areas) Most of the Project area will be covered by solar panels mounted on single axis tracking modules and spacing. Depending on the type of single axis tracking modules the height of the bottom of the solar modules could be approximately 1.2m above ground level while the height of modules could be approximately 4m above ground level. The panels will be installed in parallel rows with the spacing being between approximately 4m to 10m depending on the type of single axis tracking module selected. The solar panels and single axis tracking modules will be uniform in colour, size, and shape. The solar arrays will be aligned north/south and track east/west. Viewing the solar arrays from parts of August

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	(v) mounted on tubular towers (as opposed to lattice towers) *(b) provision of vegetated buffers around substations, maintenance sheds and other ancillary structures.* *3. Wind farms and ancillary development should avoid or minimise the following impacts on nearby property owners / occupiers, road users and wildlife:* *(a) shadowing, flickering, reflection or glint* *(b) excessive noise* *(c) interference with television and radio signals and geographic positioning systems* *(d) interference with low altitude aircraft movements associated with agriculture* *(e) modification of vegetation, soils and habitats* *(f) striking of birds and bats.* *4. Wind turbine generators should be setback from dwellings, tourist accommodation and frequently visited public places (such as viewing platforms) a distance that will ensure that failure does not present an unacceptable risk to safety.*	Highway and Locks Road will be similar in geometric layout as to viewing rows of grape vines aligned north/south on the Project area. The buildings required for operations will be similar in size to buildings and structures typically found in a primary production area and will be constructed using materials and colours that blend with the rural landscape as much as possible. The buildings are grouped together and located in close proximity to the Bungama Substation and near existing transmission lines that aligns with the current infrastructure visual amenity when viewed from this part of Augusta Highway and Locks Road. Targeted landscaping for some adjoining landowners is shown in the preliminary landscape plan attached in Appendix 14. The Project infrastructure, in particular the solar panels can potentially cause a glint and/or glare impact beyond the Project area. A Glint and Glare assessment 2018 Report is attached as Appendix 12. The report's key findings are: • No harmful glint or glare will be experienced for sensitive receivers as a result of the Project, with the potential for a low level (non-harmful) of glare experienced for some locations either very early morning or late evening in the Autumn and or Winter, if these areas are not impeded by existing vegetation. • There are no Glint or Glare issues for pilots or for the section of the railway line near the Project area or for the section of the Augusta Highway adjacent to the Project area.

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		• A section of Warnertown Road experiences only 2 minutes late evening on some Autumn and Winter days for a total of less than one hour per annum of Green Glare or low-level glare. A section of Gulf View Road experiences two minutes per year of Green Glare or low-level glare. Proposed mitigation measures will ameliorate the Green Glare or low-level glare. • Some areas of the adjacent Napperby rural living area may experience some Green Glare or low-level glare in early morning or late evening during Autumn and or Winter if views directly to the PVS solar panels were unimpeded. Proposed landscape screening mitigation measures will ameliorate the potential for low-level glare. The Project's construction phase will generate noise emissions. Noise emissions occur during site preparation, the installation of the Project's infrastructure including the panel system and from the construction vehicles and machinery. Adopting standard environmental management controls, shutting down equipment when not in use and use of noise reduction devices will minimise the construction noise impacts at sensitive receivers which are expected to be negligible. Operating the Project will generate nominal noise emissions. The Project has been configured so all inverters are located at suitable noise attenuation distances from dwellings. A Noise Assessment of the Project found noise emissions during the construction and operation phase will be compliant with the Environment Protection (Noise) Policy 2007 and will not cause adverse impacts.

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		The Project will not interfere with television and radio signals and geographic positioning systems or with low altitude aircraft movements associated with agriculture. The Project is not located near recreation areas, tourist accommodation or other frequently visited public places (such as viewing platforms) and is sited not to be an unacceptable risk to the public.
Short-Term Workers Accommodation (P81)	**Objective:** *1. A range of appropriately located accommodation types supplied for seasonal and short-term workers.*	Where suitable accommodation cannot be found at existing facilities within the Port Pirie area, a temporary construction workers camp on a suitable part of the Project area will likely be the most efficient/effective way to manage the construction workforce during the construction phase.
	Principles of Development Control *1. Accommodation intended to be occupied on a temporary basis by persons engaged in employment relating to the production or processing of primary produce including minerals should be located within existing townships or within primary production areas, where it directly supports and is ancillary to legitimate primary production activities or related industries.* *2. Buildings used for short-term workers accommodation should:* *(a) be designed and constructed to enhance their appearance* *(b) provide for the addition of a carport, verandas or pergolas as an integral part of the building*	Where suitable accommodation cannot be found at existing facilities within the Port Pirie area, a temporary construction workers camp on a suitable part of the Project area will likely be the most efficient/effective way to manage the construction workforce during the construction phase. The construction workers camp would be designed to accommodate up to an estimated 275 equivalent full-time workers during construction. Approximately 3ha – 5ha is required for the construction workers camp. An example of a typical construction workers camp layout is attached as Appendix 4. Adequate arrangements will need to be made for the provision of essential services to the construction workers camp including, the supply of water, the supply of electricity, the disposal and

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	(c) where located outside of townships, not jeopardise the continuation of primary production on adjoining land or elsewhere in the zone *(d) be supplied with service infrastructure such as power, water, and effluent disposal sufficient to satisfy the living requirements of workers.* *3. Short-term workers accommodation should not be adapted or used for permanent occupancy.* *4. A common amenities building should be provided for temporary forms of short-term accommodation such as caravan and camping sites.*	management of sewage/waste water, stormwater drainage and general waste management. The final design, specification and layout of the temporary construction workers camp, including essential services, within the Project area will be submitted to the relevant authority for approval prior to the commencement of construction.
Siting and Visibility (P82)	**Objective:** *1. Protection of scenically attractive areas, particularly natural, rural and coastal landscapes.*	The Project area is not identified and listed scenically attractive area. The Project has been developed within regard to Landscape Protection Policy Area 11 and Landscape Protection Policy Area 12.
	Principles of Development Control: *1. Development should be sited and designed to minimise its visual impact on:…* *2. Buildings should be sited in unobtrusive locations and, in particular, should:* *(a) be grouped together* *(b) where possible be sited in such a way as to be screened by existing vegetation when viewed from public.*	The Project is not located within an area of known visual or scenic significance. The Project has been developed within regard to Landscape Protection Policy Area 11 and Landscape Protection Policy Area 12. The following amendments to the Project design have occurred to minimise visual impacts: • Including in excess of 7 km of visual buffering in the form of landscape screening at a direct Project cost estimated to exceed $750,000; and

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		• Reducing the land area allocated to solar panels by approximately 24 hectares, equivalent to a reduction of 36,000 panels and equating to approximately $5,000,000 in relinquished income over the life of the Project. The buildings required for construction and operation phases are grouped together and located adjacent to the Bungama Substation and near existing transmission lines that aligns with the current infrastructure visual amenity when viewed from this part of Augusta Highway. Roadside vegetation is scattered along the Project boundaries and will assist with limiting and interrupting views of the whole Project from public roads.
	3. Buildings outside of urban areas and in undulating landscapes should be sited in unobtrusive locations and in particular should be: *(a) sited below the ridgeline* *(b) sited within valleys or behind spurs* *(c) sited in such a way as to not be visible against the skyline when viewed from public roads* *(d) set well back from public roads, particularly when the allotment is on the high side of the road.* *2. Buildings and structures should be designed to minimise their visual impact in the landscape…*	The Project is located outside an urban area but is not located on an undulating landscape. Roadside vegetation is scattered along the Project boundaries and will assist with limiting and interrupting views of the whole Project from public roads. The Project will be set back from public roads. The buildings required for operations are similar in size to buildings typically found in a primary production area e.g. intensive animal keeping infrastructure, shearing sheds, machinery sheds and grain facilities such as silos.
	5. The nature of external surface materials of buildings should not detract from the visual character and amenity of the landscape.	The buildings will be constructed using materials and colours that blend with the rural landscape as much as possible.

Assessment Section		Project Response
	6. The number of buildings and structures on land outside of urban areas should be limited to that necessary for the efficient management of the land.	Only the required number of structures to efficiently manage the solar farm will be located on the Project's land. No residential buildings are part of the development.
	7. Driveways and access tracks should be designed and surfaced to blend sympathetically with the landscape and to minimise interference with natural vegetation and landforms.	Access tracks required for the Project will be designed and constructed to blend sympathetically with the landscape and to minimise interference with natural vegetation and landforms where possible.
	8. Development should be screened through the establishment of landscaping using locally indigenous plant species: *(a) around buildings and earthworks to provide a visual screen as well as shade in summer, and protection from prevailing winds* *(b) along allotment boundaries to provide permanent screening of buildings and structures when viewed from adjoining properties and public roads* *(c) along the verges of new roads and access tracks to provide screening and minimise erosion.*	Given the scale and extent of the proposed development providing landscaping which is adequate to screen the entire Project area is not considered practical. Targeted landscaping to support erosion control and visual amenity for adjoining landowners is shown in the preliminary landscape plan attached in Appendix 14.
Transportation and Access **(P91)**	**Objectives:** *2. Development that:* *(a) provides safe and efficient movement for all motorised and non-motorised transport modes* *(b) ensures access for vehicles including emergency services, public infrastructure maintenance and commercial vehicles* *(c) provides off street parking*	The Projects' movement will be primarily motorised that will utilise the existing State and local transport facilities and networks to safely convey material and personnel to and from the Project area during the life of the Project.

Assessment Section		Project Response
	(d) is appropriately located so that it supports and makes best use of existing transport facilities and networks. *5. Safe and convenient freight movement throughout the State.*	
	Principles of Development Control - Movement Systems: *2. Development should be integrated with existing transport networks, particularly major rail, road and public transport corridors as shown on Location Maps and Overlay Maps - Transport, and designed to minimise its potential impact on the functional performance of the transport network.* *6. Development generating high levels of traffic, such as schools, shopping centres and other retail areas, and entertainment and sporting facilities should incorporate passenger pick-up and set-down areas. The design of such areas should minimise interference to existing traffic and give priority to pedestrians, cyclists and public and community transport users.* *12. Development should be designed to discourage commercial and industrial vehicle movements through residential streets and adjacent other sensitive land uses.* *13. Industrial/commercial vehicle movements should be separated from passenger vehicle car parking areas.* *14. Development should provide for the on-site loading, unloading and turning of all traffic* likely to be generated.	While the component delivery route will be finalised as part of the Traffic Management Plan preliminary analysis indicates the feasible trucking option is components are shipped to Flinders Port Adelaide and trucked direct to the Project area via National Highway A9 (Port River Expressway, Salisbury Highway) and National Highway A1 (Port Wakefield Road, Port Wakefield Highway, Augusta Highway) and Locks Road. Anticipated traffic volumes will be highest during the Project's construction while operational traffic volumes are expected to be minimal. A Transport Impact Assessment (TIA) attached as Appendix 10 assessed the potential impact of the Project's construction traffic movements on transport routes and other road users and assessed the potential impact of the Project's operational traffic movements on transport routes and other road users based on the Project being completely operational. The assessment reaches several conclusions including the traffic generated by the Project during the construction and operational phases is very low in comparison to existing traffic volumes on the State controlled roads and therefore is not expected to compromise the safety or function of the surrounding State road network and the traffic generated by the proposed Project area during the construction and operational phases is not expected to

Assessment Section		Project Response
		compromise the safety or function of the local roads that experience low volumes of traffic A Traffic Management Plan will be developed with the DPTI, Safety and Services (Traffic Operations) and Port Pirie Regional Council to minimise the impact. Section 7.12 of the Planning Report contains further detail on the Project's traffic and transport.
	Principles of Development Control – Access: *22. Development should have direct access from an all weather public road.* *23. Development should be provided with safe and convenient access which:…* *25. The number of vehicle access points onto arterial roads shown on Overlay Maps - Transport should be minimised and, where possible, access points should be:* *(a) limited to local roads (including rear lane access)* *(b) shared between developments.* *26. Development with access from arterial roads or roads as shown on Overlay Maps - Transport should be sited to avoid the need for vehicles to reverse onto or from the road.* *28. Driveways, access tracks and parking areas should be designed and constructed to:* *(a) follow the natural contours of the land*	The Project will not require vehicle access points onto arterial roads shown on the Development Plan Overlay Map PtPi/14– Transport. The Project area will primarily be accessed from Locks Road. Locks Road is an all-weather graded public road. Data is limited for Locks Road, but it is reasonable to assume it has relatively minor vehicle flows, except during harvest. The construction traffic therefore would provide significant flows on these local roads compared to the current use. During the construction phase access will likely be via existing access points and additional access points to allow for the efficient transport of components onto and around the Project area. During the operation phase use of certain access point may be reduced. The internal access roads will be sufficient to allow for safe on-site vehicle manoeuvring including large vehicle deliveries. Driveways, access tracks and parking areas will be designed and constructed to minimise excavation and/or fill, minimise the potential

Assessment Section		Project Response
	(b) minimise excavation and/or fill *(c) minimise the potential for erosion from surface runoff* *(d) avoid the removal of existing vegetation* *(e) be consistent with Australian Standard AS: 2890 - Parking facilities.*	for erosion from run-off, minimise the removal of existing vegetation and be consistent with relevant standards where practicable. An indicative internal access road layout is provided in Appendix 3.
	Principles of Development Control - Vehicle Parking: *31. Development should provide off-street vehicle parking and specifically marked accessible car parking places to meet anticipated demand in accordance with Table PtPi/2 - Off Street Vehicle Parking Requirements unless all the following conditions are met:* *(a) an agreement is reached between the Council and the applicant for a reduced number of parking spaces* *(b) a financial contribution is paid into the Council Car Parking Fund specified by the Council, in accordance with the gazetted rate per car park.*	The Project will provide parking on-site in accordance with relevant standards.
Waste **(P97)**	**Objective:** *1. Development that, in order of priority, avoids the production of waste, minimises the production of waste, re-uses waste, recycles waste for re-use, treats waste and disposes of waste in an environmentally sound manner.* *2. Development that includes the treatment and management of solid and liquid waste to prevent undesired impacts on the environment including, soil, plant and animal biodiversity, human health and the amenity of the locality.*	An objective of the Project is to avoid the production of waste, minimise the production of waste, reuse waste, recycle waste for reuse, treat waste and disposes of waste in an environmentally-sound manner when required. Waste management procedures will be implemented for the construction phase and operation phase with the intention of preventing undesired impacts on the environment including, soil,

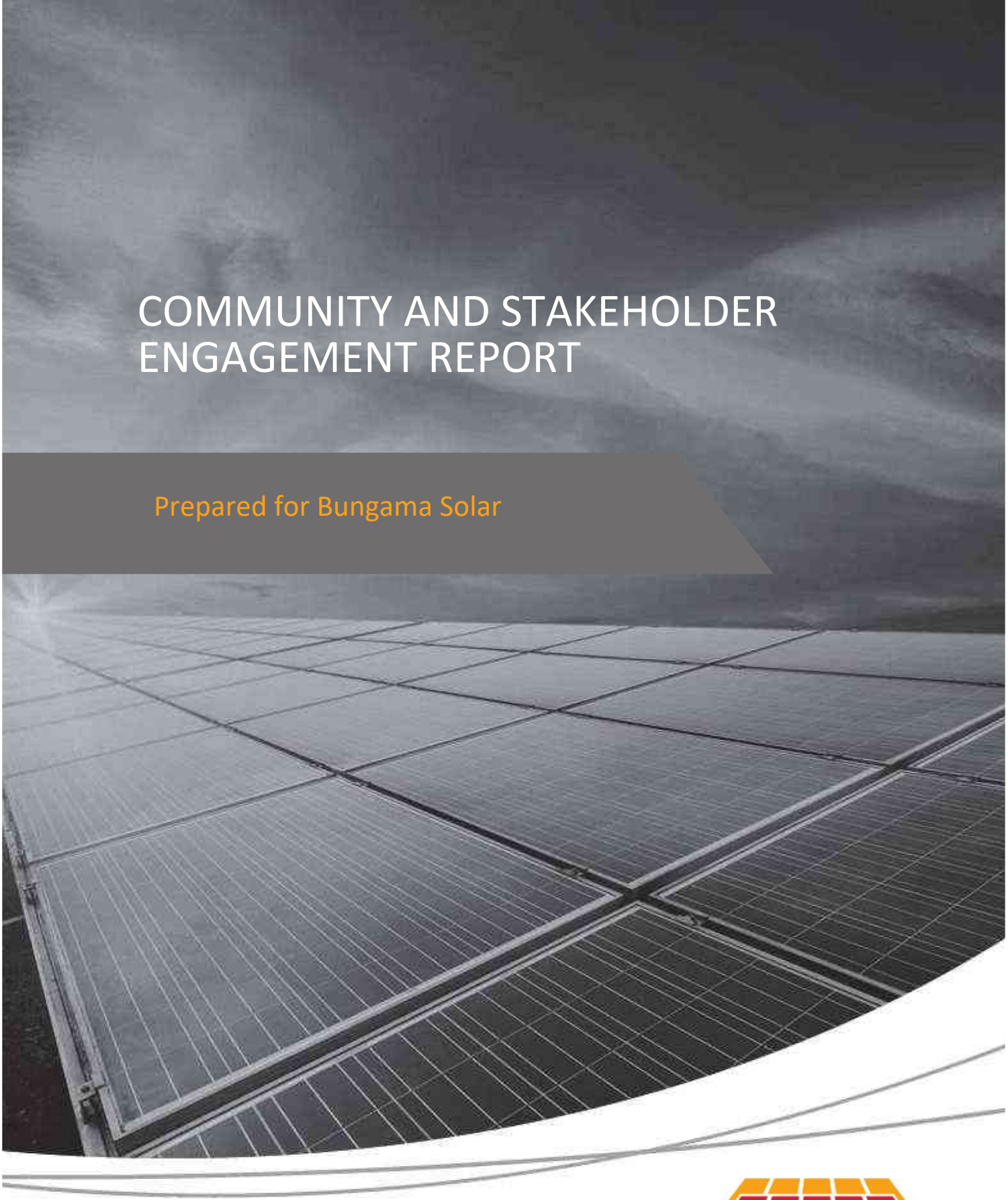
Assessment Section		Project Response
		plant and animal biodiversity, human health and the amenity of the locality.
	Principals of Development Control *1. Development should be sited and designed to prevent or minimise the generation of waste (including wastewater) by applying the following waste management hierarchy in the order of priority as shown below:* *(a) avoiding the production of waste* *(b) minimising waste production* *(c) reusing waste* *(d) recycling waste* *(e) recovering part of the waste for re-use* *(f) treating waste to reduce the potentially degrading impacts* *(g) disposing of waste in an environmentally sound manner.*	The Project is not expected to generate a significant amount of waste during the construction or operation phases. Construction waste management procedures will be implemented via a CEMP. Operational waste management procedures will be implemented via an OEMP. Any waste to be disposed of will be disposed in accordance with relevant standards.
	Principals of Development Control – Wastewater: *7. The disposal of wastewater to land should only occur where methods of wastewater reduction and reuse are unable to remove the need for its disposal, and where its application to the land is environmentally sustainable.* *8. Wastewater storage lagoons…*	During the construction phase and operation phase wastewater will likely be captured and removed from the Project area using a licensed wastewater contractor. A sewerage treatment plant will likely be designed and constructed to accommodate the estimated construction and operational staff and contractors. The exact method for dealing with wastewater will be determined during the Project's final design. Construction wastewater management procedures will be implemented via a CEMP.

Assessment Section		Project Response
		Operational wastewater management procedures will be implemented via an OEMP. The Project does not involve a wastewater storage lagoon.
	Principals of Development Control - Waste Treatment Systems: *10. Development that produces any sewage or effluent should be connected to a waste treatment system that complies with (or can comply with) the relevant public and environmental health legislation applying to that type of system.* *11. The methods for, and siting of, effluent and waste storage, treatment and disposal systems should minimise the potential for environmental harm and adverse impacts on:* *(a) the quality of surface and groundwater resources* *(b) public health* *(c) the amenity of a locality* *(d) sensitive land uses.* *12. Waste treatment should only occur where the capacity of the treatment facility is sufficient to accommodate likely maximum daily demands including a contingency for unexpected high flows and breakdowns.* *13. Any on-site wastewater treatment system/ re-use system or effluent drainage field should be located within the allotment of the development that it will service.* *14. A dedicated on-site effluent disposal area should not include any areas to be used for, or could be reasonably foreseen to be used for, private outdoor open space, driveways, car parking or outbuildings.*	During the construction phase and operation phase wastewater will likely be captured and removed from the Project area using a licensed wastewater contractor. A sewerage treatment plant will likely be designed and constructed to accommodate the estimated construction and operational staff and contractors. The exact method for dealing with wastewater will be determined during the Project's final design. The wastewater treatment and disposal will be conducted in accordance with relevant standards. The exact method of for dealing with wastewater will be determined during the Project's final design. The methods for, and siting of, effluent and waste storage, treatment and disposal systems will minimise the potential for environmental harm and adverse impacts on the quality of surface and groundwater resources, public health, the amenity of a locality and sensitive land uses.

Assessment Section		Project Response
	15. The spreading or discharging of treated liquid or solid waste onto the ground should only occur where the disposal area consists of soil and vegetation that has the capacity to store and use the waste without contaminating soil or surface or ground water resources or damaging crops.	

APPENDIX 6

Community and Stakeholder Engagement Report



COMMUNITY AND STAKEHOLDER ENGAGEMENT REPORT

Prepared for Bungama Solar

EPS ENERGY

Reference No. 11297 November 18

BUNGAMA SOLAR

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QUALITY ASSURANCE AND DECLARATION

Quality Assurance and Version Control Table		
Project:	Bungama Solar	
Client:	Bungama Solar 1 Pty Ltd and Bungama Solar 2 Pty Ltd	
Rev:	**Date:**	**Reference:**
V01	29.11.2018	Bungama Community and Stakeholder Engagement Report
Checked by:	L. Bryson	
Approved by:	S. McCall/ J. Burns	
Declaration:	*The opinions and declarations in this document are ascribed to EPS Energy and are made in good faith and trust that such statements are neither false nor misleading.* *In preparing this document, EPS Energy has considered and relied upon information obtained from the public domain, supplemented by discussions between key EPS Energy staff, representatives from governing agencies and independents, including the client and specialist consultants.*	
Applicant:	EPS Energy PO Box 195 Charlestown NSW 2290 (02) 9258 1362	
Prepared By:	M. Budisavljevic	
Reviewed By:	A. Tipper/ S. Duffy	
Project Land:	CT 6037/29 – A20 DP80628 CT 6127/5 – A558 FP188690 CT 5954/187 – A52 DP25903 CT 5949/272 – A4 DP24997 CT 5390/999 – A559 FP188691 CT 5360/334 – A551 FP188683 CT 5972/304 – A1 DP24255 CT 5776/531 – A501 DP52803 CT 5776/532 – A502 DP52803 CT 5978/766 – A55 DP71831	

Contents

APPENDICES

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1. INTRODUCTION

Bungama Solar is proposed to be an integrated but separately operated grid connected Photovoltaic Energy Generation System (PVS) of approximately 280MW (AC) generation capacity and a 140MW capacity Battery Energy Storage System (BESS) with 560MWh of storage that will feed into the National Electricity Market via ElectraNet's Bungama Substation. The PVS element, the BESS element and associated infrastructure, together are "the Project".

This Community and Stakeholder Engagement Report has been prepared by Energy Projects Solar (EPS) Pty Ltd ACN: 609 935 588 for Bungama Solar 1 Pty Ltd ACN: 621 450 762 the special purpose vehicle for the (PVS) and Bungama Solar 2 Pty Ltd ACN: 621 450 995 the special purpose vehicle for the (BESS).

EPS Energy has previously prepared a Community & Stakeholder Engagement Plan including the proposed tools and activities to assist with the engagement process. The purpose of this report is to summarise the outcomes of the engagement that has taken place.

The objectives of this report are to:

- Summarise the outcomes of the engagement undertaken to date;
- Analyse the comments, views and concerns raised by the community and other stakeholders;
- Demonstrate how the engagement process has informed the proposed Project; and
- Outline the ongoing communication tools to be implemented for the life of the Project.

1.1. PROJECT SUMMARY

Bungama Solar is proposed as a 280 MW (AC) utility scale solar photovoltaic plant and a 140 MW capacity battery energy storage system with up to 560 MWh of storage to feed into the National Electricity Market (NEM) through a 275kV connection to ElectraNet's Bungama Substation.

Bungama Solar is to be developed on approximately 530 hectares of cleared land in the suburbs of Bungama, Napperby and Warnertown, South Australia. The site is situated approximately 6 kilometres east of Port Pirie and 220 kilometres north of Adelaide. Bungama Solar is within the Local Government Area of Port Pirie Regional Council.

A Local Community Fund is proposed as a financial contribution for the life of the Project. The Community Fund is intended for the local community who are hosting the Project to assist with funding environmental, social and economic development opportunities.

One of the key purposes of the engagement process was to allow for the community and other stakeholders to input their values, concerns and feedback on various aspects of the Project, which intended to assist EPS Energy in managing the final Project design. Detailed discussions with the Port Pirie Regional Council, ElectraNet and other agencies will also continue to influence final decisions regarding the Project design. A description of each element of the proposal will be provided as part of the Development Application.

2. ENGAGEMENT STRATEGY

The Community & Stakeholder Engagement Plan (the Plan) was prepared at the Project Preparation Phase to ensure that the engagement was undertaken in a comprehensive and constructive manner for the proposed Project.

The Plan was used as a tool to assist with the planning and management of engagement activities proposed to be undertaken at various stages of the Project. The Plan is founded on a Statement of Intent and subsequent Aims and Objectives to promote effective engagement with community and other stakeholders. The Statement of Intent, Aims and Objectives are included below.

Section 3 of this report summarises the outcomes of the engagement activities undertaken in accordance with the Plan, making reference to the Aims and Objectives outlined below, where applicable.

Statement of Intent

EPS Energy intends to involve the community and other stakeholders at each phase of the Project to ensure local values and concerns are identified and inform the decisions and activities of the Bungama Solar Project.

Aim 1

Obtain and maintain a Social Licence to Operate with the identified community and other stakeholders.

Objectives:

- Undertake an audience analysis to identify the key community groups and other stakeholders who may be impacted/interested in the Project;
- Undertake early discussions with relevant landowners, Council, Departments and other agencies to determine Project support and feasibility;
- Engage with the community and other stakeholders early and throughout the Project's life;
- Review the key community groups and other stakeholders who may gain or lose interest in participating in the engagement process;
- Disclose any potential impacts that may occur during the construction, operation, and decommissioning of the Project;
- Obtain an understanding of specific community and other stakeholder values and concerns regarding the Project; and
- Demonstrate how input from the community and other stakeholders influences the Project.

Aim 2

Enable and collaborate with the community and other stakeholders to provide feedback and input to the Project.

Objectives:

- Raise awareness of the proposal with adjacent landowners, local community and Council, key Government agencies and other key stakeholders;
- Provide relevant information to educate the community and other stakeholders on solar development and the development approval process generally so that they can participate in a meaningful way;
- Actively seek local information and input from the community and other stakeholders on local matters of importance that are relevant to the Project;
- Use a variety of engagement tools and activities to reach the broadest sample of the community and other stakeholders; and
- Collaborate with the community and other stakeholders to develop acceptable solutions to raised issues and/or concerns, wherever practicable.

Aim 3

Establish and maintain an open, honest and genuine relationship with the community and other stakeholders.

Objectives:

- Be genuinely available to meet and talk to community members and interested individuals or groups;
- Provide opportunities to interact with the community and other stakeholders;
- Respond to questions and concerns raised by the community and other stakeholders in a respectful, clear, and honest manner;
- Provide updates on the status of the Project; and
- Prioritise the achievement of mutually agreed outcomes, wherever practicable.

2.1. PRELIMINARY AUDIENCE ANALYSIS

The preliminary audience analysis was conducted during the Project Preparation Phase. This analysis included the identification of parties known to be potentially impacted by the Project, and those who may have an interest in the Project, vested or otherwise.

EPS Energy contacted the Port Pirie Regional Council on 24 April 2018 to request a comprehensive list of all community groups and other stakeholders whom Council regularly engage with for developments in the area. This was to ensure the preliminary audience analysis was inclusive of all potential stakeholders.

The following stakeholders have been identified as key to the Project.

- Landowners and occupiers of the:
    - Properties forming the proposed Project Area; and
    - Adjacent properties;
- Key government and agency members:
    - Low Carbon Economy Unit within the Department for Energy and Mining;
    - ElectraNet;
    - Regional Development Australia;
    - Federal Member for Grey;
    - State Member for Frome; and
    - CEO, Mayor and relevant Development Officers of the Port Pirie Regional Council;
- The Nukunu Peoples Council Inc.;
- The wider Bungama/Napperby/Warnertown communities and established groups including:
    - Upper Spencer Common Purpose Group;
    - Napperby Tennis Club and Community Centre;
    - Napperby Memorial Hall;
    - Port Pirie CommUNiTY;
    - HOPE Partnership
    - Rotary Club of Port Pirie;
    - Uniting Care Wesley Country SA; and
    - Soroptimist International of Port Pirie Incorporated;
- The relevant authorities who manage the registered easements across the Project Area:
    - ElectraNet;
    - SA Power Networks;
    - Telstra; and
    - The Minister for Transport, Infrastructure and Local Government.

Additional stakeholders may be identified as the Project progresses over time. EPS Energy will continue to review the above list as stakeholders gain or lose interest in participating in the engagement process over the Project's life.

2.2. STAGED RELEASE OF INFORMATION

As outlined in the Plan, EPS Energy staged the initial release of Project information with the purpose of directly informing the local community and ensuring the parties considered to have the highest level of impact and/or interest in the Project were notified earliest. This direct communication was an effort to begin building trust and a genuine relationship with the local community and key stakeholders.

EPS Energy recognised the potential risks associated with staging the release of information and simultaneously contacting the adjacent residents and key stakeholders due to the rapidity of sharing information via digital social media. Where relevant risk management measures were implemented they are specified in the subsections below.

2.2.1. Commercial-Confidential Release

In order to conduct preliminary site selection and feasibility studies, EPS Energy discussed certain Project information to the landowners of the proposed Project Area prior to public release of any information. This included landowners and occupiers of land where the easement is proposed to connect the Project to the existing electricity substation.

For the same purposes, EPS Energy discussed Project information with members of ElectraNet and the Low Carbon Unit of the Department for Energy and Mining (then Department for Premier and Cabinet) prior to public release of any information.

EPS Energy also released certain Project information to subconsultants in order to complete preliminary studies on the proposed Project Area.

Where applicable, EPS Energy expressed the information shared was Commercial in Confidence and Confidentiality Deeds would be executed where necessary.

2.2.2. Initial Public Release

EPS Energy conducted a "cold-calling" process to correspond directly with the landowners and occupiers of adjacent properties with the purpose of introducing the Project, personally inviting them to a dedicated Neighbour Information Session and to seek their preference for receiving impending Project information materials.

A total of 27 neighbouring landowners were identified whose properties adjoin the Project Area. EPS Energy had access to 16 neighbouring landowners' telephone numbers, four (4) of these were disconnected lines and three (3) of these did not answer or return calls. Therefore, only nine (9) of the 27 neighbouring landowners were contacted on 8 – 9 May 2018 at various times of the day. EPS Energy sent an invitation for the dedicated Neighbour Information Session (Appendix 2) and Project Information Brochure (Appendix 1) to these nine (9) neighbouring landowners upon receiving their preference of delivery (i.e. express-post or Email).

EPS Energy express-posted the invitation and information brochure to the remaining 18 neighbouring landowners on 11 May 2018 to the PO Box listed on the Certificate of Title for the landholdings; three (3) of which returned unopened. The same three (3) were unable to be contacted via telephone as two (2) were disconnected lines and one (1) was a private number. It is anticipated that these remaining three (3) were captured in the unaddressed mailbox drop described in Section 2.2.3.

Concurrent to this, EPS Energy placed calls on 10 May 2018 to key members of the above-mentioned Government and agencies to introduce the Project and request preliminary meetings. A telephone conference was held on 25 May 2018 and additional meetings were held on 28 May 2018 and 1 June 2018 in South Australia.

During this process, EPS Energy declined numerous requests for interviews until after it had made sufficient efforts to directly contact the above-mentioned parties.

2.2.3. Secondary Public Release

Once communication had been established with these parties, EPS Energy directly notified the community groups and other stakeholders stated in Section 2.1 via Email and post on 14 May 2018.

This secondary stage also included publishing the Project website, an unaddressed mailbox drop of the invitation to the Community Information Sessions (Appendix 3) to 695 post office boxes and 13 over-the-counter addresses at the Port Pirie Post Office and releasing an announcement to the media on 21 May 2018 (Appendix 6).

3. ENGAGEMENT PROGRAM

As outlined in the Plan, EPS Energy developed a proposed Engagement Program, including the relevant timeframes and actions for each phase of the Project. The Engagement Program is divided into five distinct phases, providing a logical sequence for engagement activities.

Below is a summary of the outcomes achieved at each phase and the intended outcomes for phases that have not yet ensued.

3.1. PHASE 1: PREPARATORY PHASE

The purpose of the engagement conducted during the Preparatory Phase was predominantly to discuss/meet with the potential Project landowners to discuss hosting the Project.

The Preparatory Phase included the following engagement:

- Discussions and meetings with the Project landowners to discuss hosting the Project and executing Agreements, where relevant;
- Discussions and meetings with the Low Carbon Economy Unit within the Department for Energy and Mining (then Department for Premier and Cabinet) to discuss the process of applying for Crown Sponsorship; and
- Discussions and meetings with ElectraNet to discuss and execute a Preliminary Works Agreement and Works Orders to determine connection options to the Bungama Substation.

3.2. PHASE 2: PRE-LODGEMENT COMMUNITY & STAKEHOLDER ENGAGEMENT

The purpose of the engagement conducted during this phase was predominantly to introduce the Project to the community and other stakeholders prior to lodging a Development Application. This is to ensure that the comments, concerns and values of these parties are considered in project decision making.

Phase 2 engagement included the following:

- Correspondence with specialists as stated in Section 2.2 regarding site suitability and feasibility;
- Correspondence with the adjacent landowners to the Project to introduce EPS Energy and the Project, this entailed:
    - Telephoning the landowners directly and seeking their preference of receiving the impending Project information materials; and
    - Emailing and express-posting an invitation to the dedicated Neighbour Information Session and a Project Information Brochure;
- Correspondence and meeting with members of State and Local Government to further discuss the Project and expectations regarding ongoing engagement;

- Correspondence with the identified local community groups by Emailing and express-posting an invitation to the Community Information Session;
- Unaddressed mailbox-drop to 708 in the locality;
- Newspaper advertisement in local paper advising of the proposal and the particulars of the Community Information Sessions;
- Press release to local media;
- Activation of the Project website;
- Correspondence with the Project landowners to keep informed of upcoming community and other stakeholder engagement and the resulting outcomes;
- Community Information Sessions and Neighbour Information Session held at the Napperby Tennis and Community Centre on 31 May 2018 and 1 June 2018;
- Collating expressions of interest from the local and regional industry workforce seeking to participate in the construction phase;
- Sending a courtesy letter to key Local and State Government members to advise of the outcomes of the Information Sessions;
- Preparation of a Post- On-ground Consultation Summary Report to ensure the comments, concerns, values and feedback from the community and other stakeholders has been captured and considered; and
- Ongoing response to enquiries from the community and other stakeholders.

3.3. PHASE 3: DEVELOPMENT APPLICATION

The key objectives for this phase in relation to community and other stakeholder engagement is to provide updates on the status of the Project as key milestones are executed.

Phase 3 engagement included the following:

- Continued liaison with individual community and other stakeholder members who have expressed a high interest in the Project;
- Continued liaison with the Project landowners to keep informed of upcoming Project milestones;
- Publishing updates to the Project website, in particular the Frequently Asked Questions in response to regular enquiries and comments;
- Correspondence with the Office for the Technical Regulator to obtain the Certificate for Development to append the Crown Sponsorship application;
- Correspondence with the Low Carbon Economy Unit of the Department of Energy and Mining to lodge the Crown Sponsorship application; and
- Sending a courtesy update to key members of the Port Pirie Regional Council, State Government and other key agencies upon lodgement of the Crown Sponsorship application.

Phase 3 engagement will also include continued correspondence with Project landowners, adjoining landowners, and community and other stakeholders regarding the following matters:

- Lodgement of the Development Application with the State Commission Assessment Panel;
- Issuing responses to any potential submissions to the Development Application;
- Providing updates if/when approval is granted for the Development Application; and
- And any other matters resulting from the Conditions of Consent.

3.4. PHASE 4: CONSTRUCTION

The key purpose of engagement during Phase 4 is to ensure the community and other stakeholders are aware of the construction activities and any temporary disruptions.

Phase 4 engagement will likely include the following:

- Public notification and updates of construction information including timelines and contact information to be available on the Project website, via local media and on signage at the entrance to the site;
- Correspondence and potential meetings with adjacent landowners with the aim of minimising impacts during this phase; and
- The appointment of a dedicated "complaints line" for the public to report nuisance or negligence of construction terms.

3.5. PHASE 5: OPERATION AND DECOMMISSION

The key objective of engagement during this phase is to maintain ongoing and open channels of communication with the community and other stakeholders to ensure any potential concerns are appropriately managed.

With the end of the operational life of the Project, the Project will likely be decommissioned. An appropriate Community and Stakeholder Engagement plan or strategy should be developed approximately 12-18 months prior to decommissioning.

Phase 5 engagement will likely include the following:

- Public notification and updates of operation and/or decommissioning information and contact information to be available on the Project website and a sign at the entrance to the site;
- The establishment of a Local Community Fund and any correspondence relating to the management and governance of the Fund;
- Correspondence and potential meetings with adjacent landowners with the aim of minimising impacts during operation and decommissioning;
- The appointment of a dedicated Community Liaison Officer with contact details (phone, Email and mailing address) to be the priority point of contact for the community and other stakeholders. Their role should entail:
    - Developing and maintaining relationships with the key community and other stakeholders; and
    - Establishing and maintaining a complaints/comments register.

4. ENGAGEMENT TOOLKIT

The following Engagement Toolkit outlines the means by which EPS Energy engaged the community and other stakeholders to meet the Aims and Objectives stated in Section 2.

4.1. ENGAGEMENT ACTIVITIES

The engagement activities outlined below have been selected in accordance with industry practice. The activities are designed to be engaging, informative and promote deliberative discussions that aims to inform Project decision making.

4.1.1. Information Sessions

EPS Energy held four information sessions over two days; one of which was a dedicated Neighbour Information Session, while the remainder were general Community Information Sessions. The purpose of the information sessions was to promote a two-way exchange of information, where the community and other stakeholders could raise any concerns and provide local knowledge, while EPS Energy provided further information about the Project both verbally and via visual and documented communication materials.

Details of the communication materials used are outlined in Section 4.2 below.

The information sessions were held at the Napperby Tennis and Community Centre, 33 Second Street, Napperby, South Australia 5540. The session times were as follows:

- Community Information Sessions:
  - Thursday, 31 May 2018, between 11:00am – 1:00pm and 5:00pm – 7:00pm;
  - Friday, 1 June 2018, between 10:30am – 12:30pm.
- Neighbour Information Session:
  - Thursday, 31 May 2018, between 2:00pm – 4:00pm.

As detailed in the Community and Stakeholder Engagement Plan, the information sessions were intended to be delivered in a casual setting where attendees could engage at their own pace. A total of five EPS Energy representatives were present at the information sessions. The communication materials were arranged in an open display that enabled attendees to walk through at their own pace, or with an EPS Energy representative. A table of refreshments was also available.

This was positively received by attendees who preferred this delivery over a seminar style.

An estimated 124 guests attended the information sessions over the two days. This included 13 of the 27 identified adjacent landowners who attended the dedicated Neighbour Information Session. This also included a number of representatives from the Port Pirie Regional Council, Regional Development Australia and ElectraNet.

4.2. COMMUNICATION MATERIALS

The intention of the communication materials outlined below were to facilitate the exchange of information between EPS Energy and the community and other stakeholders in an engaging manner.

4.2.1. Website

During the Project Preparation Phase, EPS Energy created a Project specific website to provide information in an engaging manner. The website has been used to publish Project updates and facilitate the exchange of information via a downloadable Information Brochure and responses to frequently asked questions, while the Contact Page includes an electronic feedback form. The Project website is located at www.bungamasolar.com.au

4.2.2. Preliminary Information Package

During the Preparation Phase EPS Energy prepared the Information Brochure (Appendix 1) outlining the key features of the Project including its proposed location, summary of the technical functions of the Project, current status, key social and environmental benefits, a map of the Project and contact information.

EPS Energy also prepared an invitation to the designated Neighbour Information Session (Appendix 2) for the adjoining landowners and a separate invitation to the broader Community Information Sessions (Appendix 3). Both invitations include a brief summary of the proposal as it was at that time, the session dates and times, venue address, photograph of the venue and contact information. The reverse side of the invitations include a summary of the Project information brochure.

Copies of the Information Brochure were made available at the Information Sessions and were distributed along with the invitation to the Neighbour Information Session to adjoining landowners during the Initial Public Release between 8 - 9 May 2018.

The invitations to the Community Information Sessions were delivered to the Community Groups outlined in Section 2.1 and a further 708 unaddressed mailboxes (including the 13 over-the-counter collections) in Port Pirie on 21 May 2018.

4.2.3. Feedback Form

EPS Energy prepared the Feedback Form (Appendix 4) including a short questionnaire to gain valuable information about the community and other stakeholders attending the Information Sessions including, their age group, the distance they reside from the Project, and how long they have resided in the area. The questionnaire aimed to gain information about the community and other stakeholders' opinion of renewable energy generally and whether they consider there to be any positive or negative impacts from the Project.

The Feedback Form will also be a useful tool to inform future engagement with the community and other stakeholders, specific to their values and concerns.

Analysis of the Feedback Form demonstrated a largely positive opinion of the Project (approximately 75%) and renewable energy generally (75% positive; 25% neutral; nil negative).

The positive comments included:

- Potential for local employment during construction;
- Interest in the locality for future projects;
- Economic benefit to the locality during construction;
- Clean energy production/ reduction in use of fossil fuels;
- Environmental benefits;
- Lower power costs; and
- Science, technology, engineering and mathematics (STEM) education.

The concerns recorded in the Feedback Forms included:

- Visual impacts on the scenery; and
- Uncertainty of negative effects on property values.

Responses to these concerns have been included in the revised frequently asked questions on the Project website.

4.2.4. Attendance Register

EPS Energy prepared an attendance register (Appendix 5) for the Information Sessions. This enabled the collection of key information about attendees including, their name, contact details and if they wish to receive Project updates via Email.

A total of 28 attendees signed the Register providing further positive feedback.

4.2.5. Media Release

EPS Energy advertised the Community Information Sessions in The Recorder and The Flinders News. An example of the advertisement is shown in plate 1 below.

A press release was issued to both of the above-mentioned local media outlets on 21 May 2018 (Appendix 6).

Plate 1: Clipping of Bungama Solar advertisement in The Recorder, Thursday 24 May 2018, page 4

4.2.6. Correspondence Register

EPS Energy developed a correspondence register to record known key stakeholder contact information and details of any correspondence that has occurred. The register is a 'live' document and updated according to all communication proceedings. The register is intended for internal-use only.

4.2.7. Visual Communication

A number of types of visual communication such as maps, images, information boards and a video were used to assist in the exchange of information in an engaging way and demonstrate examples of similar projects.

Mapping

The following maps were created by EPS Energy to visually communicate the Project's location:

- Bungama Solar - Locality Plan; and
- Bungama Solar – Site Plan.

Information Boards

A number of information boards were prepared providing the following information:

- Summary of EPS Energy;
- Summary of the technical aspects of solar technology;
- The development approval process and the Project's status;
- Example images of solar panels from both the front and behind the panels;
- Example images of solar panel cleaning technology; and
- Images of the visibility and scale of an existing solar farm.

As described above, these information boards were arranged in an open display that enabled attendees to walk through at their own pace or with an EPS Energy representative. The following Plates depict examples of the layout.

Plate 2: EPS Energy representatives with attendees of the Community Information Session, 31 May 2018

Plate 3: EPS Energy representatives with attendees of the Community Information Session, 31 May 2018

Video

EPS Energy compiled videos from solar technology suppliers demonstrating examples of the types of technology that may be used for the Project. The video provided an overview of the process involved in planning, designing, constructing and maintaining similar projects as well as an example of an operating project.

The video was set to play on a continuous loop positioned at the end of the displays and near the refreshments table. Many attendees watched the video while helping themselves to the refreshments and filled out the Feedback Form or conversed further with EPS Energy representatives.

5. COMMUNITY AND STAKEHOLDER RESPONSE

The initial response from the community and other stakeholders has been largely positive and supportive of the Project. Some adjoining rural residential land owners, while supporting solar energy, have raised concerns about the Project area adjoining their land. The project has been amended in response to the concerns raised, as detailed within this section.

Overall, the response has remained positive and supportive at the time of this report.

5.1. PRE- MAY/JUNE 2018 INFORMATION SESSIONS

5.1.1. Government and other Agencies

The response from Government and other Agencies to the initial contact was largely positive. Most organisations expressed interest in attending the sessions.

Some organisations were unavailable during the scheduled Information Session times therefore could not attend, and organised meetings with EPS Energy at other suitable times, or simply requested to be provided with project updates as the project progressed.

Key members of the Port Pirie Regional Council expressed their commendation of EPS Energy's early and comprehensive engagement approach.

5.1.2. General Community

As stated in Section 2.2.3, EPS Energy directly notified the identified community groups and other stakeholders via email and post on 14 May 2018.

This secondary stage also included publishing the Project website, conducting an unaddressed mailbox drop of the invitation to the Community Information Sessions (Appendix 3) to 695 post office boxes and 13 over-the-counter addresses at the Port Pirie Post Office and releasing an announcement to the media on 21 May 2018 (Appendix 6).

During this time, EPS Energy conducted interviews via telephone with ABC News (North and West), the Port Pirie Recorder and Southern Cross News Port Pirie.

EPS Energy received numerous expressions of interest via the Project website and Email for the provisions of services and employment.

EPS Energy were not contacted during this time by the general community otherwise.

5.1.3. Adjacent Landowners

As stated in Section 2.2.2, EPS Energy conducted a "cold-calling" process to correspond directly with the landowners and occupiers of adjacent properties with the purpose of introducing the Project, personally inviting them to a dedicated Neighbour Information Session and to seek their preference for receiving impending Project information materials. A total of 27 neighbouring landowners were identified whose properties adjoin the Project Area. EPS Energy had access to 16 neighbouring landowners' telephone numbers, four (4) of these were disconnected lines and three (3) of these did not answer or return calls.

During this time, only three (3) of the 27 adjacent landowners contacted EPS Energy via telephone to ask questions and raise initial concerns about the Project. Concerns raised by adjacent landowners prior to the May/June Information Sessions were specifically regarding:

- Project approval status;
- The potential adverse visual impact on their land;
- The potential adverse noise impacts on their land; and
- The potential negative impacts on the value of their land.

EPS Energy recorded all concerns and encouraged adjacent landowners to attend the dedicated Neighbour Information Session to further discuss their queries and concerns in detail with key Project team members.

Prior to the May/June Information Sessions, EPS Energy undertook a follow-up calling exercise to the adjacent landowners to gauge the expected attendance for the Information Sessions. During this time only one (1) adjacent landowner expressed their concerns regarding the Project, which was related to Project's effect on the value of their land. This landowner agreed to attend the dedicated Neighbour Information Session to discuss the matter further.

5.1.4. Nukunu Peoples Council Inc.

On 14 May 2018 EPS Energy sent the Nukunu Peoples Council Inc. information about the Project and an invitation to the Community Information Sessions. Further attempts to contact the group via telephone occurred on 28 May 2018. It is noted that EPS Energy did not receive a response during this time.

5.1.5. Easement Authorities

On 21 May 2018 EPS Energy sent a letter with information about the Project and an invitation to the Community Information Sessions to representatives of Department for Transport, Infrastructure and Local Government, Telstra, ElectraNet and SA Power Networks.

5.2. POST- MAY/JUNE 2018 INFORMATION SESSIONS

5.2.1. Government and other Agencies

A number of key members of Council, State Government and other agencies attended the Community Information Sessions. The responses remained largely positive and supportive of the Project.

EPS Energy has since provided a number of Project updates via email to these parties and will continue to do so as the Project continues to progress.

5.2.2. General Community

Most attendees of the Community Information Sessions were generally interested in learning more about the Project and looking for additional details around some of the information in the Information Brochure. Conversations with the attendees also identified anecdotal information about the area, including potential risks that may be useful to inform various aspects of the Project (e.g. the occurrence of strong winds, local resources).

The key themes that have arisen from correspondence with the general community to date include:

- Expressions of interest to participate in the Construction Phase by providing services and/or equipment;
- Interest in the locality for future projects;
- Economic benefit to the locality during construction;
- The potential adverse visual impacts of the Project;
- Clean energy production/ reduction in use of fossil fuels;
- Environmental benefits; and
- Lower power costs.

5.2.3. Adjacent Landowners

A total of 13 of the 27 identified adjacent landowners attended the Information Sessions. While supporting renewable energy in the form of solar energy, some landowners raised concerns about the Project being located near their land. Common concerns that were raised included:

- The potential adverse visual impact on their land;
- The potential adverse noise impacts on their land;
- The potential adverse impacts on their livestock and horses on their land;
- The potential negative impacts on the value of their land; and
- The potential safety issues with construction traffic.

These concerns corresponded to those raised during contact with adjacent landowners prior to the sessions.

Key members of EPS Energy attended individual site visits of particularly interested adjacent landowners to discuss their specific concerns with the Project.

Overall, the remaining adjacent landowners were complaisant and/or supportive of the Project. Many of the adjoining properties are primarily used for agricultural purposes with those landowners residing on different properties. Other enquiries and interests from the adjacent landowners included:

- Their land being part of the Project;
- Shared use of the land (i.e. grazing under/around panels); and
- Management of land under the panels.

After the Information Sessions, EPS Energy continued to correspond with adjacent landowners who remained concerned about the Project. This correspondence occurred via telephone, short message service (SMS) and email.

Despite the continued direct correspondence, one (1) adjacent landowner contacted the media regarding concerns. One (1) media outlet published an article on the matter.

The key concerns expressed within the article reflect the same concerns that this adjacent landowner discussed directly with EPS Energy both via telephone before the May/June Information Sessions, at the dedicated Neighbour Information Session and at an individual site visit to their land. These concerns include the siting of the Project, noise and visual effects of the Project, fiscal value of their land and recompense.

EPS Energy note that this article was also published on the media outlet's digital social media webpage on 22 July 2018, and while it received approximately 180 comments in approximately three (3) days of being published, only approximately ten (10) individuals were primarily involved in these comments, one (1) of these being the adjacent landowner who contacted the media. EPS Energy conducted a review of these comments three (3) days after the article was published and note that of the 180 comments approximately 36.7% were negative, 26.1% were positive and 37.2% were either neutral or not applicable. EPS Energy has continued to correspond with this landowner and all others who have expressed concerns or sought to discuss the Project's progress.

EPS Energy recognised a substantial amount of misleading information being shared through the comments relating to the above-mentioned article. As a result, EPS Energy distributed a letter on 5 July 2018 to the adjacent landowners clarifying this information, which essentially stated:

- The community feedback received to date (at the time of the letter), along with information from reports and investigations required for the Project is being used to inform the next round of solar farm design and information for a Development Application;
- A Development Application had not been lodged (at the time of the letter) and a number of works needed to be completed before a Development Application is lodged; and
- EPS Energy would directly provide an update when the Development Application is lodged and details on how submissions about the Project could be made.

In direct response to adjacent landowner concerns, designs have been amended to reduce the potential for adverse impacts by;

- Including in excess of 7 kilometers of visual buffering in the form of landscape screening at a direct project cost estimated to exceed $750,000;
- Reducing the land area allocated to solar panels by approximately 24 hectares, equivalent to a reduction of 36,000 panels and equating to approximately $5,000,000 in relinquished income over the life of the project; and
- Power Conditioning Units near adjoining boundaries being relocated to reduce the potential for noise impact.

Further, EPS Energy has commissioned a Traffic Impact Assessment (Appendix 10), a Visual Impact Assessment (Appendix 7), a Glint and Glare Assessment (Appendix 12) an Acoustic Assessment (Appendix 13) and prepared a Landscaping Plan (Appendix 14) to assist in ameliorating potential or perceived impacts.

5.2.4. Nukunu Peoples Council Inc.

Although representatives from the Nukunu Peoples Council Inc. were unable to attend the Information Sessions correspondence has occurred via telephone, Email and post.

EPS Energy is continuing to correspond with Nukunu Peoples Council Inc. representatives to gain an understanding of their expectations of involvement in the Project post lodging a Development Application.

The Nukunu Peoples Council Inc. has thus far expressed that they are pleased with EPS Energy corresponding with them prior to lodging a Development Application.

EPS Energy understand that the Nukunu Peoples Council Inc. have experience in engaging in Heritage aspects of other types of development on Native Title land.

5.2.5. Easement Authorities

A representative of ElectraNet attended the Community Information Session in June 2018. ElectraNet is a key stakeholder to the Project and has worked collaboratively with EPS Energy on a number of matters including Connection Options and auxiliary advice and guidance on matters where ElectraNet is referenced in the Development Application.

EPS Energy liaised with a representative of Epic Energy on 01 June 2018 to discuss the Project and its location adjacent to Epic Energy's gas substation on Locks Road. Epic Energy have been responsive to communication with EPS Energy and have not expressed any concerns.

Ongoing correspondence with these authorities will continue as the Project progresses to ensure no encroachment on any easement authorities' registered interest on the land.

5.3. ONGOING COMMUNICATION MEASURES

Notwithstanding the current generally positive response toward the Project, EPS Energy intend to maintain an open dialogue with the community and other stakeholders. These measures are described in Sections, 3.4 and 3.5 of this report.

6. CONCLUSION

EPS Energy consider early and ongoing engagement with the community and other stakeholders that are involved, impacted or interested in Bungama Solar Project an essential component of the Project's development process and overall success.

The main purpose of the engagement process thus far has been to involve the community and other stakeholders and identify local values and concerns, to inform the decisions and activities of the Project. The tools and activities outlined in this Community & Stakeholder Engagement Plan seek to create numerous opportunities to foster a genuine relationship between EPS Energy and these parties.

The outcomes of the engagement undertaken thus far indicate there is an interest from the local community and other stakeholders. It is considered that the comprehensive Engagement Program developed at the Preparatory Phase has facilitated a process of genuine and effective community and other stakeholder engagement.

As noted, to address directly adjacent landowner concerns, designs have been amended to reduce the potential for adverse impacts by;

- Including in excess of 7 kilometers of visual buffering in the form of landscape screening at a direct project cost estimated to exceed $750,000;
- Reducing the land area allocated to solar panels by approximately 24 hectares, equivalent to a reduction of 36,000 panels and equating to approximately $5,000,000 in relinquished income over the life of the project; and
- Power Conditioning Units near adjoining boundaries being relocated to reduce the potential for noise impact.

Recognising the ongoing engagement measures to be maintained during the construction and operational phases, it is not anticipated that any adverse impacts upon the community or other stakeholders will arise with respect to the Project.

APPENDIX 1

Project Information Brochure

BUNGAMA SOLAR

BUNGAMA SOLAR

PROJECT INFORMATION

Bungama Solar is a proposed 280 MW (AC) utility scale solar photovoltaic and battery storage plant to integrate into the National Electricity Market through a 275kV connection to ElectraNet's Bungama Substation in South Australia.

LOCATION

Bungama Solar is to be developed on approximately 500 hectares of cleared land in the suburbs of Bungama, Napperby and Warnertown, South Australia. The site is situated approximately 6 kilometres east of Port Pirie and 220 kilometres north of Adelaide. The project is within the Local Government Area of Port Pirie Regional Council.

PROJECT

HOW BUNGAMA SOLAR WORKS

Bungama Solar is a large-scale utility power plant that creates energy from the sunlight via photovoltaic (PV) cells most likely to be mounted on sun tracking systems.

Tracking solar panel systems follow the sun's movement throughout the day for maximum collection. At the end of the day the panels track back to the east ready for the next operation.

The DC electricity that is created by sun through the cells is fed through cables to a series of invertors where the electricity is converted to AC and increased in voltage. The invertors are connected through underground cables to a switching yard and by overhead transmission lines to the Bungama Substation for connection to the South Australian electrical grid.

Battery storage is proposed as part of Bungama Solar and will provide additional power system security for South Australia's grid.

During the operational phase, regular inspections, panel cleaning, componentry servicing and site maintenance are required. Additional infrastructure includes internal access tracks, offices, workshop sheds, fence lines and drainage.

Solar farms typically have a minor physical disturbance footprint. As such, investigations into co-agriculture opportunities are underway to ascertain opportunities within Bungama Solar for other forms of traditional agriculture such as sheep grazing and apiculture to co-exist with the solar operations.

Figure 1 – Bungama Solar Project Area (Source: Google Earth Pro, 2018).

Bungama Solar
www.bungamasolar.com.au

Contact us:
E: enquiries@bungamasolar.com.au
P: 0474 319 195

KEY PROJECT STATISTICS

BUNGAMA SOLAR

PROJECT STATUS

SOCIAL AND ENVIRONMENTAL BENEFITS

Bungama Solar local community social contribution includes:

- Local Community Fund
- 150-200 construction jobs with a large component from the regional workforce

Bungama Solar 280 MW generating capacity is equivalent to:

- Powering 86,000 homes each year
- 195,000 cars off the road each year
- Reducing 487,000 tonnes of GHG emissions each year
- Planting 70,000 trees each year

CONTACT INFORMATION

Phone:	**0474 319 195**
E-mail:	**enquiries@bungamasolar.com.au**
Website:	**www.bungamasolar.com.au**

APPENDIX 2

Invitation to Neighbour Information Session

BUNGAMA SOLAR

invite you to join us for our

Neighbour Information Session

Bungama Solar is a new large scale solar and battery storage facility proposed near Port Pirie, South Australia. Bungama Solar is a 280 MW (AC) utility scale solar photovoltaic plant with battery storage to feed into the National Electricity Market through a 275kV connection to ElectraNet's Bungama Substation. Bungama Solar is to be developed on approximately 500 hectares of existing cleared land in the suburbs of Bungama, Napperby and Warnertown, South Australia.

Bungama Solar is committed to a genuine and early community and stakeholder engagement process. As part of this process, Bungama Solar is seeking to inform neighbouring property owners about the project. We look forward to discussing the project with you.

SESSION DATES & TIMES

Thursday 31st May 2018
2.00pm — 4.00pm

LOCATION

Napperby Tennis and Community Club
33 Second Street
Napperby
South Australia 5540

ENQUIRIES

Phone:	**0474 319 195**
E-mail:	enquiries@bungamasolar.com.au
Website:	www.bungamasolar.com.au

Please note that if you cannot attend this session we will be holding information sessions for the wider community, which you are welcome to attend. These will be held Thursday 31st of May between 11.00am – 1.00pm and 5.00pm – 7.00pm and Friday 1st of June between 10.30am – 12.30pm.

BUNGAMA SOLAR

Bungama Solar local community social contribution includes:

Local Community Fund

150-200 construction jobs with a large component from the regional workforce

Bungama Solar 280 MW generating capacity is equivalent to:

- **Powering 86,000 homes each year**
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For more visit:
www.bungamasolar.com.au

Bungama Solar
www.bungamasolar.com.au

Contact us:
E: enquiries@bungamasolar.com.au
P: 0474 319 195

APPENDIX 3

Invitation to Community Information Sessions

BUNGAMA SOLAR

invite you to join us for our

Community Information Session

Bungama Solar is a new large scale solar and battery storage facility proposed near Port Pirie, South Australia. Bungama Solar is a 280 MW (AC) utility scale solar photovoltaic plant with battery storage to feed into the National Electricity Market through a 275kV connection to ElectraNet's Bungama Substation. Bungama Solar is to be developed on approximately 500 hectares of existing cleared land in the suburbs of Bungama, Napperby and Warnertown, South Australia.

Bungama Solar is committed to a genuine and early community and stakeholder engagement process. As part of this process, Bungama Solar is seeking a cooperative approach with the local community, key stakeholders and the Council to inform the project and to identify opportunities for local engagement and employment during construction and operation. We look forward to discussing the project with you.

SESSION DATES AND TIMES

Thursday 31st May 2018
at 11.00am – 1.00pm and
5.00pm – 7.00pm
and **Friday 1st June 2018**
at 10.30am – 12.30pm

LOCATION

Napperby Tennis and Community Club
33 Second Street
Napperby
South Australia 5540

ENQUIRIES

Phone:	**0474 319 195**
E-mail:	enquiries@bungamasolar.com.au
Website:	www.bungamasolar.com.au

Please note that if you cannot attend, project information is available on the Bungama Solar website.

BUNGAMA SOLAR

Bungama Solar local community social contribution includes:

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APPENDIX 4

Feedback Form

BUNGAMA SOLAR

FEEDBACK FORM

We value your honest feedback and opinions to ensure our project appropriately addresses local values and concerns. This feedback will be used to inform future engagement with the community as well as the Project so we can prioritise mutually beneficial outcomes.

QUESTIONNAIRE

Of the options listed below, which best describes where you live in relation to the Bungama Solar project?

- ☐ Less than 1 km
- ☐ Between 1 km and 5 km
- ☐ Greater than 5 km

Which age group are you included in?

- ☐ 18—34
- ☐ 35—54
- ☐ 55+

Approximately, how long have you lived in the area?

- ☐ Less than 5 years
- ☐ 5 to 10 years
- ☐ 10 years+

What is your opinion of renewable energy, generally?

- ☐ Positive
- ☐ Neutral
- ☐ Negative

Do you consider there to be any positive impacts from the Bungama Solar project?

Do you consider there to be any negative impacts from the Bungama Solar project?

Other comments:

CONTACT US

P: 0474 319 195

E: enquiries@bungamasolar.com.au

BUNGAMA SOLAR

APPENDIX 5

Attendance Register

BUNGAMA SOLAR

Full Name	Contact Number	Email Address	Postcode	Feedback/ Comments
		☐ Please tick if you **would like** updates via email*		

*Alternatively, you can check www.bungamasolar.com.au for updates relating to the Project.

APPENDIX 6

Media Release

21/05/2018

Media Release: Bungama Solar

Bungama Solar is a new large-scale solar and battery storage facility proposed near Port Pirie, South Australia. Bungama Solar is a 280 MW (AC) utility scale solar photovoltaic plant with battery storage to feed into the National Electricity Market through a 275kV connection to ElectraNet's Bungama Substation.

Bungama Solar is to be developed on approximately 500 hectares of existing cleared land in the suburbs of Bungama, Napperby and Warnertown, South Australia.

South Australian energy consumers will benefit from Bungama Solar's proposed large scale renewable energy project through reduced energy costs and a reduction in emissions. The project will offer employment opportunities, diversify the region's energy mix and create potential education and tourism opportunities. The project will also directly contribute to the local community through a community fund.

Bungama Solar is committed to a genuine and early community and stakeholder engagement process. As part of this process, Bungama Solar is seeking a cooperative approach with the local community, key stakeholders and the Council, and also seeks to identify opportunities for local employment during construction and operation.

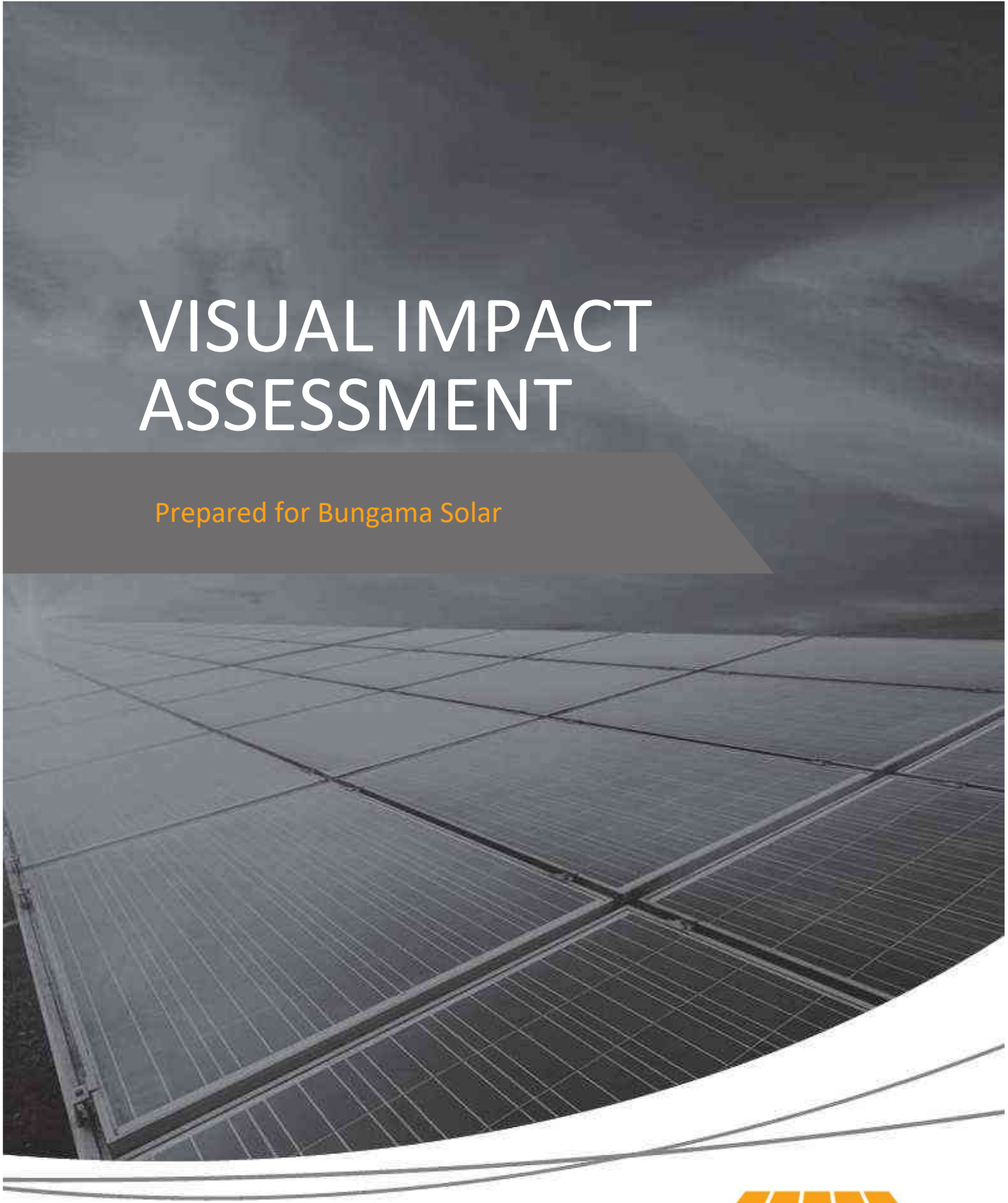
Bungama Solar will be hosting community information sessions over two days at the Napperby Tennis and Community Club, 33 Second Street, Napperby, South Australia 5540. The session times are:

- Thursday 31st May 2018: 11.00am – 1.00pm and 5.00pm – 7.00pm; and
- Friday 1st June 2018: 10.30am – 12.30pm.

For more information please see the Bungama Solar website at www.bungamasolar.com.au

APPENDIX 7

Visual Impact Assessment



VISUAL IMPACT ASSESSMENT

Prepared for Bungama Solar

EPS ENERGY

Reference No. 11297 November 18

BUNGAMA SOLAR

www.bungamasolar.com.au

QUALITY ASSURANCE AND DECLARATION

Quality Assurance and Version Control Table		
Project:	Bungama Solar	
Client:	Bungama Solar 1 Pty Ltd and Bungama Solar 2 Pty Ltd	
Rev:	**Date:**	**Reference:**
V01	29.11.2018	11297_Bungama Solar – Visual Impact Assessment
Checked by:	L. Bryson	
Approved by:	S. McCall/ J. Burns	
Declaration:	*The opinions and declarations in this document are ascribed to EPS Energy and are made in good faith and trust that such statements are neither false nor misleading.* *In preparing this document, EPS Energy has considered and relied upon information obtained from the public domain, supplemented by discussions between key EPS Energy staff, representatives from governing agencies and independents, including the client and specialist consultants.*	
Applicant:	EPS Energy PO Box 195 Charlestown NSW 2290 (02) 9258 1362	
Prepared By:	M. Budisavljevic	
Reviewed By:	S. McCall	
Project land:	CT 6037/29 – A20 DP80628 CT 6127/5 – A558 FP188690 CT 5954/187 – A52 DP25903 CT 5949/272 – A4 DP24997 CT 5390/999 – A559 FP188691 CT 5360/334 – A551 FP188683 CT 5972/304 – A1 DP24255 CT 5776/531 – A501 DP52803 CT 5776/532 – A502 DP52803 CT 5978/766 – A55 DP71831	

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TABLE OF FIGURES

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1. INTRODUCTION

This Visual Impact Assessment (VIA) has been prepared by EPS Energy for Bungama Solar an integrated but separately operated grid connected Photovoltaic Energy Generation System (PVS) of approximately 280MW (AC) generation capacity and a 140MW capacity Battery Energy Storage System (BESS) with 560MWh of storage that will feed into the National Electricity Market via ElectraNet's Bungama Substation. The PVS element, the BESS element and associated infrastructure, together are "the Project".

The Project land currently supports grazing and cropping agricultural activities, consistent with the surrounding land use. Various forms of existing infrastructure are present within the area including SA Power Networks (SAPN) and ElectraNet's Bungama Substation, and numerous high voltage transmission lines both crossing and surrounding the Project area.

The Project land is zoned Primary Production under the Port Pirie Regional Council Development Plan 2017. The Development Plan provisions contemplates that Renewable Energy Projects such as Bungama Solar will be established in the Port Pirie Council area on land within the Primary Production Zone subject to implementation of management techniques set out in the Development Plan.

This VIA has been prepared to support a Development Application for the Project. The intent of this VIA is to provide an assessment of the existing landscape within the Project area, as well as the surrounding area, to determine the potential visual impact of the Project to the landscape and visual receptors during construction and operational phases. EPS Energy understand that the assessment of visual impact is subjective, and the individual consideration of visual and landscape effects and the significance of these effects may differ between receptors depending on personal values attached to the landscape.

1.1. OBJECTIVES

The objectives of this VIA are to:

- Identify and analyse the landscape character within and around the surrounding Project area;
- Identify and assess potential visual receptors and viewpoints from which the Project may have a visual effect, within the Visual Catchment;
- Assess the visual significance of the viewpoints and the sensitivity of the potential visual receptors;
- Assess the suitability of the Project within its location; and
- Recommend mitigation measures where appropriate.

1.2. KEY TERMS

Key terms used throughout this VIA are defined in Table 1-1 below:

Table 1-1: Key Terms

Term	Definition
Background	Defined by exceeding the extent of the Visual Catchment and/or features and elements in the horizon.
Effect	The landscape or visual outcome of a proposed change. It may be the combined result of sensitivity together with the magnitude of the change.
Foreground	Within 100m of the Visual Catchment where details are easily discernible and/or the occupy a large proportion of the field of view.
Impact	The effect of a proposal, which can be adverse or beneficial, when measured against an existing condition.
Landscape Values	The relative value that is attached to different landscapes by present or future generations. Landscape values may include biodiversity, geo-diversity, historic, and aesthetic values, as well as more personal values such as a person's associations, memories, knowledge or experiences of that landscape.
Landscape Character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse.
Landscape Effect	A change to landscape values as a result of development, which can be either positive or negative.
Landscape Receptors	Defined aspects of the landscape resource that have the potential to be affected by a proposal.
Midground	Within the 1-2km Visual Catchment, where details are less distinguishable but the features occupy a moderate proportion of the field of view.
Perception	Combines the sensory (that we receive through our senses) with the cognitive (our knowledge and understanding gained from many sources and experiences).
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Significance	A measure of the importance or gravity of the environmental effect, defined by significance criteria specific to the environmental topic.
Surrounding Area	Those areas outside the Project area that have been identified as relevant for investigation of landscape values and potential effects.

Term	Definition
View	Any sight, prospect or field of vision as seen from a place, and may be wide or narrow, partial or full, pleasant or unattractive, distinctive or nondescript, and may include background, midground and/or foreground elements or features.
Visual Amenity	The overall pleasantness of the views people enjoy of their surroundings, which provides an attractive visual setting or backdrop for the enjoyment of activities of the people living, working, recreating, visiting or travelling through an area.
Visual Catchment	Areas visible from a combination of locations within a defined setting (may be modelled or field-validated).
Visual Effect	Effects on specific views and on the general visual amenity experienced by people.
Visual Receptors	Individuals and/or defined groups of people who have the potential to be affected by a proposal.
Visual Significance	Used in this instance to describe the weighting that is given to the relative importance of identified landscape values. The landscape values of an area likely to be significant are those that help understand the past, enrich the present, and which will be of value to future generations.
Zone of Theoretical Visibility (ZTV)	A map, usually digitally produced, showing areas of land within which, a development is theoretically visible. The ZTV does not account for any vegetation or built environment. Therefore, the actual view of the project is likely to be less than indicated on the ZTV plan.

(Landscape Institute and IEMA, 2013; Australian Institution of Landscape Architects, 2018; Roads and Maritime Services, 2013)

2. METHODOLOGY

The Project's potential visual impact on the landscape and visual receptors is derived from changes in the landscape, its character and how this is experienced. Effects may arise at different scales (local, regional and national) and have different levels of significance (high, moderate and low) depending on the sensitivity of the visual receptors and the magnitude of change. Changes to the landscape are more than visual and include a range of physical and perceptual factors. Determining the overall visual impact therefore requires a combination of qualitative and quantitative assessment measures and acknowledgement of limitations.

2.1. ASSESSMENT FRAMEWORK & CRITERIA

It is noted that specific guidelines for assessing the visual impact of utility-scale solar projects in South Australia are unavailable. This is a recognised limitation to this VIA. To mitigate this, the methodology used throughout this VIA is based on a number of existing national and international landscape and VIA guidelines. These resources are consistently used for VIAs across Australia, in place of available specific guidelines, and are generally considered industry standard and appropriate. The key resources this methodology is based on includes:

- *Guidelines for Landscape and Visual Impact Assessment* (Landscape Institute and Institute of Environmental Management & Assessment (IEMA), 2013);
- *Guidance Note for Landscape and Visual Assessment* (Australian Institute of Landscape Architects (AILA), 2018);
- *Environmental Impact Assessment Practice Note: Guidelines for Landscape Character and Visual Impact Assessment* (Roads and Maritime Services (RMS), 2013); and
- *Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design* (Department for Planning and Infrastructure, 2007).

Further to the above-mentioned resources, the 'Objectives' and 'Principles of Development Control' related to the visual impact of proposed developments from the Port Pirie Regional Council Development Plan (Consolidated – 31 October 2017) (Development Plan) are also considered as part of this methodology.

The methodology, and therefore the subsequent Sections of this VIA, follows the process outlined in below.

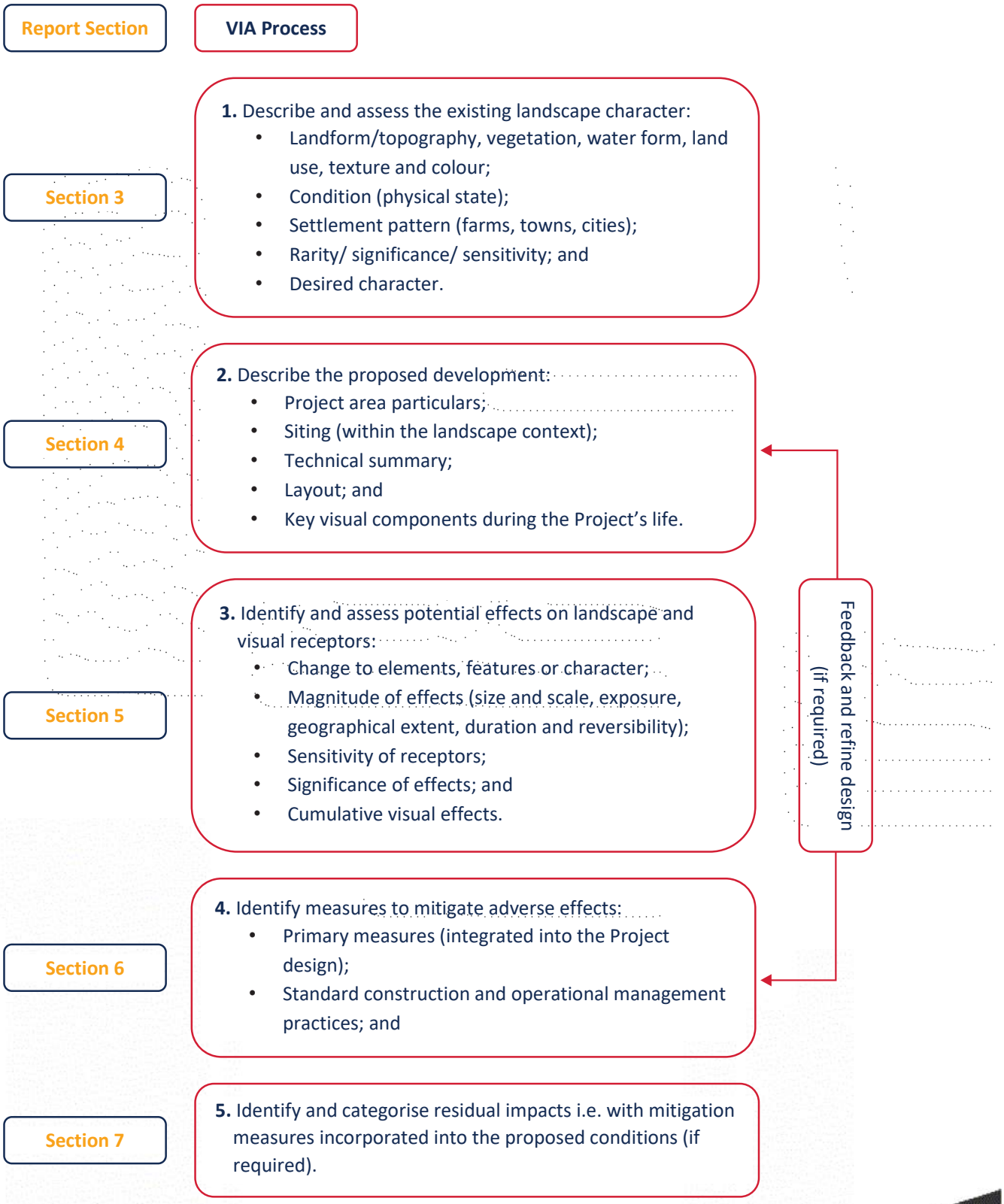


Figure 2-1: Visual Impact Assessment Process and Report Structure

2.1.1. Landscape Character Assessment Criteria

Landscape character is determined by the way the physical, natural and cultural components within a landscape interact, which together create a distinctive area, or character (Landscape Institute & IEMA, 2013). Although some of these components are relatively objective and are able to be assessed against a standardised set of criteria, landscape character is also defined by aesthetic, perceptual and experiential aspects (landscape values), which are subjective, and based on personal associations and opinions which are different between individuals.

This is a recognised limitation affecting many components of this VIA. To mitigate the subjectivity concerning perceptions and values, this VIA utilises commonly accepted landscape characteristics for various landscape characters that are generally preferred and valued. These will underpin the landscape character assessment criteria outlined in Table 2-1 as well as other assessments throughout this VIA.

It is noted that preferences and values will also differ depending on the context of the landscape (i.e. urban landscape, rural landscape, natural landscape) (Landscape Institute and IEMA, 2013; Department for Planning and Infrastructure, 2007). To ensure the criteria is appropriate to the local context in which the Project is proposed to be located, the general planning designation (i.e. land zoning) has been used as the indicator to the general landscape type.

Pursuant to the Port Pirie Regional Council Development Plan the Project land is zoned 'Primary Production' and therefore key elements of the 'Desired Character' for the Primary Production Zone have been included in the landscape character assessment criteria (Table 2-1). Additionally, Table 2-1 includes the most and least preferred (generally) landscape characteristics indicated by the literature specifically regarding rural landscapes.

Notably, renewable energy is envisioned for this zone in the Development Plan, in the form of solar farms and ancillary developments such as substations, maintenance sheds, access roads and connecting power-lines. The Plan details that these facilities will need to be located in areas where they can take advantage of the natural resource upon which they rely.

The Desired Character section for the Primary Production Zone also sets out that, subject to the implementation of management techniques by council wide policy regarding renewable energy facilities, visual impacts are to be accepted in pursuit of benefits derived from increased generation of renewable energy.

Nonetheless, this VIA provides a comprehensive assessment of the potential landscape and visual effects in accordance with the process outlined in above. Accordingly, once the existing landscape character has been identified, this will be reviewed alongside the description of the Project to identify the potential landscape and visual receptors and effects. The method for identifying and assessing these are outlined in Section 2.1.2.

Table 2-1: Landscape Character Assessment Criteria

Landscape Characteristic	Higher preference/value	Lower preference/value
Landform/topography	• Topographic variety and ruggedness • Significant landscape features (trees, tree stands, historic relics, windmills)	• Uniform or flat with little to no vertical relief • Absence of landscape features • Eroded areas • Unmanaged roads and access tracks
Landcover/vegetation	• Areas or sites frequently prone to ephemeral features (presence of fauna, distinctive crop rotations, water conditions and climatic conditions) • Distinctive remnant vegetation located along streamsides, roadsides and in paddocks	• Areas of soil salinity/salt scalds or dead, dying or diseased vegetation • Areas of extensive weed infestation • Recently harvested areas (stumps, debris, abandoned off-cuts)
Water form	• Presence of water bodies (dams, lakes, inundated areas)	• Absence of or eutrophied water bodies
Land use	• Gradual transition zones between agricultural land and natural landscape • Historic features and land use patterns that strengthen local rural character (historic farm machinery, old shearing sheds, windmills and historic buildings) • Well maintained buildings and/or structures that support the rural character (including building materials/finishes)	• Tips, dumps and landfill areas • Land use areas that contrast significantly from local rural landscape characteristics (plantations, mines, housing, utility towers, roads and fencing) • Abandoned structures (including farm structures) in a state of disrepair or destruction
Texture and colour	• Diverse colour and contrast or species diversity of cropping • Agricultural patterns, colours and textures that complement natural features	• Lack of diversity in colour and texture • Difficult to distinguish details in the midground • No discernible focal points on the horizon
Settlement pattern	• Scattered settlement pattern and individual structures (silos, windmills, water tanks, historic buildings, bridges, hay bales and dams) • Large allotments	• Concentrated settlements with uncharacteristic structures (industrial structures; modern housing) • Subdivided allotments
Rarity	• Presence of rare elements or features in the landscape or presence of a rare landscape character type	• Common elements or features within the region

(Landscape Institute & IEMA, 2013, Department for Planning and Infrastructure, 2007; AILA, 2018; RMS, 2013; Department of Planning, Transport and Infrastructure, 2016 (Port Pirie Regional Council Development Plan 2017)).

2.1.2. Landscape and Visual Effects Assessment Criteria

The overall visual impact of a proposed development is determined by combining the separate assessments of landscape and visual effects as perceived by receptors. Landscape effects are changes within or to the landscape as a result of interactions between a proposed development and elements within the landscape or the landscape character itself (landscape receptors), while visual effects are the changes of views or visual amenity of the landscape as perceived by people (visual receptors) (Landscape Institute & IEMA, 2013).

As discussed in Section 2.1.1, the significance of landscape and visual effects are also perceived differently by individuals based on personal preferences and values associated to the landscape and views. As with landscape character, these values and the perceived significance of changes can be difficult to quantify and is a recognised limitation of this VIA. In accordance with the landscape character assessment, the landscape and visual effects assessment will also utilise the preferred and valued landscape characteristics identified in the literature (Table 2-1) when assessing value-based criteria. The remaining criteria used in the landscape and visual effects assessment are outlined in Table 2-2 along with specifications of the category scale (high, moderate, and low) used for measuring each criterion.

It is recognised that relationships can exist between criteria (i.e. the size and scale, distance and visibility of the effect all influence the susceptibility of the receptor) and must be considered concurrently when determining the most appropriate category scale for the effect being assessed. Similarly, some of the specifications of category scales for landscape and visual effects can overlap (i.e. the defined measurable distance in metres or kilometres between an effect and the receptor), while others are specific to either landscape or visual effects (i.e. a change to a view does not consequentially change the overall landscape character). These distinctions are clearly defined in Table 2-2 to ensure transparency in the assessment, as far as practicable. Any necessary explanation of influences between criteria will be discussed in Section 5.

Although the criteria for assessing landscape and visual effects can differ, the process is inherently the same; using the predetermined landscape character alongside the description of a proposed development to identify potential receptors and effects. Subsequently, assessing each effect against the established criteria to determine the ***sensitivity*** of the receptor and the ***magnitude*** of the effect. This is an iterative process that is undertaken for each effect and is depicted in Figure 2-2 below. Finally, the sensitivity of the receptors and the magnitude of the effects are successively combined to determine the overall ***significance*** of the effect, depicted in Table 2-3.

Although considerable efforts have been made to avoid subjectivity within this assessment process, it is important to note that a level of professional judgement must still be utilised (Landscape Institute & IEMA, 2013). For example, a receptor may collectively score a "Moderate" level of sensitivity and a "Moderate" level for the magnitude of the effect, which according to Table 2-3 should result in an overall "Moderate" significance of the effect. However, if the constructed Project is not visible or does not change the view from the receptor, logical reasoning should indicate a "Low" or negligible significance of the effect as there is no change to the landscape in this instance. Where this professional judgement has been employed it is clearly disclosed during the associated assessment.

Table 2-2: Category Scale to Assess Landscape and Visual Effect Criteria (Landscape Institute & IEMA, 2013)

Criteria	High	Moderate	Low
Sensitivity of Receptors			
Susceptibility			
Landscape effect	The degree to which the landscape may accommodate the Project would potentially result in a number of perceived uncharacteristic and significant changes.	The degree to which the landscape may accommodate the Project would potentially result in the introduction of prominent elements but may be accommodated to some degree.	The degree to which the landscape may accommodate the Project would not significantly alter existing landscape character.
Visual effect	Residents at home in high proximity and visibility to the Project; visitors to heritage assets or other areas where the views are an important factor to the experience (i.e. lookouts).	People engaged in activities whose attention is likely to be focused on the landscape and on particular views (i.e. scouts/camping groups); people at their place of work whose attention is not focused on their surroundings and where the setting is not important to the quality of working life.	Pedestrians and motorists that would typically have less vested interest and emotional connection to the landscape i.e. view the Project infrequently, intermittently and/or over a short timeframe.
***Value* *(also refer to Table 2-1)**			
Landscape effect	The effect may compromise the specific basis for the value attached to the landscape, for example if the landscape character is valued on an international, national or local scale (i.e. World Heritage Sites, National Parks).	The effect does not compromise the specific basis for the value attached to the landscape.	The existing landscape characteristics are not considered to be generally preferred or valued and therefore the effect does not negatively affect the value attached to the landscape.
Visual effect	The view appears in guidebooks or on tourist maps, there is a provision of facilities for visitor's enjoyment of the view (i.e. parking places, sign boards and interpretive material); or the local planning designations restrict the introduction of effects that compromise the value of a particular view.	The effect does not compromise the specific basis for the value attached to the particular view.	The view is not considered to be generally preferred or valued and therefore the effect does not negatively affect the value attached to the view.

Criteria	High	Moderate	Low
Magnitude of Effects			
Size and scale			
Landscape effect	Key characteristics of the landscape character may be adversely impacted by the Project and may result in major alterations to perceived characteristics of the landscape character.	Some characteristics of the landscape character may be altered by the Project, although the landscape has the capability to absorb these changes without compromising the overall landscape character.	The characteristics of the landscape character are generally robust (evidenced by the existence of artificial elements) and would be minimally affected by the Project.
Visual effect	Large proportion of the view occupied by the Project; high degree of contrast or integration of new features/ changes in terms of form, scale and mass, height, colour and texture.	Some change to the view due to loss of existing features and addition of new features in the view without significant change in its composition.	No obvious change to the view due to loss of existing features or addition of new features.
Frequency of use			
Landscape effect	Frequently visited or populated areas often used for appreciating the view of the landscape for prolonged periods of time (e.g. residences, lookouts, townships).	Less visited areas with intermittent visitation (e.g. major/secondary roads) with partial visibility from the receptor (i.e. unobstructed features of the Project from a vehicle while passing within the Visual Catchment of the Project).	Infrequent visitation brief glimpses of the Project not in the direct line of sight. (e.g. secondary/local roads, screened visibility).
Visual effect	As above.	As above.	As above.
Distance/ Geographical extent			
Landscape effect	The Project is a very prominent element in the view from the receptor (i.e. in the foreground or within the 100m Visual Catchment) in the receptor's direct line of sight.	The Project is a noticeable element in the view from the receptor (i.e. in the midground or within the 1-2km Visual Catchment) but not in the direct line of sight.	The Project is difficult to distinguish from the receptor (i.e. in the background or beyond the 2km Visual Catchment) not in the direct line of sight.
Visual effect	As above.	As above.	As above.

Criteria	High	Moderate	Low
Duration			
Landscape effect	The effect is a permanent feature or lasting over a generation (excess of 30 years).	The effect is a temporary but lasting a significant period of time (i.e. 5 to 30 years).	The effect is temporary lasting a short period of time (i.e. less than 5 years).
Visual effect	As above.	As above.	As above.
Reversibility			
Landscape effect	The effect has irreversible changes to the landscape character or view.	The effect is reversible but may result in some lasting changes to the Landscape character or view.	The effect is reversible, and the landscape or view can be returned to the state prior to introduction of the effect.
Visual effect	As above.	As above.	As above.

Table 2-3: Matrix of Significance of Effects (Landscape Institute & IEMA, 2002)

		Magnitude of Effects		
		High	**Moderate**	**Low**
Sensitivity of Receptors	**High**	High Significance	High-Moderate Significance	Moderate Significance
	Moderate	High-Moderate Significance	Moderate Significance	Moderate-Low Significance
	Low	Moderate Significance	Moderate-Low Significance	Low Significance

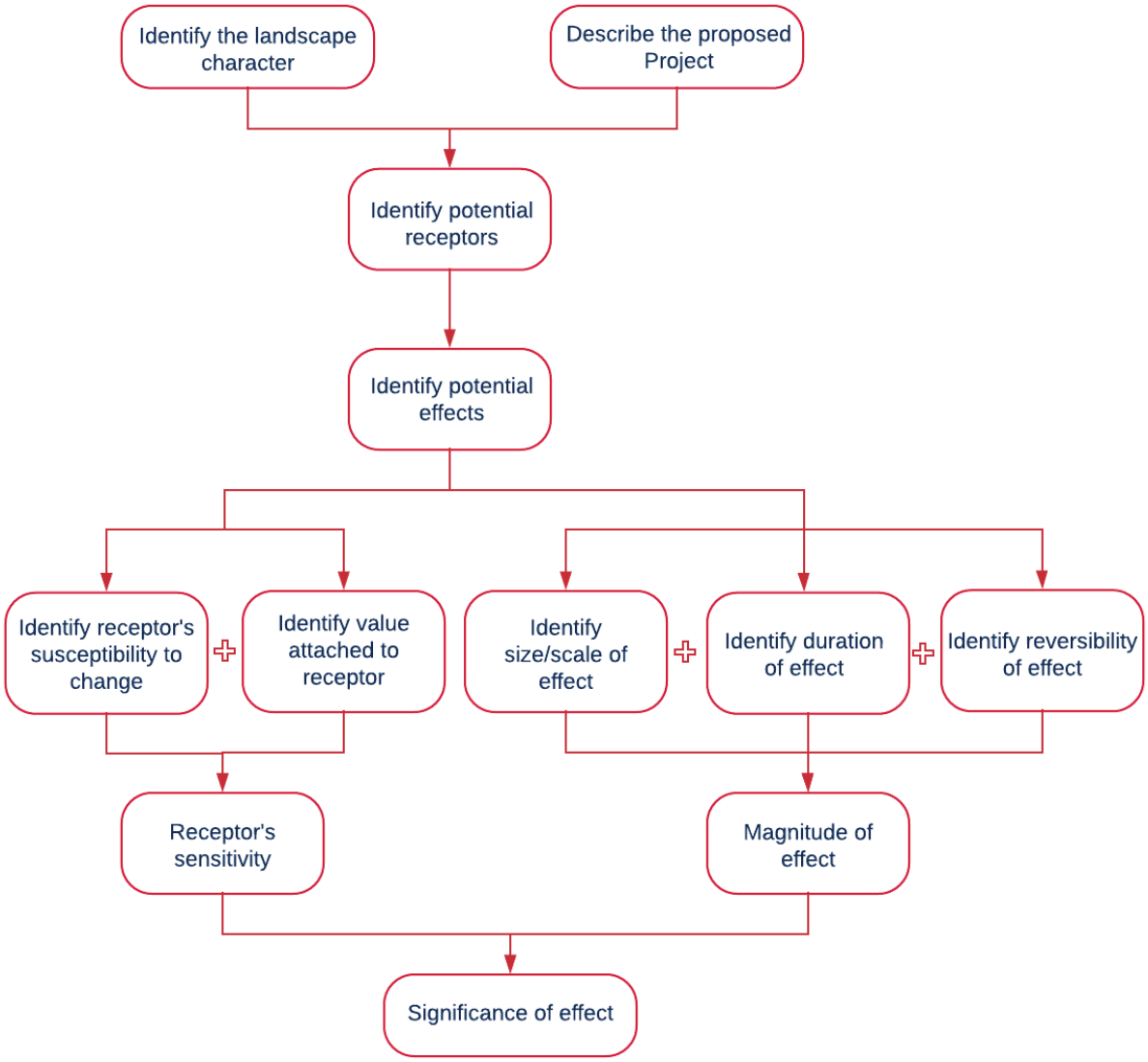


Figure 2-2: Process for Assessing Landscape and Visual Effects (Landscape Institute & IEMA, 2013)

2.2. SCOPE OF VIA

In defining the scope of this VIA, a 100m, one (1) km and two (2) km varied distance buffer of the Project area was created using Geographical Information System (GIS) technology. These buffers are referred to as Visual Catchments throughout this VIA and are used to define the extent of the assessments on both the landscape character and the landscape and visual receptors/effects.

2.3. DATA COLLECTION

The following specific data has been collected and relied upon for this VIA:

- Photographs and associated data provided/sourced by EPS Energy;
- Preliminary concept plans of the Project;
- Survey data including contours of the existing site;
- Topographic maps and aerial photographs;
- Computer-generated (GIS) areas of theoretical visibility; and
- Other investigations undertaken for the Project, including a glint and glare assessment, and heritage and environmental studies.

In preparing this VIA, key EPS Energy personnel attended the Project land on five (5) separate occasions to photograph and record the existing landscape, liaise with relevant landowners, and collect other data pertinent to the VIA. Data collected on the following dates has been included in this VIA:

- 8 June 2017;
- 19 December 2017;
- 13 March 2018;
- 31 May – 01 June 2018; and
- 24-25 July 2018.

2.4. RENEWABLE ENERGY AND LANDSCAPE CHARACTER

Landscapes are an important consideration because of the value that individuals, communities and public bodies attach to them. Landscapes are a shared resource which are as important in their own right as they are as a public good. Certain landscapes also provide economic benefits, either directly such as through agriculture or indirectly through health and wellbeing improvements.

Landscapes are not static but continue to evolve and change with communities. Landscape changes are driven by changing requirements for development to meet the needs of a growing population and economy. This includes new forms of energy generation, such as renewable energy.

Emerging modern perspectives are placing increasing emphasis on the importance of sustainable development. Sustainable development is development which is able to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. A key component of sustainable development is that this type of development balances economic, social and environmental matters. Sustainable developments do not rely upon depleting, limited or finite resources. Renewable energy is an example of a type of sustainable development, compared with traditional energy-generation methods. In considering our shift towards more sustainable developments, authorities must balance big-picture policy considerations against small-scale local impacts, including visual impacts.

2.4.1. Australian Context

As a signatory to the Paris Agreement, Australia has international obligations in response to climate change to reduce greenhouse gas emissions. Australia's goal is to reduce emissions by 26-28 per cent below 2005 levels by 2030. In order to meet this goal, Australia has set a Renewable Energy Target aiming towards a doubling to more than 23 per cent of Australia's electricity to be from renewable sources by 2020. This target sees energy production move away from the development of traditional fossil fuels, to low carbon technologies. Whilst traditional fossil fuel energy sources tended to be large and centralised, renewable energy technologies are available at different scales with different distribution models. Renewable energy developments can produce energy close to the point of use, with different ownership models that depend upon the scale of the development.

The transition to renewable energies will have a profound shift on our landscapes, places, communities and economies. Renewable energies offer an opportunity to consider how these new technologies will best fit into our existing environment. A potential challenge for new renewable energy developments is the competition for land use with existing land uses. A balance needs to be struck against the production of both food and energy. Treasured landscapes, unique biodiversity and valuable heritage assets need to be respected and preserved. Site selection for renewable energy developments presents a unique challenge to minimise impacts on existing environments, with the opportunity to create positive change in communities with untapped potential.

Appropriate site selection is vital to the success or failure of any renewable energy project, including solar farms. Availability of solar resources, land use for both the site and the surrounding area, environmental constraints of the site, community attitudes towards the development and the ability to provide unconstrained energy into the electrical grid are all important considerations for any solar energy project. Examples of existing renewable energy infrastructure throughout Australia is shown in Figure 2-3.

Figure 2-3: Existing Renewable Energy Infrastructure in Australia

2.4.2. South Australian Context

Investment in solar energy projects has been rapidly increasing in recent years throughout South Australia. South Australia is currently on track to have three quarters of its electricity generated from renewable sources by 2025. South Australia's Department for Energy and Mining is committed to facilitating investment into renewable energy and energy storage projects to meet the state's future energy needs as well as Australia's Paris climate emission agreements. South Australia is a world leader in renewable energy production, with the state currently undergoing a renewable energy boom. South Australia is home to the world's largest Lithium-Ion Battery now operating in Jamestown and is the leading producer of wind power in Australia.

The impact of this rapid uptake of renewable energy projects results in an ever-changing landscape to accommodate this infrastructure. Despite the fast-paced changing landscape, adequate consideration of appropriate bulk and scale within the existing landscape is an important consideration for renewable energy developers. Examples of existing renewable energy infrastructure in South Australia is shown in Figure 2-4.

Figure 2-4: Existing Renewable Energy Infrastructure in South Australia

2.4.3. Local Character

Local Character is what makes a neighbourhood distinct. Local Character contributes to the identity of an area, and is created by the landscape, both private and public places as well as natural and human elements. In considering the appropriateness of locating a proposed development, attention is needed to be paid to the distinctive character of the area. An important component of this is how the community sees the insertion of specific development types, such as renewable energy developments, into their existing landscape.

The Port Pirie Regional Council Development Plan 2017 is the on-ground development assessment document which sets out the rules about what can be done on any piece of land in the Regional Council of Port Pirie and the detailed criteria against which development applications will be assessed.

This Plan outlines the Desired Character for land zones, including the Primary Production Zone, where the Project is proposed. Renewable energy is envisioned for this zone in the form of solar farms and ancillary developments. The Development Plan details that these facilities will need to be located in areas where they can take advantage of the natural resource upon which they rely.

The Desired Character section for Primary Production Zone sets out that, subject to the implementation of management techniques by council wide policy regarding renewable energy facilities, visual impacts are to be accepted in pursuit of benefits derived from increased generation of renewable energy.

One of the key design elements in determining whether or not a development proposal is in accordance with the Desired Character, is considering the visual impact on the character of a landscape. The visual impact on the character of rural landscapes is considered in the section below.

2.4.4. Visual Impact on Rural Landscapes

Rural landscapes have historically been the preferred location for large electrical infrastructure. Electrical infrastructure, including substations and transmission lines are already prevalent in rural landscapes across Australia. Examples of electrical infrastructure in rural Australian landscapes are shown in Figure 2-5.

Figure 2-5: Existing Electrical Infrastructure in Australia

Rural landscapes are the preferred landscape type for the development of new electrical infrastructure, including renewable energy developments for a number of reasons including:

- **Proximity to Electrical Infrastructure** - Rural land use is typically the land use surrounding existing electrical infrastructure. Proximity to substations and 275kV transmission lines are key requirements for utility-scale solar projects;
- **Large Land Areas** - Rural land offers large areas which can satisfy the requirements for economically viable renewable energy projects. An area of about two hectares is required in order to generate 1MW of utility-scale solar, with projects typically requiring between 200-2,000 hectares of land;

- **Large Allotments and Land Tenure** - Rural landholdings typically have large allotments and land tenure, which ease project inception, as far less allotments are required than in urban environments;
- **Regional Economic Benefits** - New infrastructure in a regional area, including rural landscapes has the positive flow on effect of stimulating local business;
- **Income Diversification** - Co-benefits can be produced where agricultural land is used for renewable energy production, as rural landowners can diversify their income. Energy production offers an excellent alternative source of revenue where land is of variable productivity potential. Rural landowners can generate a passive income from renewable energy developments, which can be supplemented in some cases with co-location of agricultural activities; and
- **Fewer Receptors** - Rural landscapes typically have minimum receptors nearby, compared with urban environments. Rural areas are less built-up, meaning that the number of individuals to be exposed to a change in the visual landscape is far less than in an urban environment.

2.4.5. Character of the Project Area

The location of the Project is within a rural setting. The Project area and the surrounding land is currently used for agricultural purposes. However electrical infrastructure already forms part of the character of the Project area.

The Project area has existing surrounding electrical infrastructure. Bungama Substation is located to the west of the Project area, on the corner of Warnertown Road and Pirie Blocks Road. Transmission lines (both 132kV and 275kV) as well as their associated easements transect and surround the Project area. The existing electrical infrastructure in and around the Project area is shown in Figure 2-6. The visual impact of the existing electrical infrastructure is important contextually for considering both the existing character of the Project area, and how the Project is likely to impact upon the visual landscape of the local area.

Figure 2-6: Existing Electrical Infrastructure in and Around the Project Area

2.4.6. Visual Interpretation of Utility-Scale Solar

Utility-scale solar projects share similar visual characteristics to existing rural landscapes. This is important in understanding how solar projects are visually interpreted in their contexts. The following section examines the comparison between the proposed indicative technology of the Project to examples of agricultural uses and rural infrastructure.

The technology currently proposed for the Project is a single axis tracking system with an approximate 5m or 10m separation between rows, with ancillary infrastructure such as battery storage sheds. The modules will generally be aligned on the tracking system in a north/south row and rotate in position from east to west.

Further site layout assessments and detailed engineering will define the preferred configuration of panels to ensure:

- Maximum exposure to sun;
- Efficient layout of solar panels across the Project area;
- Efficient connection to the substation;
- Ease of construction;
- Efficient access for maintenance and long-term operation; and
- Technology advances can be incorporated.

Generally, however, the configuration will demonstrate lineal geometric repetition consistent with typical utility-scale solar farms.

As shown below in Figure 2-7, Figure 2-8 and Figure 2-9 a project of this scale provides uniformity within rural landscapes, not dissimilar to the lineal patterns of vineyard or orchard rows, or the geometric form of monocultural fields.

Figure 2-7: Lineal Repetition of Vineyards and Solar Farm Panels

Figure 2-8: Comparison of Monoculture to the Geometric Landscape of Solar Farms

Figure 2-9: Viewpoints Articulating the Repetition and Lineal Sight Lines

The design of the Project's ancillary infrastructure including battery storage, are also reflective of existing rural landscapes. Solar infrastructure can be compared to the form of metal clad shedding and storage typically found in rural settings (See Figure 2-10 below).

Figure 2-10: Comparison of Typical Battery Infrastructure to Farming Structures

Utility-scale battery storage structures are typically constructed according to two design methodologies; modular systems and building-based systems. A number of technologies are being assessed to provide the optimum solution for the project and integration in the South Australian transmission electricity network. Although the BESS footprint and storage structure is subject to the final technology decision, it could cover up to approximately 12ha of the 530ha Project land.

At this stage the storage of the BESS could include a combination of solid structures representative either of typical agricultural style storage buildings e.g. intensive animal keeping sheds used in the Primary Production Zone (See Figure 2-11 below) or Tesla style battery units (See Figure 2-10 above) or 40-foot shipping containers. The specific height of storage structures within the battery storage area is yet to be determined.

Figure 2-11: Typical Sheds Used at a Chicken Farm

3. LANDSCAPE CHARACTER

The scope of this assessment of landscape character includes the identification of Landscape Character Zones and description of the general landscape characteristics of the Project land and surrounding area within the 2km Visual Catchment.

3.1. PROJECT LOCATION

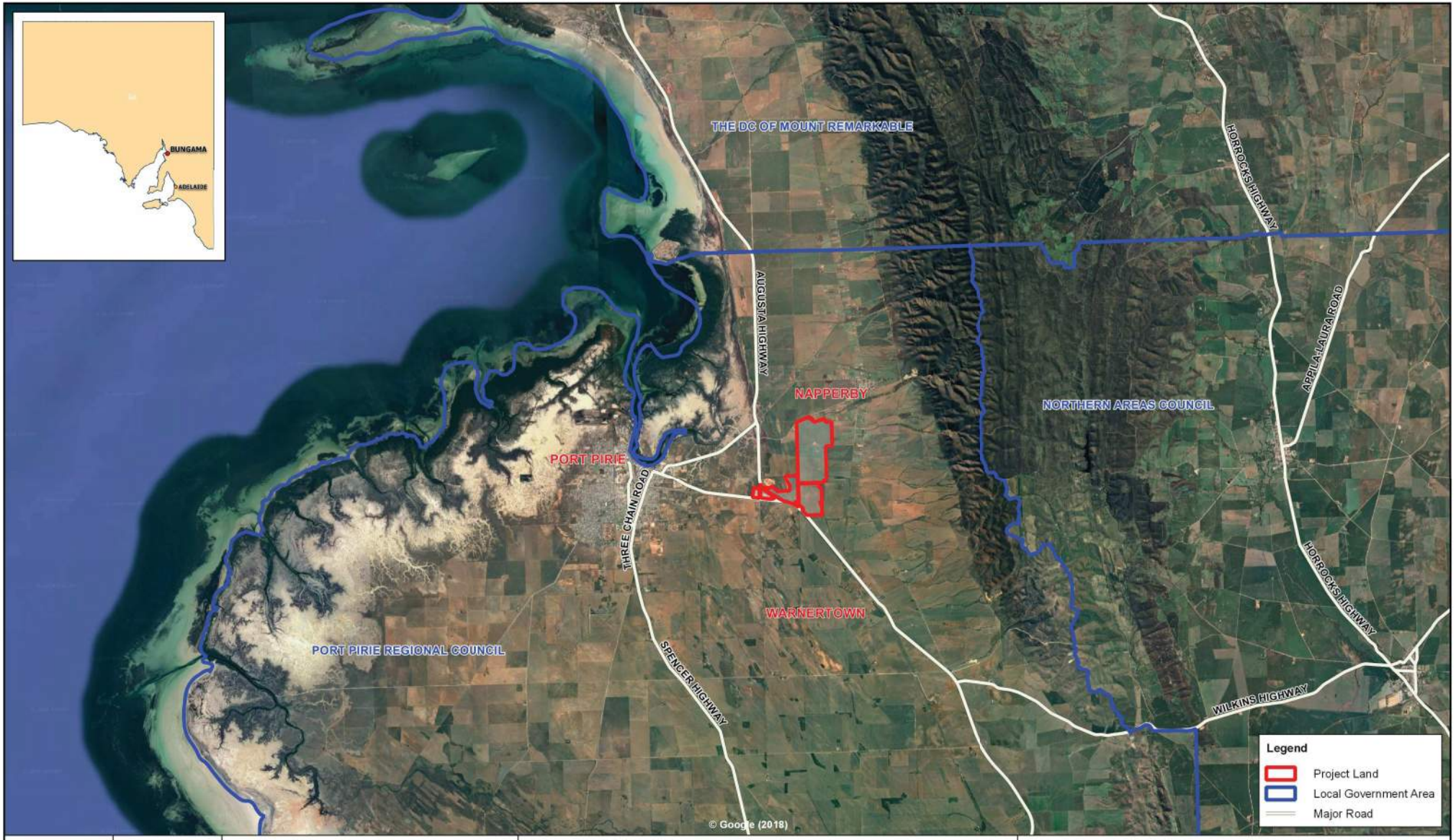
The Project land is approximately 530ha and is shown on the location plan in Figure 3-1.

The Project land is located in the suburbs of Bungama, Napperby and Warnertown, approximately six (6) km east of Port Pirie and 128 km north of Adelaide. The Project land is within the Local Government Area of the Port Pirie Regional Council.

The Project land incorporates the Project area on which the PVS, BESS, Project's substation, Operations and Maintenance buildings and associated infrastructure will be built and operated.

The following features characterise the Project area with further details outlined in Section 3.3 below.

- Adjacent to the existing Electricity Substation and Gas Substation;
- Bound by Gulf View Road (north), Bungama North Road (west), Locks Road (running west-east) through the centre of the Project site, and Augusta Highway (south);
- 275kV and 132kV transmission lines and associated easements crossing and surrounding the Project area; and
- Mostly cleared, flat land that has been historically used for cereal cropping and grazing activities.



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:150,000
Job Ref/Version:	11297/ V04

0 2.5 5 7.5 10 km

Map Projection: GDA 1994 MGA Zone 54

Figure 3-1

Bungama Solar Location

Bungama Solar | Bungama SA Australia

21/11/2018

BUNGAMA SOLAR

11297_V1A_Locality Map.qgs

3.2. LANDSCAPE CHARACTER ZONES

Landscape Character Zones are described as having strongly defined spatial qualities and/or features, distinct from areas immediately adjacent (RMS, 2013; Landscape Institute & IEMA, 2013). Although these are separate from Development Plan Zoning, there is typically a high degree of correlation between these planning designations and the landscape characteristics that define the Landscape Character Zones. Development Plan Zoning may place specific planning controls over a single parcel of land, while Landscape Character Zones are more general and can encompass multiple Development Plan Zones if there are shared spatial qualities or features across the landscape.

Within the 2km Visual Catchment, there are five (5) Development Plan Zones:

- Primary Production;
- Rural Living;
- Residential;
- Industrial; and
- Commercial.

However, the landscape within the 2km Visual Catchment can be separated into two (2) distinct Landscape Character Zones:

- Rural-Agricultural Characteristics; and
- Rural-Residential Characteristics.

These are discussed in turn below and depicted within Figure 3-2.

3.2.1. Rural-Agricultural Characteristics

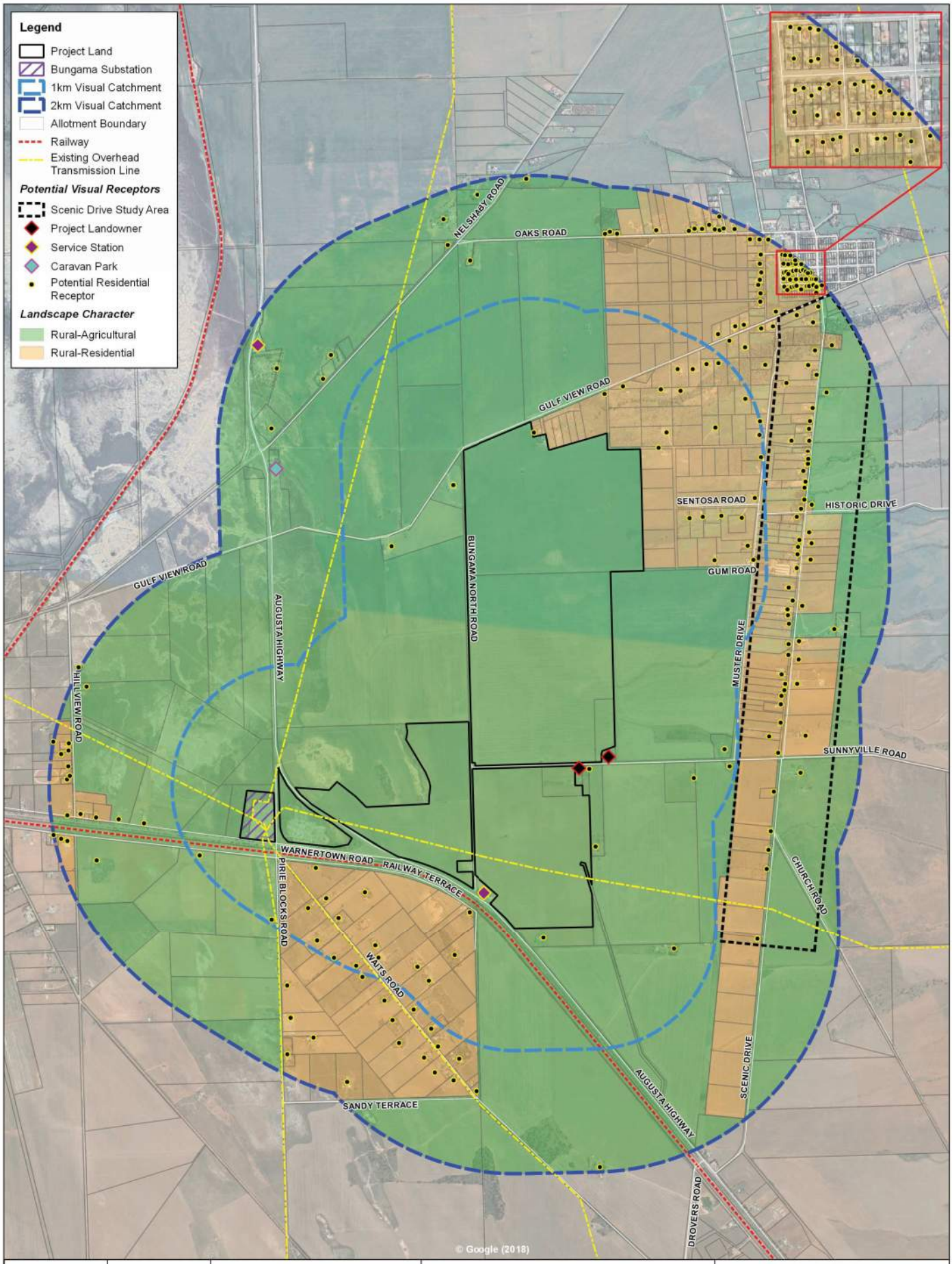
This zone characteristic is identified as being the most prominent landscape surrounding the Project area. The rural agricultural landscape is large and open, with flat terrain, simple uniform and linear patterns with little variation. Views are often interrupted by scattered vegetation, the Morgan-Whyalla Pipeline, and high-voltage transmission lines.

Key features of this zone characteristic include large allotments, typically larger than 10 hectares, ancillary structures (i.e. sheds), rudimentary fencing, unsealed road networks and scattered rural residential structures. Although some rural residential structures are present throughout this zone characteristic, they are scattered/wide-spread and remain distinctly separate from the density of the rural residences that define the Rural-Residential Characteristic.

The Project area is located within the Rural-Agricultural Characteristic zone.

3.2.2. Rural-Residential Characteristics

This zone characteristic is identified by clusters of higher-density rural residential structures. The allotments are typically smaller than 10 hectares. This zone characteristic includes part of the township of Napperby, residences along Scenic Drive, part of Gulf View Road, Oaks Road and a group of residences located south of Railway Terrace.



Author:	MB
Reviewer:	SMC/ JB
A3 Scale:	1:28,000
Job Ref/Version:	11297/ V04

0 0.25 0.5 0.75 1 km

Map Projection: GDA 1994 MGA Zone 54

Figure 3-2

Landscape Character

Bungama Solar | Bungama SA Australia

21/11/2018

BUNGAMA SOLAR

11297_VIA_Landscape_Character.qgs

3.3. LANDSCAPE DESCRIPTION

The existing landscape character within the 2km Visual Catchment is described in the following subsections which align with the landscape characteristics described in Section 2.1.1 and Table 2-1.

As described in Section 2, once the existing landscape character has been identified, this will be reviewed alongside the description of the Project to identify the potential landscape and visual receptors and effects.

3.3.1. Landform/topography

The Project area and surrounding landscape is characterised by mostly flat, smooth and open land (Plate 1). The Project area is approximately 24 metres above sea level.

There are little to no natural landscape features aside from scattered vegetation (discussed in Section 3.3.2) evident within the 2km Visual Catchment, however a number of artificial features are dominant (Plate 2) and discussed in Section 3.3.4.

Although there is no vertical relief to the landform within the Project area or 2km Visual Catchment, the Southern Flinders Ranges are located approximately 5km to the east and provide vertical relief in the background.

Plate 1: Flat Terrain on Project Area, Southern Flinders Ranges Visible in Background

Plate 2: Flat Terrain on Project Area, Morgan-Whyalla Pipeline Along Gulf View Road

3.3.2. Landcover/vegetation

The Project area and surrounding landscape consists of mostly cleared land due to historic cropping and grazing activities (Plate 3).

There are scattered trees surrounding the Project area and a small amount of Acacia shrubland present, however the majority of existing vegetation is located within the road reserves. There is medium-high density vegetation along Bungama North Road (west), and medium density along Locks Road (west-east through the centre of the Project site), Gulf View Road (north-east) and along the Augusta Highway (south).

Existing vegetation also mostly obscures some residences to the north of the Project area (Plate 4). It is not intended to remove the existing vegetation where practicable.

3.3.3. Water Form

There is no presence of waterbodies or inundated areas within the Project area or surrounding landscape.

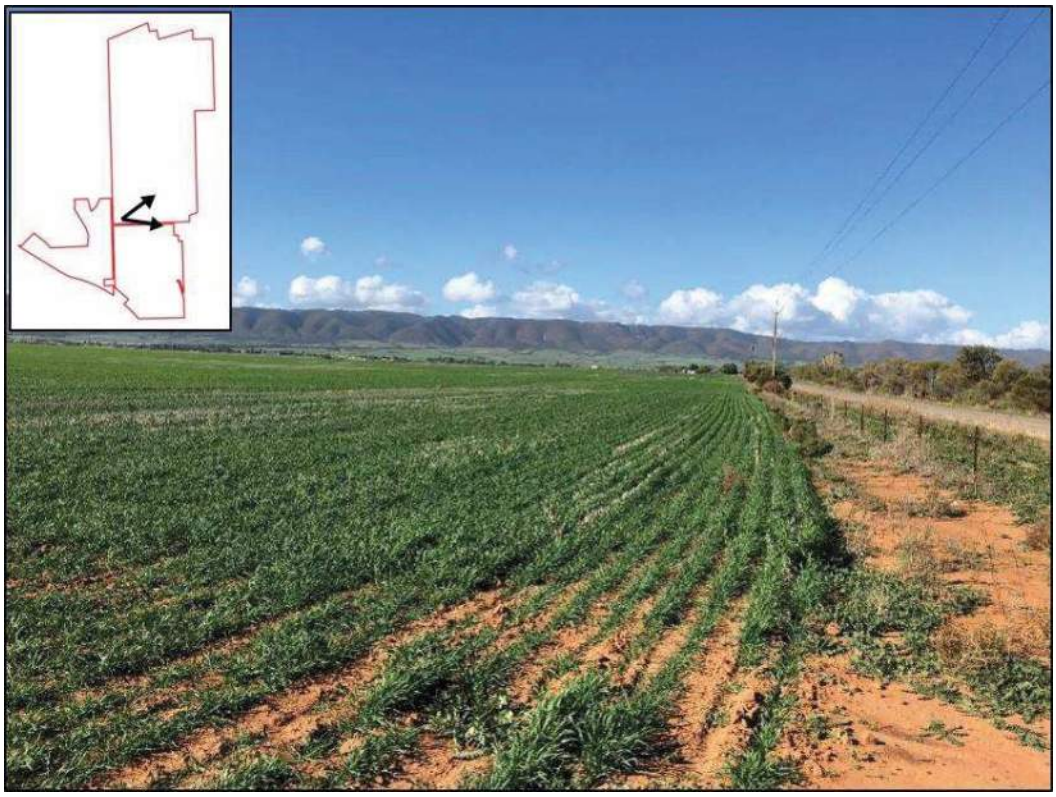


Plate 3: Crop on Project Area, Vegetation Within Road Reserves Along Locks Road

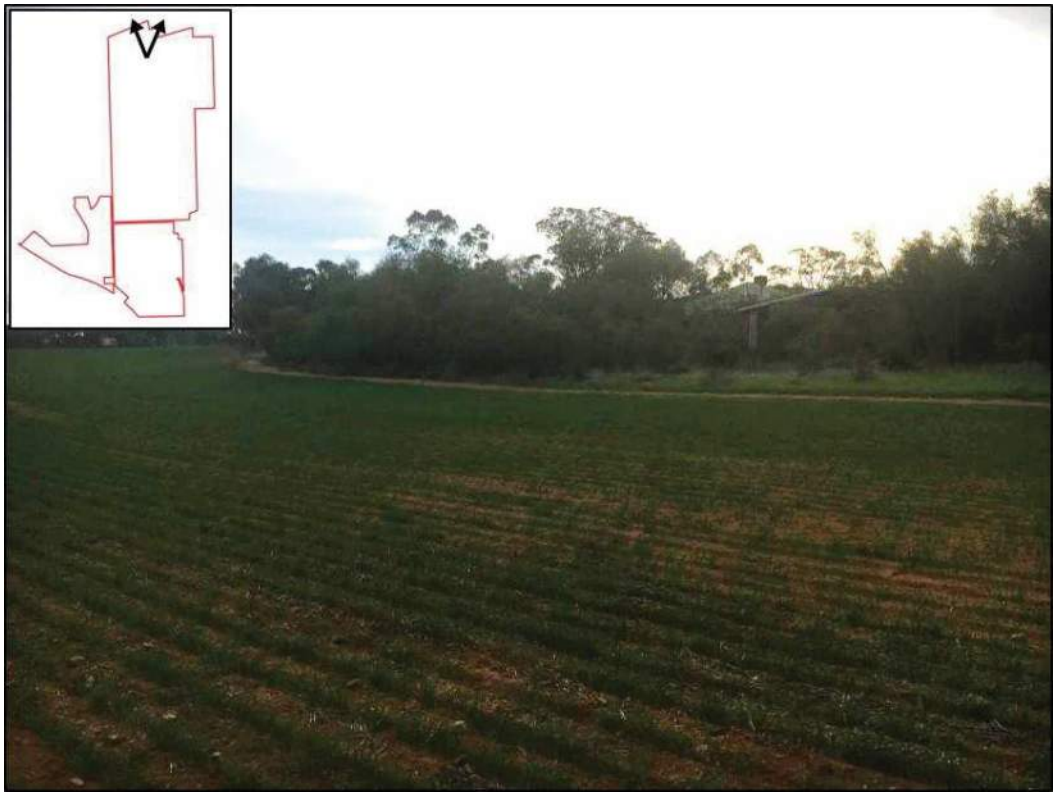


Plate 4: Mostly Concealed Residence Adjoining Northern Boundary of the Project Area

3.3.4. Land Use

The Project area and immediately surrounding landscape contains prominent areas of farmland. Further from the Project area is clusters of rural-residential structures.

The Bungama Substation (Plate 5) is located to the south west of the Project area, on the corner of Warnertown Road and Pirie Blocks Road, which is visible from several surrounding roads and viewpoints. The associated high-voltage transmission lines are located across the allotments within the Project area and are spread throughout the surrounding landscape (Plate 6 and Plate 7).

A mining operation adjoins the west of the Project area. Further, the large silos and the Port Pirie Nyrstar Smelter are prominent features in the landscape located in the background to the west (Plate 6 and Plate 7).

A gas substation (Plate 8) and a roadhouse service station exist in the centre of the southern portion of the Project area, on either side of Locks Road. Further, an auto-wreckers car yard exists between the Project area and the Bungama Substation.

The Augusta Highway is located along the southern boundary of the Project area and nearby the western boundary. A railway also runs parallel to the Augusta Highway.

Plate 5: Bungama Substation

Plate 6: Transmission Towers Across the Project Area, Large Silos and Nyrstar Smelter Stack Prominent in Background

Plate 7: Transmission Lines and Towers as Seen From Scenic Drive, Large Silos and Nyrstar Smelter Prominent in Background

Plate 8: Gas Substation

3.3.5. Texture and Colour

The Project area and surrounding landscape may present a variety of colours and textures which is largely influenced by seasons and cropping cycles of the farmland. As demonstrated in the Plates above, the Project area and surrounding landscape can at times lack diversity in colour tones and texture.

3.3.6. Settlement Pattern

As described in Section 3.2, the settlement pattern includes a combination of scattered individual structures and concentrated settlements with a combination of both large and smaller subdivided allotments.

3.3.7. Rarity

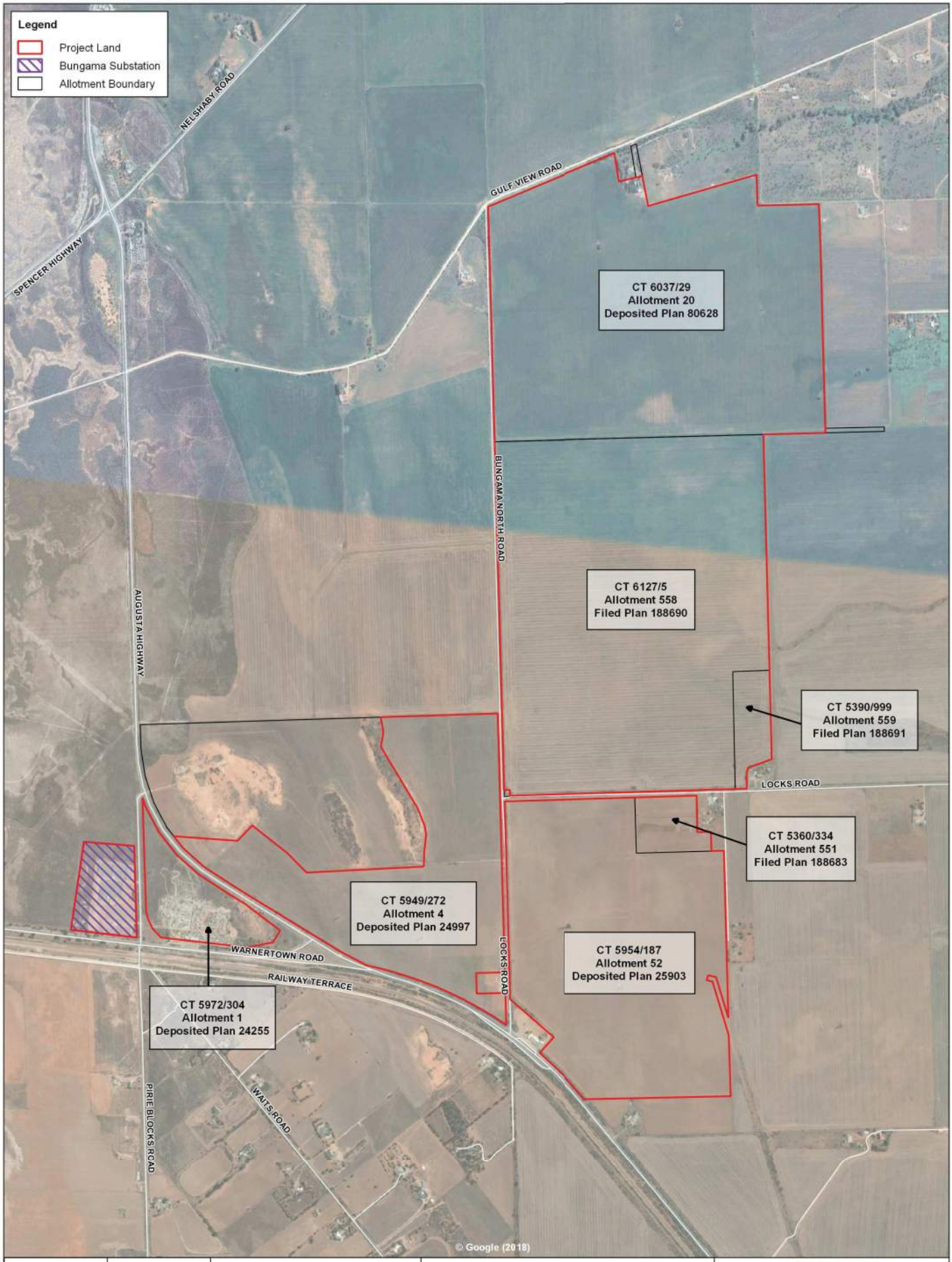
The existing landscape elements within the Project area and surrounding landscape are common within the region and other rural landscapes.

Plate 9: Transmission Line Towers on CT 5949/272 and Over the Aboriginal Cultural Heritage Site Adjoining the Project Area

4. BUNGAMA SOLAR PROJECT

4.1. PROJECT LAND PARTICULARS

The Project land and title particulars are detailed in Figure 4-1 below.



Author:	MB
Reviewer:	SMC/JB
A3 Scale:	1:15,000
Job Ref/Version:	11297/ V04

0 100 200 300 400 500 m

Map Projection: GDA 1994 MGA Zone 54

Figure 4-1

Project Land Title Particulars

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BUNGAMA SOLAR

11297_VIA_Project_Land_Particulars.qgs

4.2. TECHNICAL DESCRIPTION

Bungama Solar is an integrated but separately operated grid connected Photovoltaic Energy Generation System (PVS) of approximately 280MW (AC) generation capacity and a 140MW capacity Battery Energy Storage System (BESS) with 560MWh of storage that will feed into the National Electricity Market via ElectraNet's Bungama Substation. The PVS element, the BESS element and associated infrastructure together are "the Project".

The Project will comprise of a series of mounted PV modules set out in arrays using a single axis tracking system. The arrays will be connected to inverters and voltage step-up transformers. The Project will be connected to the adjacent Bungama Substation via a dedicated 275kV double circuit overhead or underground transmission line.

The Project components includes but is not limited to:

- A PVS of approximately 280MW (AC) generation capacity and associated infrastructure;
- A 140MW capacity BESS with 560MWh of storage and associated infrastructure;
- Permanent operations components of the PVS element include (but are not limited to) the series of mounted photovoltaic modules set out in arrays, inverter/ transformer stations, interconnector substations, switching station, all overhead transmission and underground cabling and operational, maintenance and control buildings;
- Permanent operations components of the BESS element including (but not limited to) the BESS area, sheds and all overhead transmission and underground cabling;
- Any synchronous condensers if included in the Project; and
- Permanent operations ancillary components of the Project including (but not limited to) all internal roads, car parking areas, fencing, and access points to the road network, and any other relevant matter.

4.3. LAYOUT AND KEY VISUAL COMPONENTS

The indicative layout and indicative key visual components of the Project considered in this assessment include:

- Solar modules – mounted on single axis tracking racks;
  - Approximately 800,000 solar panels installed in rows orientated north;
  - Solar panels of approximately 2 x 1.2m mounted on steel frames approximately 1m (at 5m row spacing and panel tilt height of ~1.6m) or 3m (at 10m row spacing and panel tilt height of ~4.5m) above the ground (dependent on the final technology selection);
  - Panels are specifically designed to absorb light and should not produce any significant reflectivity or glare;
- Inverter stations (~3m high);
- Transformers;

- Switching substation;
- One or more synchronous condensers (subject to requirement); and
- Utility-scale battery facility (either 3-4m high containerised system or possible rural sheds up to ~8 or 9m high).

Typical examples of the proposed mounted solar panels are shown in below. Panels can tilt on the one axis. There are wide distances between the rows of panels which provides for greater access during construction and operation and eliminates overshadowing from adjacent panels. Panels are attached to the racking in different formations, which can range from four panels to one panel and be orientated either landscape or portrait.

Figure 4-2: Examples of Typical Single-axis Tracking Solar Modules

Groups of solar panels are connected to an inverter, typically via underground cabling and the inverters are linked together to collect the total energy being produced. Step-up transformers, that increase the voltage are housed in the inverter containers. An example of a typical utility-scale inverter is shown in Figure 4-3 below.

Figure 4-3: Example of an Indicative Inverter

Examples of utility-scale battery technology configurations are shown in Figure 4-4. A battery facility is scalable to the space, power and energy requirements of the site. It can be configured in various arrangements, offering a high amount of modularity. Alternate battery technology such as flow batteries may be used which may either be laid out in container similar to shipping containers or located in multiple rural style sheds (up to 8-9m in height) over a larger footprint area than lithium ion type batteries.

Figure 4-4: Examples of Utility-scale battery Technology Options

Connection infrastructure includes:

- Associated underground cables connecting groups of solar panels to inverter stations and underground and/or overhead transmission lines from inverter stations to the Project's switching substation; and
- A switching substation comprising typical electrical infrastructure to that which is found within the existing Bungama Substation, depicted in below. The switching substation will contain any synchronous condenser if required and will be fenced for safety and security purposes.

Plate 10: Bungama Substation

Administration and controls area including:

- Control room and site office with amenities (typical demountable style building);
- Maintenance and spare parts building;
- Other buildings;
- Car parking sufficient for employees and contractors during operation;
- Laydown/compound area and battery storage area; and
- Internal access roads.

Ancillary infrastructure includes:

- Drainage works, including stormwater management systems;
- Areas not to be developed e.g. native vegetation areas, heritage areas;
- Security fencing and CCTV will be installed;

- Low-level night time lighting; and
- Lightning protection.

Examples of indicative development components are shown below for a typical Office and Maintenance (O&M) buildings (Figure 4-5), a typical Switch Room (Figure 4-6), a typical staff room (Figure 4-7), how these buildings typically appear alongside each other (Figure 4-8), and security fencing (Figure 4-9).

Figure 4-5: Example of a Typical O&M Building

Figure 4-6: Example of a Typical Switch Room

Figure 4-7: Example of a Typical Staff Room

Figure 4-8: Example of a Typical Switch Room-Alongside O&M Building

Figure 4-9: Indicative View of Security Fencing Surrounding a Solar Farm

In the event that the Project is connected to the Bungama Substation via an overhead transmission line, the associated tower and lines will visually appear as a duplicate of the existing connection (Figure 4-10) and be situated alongside it. Should the connection be via an underground cable this will not be visible.

Figure 4-10: Existing Transmission Lines and Tower Connecting to the Bungama Substation

4.3.1. Construction and Decommissioning

The Project has three phases; construction, operation and decommission. Each phase is anticipated to have a varying degree of visual impact and duration. Each phase involves various activities, machinery, equipment and structures detailed below.

The key construction works required for the construction phase include (but are not limited to):

- Construction of internal access tracks and laydown areas;
- Installation of site office, maintenance sheds and other buildings;
- Site preparation earthworks for installation of panel supports;
- Installation of panel supports;
- Solar panel erection;
- Installation of the battery system/technology and battery storage structures;
- Electrical connection between solar panels and central inverters, substation and battery storage;
- Provision of other utility services (electricity, communications, etc.) as required;
- Overhead or underground electrical connections to the Bungama Substation;
- Installation of the remaining system components (including synchronous condensers if included);
- Landscaping (if required), fencing and signage; and
- Commissioning.

The operational period will run for approximately 30 years and includes:

- Solar panel washing;
- General PVS and BESS equipment maintenance;
- Fence and landscape maintenance; and
- Land management.

During the decommissioning phase all Project related infrastructure would be removed from the Project area, and the land restituted to its original use.

5. ASSESSMENT OF POTENTIAL RECEPTORS AND EFFECTS

The following assessment of potential effects is based primarily on the PVS component of the Project and does not include an assessment of the ancillary structures (described in Section 4.3). This is primarily due to the horizontal spread of the PVS spanning a large area of the landscape, subsequently posing a higher potential for visual change to the landscape. Whereas the ancillary structures are not uncommon structures in the landscape (as described in Section 4.3) and are also proposed to be located immediately adjacent to the existing Bungama Substation along Pirie Blocks Road. Similarly, as described above, should the Project connect to the Bungama Substation vis an overhead transmission line, this will visually appear as a duplicate of the existing infrastructure. These are therefore not anticipated to pose a visual change requiring detailed assessment.

5.1. POTENTIAL LANDSCAPE RECEPTORS

Landscape receptors can include the constituent elements of the landscape, its specific aesthetic or perceptual qualities and the landscape character itself (Landscape Institute & IEMA, 2013). As such, the landscape characteristics described in Section 3.2 are considered landscape receptors, as well as the identified rural landscape character.

As indicated in Section 2.1.2, this assessment will be guided by the most and least preferred characteristics identified in the literature (Table 2-1) and considered against the specifications of the assessment criteria (Table 2-2). The category scales (high, moderate, low) are referred to with either H, M, L for the assessment of potential landscape effects in Table 5-1 below.

Notably, the Desired Character of the Primary Production Zone as stated in the Development Plan envisages solar and ancillary development as a land use in this Zone.

Further, the Development Plan describes that wind farms, which pose a significantly greater visual impact than solar farms primarily due to scale, but nonetheless have similar requirements regarding natural resources, need to be located in areas where they can take advantage of these natural resources and as a consequence may need to be:

- *"located in visually prominent locations such as ridgelines*
- *visible from scenic routes and valuable scenic and environmental areas*
- *located closer to roads than envisaged by generic setback policy."*

The Development Plan further states that:

> *"This, coupled with the large scale of these facilities (in terms of both height and spread of components), renders it difficult to mitigate the visual impacts of wind farms to the degree expected of other types of development. Subject to implementation of management techniques set out by general / council wide policy regarding renewable energy facilities, these visual impacts are to be accepted in pursuit of benefits derived from increased generation of renewable energy."*

Additionally, the Development Plan includes Landscape Protection Policy Areas, which aim to preserve and/or enhance the characteristics and values of the of the Policy Areas.

Although the Project area is situated between National Highway 1 (Augusta Highway) and the Landscape Protection Policy Areas 11 and 12, it does not fall within these Policy Areas and is therefore not constrained by the associated Policies. Notwithstanding, it is notable that due to the Project's low profile and the implementation of any standard and/or necessary mitigation measures, the Project will not impair or compromise the natural view of the ranges or the Landscape Protection Policy Areas.

Table 5-1: Assessment of Landscape Effects

	Sensitivity of Receptor		Magnitude of effect						
Landscape Receptor	**Susceptibility**	**Value**	**Size and scale**	**Frequency of Use**	**Distance/ Geographical extent**	**Duration**	**Reversibility**	**Description**	**Significance of Effect**
Landform/ topography	L	L	L	L	M	M	L	As Project does not involve excavation of the land, it will not result in a change to the existing landform or topography of the Project area or surrounding landscape.	Low
Landcover/ vegetation	M	M	L	L	M	M	L	Although limited vegetation clearance will be undertaken as part of this Project, the Project area and surrounding landscape has relatively distinct crop rotations and climatic conditions, which are generally more preferred characteristics within the rural landscape. None the less, the Project would result in a small reduction of cropping land for the duration of operation.	Moderate-Low
Water form	L	L	L	L	L	M	L	No water forms evident within the Project area or the surrounding landscape.	Low
Land use	L	L	L	L	M	M	L	Although the addition of the Project would be a noticeable change to the existing land use of the Project area, the co-location of the existing Bungama Substation, other electrical infrastructure the Project area render the proposed use of the site appropriate within the landscape.	Low

	Sensitivity of Receptor		Magnitude of effect						
Landscape Receptor	**Susceptibility**	**Value**	**Size and scale**	**Frequency of Use**	**Distance/ Geographical extent**	**Duration**	**Reversibility**	**Description**	**Significance of Effect**
Texture and colour	M	L	L	L	M	M	L	The introduction of PV solar panels will introduce a new scale of colour and texture to the Project area, however, these textures and colours are common place in the landscape from machinery sheds, silos, storage sheds, etc.	Moderate-Low
Settlement pattern	L	L	L	L	M	M	L	As described, the settlement pattern includes a combination of scattered individual structures and concentrated settlements with a combination of both large and small subdivided allotments. The Project does not require further subdivisions of land or introduction of additional settlements within the landscape.	Low
Rarity	L	L	L	L	M	M	L	The existing landscape elements within the Project area and surrounding landscape are common within the region and other rural landscapes.	Low
Rural landscape character	L	L	L	L	M	M	L	Renewable energy developments are a type of desired character for the Primary Production Zone. Further, developments of this nature are not considered a significant change in rural landscapes, generally. Changes are negligible in this regard.	Low

5.2. VIEWSHED ANALYSIS

Viewshed analysis is a GIS tool used to identify the theoretical visibility of the Project within a defined study area. As stated, the results of the analysis are theoretical only and recognising the limitations of its use can assist with understanding the results of the analysis.

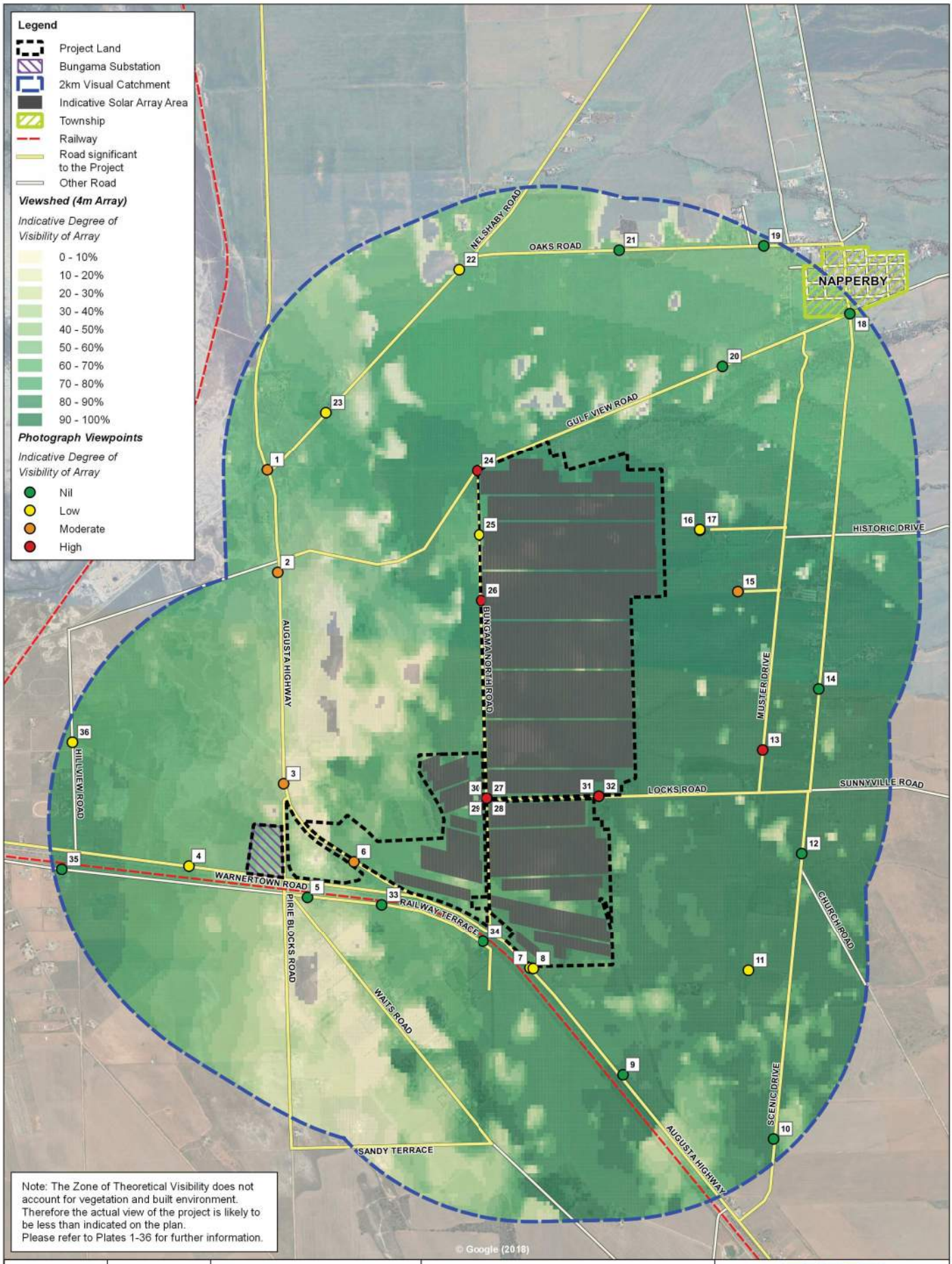
It is important to note that the Project in its entirety cannot be viewed from one single viewpoint.

The viewshed analysis completed for this VIA (Figure 5-1) is based on digital elevation model (DEM) information derived from Geoscience Australia. This data has a resolution of approximately 30m, where 90% of tested elevations were within 6m of reference heights, and in flatter areas height errors are less than 3m (Gallant, et. al., 2011). Although smoothing has been applied, and after vegetation removal random noise is still present. The noise typically alters elevations by 2 to 3m, but in some cases by as much as 10m (Gallant, et. al., 2011). Considering the Project area and surrounding area is mostly flat and sparsely vegetated the accuracy is considered to be manageable over a larger area.

It is not common practice to include other land use or topographical data when processing the viewshed, therefore the results do not account for features or "obstructions" (i.e. buildings/structures, vegetation, and ridgelines) that have potential screening abilities. Accordingly, false-positives are a common occurrence. The earth curvature can also have an influence on screening potential, however given the size and scale of the Project in relation to the earth curvature this is not considered necessary to include in the viewshed. Lastly, the heights of the viewer/receptors and the Project are also integral to the analysis. In this instance, the receptor height is set at 1.6m, which is considered average, and the PVS height is set at 4m, which is the maximum height of the PVS technology options being considered for the Project. Although the PVS technology options being considered range from 1m to 4m in height, EPS Energy has taken a conservative approach and based the viewshed analysis on the maximum potential height of the PVS technology options.

Using the viewshed analysis, a total of 36 viewpoints scattered throughout the surrounding landscape were selected. These viewpoints underwent assessment during numerous site visits to "ground-truth" the degree of visibility and effects of the Project. This revealed a significant amount of false-positives within the viewshed output and confirmed the limitations of this type of analysis and that the results are theoretical only.

An assessment of the visual effects from the 36 viewpoints are also depicted in Figure 5-1 and discussed in Section 5.3.5.



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:27,000
Job Ref/Version:	11297/ V04

0 0.25 0.5 0.75 1 km

Map Projection: GDA 1994 MGA Zone 54

Figure 5-1

Zones of Theoretical Visibility (4m Array)

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21/11/2018

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11297_VIA_Viewshed_Analysis.qgs

5.3. POTENTIAL VISUAL RECEPTORS

Visual receptors are defined as individuals and/or groups of people who are affected by changes to views or visual amenity of the landscape as a result of the Project (Landscape Institute & IEMA, 2013). It follows that the key visual receptors to consider in this assessment are the potential "residential receptors" and the "viewpoint receptors". These have been assessed separately in the following sections.

The potential *residential* receptors identified within a 100m, 1km and 2km Visual Catchment of the Project area are shown in Figure 5-2. This figure identifies 231 potential visual receptors, three (3) of which are owned by Project landowners. The Project landowners are exempt from this VIA as EPS Energy will liaise with them directly on any potential visual mitigation measures. Further, two (2) of the potential visual receptors are service stations, and one (1) is a caravan park. Accordingly, an approximate total of 225 potential visual receptors are considered to be residential buildings.

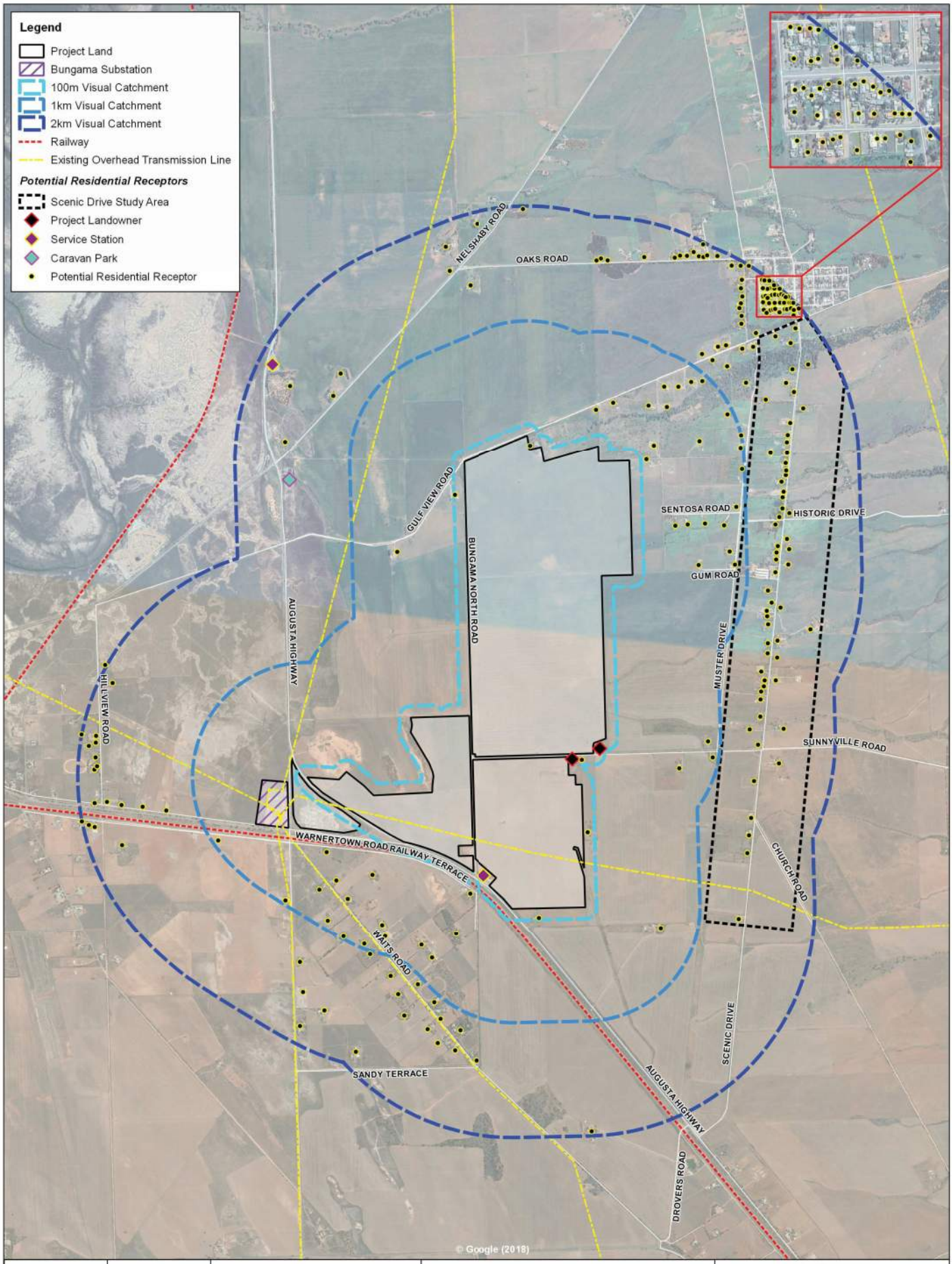
It is noted that at the time of this assessment some of these residential receptors were unable to be distinguished between residences or ancillary structures such as sheds. EPS Energy has taken a conservative approach to this and has treated each as if it were a residence.

Due to the number of potential residential receptors, the following assessment of visual effects is undertaken in groups correlating with the individual Visual Catchments that the potential receptors are located, being 100m Visual Catchment (Table 5-2,Figure 5-3), 1km Visual Catchment (Table 5-3, Figure 5-4), 2km Visual Catchment (Table 5-4, Figure 5-5) and Scenic Drive Study Area (Table 5-5, Figure 5-6).

The potential *viewpoint* receptors are those identified in the viewshed analysis in Section 5.2. Again, it is important to note that the Project in its entirety cannot be viewed from one single viewpoint. The potential degree of visibility of the Project from each visual receptor has been depicted in within the associated figures. Further to this, Figure 5-7 demonstrates the indicative degree of visibility of the Project along the roads within the extent of the 2km Visual Catchment and Figure 5-8 demonstrates the indicative frequency of use of these roads. Where the Project is expected to be visible, it is indicated in Plates 13-48 as blue shading.

The assessment of visual effects on both the potential residential receptors and potential viewpoint receptors is undertaken in accordance with the assessment criteria outlined in Table 2-2. As with the assessment of landscape effects, the category scales (high, moderate, low) are referred to with either H, M, L in the following assessment tables.

It is noted that in the following assessment of visual effects all potential residential receptors are assigned a “High” level of ‘susceptibility’, as they are considered residences. Similarly, ‘duration’ and ‘reversibility’ criteria for all potential residential receptors score “Moderate” and “Low” respectively. This is due to the nature of the Project as a utility-scale solar development, which is a temporary feature lasting up to 30 years, is non-invasive to install, and the associated infrastructure can be removed upon decommissioning and the landscape and associated views restored to their condition and use prior to the introduction of the Project. Similarly, the ‘value’ for all viewpoint receptors is assigned “Low” in accordance with the value results from the assessment of rural landscape character (Table 5-1).



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:30,000
Job Ref/Version:	11297/ V08

0 0.25 0.5 0.75 1 km

Map Projection: GDA 1994 MGA Zone 54

Figure 5-2

Potential Residential Receptors

Bungama Solar | Bungama SA Australia

21/11/2018

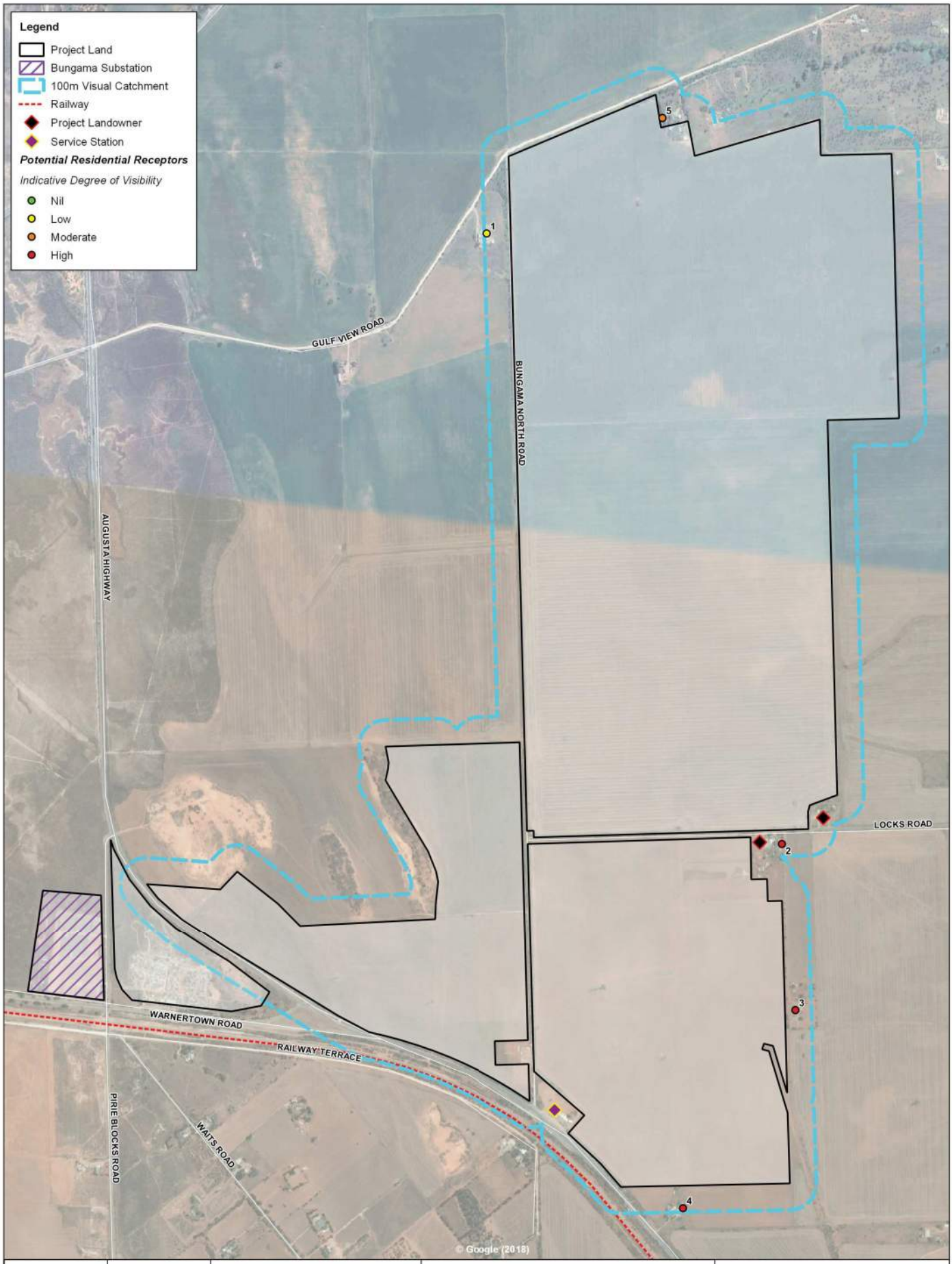
BUNGAMA SOLAR

11297_VIA_Potential Residential Receptors.qgs

5.3.1. Potential Residential Receptors – 100m Visual Catchment

The potential residential receptors within the 100m Visual Catchment are numerically identified in Figure 5-3 below, and the assessment of visual effects outlined in Table 5-2.

As the Project area is located within the foreground for these potential residential receptors, they are each assigned a “High” level of distance/geographical extent in addition to their susceptibility.



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:13,000
Job Ref/Version:	11297/ V07

0 100 200 300 400 500 m

Map Projection: GDA 1994 MGA Zone 54

Figure 5-3

Potential Residential Receptors – 100m Visual Catchment

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21/11/2018

BUNGAMA SOLAR

11297_VIA_Potential_Residential_100m.qgs

Table 5-2: Assessment of Visual Effects on Potential Residential Receptors – 100m Visual Catchment

	Sensitivity of Receptor		Magnitude of effect						
Receptor Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
1	H	M	M	H	H	M	L	It is noted that Bungama North Road separates this receptor from the Project, which has substantial vegetation within the road reserves as depicted in Plate 11. It is recognised that this receptor is oriented north and not in the direction of the Project (east). Further, much visibility of the Project from this receptor is screened by the existing moderate-dense vegetation along Bungama North Road, resulting in low visibility of the Project. This factor has a substantial influence over the significance of the effect as there is no anticipated change to the view from this receptor and is therefore downgraded to "Low".	Low
2	H	M	L	L	H	M	L	Views toward the Project from this receptor include the expanse of existing transmission lines and towers along Locks Road. It is recognised that this receptor has existing vegetation screening within their property to Locks Road and toward the Project site as shown in Plate 12. This, along with the existing vegetation within the road reserve of Locks Road obstructs the visibility of the Project. This existing vegetation will not be removed as a result of the Project.	Moderate-Low
3	H	M	M	H	H	M	L	This receptor is proximate to the large 275kV transmission lines and associated towers and has prominent views of the large silos and Nyrstar Smelter stack in the background, detracting from the otherwise typical rural landscape. Despite the presence of artificial elements, the Project,	Moderate-High

	Sensitivity of Receptor		Magnitude of effect						
Receptor Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
								without mitigation measures, would likely result in a prominent physical change to the view from this receptor and portions of the Project will be due to the close distance.	
4	H	M	M	H	H	M	L	This receptor is proximate to the Augusta Highway and railway to the south and has prominent views of the large 275kV transmission lines and towers to the north. Despite the presence of artificial elements, the Project, without mitigation measures, would likely result in a prominent physical change to the view from this receptor and portions of the Project will be visible due to the close distance.	Moderate-High
5	H	M	M	H	H	M	L	Views from this receptor include a significant amount of existing vegetation both within their property and the Project area, a fence and a number of sheds with Low to Nil visibility of the Project area in a southerly direction (Plate 13). Despite the presence of artificial elements, the Project, without mitigation measures, would likely result in a physical change to the view from a south-westerly direction from this receptor and portions of the Project will be visible due to the close distance (Plate 14).	Moderate
Service Station	L	L	L	L	H	M	L	The views from this receptor present significant disturbance and has artificial elements, particularly due to its location on the Augusta Highway. The active use of the site is toward the Augusta Highway, not the Project. Visibility of the Project from this receptor is likely to be from behind the service station.	Low

Plate 11: Indicative View of the Project From Receptor #1

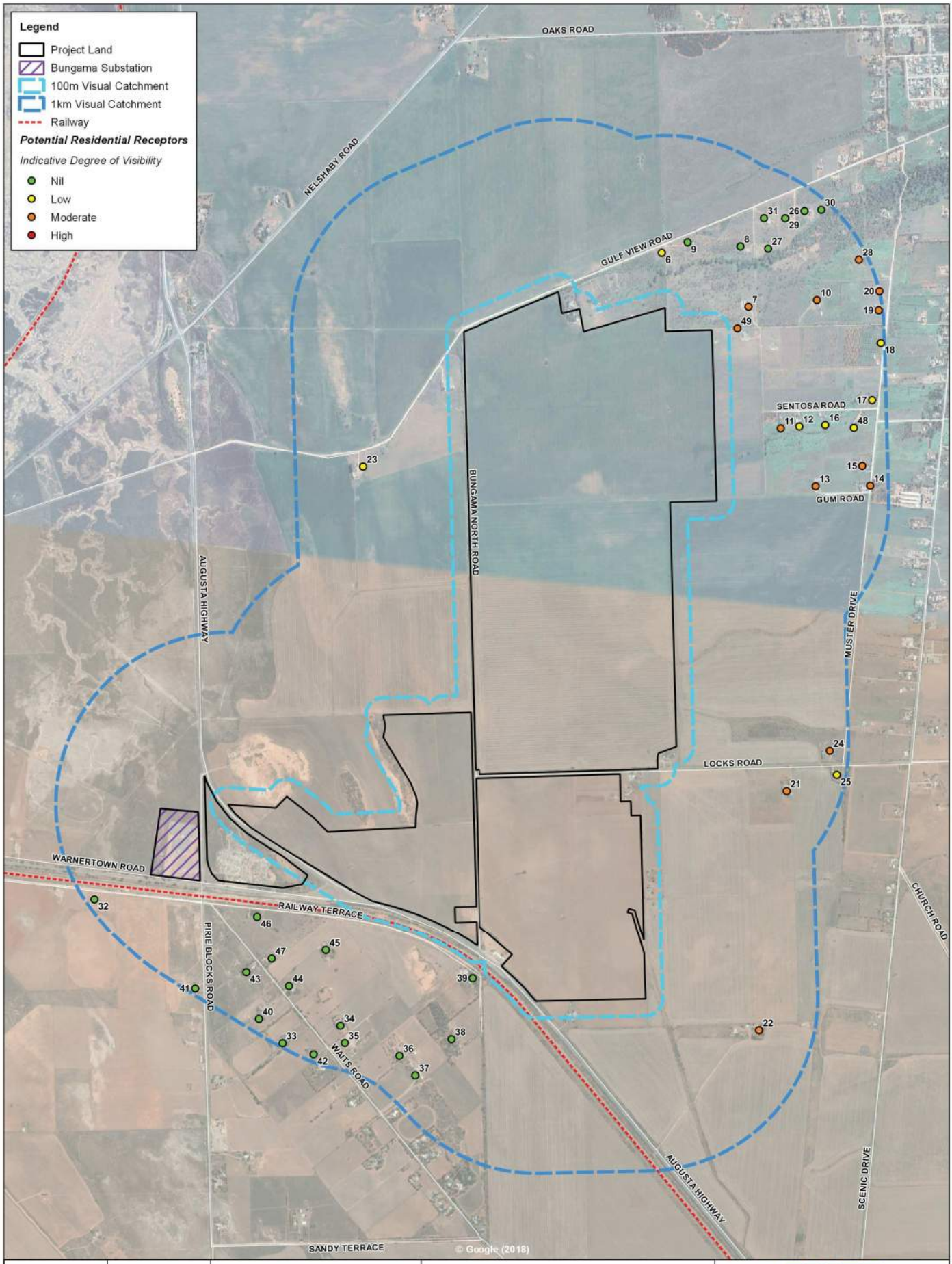
Plate 12: Vegetation Within Road Reserve of Locks Road and in Front of Receptor #2 (left)

Plate 13: Southerly View From Receptor #5

Plate 14: South-westerly View From Receptor #5

5.3.2. Potential Residential Receptors – 1km Visual Catchment

The potential residential receptors within the 1km Visual Catchment are numerically identified in Figure 5-4 below, and the assessment of visual effects outlined in Table 5-3.



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:20,000
Job Ref/Version:	11297/ V06

0 0.25 0.5 0.75 1 km

Map Projection: GDA 1994 MGA Zone 54

Figure 5-4

Potential Residential Receptors – 1km Visual Catchment

Bungama Solar | Bungama SA Australia

21/11/2018

BUNGAMA SOLAR

11297_VIA_Potential_Residential_1km.qgs

Table 5-3: Assessment of Visual Effects on Potential Residential Receptors – 1km Visual Catchment

	Sensitivity of Receptor		Magnitude of effect						
Receptor Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical extent	Duration	Reversibility	Description	Significance of Effect
6	H	M	L	L	M	M	L	It is noted that this receptor is surrounded by a considerable amount of existing vegetation. The view from this receptor is not anticipated to change as a result of the Project. The overall significance of effect is therefore considered to be downgraded to "Low".	Low
7 & 49	H	M	M	M	M	M	L	Without mitigation measures, the constructed Project would likely result in a noticeable change to the view.	Moderate
8, 9, 26, 27, 29-31	H	M	L	L	M	M	L	These receptors are proximate to a number of other rural residential dwellings, ancillary structures and the township of Napperby. A substantial amount of vegetation separates these receptors from the Project area. Due to this vegetation the Project would not likely be visible from these receptors. The overall significance of effect is therefore considered to be downgraded to "Low".	Low
10-20, 28 & 48	H	M	M	L	M	M	L	The view from these receptors toward the Project is obstructed by other rural residences and scattered vegetation. Further, these receptors are situated close to/along the 1km Visual Buffer. Views from these receptors are not anticipated to be significantly affected by the Project. The overall significance of effect is therefore considered to be downgraded to "Moderate-Low".	Moderate-Low

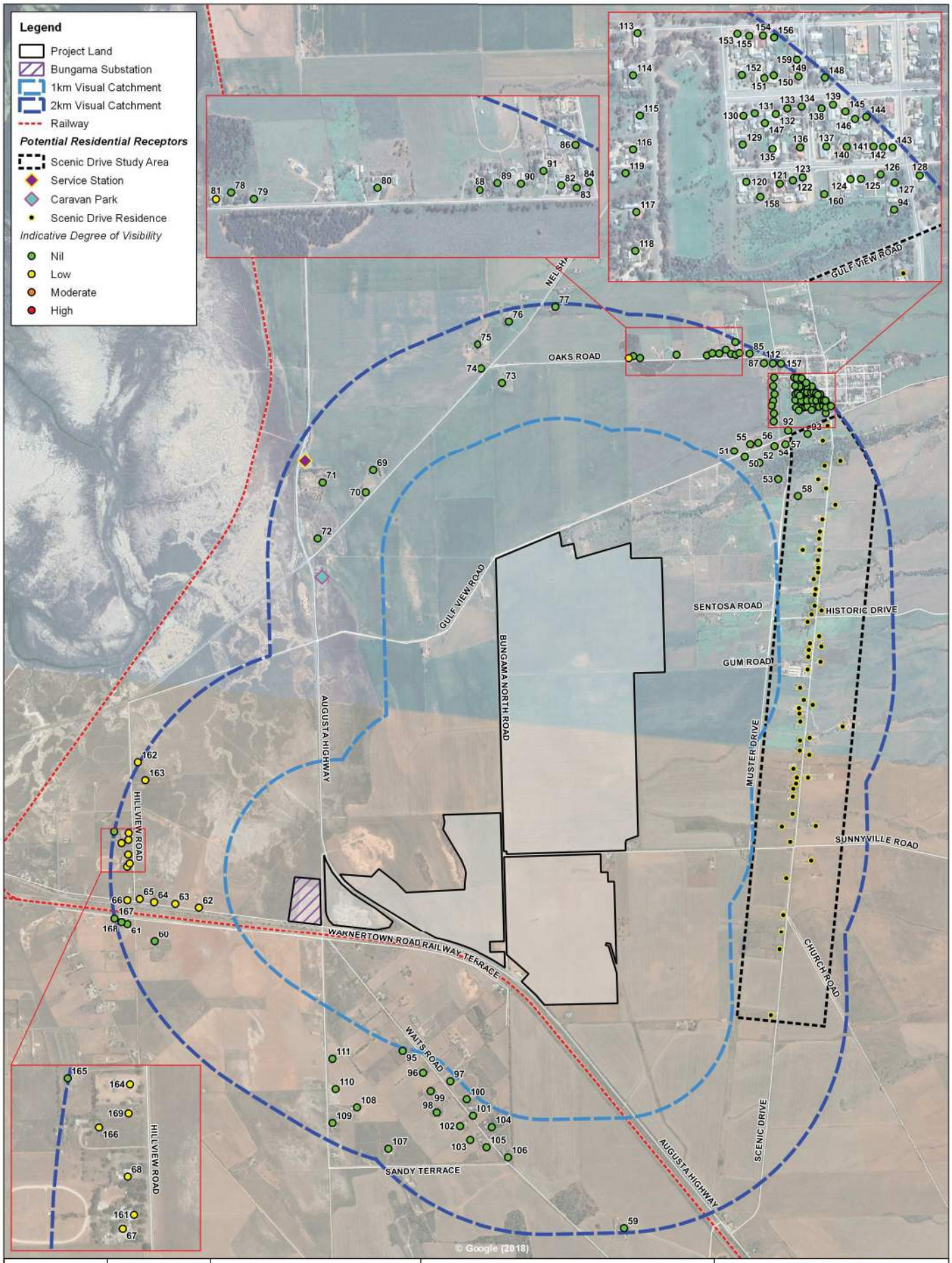
	Sensitivity of Receptor		Magnitude of effect						
Receptor Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical extent	Duration	Reversibility	Description	Significance of Effect
21, 22, 24 & 25	H	L	L	L	L	M	L	These receptors are proximate to the existing 275kV transmission lines and towers spanning the surrounding properties and along Locks Road (Plate 24). There is a considerable amount of existing scattered vegetation between Receptors 21, 24 & 25 and the Project area, providing natural screening. The views from Receptor 22 not only includes the transmission lines and towers but also the large silos in Port Pirie and the Nyrstar Smelter in the background.	Low
23	H	L	M	L	M	M	L	This receptor is exposed to the Morgan-Whyalla Pipeline that runs parallel to Gulf View Road. As with Receptor #1, this receptor is also separated from the Project by Bungama North Road, which has substantial vegetation within the road reserves providing natural screening. Further, the dominant view from this receptor toward the Project is the Southern Flinders Ranges in the background. When observing the view in its entirety the low profile of the constructed Project does not constitute a substantial change to this view.	Moderate-Low
32-47	H	L	L	L	L	M	L	These receptors are on the southern side of the Augusta Highway and Railway Terrace. The Project is not likely to be visible from these receptors due to the substantial vegetative screening along the railway and Augusta Highway (Plate 47 and Plate 48).	Low

5.3.3. Potential Residential Receptors – 2km Visual Catchment

The potential residential receptors within the 2km Visual Catchment are numerically identified in Figure 5-5 below, and the assessment of visual effects outlined in Table 5-4.

The distance of these potential residential receptors to the Project is considered “Low”, where the Project area is situated within the midground and, once constructed, unlikely to result in a prominent change to the views of the landscape and may be difficult to distinguish from existing elements from certain receptors.

Concentrations or groups of potential residential receptors exist in the township of Napperby, south of Railway Terrace and along Scenic Drive. The groups within Napperby and south of Railway Terrace are not likely to have any visibility of the Project and are therefore discussed as a collective. The group of potential residential receptors along Scenic Drive have various degrees of visibility that are able to be further grouped. The Scenic Drive sub-groups are depicted in Figure 5-6 and discussed as Groups 1, 2 and 3 in Table 5-5.



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:30,000
Job Ref/Version:	11297/ V06

0 0.25 0.5 0.75 1 km

Map Projection: GDA 1994 MGA Zone 54

Figure 5-5

Potential Residential Receptors – 2km Visual Catchment

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11297_VIA_Potential_Residential_2km.qgs

Table 5-4: Assessment of Visual Effects on Potential Residential Receptors – 2km Visual Catchment

	Sensitivity of Receptor		Magnitude of effect						
Receptor Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical extent	Duration	Reversibility	Description	Significance of Effect
59	H	M	L	L	L	M	L	This potential receptor is located on the boundary of the 2km Visual Catchment and is proximate to the Augusta Highway, railway line and the township of Warnertown. The Project is not anticipated to be visible from this receptor. The overall significance of effect is therefore considered to be downgraded to "Low".	Low
62-68, 161-164, 166 & 169	H	L	L	L	L	M	L	Views from these receptors toward the Project are interrupted by both the Bungama Substation and the Augusta Highway. The visual effect of the Project is not considered to affect the overall views from these potential receptors.	Low
165	H	L	L	L	L	M	L	This potential receptor is set behind potential receptors 164 and 169. Views toward the Project are impeded by existing vegetation within these properties in addition to vegetation scattered across the 2kms between this receptor and the Project.	Low
69-77	H	M	L	L	L	M	L	Although views toward the Project are mostly typical of the rural landscape, the Project is not anticipated to be distinguishable from these receptors. The overall significance of effect is therefore considered to be downgraded to "Low".	Low

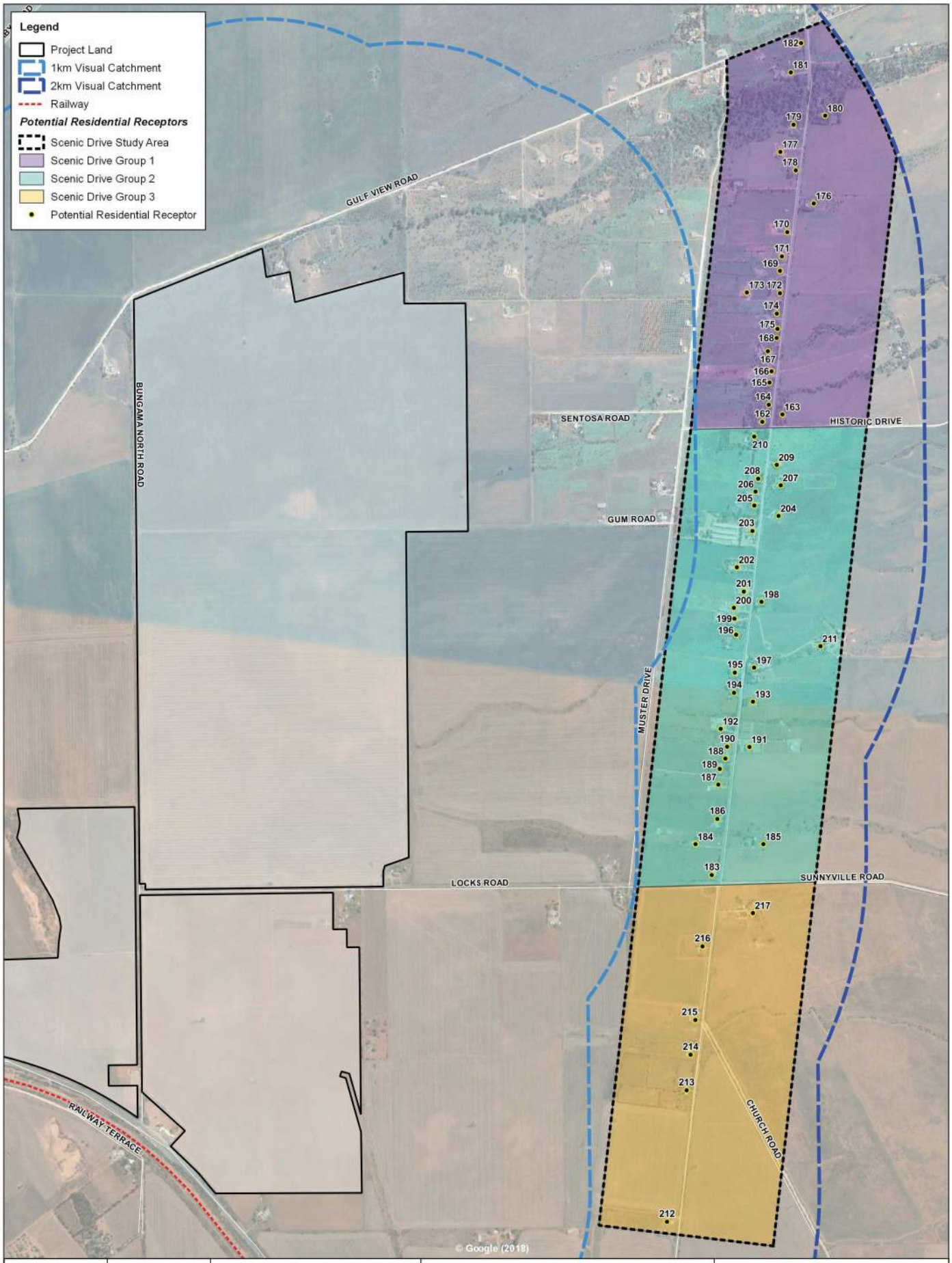
	Sensitivity of Receptor		Magnitude of effect						
Receptor Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical extent	Duration	Reversibility	Description	Significance of Effect
79-91 *(Oaks Rd inset box)*	H	M	L	L	L	M	L	As above.	Low
85, 87, 112 & 157	H	L	L	L	L	M	L	These receptors are proximate to the township of Napperby and views toward the Project are significantly screened by the existing vegetation along Gulf View Road.	Low
50-58, 92 & 93	H	L	L	L	L	M	L	These receptors are also proximate to the township of Napperby and views toward the Project also significantly screened by the existing vegetation along Gulf View Road and the residences and scattered vegetation between the receptors and the Project.	Low
Service Station	L	L	L	L	L	M	L	The views from this receptor present significant disturbance and have artificial elements, particularly due to its location on the Augusta Highway. The active use of the site is toward the Augusta Highway, not the Project. The Project is in the midground from this receptor and may be difficult to distinguish.	Low
Caravan Park	L	L	L	L	L	M	L	As above. Further, the caravan park itself is well vegetated, providing vegetated screening toward both the Augusta Highway and the Project area.	Low

	Sensitivity of Receptor		Magnitude of effect						
Receptor Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical extent	Duration	Reversibility	Description	Significance of Effect
South of Railway Terrace									
95-111	H	L	L	L	L	M	L	Although these receptors are further removed from the railway and Augusta Highway, the views are still modified with prominent artificial elements evident, particularly the neighbouring residential properties. The constructed Project is not likely to be visible from these receptors.	Low
60-61 & 167-168	H	L	L	L	L	M	L	This group of potential receptors are also located on the southern side of Railway Terrace but to the west. Views toward the Project are obscured by the existing vegetation on either side of the railway line and Warnertown Road. The Project is not anticipated to be visible from these receptors.	Low
Township of Napperby									
94, 113-156, 158-160 *(Napperby inset box)*	H	L	L	L	L	M	L	These receptors are located within the township of Napperby, which has views of other residential properties in a higher-density than the other receptors in this assessment. The Project is not anticipated to be visible from these receptors.	Low

5.3.4. Potential Residential Receptors – Scenic Drive

The potential residential receptors within the Scenic Drive Study Area are numerically identified in Figure 5-6 below, and the assessment of visual effects outlined in Table 5-5.

As stated, the group of potential residential receptors along Scenic Drive have various degrees of visibility that are able to be further grouped into three (3) groups based on similar views of the landscape toward the Project site. Details of which are outlined in Table 5-5 below.



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:15,000
Job Ref/Version:	11297/ V04

0 100 200 300 400 500 m

Map Projection: GDA 1994 MGA Zone 54

Figure 5-6

Potential Residential Receptors – Scenic Drive

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11297_VIA_Potential_Residential_SD.qgs

Table 5-5: Assessment of Visual Effects on Potential Residential Receptors – Scenic Drive

	Sensitivity of Receptor		Magnitude of effect						
Receptor Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical extent	Duration	Reversibility	Description	Significance of Effect
162-182 *(Group 1)*	H	L	L	L	L	M	L	The views toward the Project from these receptors are significantly more screened by a significant amount of vegetation, residential development and associated ancillary structures. than Group 2 or 3. These receptors are not likely to experience noticeable changes to their views as a result of the Project. In many cases, it is unlikely that the Project will be visible from most of these receptors. Further, it is recognised that many of these receptors are orientated east, away from the Project area with views of the Southern Flinders Ranges.	Low
183-211 *(Group 2)*	H	L	M	L	L	M	L	Although these receptors are further removed from the township of Napperby, the views are still significantly modified with considerable artificial elements visible including the large silos and the Nyrstar Smelter in Port Pirie, and other residences with associated ancillary structures. As there is less development separating these receptors and the Project, there is likely to be a higher degree of visibility than Group 1. However, it is recognised that any visibility of the Project would be limited to small sections only and be from a considerable distance. As stated above, it is recognised that many of these receptors are orientated east, away from the Project and toward the Southern Flinders Ranges.	Moderate-Low

	Sensitivity of Receptor		Magnitude of effect						
Receptor Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical extent	Duration	Reversibility	Description	Significance of Effect
212-217 *(Group 3)*	H	L	M	L	L	M	L	Although the views of the landscape from this viewpoint are predominantly rural, these receptors are proximate to the existing 275kV transmission lines and towers spanning the surrounding properties and along Locks Road. Other significant artificial elements visible from these receptors include the large silos and the Nyrstar Smelter in Port Pirie. Again, many of these receptors are oriented east, away from the Project area. Although there is the least amount of development separating these receptors and the Project, the large 275kV transmission lines and towers are a prominent element in the foreground and midground and are situated proximate to these receptors.	Moderate-Low

5.3.5. Potential Viewpoint Receptors

The potential viewpoint receptors are those identified in the viewshed analysis in Section 5.2. Again, it is important to note that the Project in its entirety cannot be viewed from one single viewpoint. The potential degree of visibility of the Project from each viewpoint receptor has been depicted in both Figure 5-1 and Figure 5-7. Further to this, Figure 5-7 also demonstrates the degree of visibility of the Project along the roads within the extent of the 2km Visual Catchment.

The assessment of visual effects on the potential viewpoint receptors is undertaken in accordance with the assessment criteria outlined in Table 2-2. As with the assessment of landscape effects and potential residential receptors, the category scales (high, moderate, low) are referred to with either H, M, L in the following assessment table.

Further, as with the assessment of the potential residential receptors, the 'duration' and 'reversibility' criteria for all potential viewpoint receptors also score "Moderate" and "Low" respectively. Again, this is due to the nature of the Project as a utility-scale solar development, which is a temporary feature lasting up to 30 years, is non-invasive to install, and the associated infrastructure can be removed upon decommissioning and the landscape and associated views restored to the condition and use prior to the introduction of the Project. Similarly, the 'value' for all potential viewpoint receptors is assigned "Low" in accordance with the value results from the assessment of rural landscape character (Table 5-1).

It is also important to consider that the visual receptors from these viewpoints would likely be passengers travelling in vehicles. It follows that the receptors would only be exposed to potential views of the Project for a certain amount of time based on the speed they are travelling. The following table details the view times for the roads surrounding the Project area that have visibility of the Project (Figure 5-7), calculated based on the following formula:

$$time = \frac{distance}{velocity}$$

For example, passengers travelling either north or southbound along the Augusta Highway at a speed of 100km/hr where the Project is visible for approximately 3km, their view time of the Project would be approximately 1 minute 48 seconds, where:

$$time = \frac{3km}{100km/hr}$$

$$time = 0.03\ hours\ x\ 60$$

$$time = 1.8\ minutes\ x\ 60$$

$$time = 108\ seconds \text{ i.e. } 1\ minute\ 48\ seconds$$

Table 5-6: Approximate Viewing Times of the Project From Surrounding Roads

Road Name	Distance (km)	Max Speed limit (km/h)	Time (minutes:seconds)
Augusta Highway north/southbound	~3.0	100	1:48
Augusta Highway north-west/south-eastbound	~1.8	100	1:05
Warnertown Road	~2.5	100	1:30
Scenic Drive	~2.2	100	1:19
Oaks Road	~1.2	80	0:54
Nelshaby Road	~2.3	110	1:15
Gulf View Road	~2.4	100	1:26
Bungama North Road	~2.6	100	1:33
Locks Road (east-west)	~2.5	100	1:30
Locks Road (north-south)	~1.0	100	0:36
Muster Drive	~3.1	100	1:51

In addition to the view times, it is also important to consider the frequency of use of these roads (Figure 5-8) when determining the overall significance of the effect. For example, when simultaneously viewing Figure 5-7 and Figure 5-8 it can be determined that although the Augusta Highway is considered to have a High frequency of use (Figure 5-8), it has relatively Low degree of visibility of the Project (Figure 5-7). Similarly, although Bungama North Road has a High degree of visibility of the Project (Figure 5-7), it has relatively Low frequency of use (Figure 5-8). Therefore, when determining the significance of effect, a level of professional judgement must be used to combine the above-mentioned factors into the assessment.

Table 5-7: Assessment of Visual Effects on Potential Viewpoint Receptors

	Sensitivity of Receptor		Magnitude of effect						
Viewpoint Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
1	L	L	L	M	L	M	L	The Project area is >1km from this viewpoint. Due to the significant disturbance that exists along the Augusta Highway, the landscape has the potential to accommodate the Project. The flat terrain and low profile of the Project would result in overall low visibility of the Project, which is located in the midground. The Project will not result in a significant change to the landscape from this viewpoint. Refer to Plate 15.	Low
2	L	L	L	M	L	M	L	As above. Refer to Plate 16.	Low
3	L	L	L	M	M	M	L	The Project area is <1km from this viewpoint. Due to the significant disturbance that exists along the Augusta Highway, including the Bungama Substation, a mining operation and an auto-wreckers car yard, the landscape has the potential to accommodate the Project. The flat terrain and low profile of the Project would result in overall low visibility of the Project, which is located in the midground. The Project will not result in a significant change to the landscape from this viewpoint. Refer to Plate 17.	Low
4	L	L	L	M	L	M	L	The Project area is ~1km from this viewpoint. Significant disturbance is evident, particularly the Bungama Substation. The flat terrain and low profile of the Project would result in low visibility of the Project, which is located in the midground. Further, the Bungama Substation	Low

	Sensitivity of Receptor		Magnitude of effect						
Viewpoint Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
								obscures a significant amount of the southern portion of the Project. The constructed Project is not likely to result in a significant change to the landscape from this viewpoint. Refer to Plate 18.	
5	L	L	L	L	H	M	L	The Project area is <1km from this viewpoint. Significant disturbance is evident, particularly the railway line and transmission lines and towers. The Project area is not visible from the viewpoint. Refer to Plate 19.	Low
6	L	L	M	M	H	M	L	The Project area is <100m from this viewpoint. Significant disturbance is evident, particularly the railway line and transmission lines and towers. There are unobstructed sections of the Project area visible from a close distance but not a complete vista. Without mitigation measures, the Project may result in a noticeable physical change to the landscape. Refer to Plate 20.	Moderate-Low
7	L	L	L	L	H	M	L	The Project area is <100m from this viewpoint. A significant amount of disturbance is evident, particularly the transmission lines and towers and the highway itself. The Project is not likely to be visible from this viewpoint due to the existing vegetation within the road reserve. Refer to Plate 21.	Moderate-Low
8	L	L	H	M	H	M	L	The Project area is <100m from this viewpoint. A significant amount of disturbance is evident, particularly the transmission lines and towers and the highway itself. The Project	Moderate

	Sensitivity of Receptor		Magnitude of effect						
Viewpoint Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
								will appear in the midground. Without mitigation measures the Project may result in a noticeable change to the view. Refer to Plate 22.	
9	L	L	M	M	L	M	L	The Project area is ~1km from this viewpoint. A significant amount of disturbance is evident, particularly the transmission lines and towers and the highway itself. The Project is not likely to be visible from this viewpoint due to the existing vegetation within the road reserve. Refer to Plate 23.	Moderate-Low
10	L	L	L	L	L	M	L	The Project area is ~2km from this viewpoint. Artificial elements are prominent from this viewpoint, particularly the transmission lines and towers and the highway itself. The Project is not likely to be visible from this viewpoint due to the existing vegetation between this viewpoint and the Project. Refer to Plate 24.	Low
11	L	L	L	L	L	M	L	The Project area is >1km from this viewpoint. The existing transmission lines are proximate to this viewpoint and are a prominent feature in the foreground and midground. Further the large silos and Nyrstar Smelter are prominent features in the background. The landscape is therefore considered able to accommodate the Project. Refer to Plate 25.	Low
12	L	L	L	L	L	M	L	The Project area is >1km from this viewpoint. Some glimpses of the Project area (north of Locks Road) may be visible from this viewpoint however most views would likely be difficult to distinguish in the midground. Refer to Plate 26.	Low

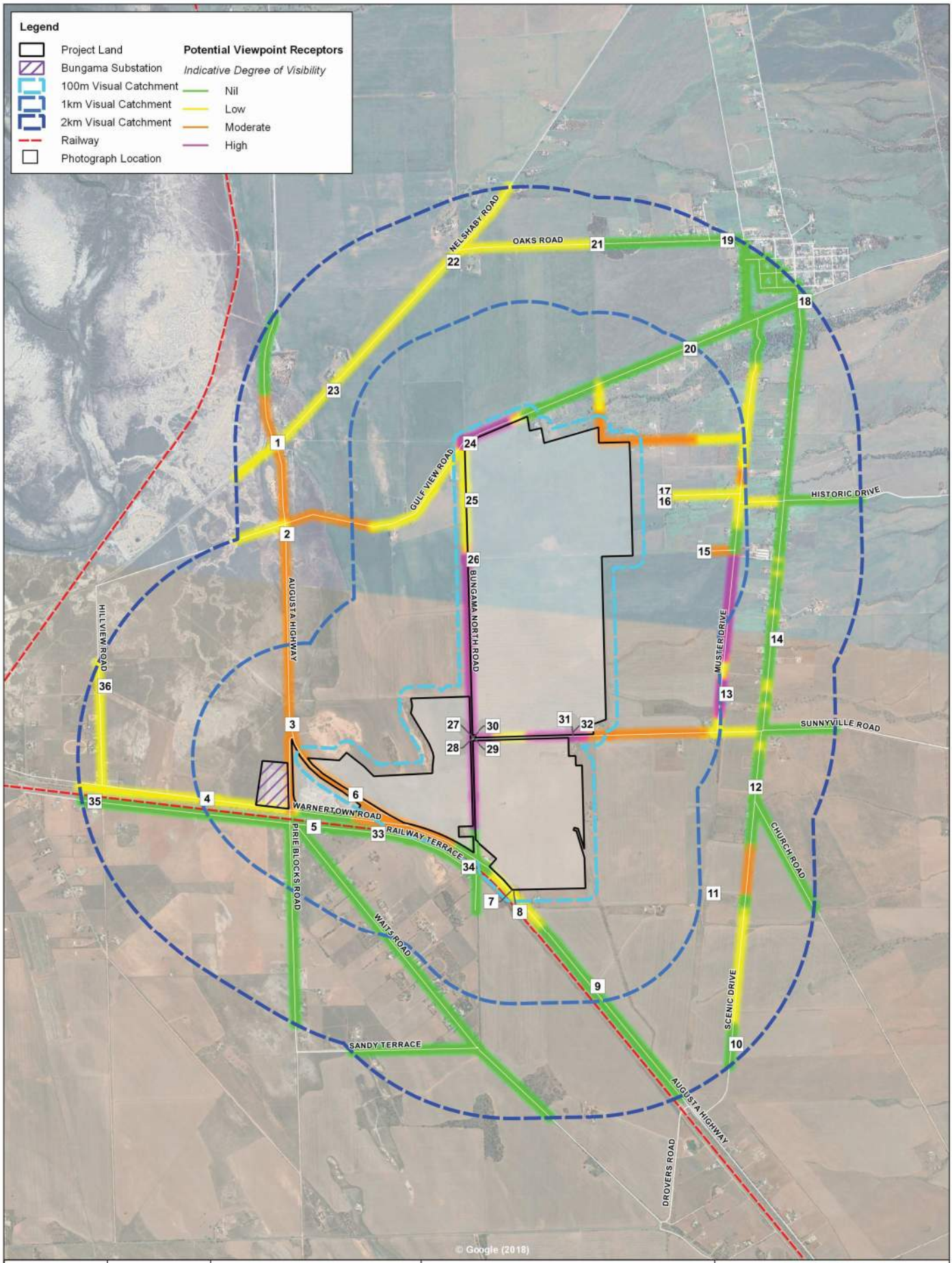
	Sensitivity of Receptor		Magnitude of effect						
Viewpoint Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
13	L	L	L	L	L	M	L	The Project area is ~1km from this viewpoint. It is unlikely that the Project area south of Locks Road would be visible from this viewpoint due to the existing vegetation providing natural screening. Views of the Project from this viewpoint would be in the midground and unlikely to result in a significant change to the landscape. Refer to Plate 27.	Low
14	L	L	L	L	L	M	L	The Project area is >1km from this viewpoint. Visibility of the Project is likely to be glimpses only due to the existing residences and structures along Scenic Drive. The Project is unlikely to result in a change to the landscape from this viewpoint. Refer to Plate 28.	Low
15	L	L	M	L	M	M	L	The Project area is <1km from this viewpoint. Although there are artificial elements evident in the view, including the large silos in Port Pirie, the Nyrstar Smelter and general development in the midground and background, the Project may result in a change to the view without mitigation measures. Refer to Plate 29.	Moderate-Low
16	L	L	M	L	H	M	L	The Project area is <500m from this viewpoint. Some prominent areas of the Project are likely to be visible without mitigation measures. Refer to Plate 30.	Moderate-Low
17	L	L	M	L	H	M	L	As above. Refer to Plate 31.	Moderate-Low
18	L	L	L	L	L	M	L	The Project area is ~2km from this viewpoint. This viewpoint is adjacent to the township of Napperby and is exposed to a high degree of artificial elements. The Project is not visible	Low

	Sensitivity of Receptor		Magnitude of effect						
Viewpoint Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
								from this viewpoint due to the existing vegetation between this viewpoint and the Project. Refer to Plate 32.	
19	L	L	L	L	L	M	L	As above. Refer to Plate 33.	Low
20	L	L	L	L	L	M	L	The Project area is ~1km from this viewpoint. The Project is not visible from this viewpoint due to existing vegetation between this viewpoint and the Project. Refer to Plate 34.	Low
21	L	L	L	L	L	M	L	The Project area is >1km from this viewpoint. A glimpse of the northern most portion of the Project may be visible from this viewpoint, located in the midground. This is unlikely to result in a negative effect on the view. Refer to Plate 35.	Low
22	L	L	L	L	L	M	L	As above. Refer to Plate 36.	Low
23	L	L	L	L	L	M	L	The Project area is >1km from this viewpoint. Some glimpses of the Project area (north of Locks Road) may be visible from this viewpoint however most views would likely be difficult to distinguish in the midground. Refer to Plate 37.	Low
24	L	L	H	M	H	M	L	The Project area is <100m from this viewpoint. Without mitigation measures, there are likely to be unobstructed views of the Project in the foreground from this viewpoint and the constructed Project would result in a very prominent physical change to the landscape. Refer to Plate 38.	Moderate-High

	Sensitivity of Receptor		Magnitude of effect						
Viewpoint Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
25	L	L	H	L	H	M	L	The Project area is <100m from this viewpoint. A substantial amount of vegetation exists in the road reserve of Bungama North Road, providing natural screening. This vegetation is not proposed to be cleared for the project, therefore the result of the effect is minor. Refer to Plate 39.	Moderate-Low
26	L	L	H	H	H	M	L	The Project area is <100m from this viewpoint. Without mitigation measures the Project would appear in the foreground as a significant change to the view. Refer to Plate 40	Moderate
27	L	L	M	M	H	M	L	The Project area is <100m from this viewpoint. There may be glimpses of the Project from this viewpoint, however it is noted that the existing Telstra caveat exists in the foreground, obstructing some visibility of the Project. Refer to Plate 41	Moderate-Low
28	L	L	M	M	H	M	L	The Project area is <100m from this viewpoint. The Project would appear in the foreground from this viewpoint, as well as the existing transmission lines and towers that spread through to the midground toward the Bungama Substation. The effect is not considered significant from this viewpoint. Refer to Plate 42	Moderate-Low
29	L	L	M	M	H	M	L	The Project area is <100m from this viewpoint. The Project would appear in the foreground from this viewpoint, as well as the existing gas substation, transmission lines and towers and the entry to the Augusta Highway. The effect is not considered significant from this viewpoint. Refer to Plate 43	Moderate-Low

	Sensitivity of Receptor		Magnitude of effect						
Viewpoint Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
30	L	L	M	M	H	M	L	The Project area is <100m from this viewpoint. The Project would appear in the foreground and some of the midground from this viewpoint, with the Southern Flinders Ranges a prominent element and viewpoint in the background. A substantial amount of vegetation exists within the road reserve of Locks Road, which has some screening potential. Refer to Plate 44.	Moderate-Low
31	L	L	L	M	H	M	L	The Project area is <100m from this viewpoint. A substantial amount of vegetation exists within the road reserve of Locks Road, which has some screening potential. The effect is not considered significant from this viewpoint. Refer to Plate 45.	Moderate-Low
32	L	L	M	H	H	M	L	The Project area is <100m from this viewpoint. Without mitigation measures the Project would appear in the foreground as a significant change to the view. Refer to Plate 46.	Moderate
33	L	L	L	L	H	M	L	The Project area is ~100m from this viewpoint. The Project is unlikely to be visible from this viewpoint due to the existing vegetation within the road reserve of Railway Terrace, both sides of the railway line and the Augusta Highway. The Project is therefore unlikely to result in a change to the landscape from this viewpoint. Refer to Plate 47.	Low
34	L	L	L	L	H	M	L	As above. Refer to Plate 48.	Low
35	L	L	L	L	L	M	L	This viewpoint is ~2km from the Project. The Project is not visible from this viewpoint due to the existing vegetation between this viewpoint and the Project. Refer to Plate 49.	Low

	Sensitivity of Receptor		Magnitude of effect						
Viewpoint Identifier	Susceptibility	Value	Size and scale	Frequency of Use	Distance/ Geographical	Duration	Reversibility	Description	Significance of Effect
36	L	L	L	L	L	M	L	This viewpoint is also ~2km from the Project. Views toward the Project are disrupted by some existing vegetation and the Augusta Highway. Further, this viewpoint observes the existing electricity substation and associated infrastructure. Views from this viewpoint are therefore considered low. Refer to Plate 50.	Low



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:30,000
Job Ref/Version:	11297/ V08

0 0.25 0.5 0.75 1 km

Map Projection: GDA 1994 MGA Zone 54

Figure 5-7

Indicative Visibility from Viewpoints within Landscape

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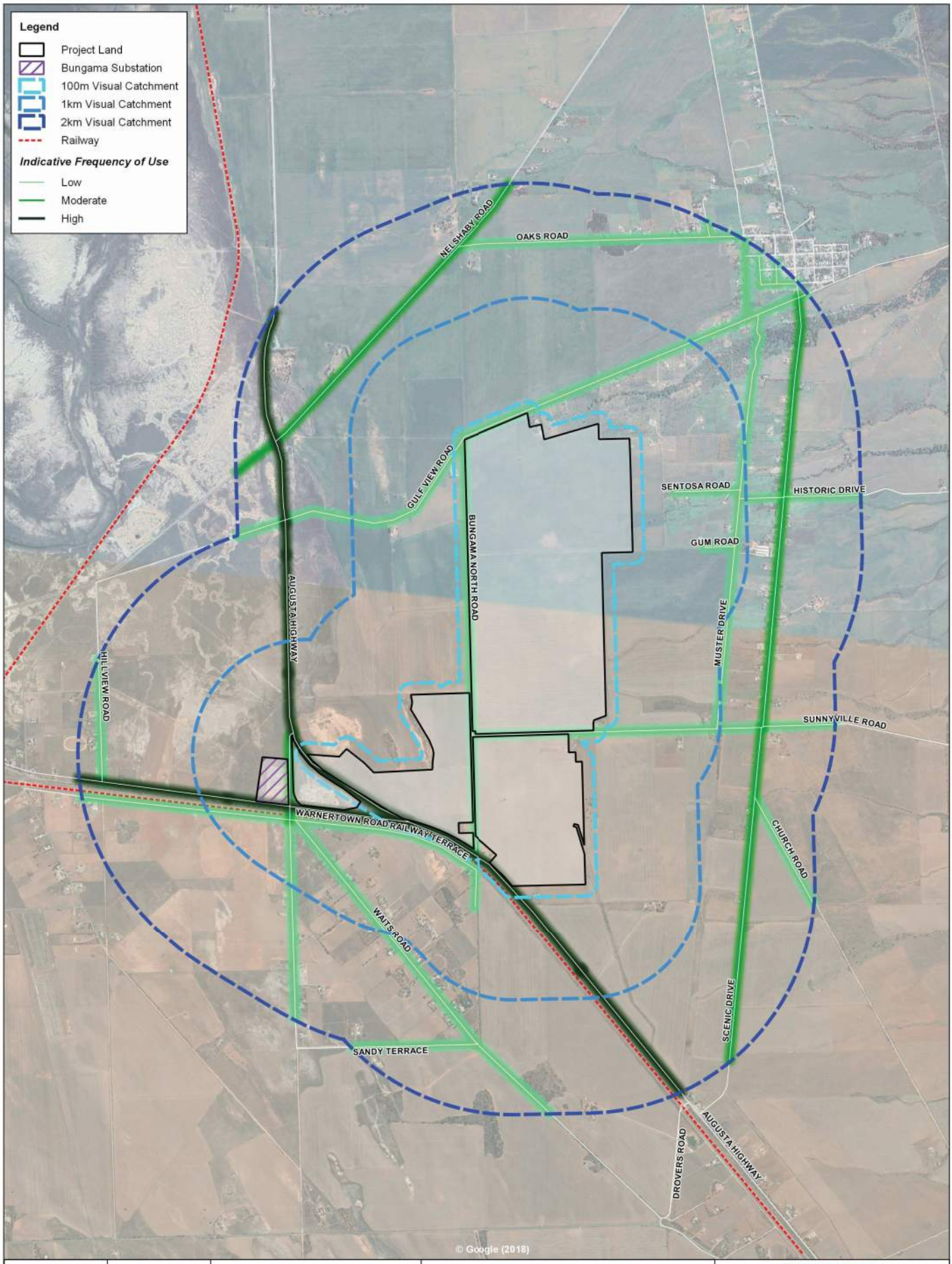
11297_VIA_Viewpoint_Receptors.qgs



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:30,000
Job Ref/Version:	11297/ V08

0 0.25 0.5 0.75 1 km

Map Projection: GDA 1994 MGA Zone 54

Figure 5-8

Indicative Frequency of Use of Transport Corridors

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11297_VIA_Indicative_Frequency.qgs

Plate 15: Viewpoint 1 – Augusta Highway/Nelshaby Road (view direction: east-south-east)

Plate 16: Viewpoint 2 – Augusta Highway/Gulf View Road (view direction: east)

Plate 17: Viewpoint 3 –Augusta Highway (view direction: north-east)

Plate 18: Viewpoint 4 - Warnertown Road (view direction: east-north-east)

Plate 19: Viewpoint 5 -Railway Terrace (view direction: north-east)

Plate 20: Viewpoint 6 – Augusta Highway (view direction: south-east)

Plate 21: Viewpoint 7 – Augusta Highway (view direction: north-west)

Plate 22: Viewpoint 8 – Augusta Highway (view direction: north)

Plate 23: Viewpoint 9 – Augusta Highway (view direction: north-north-west)

Plate 24: Viewpoint 10 – Scenic Drive (viewpoint direction: north-west)

Plate 25: Viewpoint 11 – Scenic Drive (viewpoint direction: west-north-west)

Plate 26: Viewpoint 12 – Scenic Drive (viewpoint direction: west-north-west)

Plate 27: Viewpoint 13 – Muster Drive (viewpoint direction: west-south-west)

Plate 28: Viewpoint 14 – Scenic Drive (viewpoint direction: west)

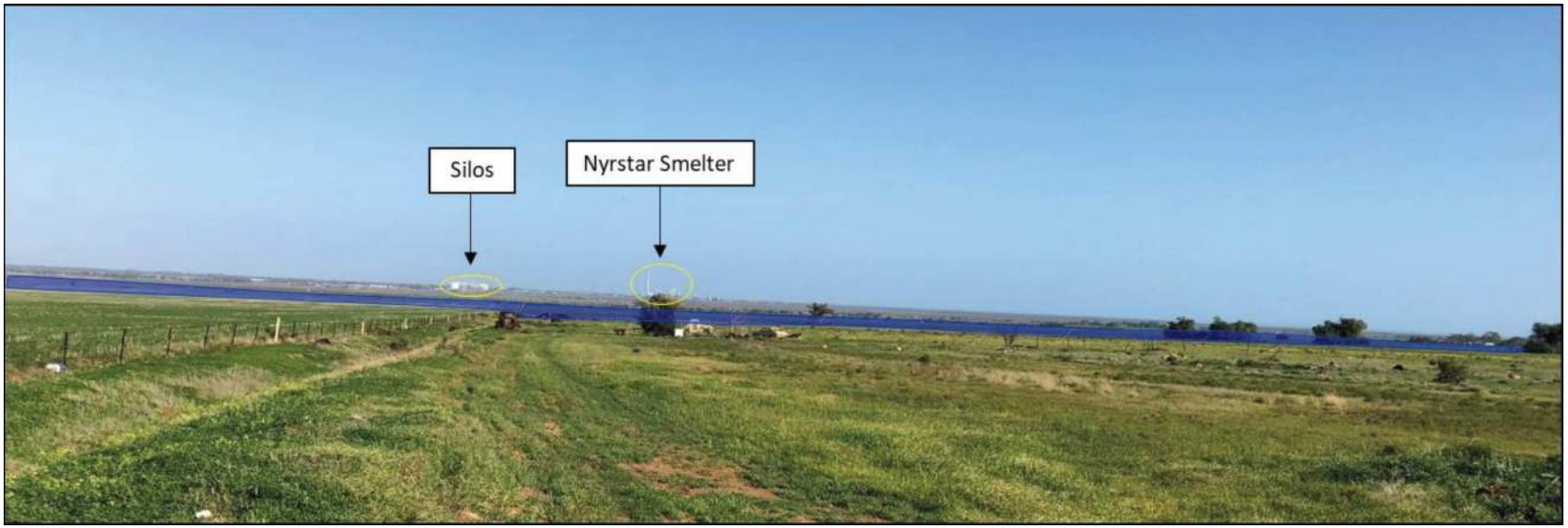


Plate 29: Viewpoint 15- Gum Road (viewpoint direction: west)

Plate 30: Viewpoint 16 – Sentosa Road (viewpoint direction: south-west)

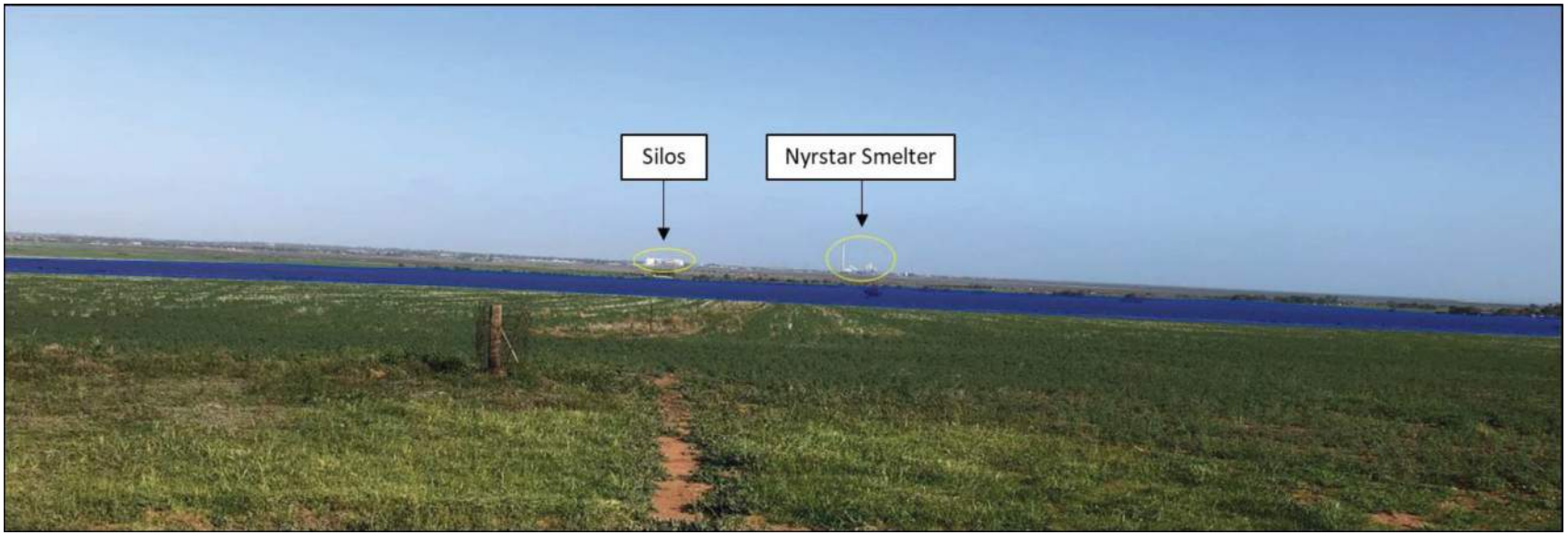


Plate 31: Viewpoint 17 – Sentosa Road (viewpoint direction: west)

Plate 32: Viewpoint 18 – Gulf View Road/Scenic Drive (viewpoint direction: south-west)

Plate 33: Viewpoint 19 – Oaks Road (viewpoint direction: south-west)

Plate 34: Viewpoint 20 - Gulf View Road (viewpoint direction: west-south-west)

Plate 35: Viewpoint 21 – Oaks Road (viewpoint direction: south-south-west)

Plate 36: Viewpoint 22 – Nelshaby Road (viewpoint direction: south)

Plate 37: Viewpoint 23 - Nelshaby Road (viewpoint direction: south-east)

Plate 38: Viewpoint 24 - Bungama North Road (viewpoint direction: east)

Plate 39: Viewpoint 25 - Bungama North Road (viewpoint direction: south)

Plate 40: Viewpoint 26 - Bungama North Road (viewpoint direction: east)

Plate 41: Viewpoint 27 - Bungama North Road/ Locks Road (viewpoint direction: north)

Plate 42: Viewpoint 28 - Bungama North Road/ Locks Road (viewpoint direction: west)

Plate 43: Viewpoint 29 - Bungama North Road/ Locks Road (viewpoint direction: south)

Plate 44: Viewpoint 30 - Bungama North Road/ Locks Road (viewpoint direction: west)

Plate 45: Viewpoint 31 - Locks Road (viewpoint direction: south-west)

Plate 46: Viewpoint 32 - Locks Road (viewpoint direction: north-west)

Plate 47: Viewpoint 33 - Railway Terrace (viewpoint direction: north-east)

Plate 48: Viewpoint 34 - Railway Terrace (viewpoint direction: north)

Plate 49: Viewpoint 35 -Railway Terrace (viewpoint direction: north-west)

Plate 50: Viewpoint 36 - Hillview Road (viewpoint direction: east)

5.3.6. Summary of Potential Visual Receptors

As stated in Section 5.3, a total of 231 potential visual receptors were identified within a 2km Visual Catchment of the Project area, three (3) of which are owned by Project landowners, two (2) of the potential visual receptors are service stations, and one (1) is a caravan park.

The Project landowners are exempt from this VIA as EPS Energy will liaise with them directly on any potential visual mitigation measures. Therefore, a total of 225 potential residential receptors were assessed against the criteria outlined in Section 2.1.2 and the assessment results detailed in Table 5-2, Table 5-3, Table 5-4 and Table 5-5.

A summary of the significance of effects for the potential **residential** receptors is as follows:

Approximately 75% of potential residential receptors scored "Low", approximately 22% scored "Moderate-Low", while approximately 3% scored "Moderate" or higher.

No potential residential receptors scored "High".

These scores indicate an overall "Low" significance of effect to potential residential receptors.

A total of 36 potential viewpoint receptors identified in the viewshed analysis in Section 5.2. Again, it is important to note that the Project in its entirety cannot be viewed from one single viewpoint. The potential viewpoint receptors are assessed against the criteria outlined in Section 2.1.2 and the assessment results detailed in Table 5-7.

A summary of the significance of effects for the potential **viewpoint** receptors is as follows:

Approximately 42% of potential viewpoint receptors scored "Low", approximately 47% scored "Moderate-Low", while approximately 11% scored "Moderate" or higher.

No potential viewpoint receptors scored "High".

These scores indicate an overall "Moderate-Low" significance of effect to potential viewpoint receptors.

Lastly, the longest calculated view time of the Project from the roads surrounding the Project area is approximately 1 minute 48 seconds. Notably, this view is from passengers travelling north or southbound along the Augusta Highway, where most of this view is approximately 1-2km from the Project and the direction of view is east, for northbound receptors and west, for southbound receptors. Further, as these receptors are travelling at a speed of 100km/hr along a highway it is reasonable to assume the actual view time would be significantly less than 1 minute 48 seconds for drivers.

As such, mitigation measures are considered appropriate and are detailed in Section 6.

5.4. CUMULATIVE IMPACTS

Cumulative landscape and visual effects are the combined visual changes (both positive and negative) caused by a proposed development in conjunction with other similar developments. It is also important to consider both the existing and evolving contextual landscape in the region.

As stated, landscapes are not static, but continue to evolve and change, driven by factors such as government policy, the needs of a growing population, economy and climate change. This includes new forms of energy generation, such as renewable energy.

Rural landscapes have historically been the preferred location for large scale electrical infrastructure. Electrical infrastructure, including substations and transmission lines are already prevalent in rural landscapes, which is an important factor when considering cumulative landscape and visual effects of a proposed development. In the context of the Project, this is supported by the Port Pirie Regional Council Development Plan 2017, which lists renewable energy as an envisioned land use for the Primary Production Zone.

Accordingly, numerous renewable energy projects either in operation, approved or proposed are evident within the region where the Project is proposed.

This Section considers the potential cumulative landscape and visual effects that may result from interactions between the Project and both existing, and proposed similar developments within 50km of the Project (Table 5-8). The 50km radius is considered an appropriate scope for this assessment as visibility beyond this distance is impractical. This study area is demonstrated in Figure 5-9, along with the location of other renewable energy projects within the study area.

Table 5-8: Renewable Energy Projects in Operation, Under construction and Proposed Within 50km of the Project

Status	Developer/ Owner	Renewable	Project	Capacity	Expected Cost
In Operation	Infratech	Solar PV	Jamestown Floating Solar Station	3.5 MW	N/A
In Operation	Neoen	Wind	Hornsdale Wind Farm	315 MW	Unknown
In Operation	SSE Australia	Solar PV	Whyalla Solar Farm	4.9 MW	Unknown
Approved/ Under Construction	Adani	Solar PV	Whyalla Solar Farm	160 MW	~$200 M
Approved/ Under Construction	Renew Power Group	Solar PV	Pirie Solar Farm	4.9 MW	~$10 M

Status	Developer/ Owner	Renewable	Project	Capacity	Expected Cost
Proposed	Neoen	Hybrid	Crystal Brook Energy Park	300 MW solar/ 150 MW wind/ 50 MW hydrogen/ 400 MWh battery storage	~$600 M
Proposed	Zen Energy	Solar PV/ Battery	Liberty OneSteel Solar Farm	200 MW/ 120 MW, 140 MWh battery storage	Unknown
Proposed	Pacific Hydro	Wind	Carmody's Hill Wind Farm	140 MW	~$350 M
Proposed	Rise Renewables	Pumped Hydro	Baroota Reservoir Pumped Hydro	270 MW	~$700 M
Proposed	Bungama Solar 1	Solar PV/ Battery	Bungama Solar	280 MW/ 140 MW, 560 MWh battery storage	~$650 M

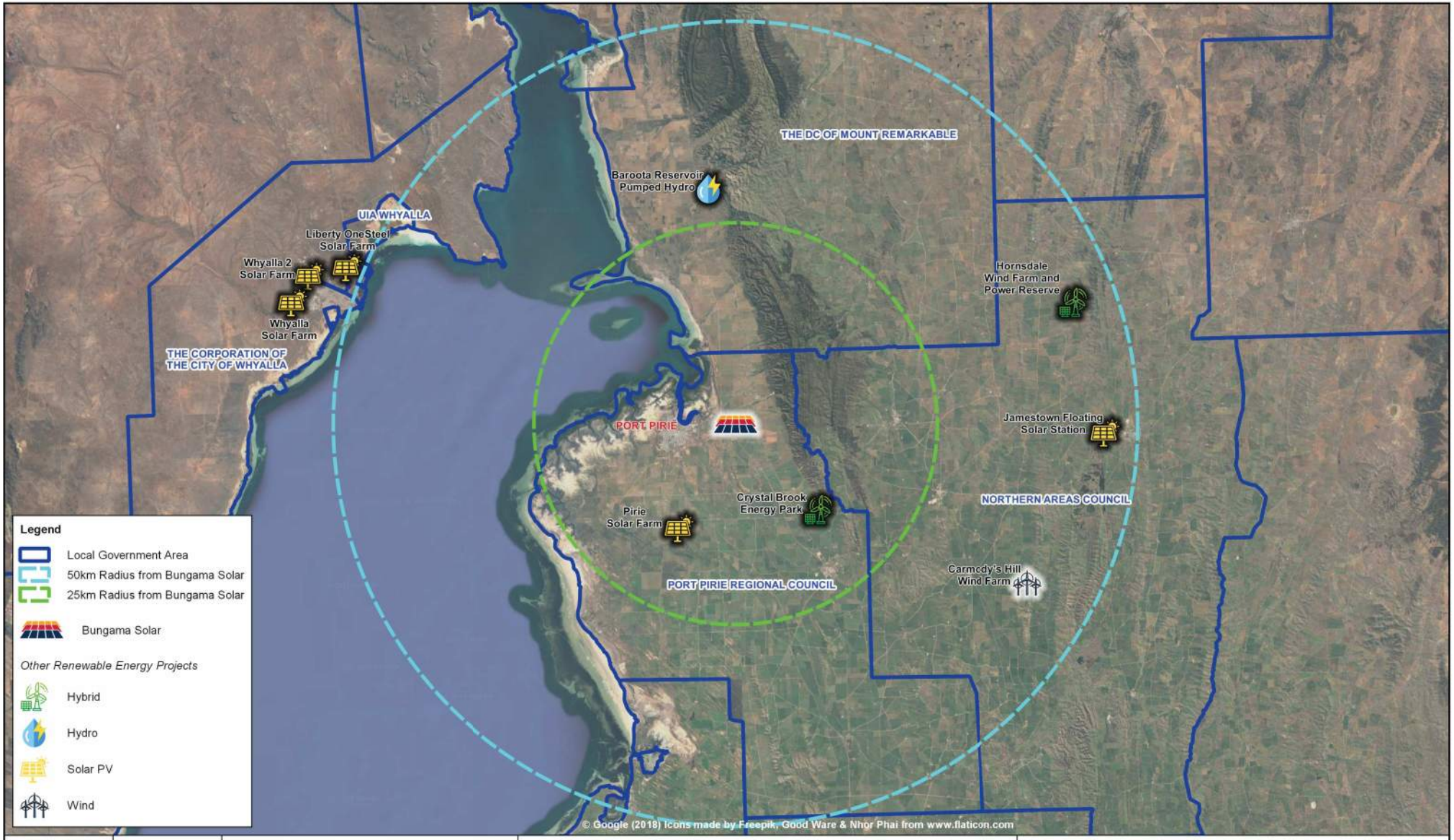
(Source: AltEnergy, 2018)

As demonstrated in Figure 5-9, the nearest other renewable energy development to the Project is in excess of 15km away. It is therefore reasonable to conclude that there will be no cumulative visual effects as these other projects cannot be viewed together from a single viewpoint and can be considered stand-alone visual elements within the landscape.

In the Port Pirie Regional Council Development Plan 2017 renewable energy development is listed as a land use under the Desired Character for the Primary Production Zone therefore it is also reasonable to conclude that the Project will not result in any negative cumulative landscape effects.

The renewable energy projects in operation, approved and proposed within 50km of the Project area support State and Local Government policy to have renewable energy projects, such as Bungama Solar, constructed and operating in South Australia, within rural Council areas and on land with a particular zone including land zoned Primary Production Zone.

As such, mitigation measures are considered suitable and are detailed in Section 6.



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:450,000
Job Ref:	11297/ V02

0 5 10 15 20 25 km

Map Projection: GDA 1994 MGA Zone 54

Figure 5-9

Renewable Energy Projects within 50km of Bungama Solar

Bungama Solar | Bungama SA Australia

21/11/2018

BUNGAMA SOLAR

11297_VIA_Potential_Cumulative_Effects.qgs

6. MITIGATION MEASURES

The assessments outlined in the above sections conclude that the overall visual impact rating to residential and viewpoint receptors is “Low” and “Moderate-Low” respectively.

Notwithstanding, the Community Consultation undertaken for the Project indicated that some residents living in close proximity to the Project were concerned about the visual impact of the Project, while others were impartial. This further demonstrates the variability of individual opinions and subjectivity of a matter such as visual effects. These concerned residents include existing residents and those who own land adjacent to the Project but do not reside on the land as there is no dwelling.

Accordingly, in direct response to the concerns raised by some residents, the Project has implemented an additional key mitigation measure for further ameliorating Project visibility from not only the adjacent existing residences, but also the potential future residences. The additional key mitigation measure is to include in excess of 7km of vegetation screening in the form of a “visual buffer zone” in targeted sections of the Project area to further screen the Project, as illustrated in Figure 6-1.

The visual buffer zone will provide for the following:

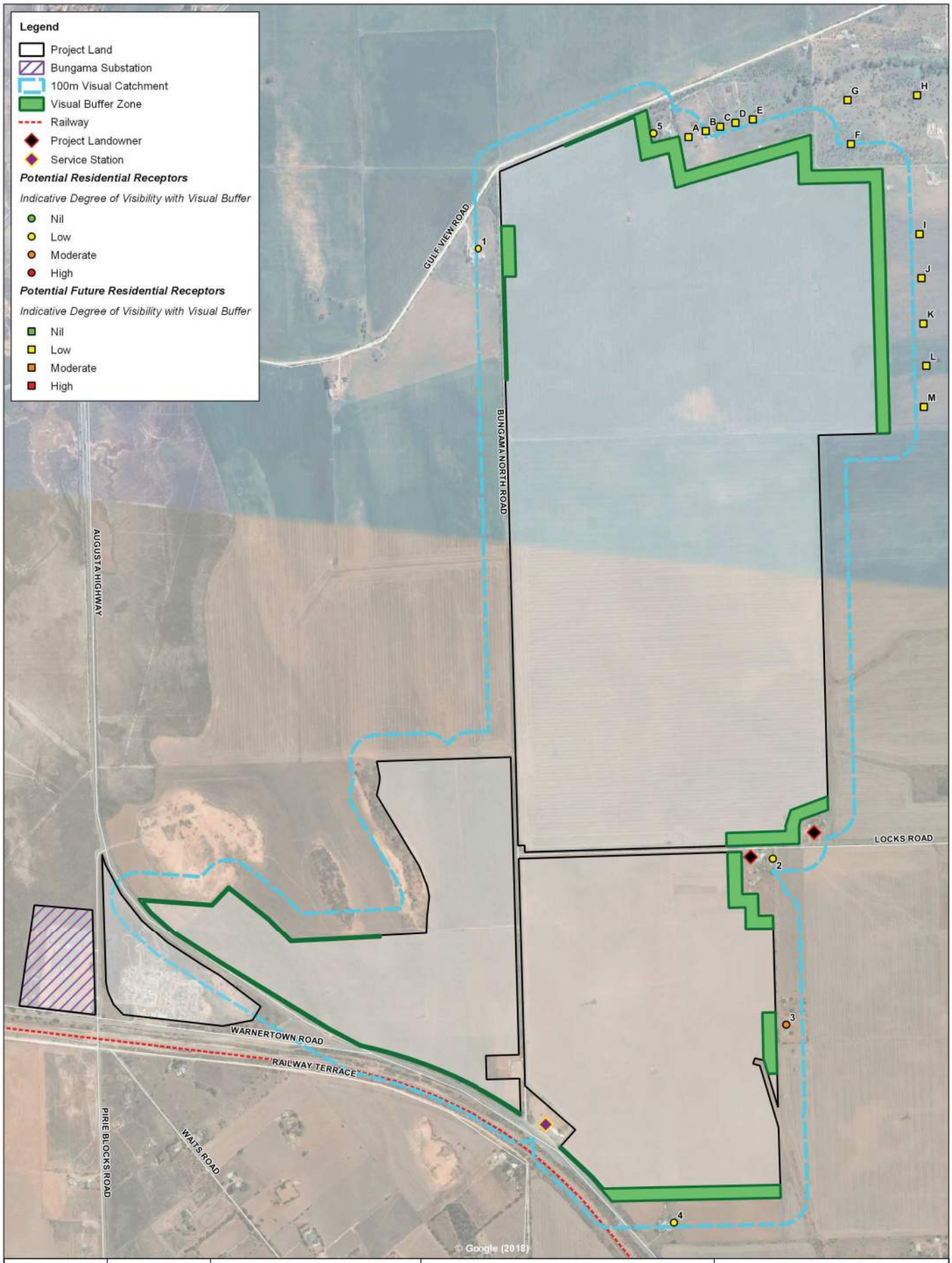
- Setback the PVS behind a 50m visual buffer zone from the Project boundary for existing residential receptors, including the potential future residences, and consequently, reduce the physical size/scale of Project, which also reduces the renewable energy production of the Project;
- Establish and maintain within the 50m visual buffer zone a 10m wide landscape screen of vegetation approximately 3-5m in height, further reducing views of the Project;
- As a result, the buffer zone and screening ameliorate the degrees of visibility of the Project from other receptors located further away from the Project; and
- Further ameliorate the potential for low level glare in accordance with the Glint and Glare assessment.

A Landscape Plan will be prepared and appended to the Development Application to address the details the proposed landscape screen within the visual buffer zones. As stated, the following standard mitigation measures are also proposed to be implemented during the construction and operation phases, where practicable:

- Stakeholder engagement activities will continue to be undertaken to understand relevant landowner and community relationships with visual aspects of the Project;
- The development will occur on land previously cleared of vegetation and which is disturbed;
- Utility buildings or structures will be sited together, away from residences and constructed of materials that are muted in colour;
- Any landscaping that is completed as part of the Project will be selected and designed so that it is complementary to the landscape and visual receptors;

- Any signage will be designed and located so it is sensitive to the landscape and visual receptors;
- Fencing will be sited and designed appropriately to blend with the facility; and
- Construction equipment and waste will be removed from the site in a timely manner.

Specific details relating to the above-mentioned mitigation matters will be considered as part of the construction and operation management plans.



Author:	SW
Reviewer:	SMC/ JB
A3 Scale:	1:13,000
Job Ref/Version:	11297/ V02

0 100 200 300 400 500 m

Map Projection: GDA 1994 MGA Zone 54

Figure 6-1

Potential Residential Receptors - Mitigation Measures

Bungama Solar | Bungama SA Australia

22/11/2018

BUNGAMA SOLAR

11297_VIA_Mitigation_Measures.qgs

7. RESIDUAL VISUAL IMPACTS

Residual visual impacts are the adverse effects remaining after all of the practical methods of mitigation have been implemented. The final stage of this VIA will assess the significance of the residual visual effects of the Project.

As stated throughout this VIA, the Port Pirie Regional Council's Development Plan 2017 details the Council's position on visual impacts from Renewable Energy Facilities. The Development Plan anticipates and encourages the introduction of solar farm infrastructure as new components of the landscape in the Primary Production Zone, accepting that it is difficult to mitigate the visual impacts and any potential visual impact needs to be considered alongside other relevant Development Plan provisions including the aim for an increase in renewable energy generation.

The assessments outlined in earlier sections of this VIA conclude that the overall visual impact rating to the potential residential receptors and landscape receptors is considered "Low" to "Moderate-Low" respectively. The inclusion of the mitigation measures outlined in the section above will further lower the residual visual effects on both potential residential receptors and viewpoint receptors. This is demonstrated in Figure 6-1 where the implementation of a visual buffer zone significantly reduces the previously "High" degree of visibility from residential receptors to "Low".

Considering the above, the residual visual impacts are therefore considered to be acceptable.

8. CONCLUSION

This VIA is intended to provide an assessment of the existing landscape character within the context of the Project's proposed location to determine the potential visual impacts of the Project during both construction and operational phases. It has been noted that the assessment of visual impact is subjective, and the individual consideration of qualitative factors such as scenic quality may differ between receptors as it is influenced by individual values, preferences and affiliations with the landscape and particular views.

The existing landscape and scenic quality of the Project area and surrounding area indicates that the site is appropriate for the Project for the following reasons:

- The bulk and scale of the Project is consistent with the existing electricity infrastructure;
- The uniform and linear layout of the Project is not considered out of character with the existing rural landscape;
- The Project will not be a dominant feature in the landscape; and
- The Project cannot be viewed in its entirety from one single viewpoint.

The assessment has concluded:

- The landscape within and surrounding the Project area can be described as predominantly rural, typified by flat terrain with scattered vegetation and the land is primarily utilised for agricultural purposes;
- Renewable energy and ancillary development is a type of development that is envisaged within the Primary Production Zone in the Port Pirie Regional Council area;
- Utility scale solar projects are becoming more common place in rural setting and are considered acceptable rurally located infrastructure;
- The significance of visual effects on potential residential receptors is categorised as "Low"; and
- The significance of visual effects on potential viewpoint receptors is categorised as "Moderate-Low".

Combined, these assessments form the basis to evaluate the magnitude and significance of the visual impact on the landscape and locality resulting from the Project, which is "Moderate-Low" overall.

While Port Pirie Regional Council's Development Plan 2017 anticipates and encourages the introduction of renewable energy infrastructure as new components of the landscape in the Primary Production Zone and accepts that it is difficult to mitigate the visual impacts of large scale renewable energy infrastructure the mitigation measures detailed in Section 6 are proposed to lower the impacts on landscape and residential receptors as far as practicable. The residual impacts are considered to be acceptable.

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